

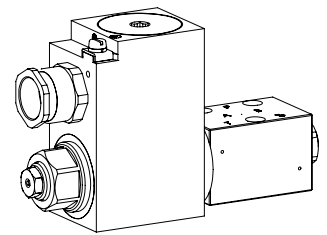
Solenoid operated spool valve

Flange construction

- ◆ 4/2-way impulse valve execution detented
- ◆ 4/3-way with spring centred mid position
- ◆ 4/2-way with spring reset
- ◆ $Q_{max} = 30 \text{ l/min}$
- ◆ $p_{max} = 350 \text{ bar}$

NG4-Mini Wandfluh standard

- ⊕ II 2 G Ex db IIC T6, T4
- ⊕ II 2 D Ex tb III C T80 °C, T130 °C
- ⊕ I M2 Ex db I Mb
- Class I Division 1
- Class I Zone 1



DESCRIPTION

Direct operated solenoid spool valve with 4 connections in 5 chamber design. With the solenoids deenergised, the spool is held in the center position by the spring (4/3), or switched back to the offset position (4/2). With the impulse spool (4/2), the spool is held in the switching position by the detent. The pressure tight encapsulated Ex-protection solenoid coil prevents an explosion on the inside penetrating to the outside as well as an ignitable surface temperature.

APPLICATION

These valves are suitable for applications in explosion-hazard areas, open cast and also in mines. Spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors. The direction of movement is determined by the position of the spool and its symbol. Miniature values are used where both, reduced dimensions and weight are important.

CERTIFICATES

	Surface	Mining	Standard -25 °C to...	Z604 -40 °C to...
ATEX	x	x	x	x
IECEX	x	x	x	x
EAC	x	x	x	x
Australia	x	x	x	x
MA		x	x	
UL / CSA	x		x	x

ACTUATION

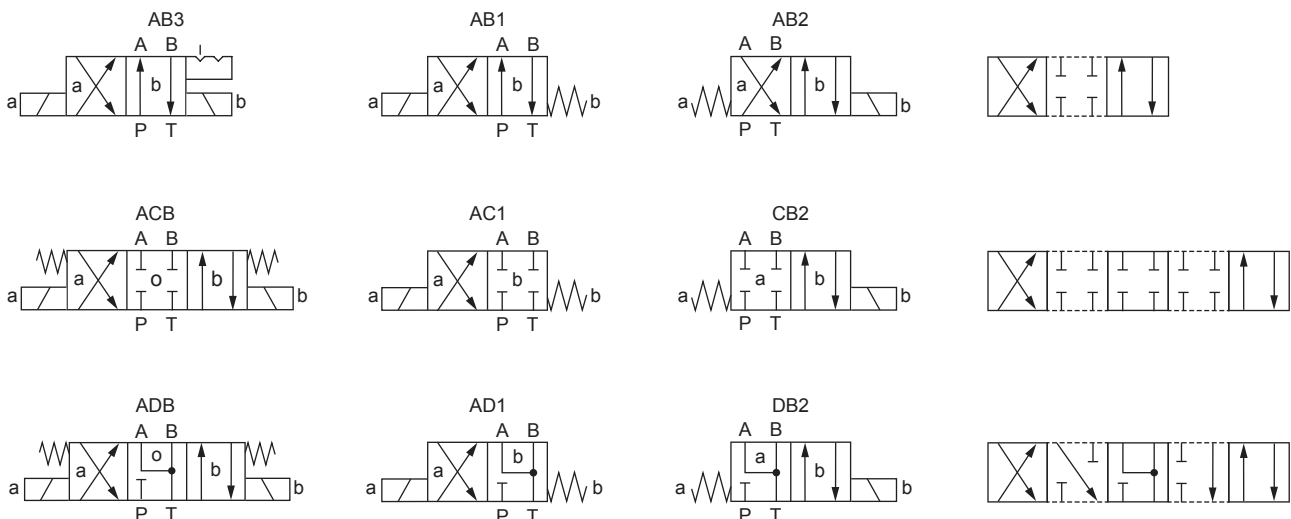
Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	MKY45 / 18x60 (data sheet 1.1-183) MKU45 / 18x60 (data sheet 1.1-184)
Connection	Cable gland for cable Ø 6,5... 14 mm

