

Solenoid operated spool valve, intrinsically safe

Flange construction

- ◆ 4/2-way impulse valve
- ◆ 4/3-way with spring centred mid position
- ◆ 4/2-way with spring reset
- ◆ $Q_{max} = 20 \text{ l/min}$
- ◆ $p_{max} = 300 \text{ bar}$

NG6

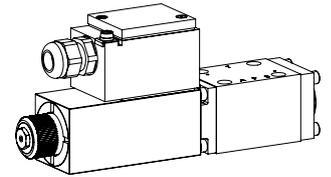
ISO 4401-03

Ex ia I Ma

Ex ia II C T5 / T6 Ga

Ⓧ II 1 G Ex ia II C T6, T5

Ⓧ I M1 Ex ia I Ma



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. Intrinsic safety is achieved by limiting the electric energy in the solenoid circuit by means of a separate intrinsically safe power supply. Therewith sparking is prevented from forming.

APPLICATION

These valves are suitable for applications in explosion-hazard areas, open cast and underground 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.

CERTIFICATES

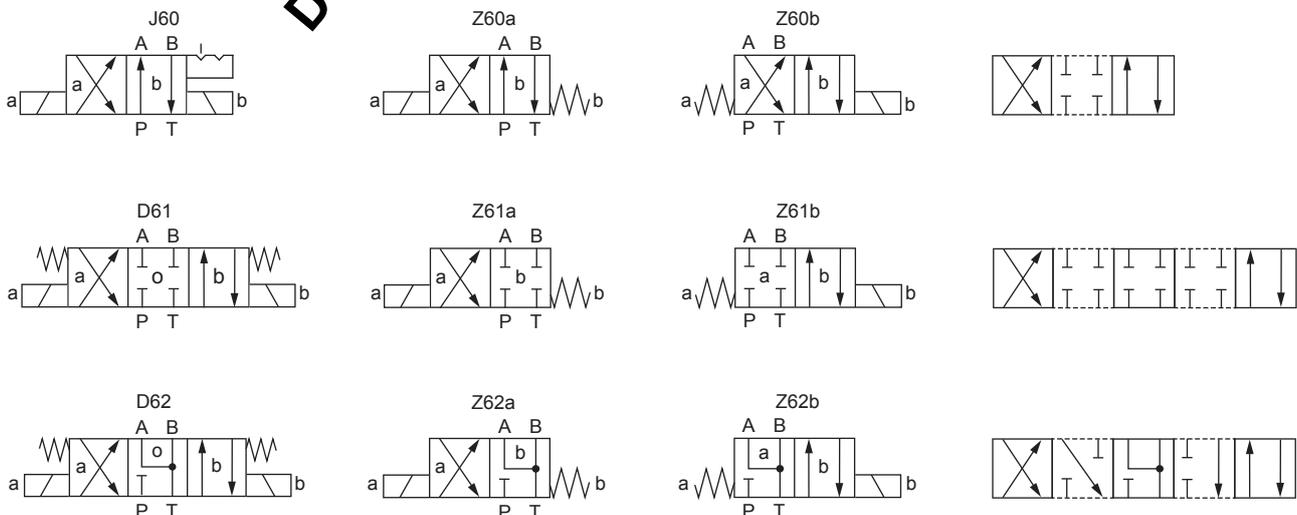
	Surface gas and dust	Mining
ATEX	x	x
IECEX	x	

The certificates can be found on www.wandfluh.com

ACTUATION

Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	M.Z45 (Data sheet 1.1-185) rotatable in steps of 90 ° and easy exchangeable
Connection	<ul style="list-style-type: none"> ◆ Cable gland for cable $\varnothing 6,5 \dots 12 \text{ mm}$, two phase conductors +/- as well as one ground conductor ◆ Connector socket EN 175301 – 803

SYMBOL



TYPE CODE

A EXi 4 - - / T6 / - #

International standard interface ISO	
Explosion proof execution, Ex ia	
Number of control ports	
Designation of symbols acc. to table	
Coil resistance	100 Ω <input type="text" value="100"/> 152 Ω <input type="text" value="152"/>
Equipment group	
Connection execution	<input type="text" value="D"/> <input type="text" value="K"/>
Sealing material	NBR <input type="text"/> FKM (Viton) <input type="text" value="D1"/>
Design index (subject to change)	

1.3-40

GENERAL SPECIFICATIONS

Designation	4/2-, 4/3-pool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG6 according to ISO 4401-03
Actuation	Ex-protection switching solenoid
Ambient temperature	-25...+45 °C (operation as T6) -25...+60 °C (operation as T1...T5)
Weight	3,2 kg (1 solenoid) 5,3 kg (2 solenoids)
MTTFd	150 years

