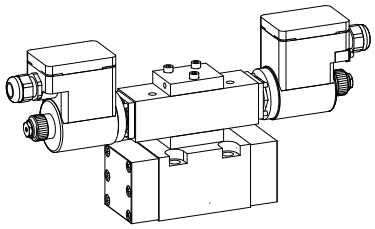
Proportional directional valve
- **pilot operated**
- **not pressure compensated**
- **Q_{max} = 220 l/min**
- **Q_N = 80 l/min**
- **p_{max} = 315 bar**

NG10
ISO 4401-05

II 2 G / II 2 D
EEx em II



DESCRIPTION
Pilot controlled spool valve, in five chamber design actuated by explosion proof proportional solenoid.
EEx: in accordance with european standards EN 50014, EN 50019, EN 50028
e: increased safety
m: encapsulation
Group II: for all applications except mining
Zone 1 / 21 (and 2 / 22):
explosive mixtures present intermittently
EC-type examination certificate:
PTB 01 ATEX 2129 X

FUNCTION
Depending on selected spool, the valve controls flow symmetrically or in meter-in or in meter-out mode. The spool is piloted by proportional pressure relief valves. Set-up, function and interaction of main and pilot stage are shown with the hydraulic diagram. To control the valve Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION
High flow capacity and stiffness of the pilot system make this valve an ideal device for fast acceleration and deceleration, high speed, and sensitive adjustment of motion of an actuator. Application: Tooling machines, lifting and haulage systems, textile and plactic industry, mobile applications.

TYPE CODE

A EX VPW ☐ 4 ☐ - 80 - ☐ - S1788 - G24/ ☐ # ☐

International interface ISO		
Pilot operated valve:		
Explosion proof solenoid		
Pilot operated proportional spool valve		
Control mode:		
Symmetrical	S	(see control mode
Meter-in	V	on page 2)
Meter-out	R	
No. of control ports		
Type charts/Symbols acc. to table 1.10. - 50500/2		
Nominal flow at 10 bar pressure drop over 2 metering edges		
Q_N = 80 l/min		
Pilot pressure supply and drain:		
Pressure supply (x) and drain (y) internal	ti	
Pressure supply (x) and drain (y) external	te	
Pressure supply (x) internal drain (y) external	pi	
Pressure supply (x) external drain (y) internal	pe	
Terminal box without cable		
Standard nominal voltage U_N: 24 VDC		
Execution: T1…T4	T4	
T1…T6	T6	
Design-Index (Subject to change)		

GENERAL SPECIFICATIONS

Nominal size	NG10 acc. to ISO 4401-05
Designation	4/2-, 4/3-way proportional-control valve
Construction	Pilot operated spool valve
Mounting	Flange, 4 fixing holes for socket head cap screws M6x65
Fastening torque	M_D = 9,5 Nm (screw quality 8.8)
Pipe connection	Connection plates, Multi-station flange subplate, Longitudinal stacking system
Mounting position	any, preferably horizontal
Admissible ambient temp.*:	
Execution T4	-20…+40 °C
Execution T6	-20…+70 °C (operation as T1…T4)
	-20…+40 °C (operation as T5/T6)
Weight: 4/2-way	m = 6 kg
4/3-way	m = 7,3 kg

HYDRAULIC SPECIFICATIONS

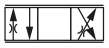
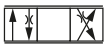
Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß 6…10≥75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Admissible fluid temp. *:	
Execution T4	-20…+40 °C
Execution T6	-20…+70 °C (operation as T1…T4)
	-20…+40 °C (operation as T5/T6)
Working pressure	p_{max} = 315 bar (connection P, A, B)
Tank pressure in T	p_{max} = 160 bar (te,pi) p_{max} = 5 bar (ti,pe)
Nominal volume flow	Q_N = 80 l/min (Q_{max} = 220 l/min) at 10 bar pressure drop over 2 metering edges
Pilot pressure	p_V = 25…315 bar
Leakage volume flow	on request
Hysteresis	on request

* Deviating pressure medium - or ambient temperatures are possible for special arrangements after checking and authorisation by a responsible inspector. Measures for the prevention of the exceeding of the admissible solenoid surface - and internal temperatures can be: a good ventilation, low ambient temperatures (for higher pressure medium temperatures), limitation of the maximum possible power supply voltage, a short switching-on duration, installation on large heat dissipating blocks, etc. The responsibility in all cases lies with the operator, resp. with his inspector.