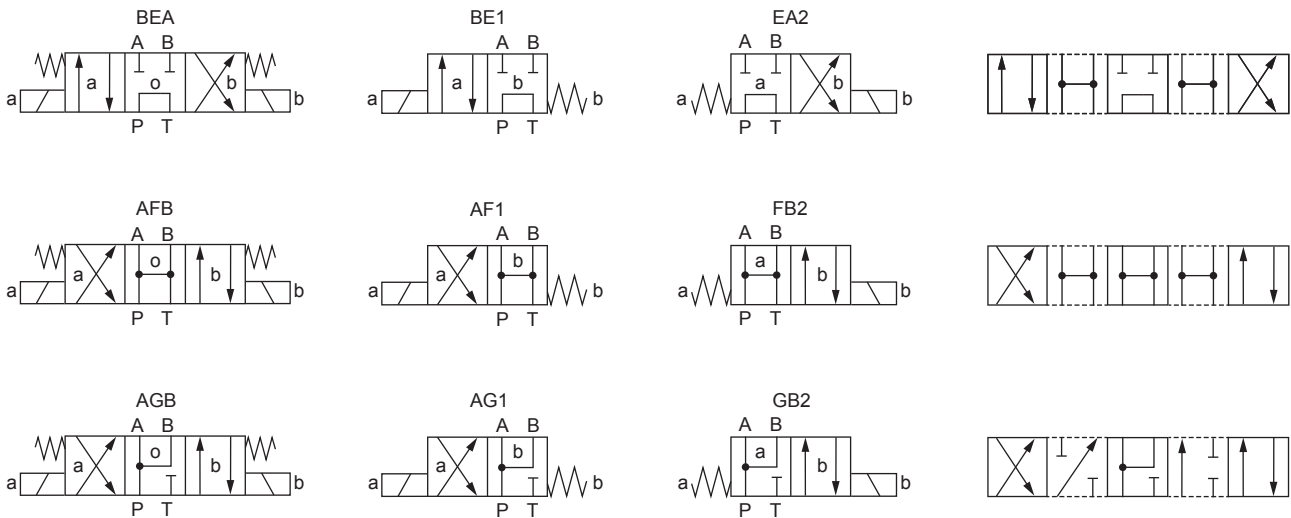
Attention! The UL execution is always supplied without cable gland



The certificates can be found on www.wandfluh.com

SYMBOL



SYMBOL

TYPE CODE

		WD Y F A04 - <input type="text"/> - <input type="text"/> - <input type="text"/> / <input type="text"/> / <input type="text"/> - <input type="text"/> # <input type="text"/>			
Spool valve direct operated					
Explosion proof execution Ex d					
Flange construction					
NG4-Mini to Wandfluh standard					
Designation of symbols acc. to table					
Spool specification	Standard	<input type="text"/>			
	Low Leakage	<input type="text"/> 1/x			
Nominal voltage U_N	12 VDC	<input type="text"/> G12	115 VAC	<input type="text"/> R115	
	24 VDC	<input type="text"/> G24	230 VAC	<input type="text"/> R230	
Nominal power P_N	9 W	<input type="text"/> L9	Ambient temperature up to:		
	15 W	<input type="text"/> L15	40 °C or 90 °C		
	17 W	<input type="text"/> L17	70 °C		
Certification	ATEX, IECEx, EAC	<input type="text"/>			
	Australia	<input type="text"/> AU	UL / CSA	<input type="text"/> UL	
	MA	<input type="text"/> MA			
Sealing material	NBR	<input type="text"/>			
	FKM (Viton)	<input type="text"/> D1			
	NBR -40 °C	<input type="text"/> y-Z604	(only with 15 W)		
Design index (subject to change)					

1.3-24

GENERAL SPECIFICATIONS

Designation	4/2-, 4/3-spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG4-Mini according to Wandfluh standard
Actuation	Ex-protection switching solenoid
Ambient temperature	Operation as T6 -25...+40 °C (L9) Operation as T4 -25...+90 °C (L9) -25...+70 °C (L15 / L17) -40...+70 °C (L15 / L17) In case of $U_N = 12$ VDC, the max. ambient temperature has to be reduced by 10 °C.
Weight	2,6 kg (1 solenoid) 4,4 kg (2 solenoids)
MTTFd	150 years