ELECTRICAL SPECIFICATIONS

Protection class	IP65
Relative duty factor	Continuous operation
Switching frequency	1'800 / h
Service life time	10 ⁷ (number of switching cycles, theoretically)
Voltage tolerance	± 10 % with regard to nominal voltage
Limiting current at 50 °C	I _{min} = 90 mA (100 Ω execution) I _{min} = 64 mA (152 Ω execution)
Temperature class	T1...T6
Coil resistance	100 Ω, 152 Ω
Minimum power consumption	P _{min} = 0,81 W (100 Ω execution) P _{min} = 0,62 W (152 Ω execution)

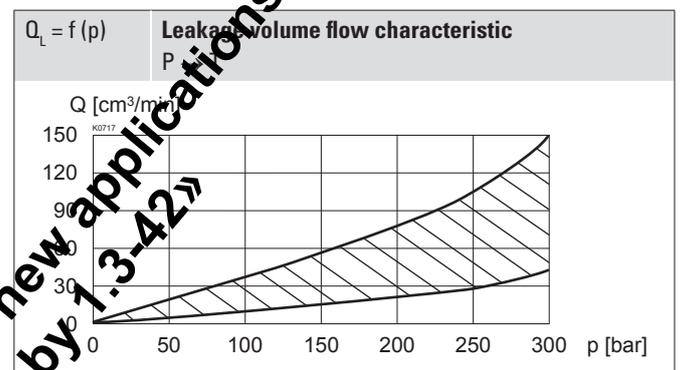
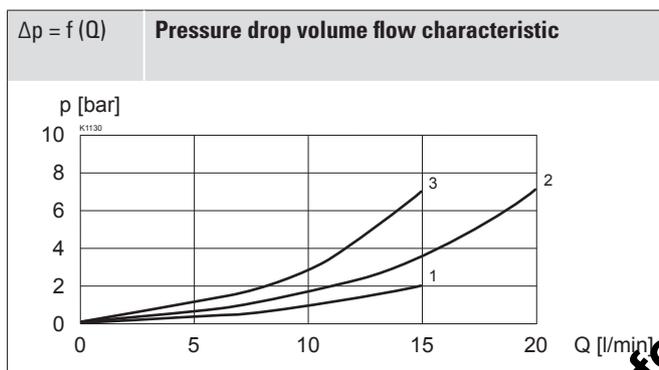
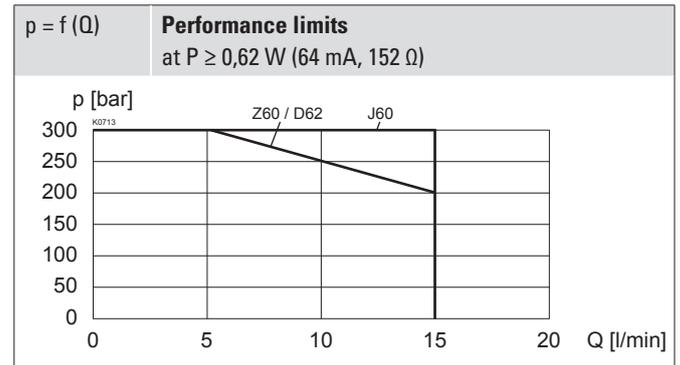
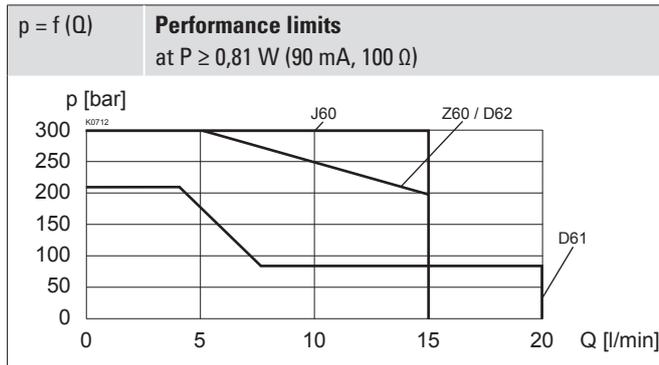
HYDRAULIC SPECIFICATIONS

Working pressure	p _{max} = 300 bar
Tank pressure	p _{T, max} = 100 bar
Maximum volume flow	Q _{max} = 20 l/min, see characteristics
Leakage oil	See characteristics
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm ² /s...320 mm ² /s
Temperature range fluid	-25...+45 °C (operation as T6) -25...+60 °C (operation as T1...T5)
Contamination efficiency	Class 20 / 18 / 14
Filtration	Required filtration grade β 10...16 ≥ 75, see data sheet 1.0-50

Note!