ELECTRICAL SPECIFICATIONS

Protection class	IP65 / 66 / 67
Relative duty factor	100 % DF
Switching frequency	12'000 / h
Voltage tolerance	± 10 % with regard to nominal voltage
Standard nominal voltage	12 VDC, 24VDC, 115 VAC, 230 VAC AC = 50 to 60 Hz ± 2 %, with built-in two-way rectifier
Standard nominal power	9 W, 15 W, 17 W
Temperature class	Nominal power 9 W: T1...T6 Nominal power 15 W / 17 W: T1...T4

Note! Other electrical specifications see data sheet 1.1-183 and 1.1-184


HYDRAULIC SPECIFICATIONS

Working pressure	$p_{max} = 350$ bar ($p_T < 20$ bar) $p_{max} = 315$ bar ($p_T > 20$ bar)
Tank pressure	$p_{Tmax} = 160$ bar
Maximum volume flow	$Q_{max} = 30$ l/min, see characteristic
Leakage oil	See characteristics
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm ² /s...320 mm ² /s
Temperature range fluid	Operation as T6 NBR -25...+40 °C (L9) FKM -20...+40 °C (L9) Operation as T4 NBR -25...+70 °C (L9 or L15 / L17) FKM -20...+70 °C (L15 / L17) FKM -20...+90 °C (L9) NBR 872 -40...+70 °C (L15 / L17)
Contamination efficiency	Class 20 / 18 / 14
Filtration	Required filtration grade $\beta_{10...16} \geq 75$, see data sheet 1.0-50

MANUAL OVERRIDE

HB6 as standard
 Optionally: HN (K)
 → see data sheet 1.1-311

SURFACE TREATMENT

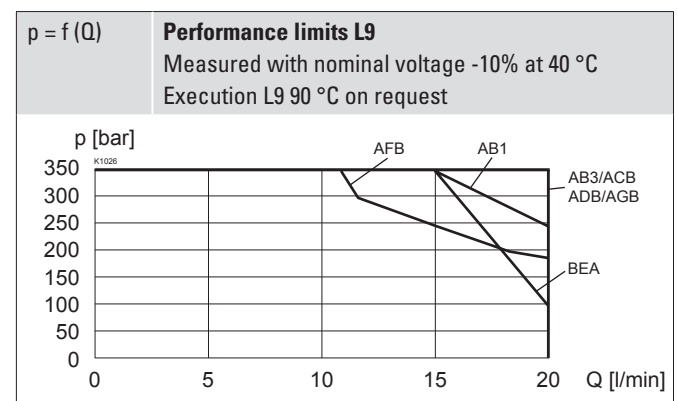
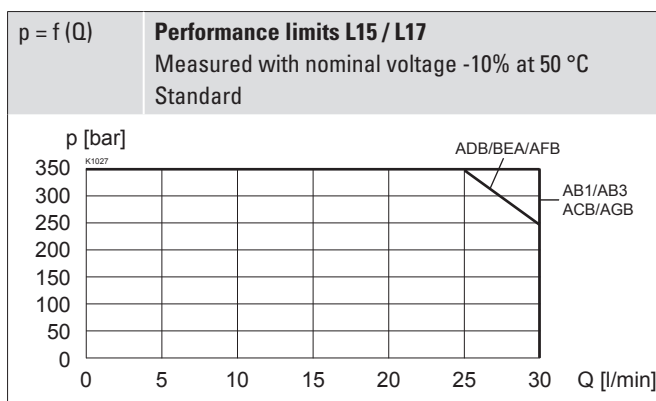
- ◆ The valve body is painted with a two component paint
- ◆ The armature tube, the slip-on coil and the plug screw are zinc-nickel coated

COMMISSIONING

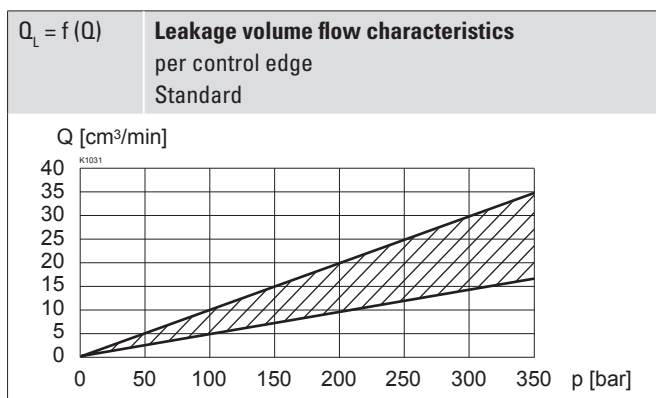
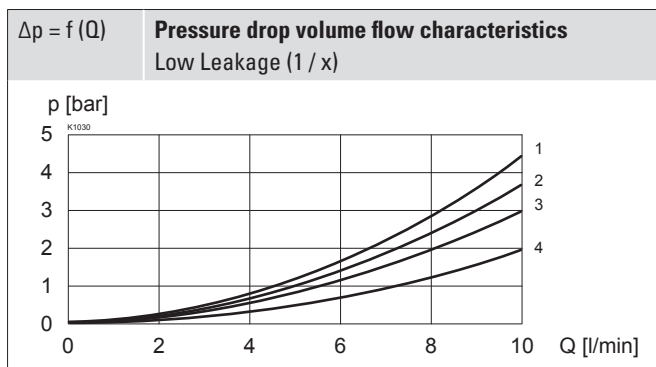
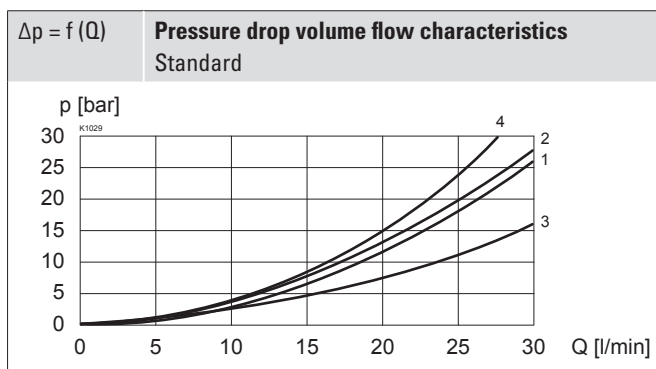
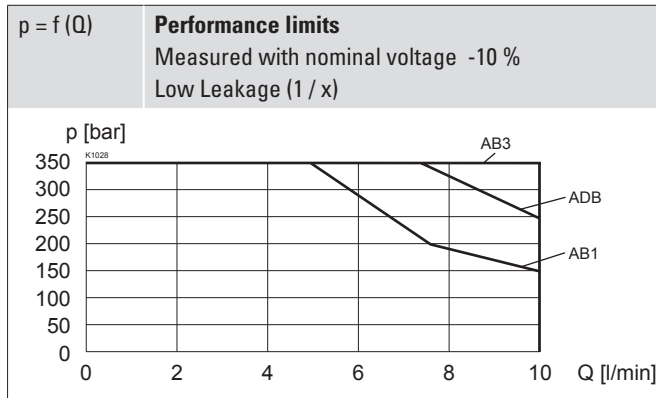
Attention! The solenoid coil must only be put into operation, if the requirements of the operating instructions supplied are observed to their full extent. In case of non-observance, no liability can be assumed.


PERFORMANCE SPECIFICATIONS

Oil viscosity $\nu = 30$ mm²/s

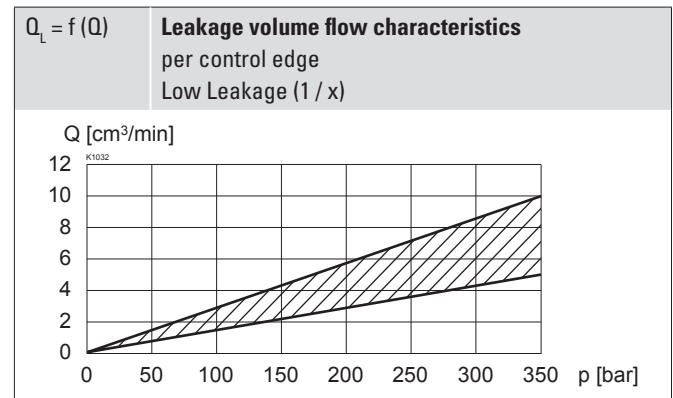


PERFORMANCE SPECIFICATIONS

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


Symbol	Flow direction				
	P - A	P - B	P - T	A - T	B - T
AB1	2	2	-	1	1
AB3	2	2	-	1	1
ACB	2	2	-	1	1
ADB	2	2	-	1	1
BEA	1	1	4	1	1
AFB	1	1	3	1	1
AGB	1	1	-	1	1

Symbol	Flow direction				
	P - A	P - B	P - T	A - T	B - T
AB1	1	1	-	1	2
AB3	1	1	-	1	2
ADB	1	1	-	4	3


Note!