Other electrical specifications, recommended power supply and safety-related limits see data sheet 1.1-185

PERFORMANCE SPECIFICATIONS

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


Symbol	Flow direction				
	P - A	P - B	P - T	A - T	B - T
Z60	3	3	-	2	2
J60	2	2	-	2	2
D61 / Z61	2	2	-	2	2
D62 / Z62	2	2	-	2	1

Attention!  If, because of the given operating conditions, during the switching process volume flows occur which exceed the power limit of the valve, these have to be limited by a throttle or an orifice in connection P.
In case of a continuous flow through, the throttle or orifice, depending on the system behaviour, an additional heating-up of the valve is possible. This has to be appropriately taken into account by the user.

SURFACE TREATMENT

- ◆ The valve body is painted with a two component paint
- ◆ The armature tube and the slip-on coil are zinc-nickel coated
- ◆ The covers and the socket head screws are zinc coated

SEALING MATERIAL

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

COMMISSIONING

Attention!  Intrinsically safe valves must be controlled only by a suitable, certified power supply from out of the hazardous area (see Operating Instructions). The selection of the power supply and the wiring must be carried out by qualified personnel. Recommended power supplies and safety-related limit values according to data sheet 1.1-185

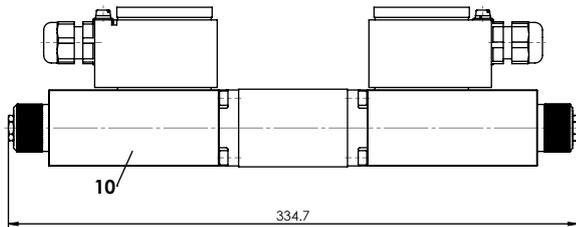
STANDARDS

Explosion protection	Directive 2014 / 34 / EU (ATEX)
Mounting interface	ISO 4401-03
Protection class	EN 60 529
Contamination efficiency	ISO 4406

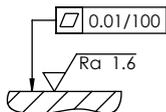
DIMENSIONS

4/3-way spool valve (spring centring)

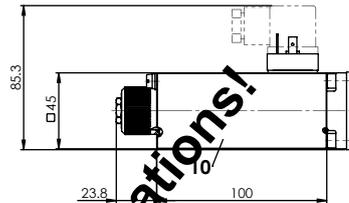
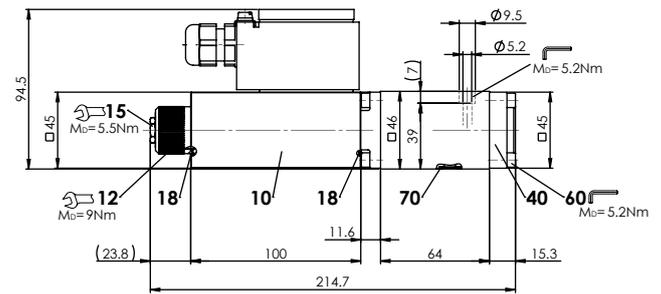
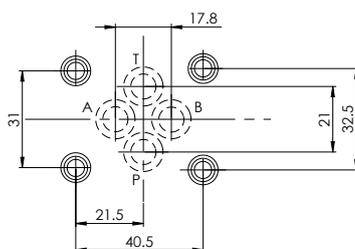
4/2-way spool valve (impulse)



Requirement of the flange surface of the counter piece



4/2-way spool valve (spring reset)


HYDRAULIC CONNECTION

PARTS LIST

Position	Part No.	Description
15	263.66..	Solenoid coil M.Z45-...
12	032.9614	Knurled nut M22 x 1 x 22
15	253.8000	Manual override HB4,5
18	160.2204	O-ring ID 20,35 x 1,78 (NBR)
40	058.4200	Cover
60	246.2117	Socket head screw M5 x 16 DIN 912
70	160.2093	O-ring ID 9,25 x 1,78 (NBR)
	160.6092	O-ring ID 9,25 x 1,78 (FKM)

INSTALLATION NOTES

Mounting type	Flange mounting 4 fixing holes for socket head screws M5 x 45
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


ACCESSORIES

Fixing screws	Data sheet 1.0-60
Threaded subplates	Data sheet 2.9-05
Multi-station subplates	Data sheet 2.9-45
Horizontal mounting blocks	Data sheet 2.9-85
Technical explanations	Data sheet 1.0-100
Hydraulic fluids	Data sheet 1.0-50
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430