With the L15 / L17 execution for ambient temperatures up to 70 °C, the performance specifications have been evaluated with an ambient temperature of 50 °C

Attention!


For valves for the temperature ranges „-40 °C to...“ (Z604) the leakage volume flow can be up to eight times higher.

INSTALLATION NOTES

Mounting type	Flange mounting 3 fixing holes for socket head screws M5 x 40 or M5 x 50 (with distance plate BDP4/12)
Mounting position	Any, preferably horizontal
Tightening torque	Fixing screws $M_0 = 5,2 \text{ Nm}$ (screw quality 8.8, zinc coated) $M_0 = 9 \text{ Nm}$ knurled nut

Note! The length of the fixing screw depends on the base material of the connection element.



Attention! For stack assembly please observe the remarks in the operating instructions



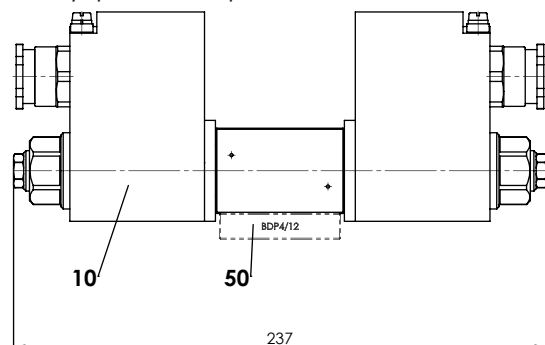
SEALING MATERIAL

NBR or FKM (Viton) as standard, choice in the type code

DIMENSIONS

4/3-way spool valve (spring centring)

4/2-way spool valve (impulse)



Dimensions of the solenoid coil see data sheet 1.1-183 and 1.1-184
The distance plate BDP4/12 has to be ordered separately

PARTS LIST

Position	Article	Description
10	263.6...	Solenoid coil MK.45 / 18 x 60
12	154.2603	Knurled nut Ex M18 x 1,5 x 18
15	253.8001	HB6 Manual override „-25 °C to...“
	253.8025	HB6-Z604 Manual override „-40 °C to...“
17	160.2251	O-ring ID 25,07 x 2,62 (NBR)
18	160.2170	O-ring ID 17,17 x 1,78 (NBR)
40	239.2206	Socket head screw M20 x 1
50	173.1450	Distance plate BDP4 / 12
70	160.2052	O-ring ID 5,28 x 1,78 (NBR)
	160.6052	O-ring ID 5,28 x 1,78 (FKM)
110	111.1080	Cable gland M20 x 1,5

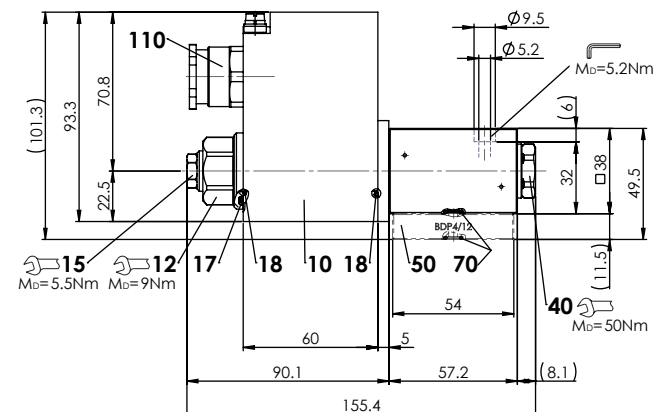
STANDARDS

Explosion protection	Directive 2014 / 34 / EU (ATEX)
Flameproof enclosure	EN / IEC / UL 60079-1, 31
Cable entry	EN 60079-0, 1, 7, 15, 31
Mounting interface	Wandfluh standard
Protection class	EN 60 529
Contamination efficiency	ISO 4406

ACCESSORIES

Fixing screws	Data sheet 1.0-60
Threaded subplates	Data sheet 2.9-10
Multi-station subplates	Data sheet 2.9-50
Module type manifold blocks	Data sheet 2.9-90
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

4/2-way spool valve (spring reset)



HYDRAULIC CONNECTION