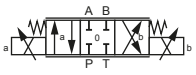
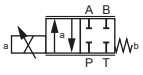
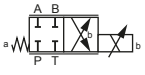
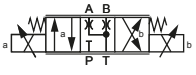
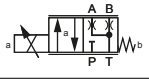
ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight
Standard nominal voltage	U_N = 24 VDC DC = Ripple 20%; wired with VDR
Limiting current	T4: I_G= 585 mA T6: I_G= 220 mA
Relative duty factor	100% DF
Protection class	IP65 / IP67 acc. to EN 60 529
Connection/Power supply	Through cable entry for cable diameter 6...12 mm
Designation	
Execution T4:	II 2 G EEx em II T4 (for gas) II 2 D IP65 T130°C (for dust)
Execution T6:	II 2 G EEx em II T6 (for gas) II 2 D IP65 T80°C (for dust)
Power	
Execution T4:	14 W at I_G= 585 mA
Execution T6:	5,8 W at I_G= 220 mA

CONTROL MODE

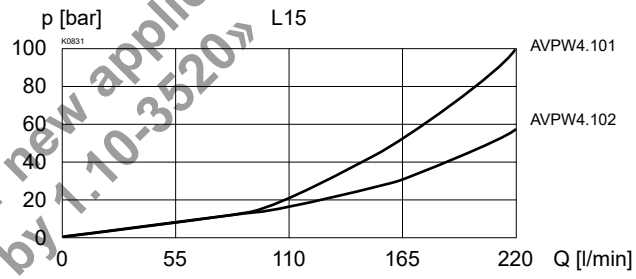
Symmetrical	S	
Meter-in	V	
Meter-out	R	

TYPE CHARTS / DESIGNATIONS OF SYMBOLS

	S V R .D101
	S V R .Z101a
	S V R .Z101b
	V .D102
	V .Z102a
	V .Z102b

CHARACTERISTICS oil viscosity υ = 30 mm²/s

$\Delta p = f(Q)$ Pressure loss/flow-characteristic over 2 metering edges



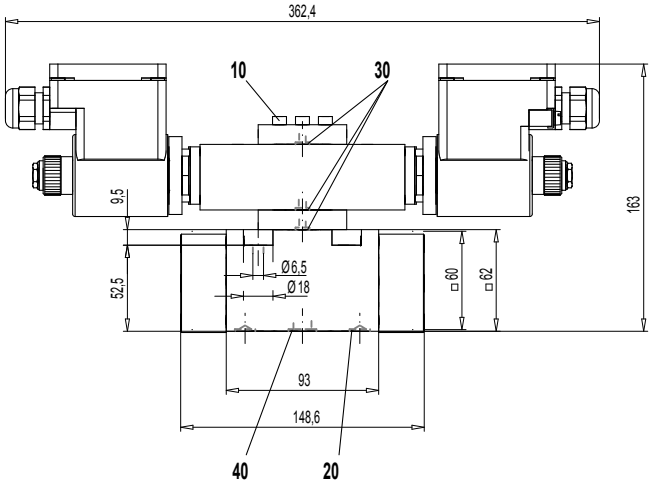
START-UP

1. In the power supply for each solenoid a fuse of an appropriate rating (max. 3 times I_B of solenoid, DIN 41571 or IEC 127) respectivly a motor circuit breaker with electromagnetic an thermal interruption must be installed. The fuse may be located in the power supply unit for the solenoid or between power supply and solenoid. The voltage rating for the fuse must be equal or higher than the one for the solenoid.

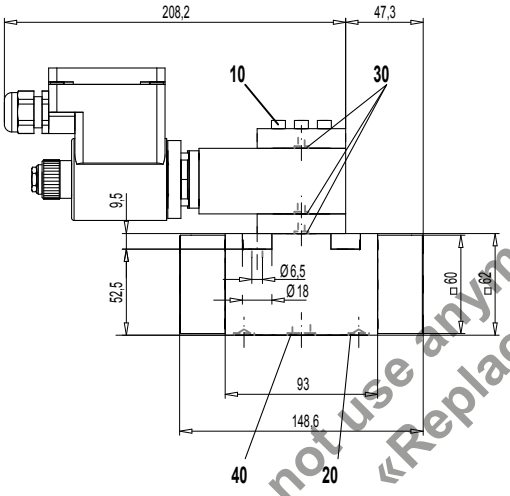
2. The solenoid coils must only be operated on the valve belonging to them. More information concerning the installation and commissioning is contained in the operating instructions supplied together with the solenoid coil.

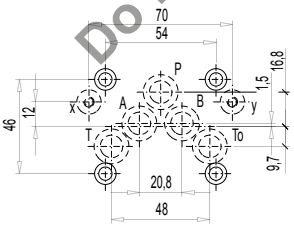
DIMENSIONS

4/3-way valve



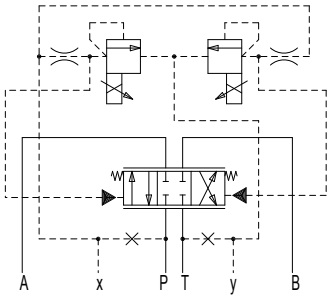
4/2-way valve



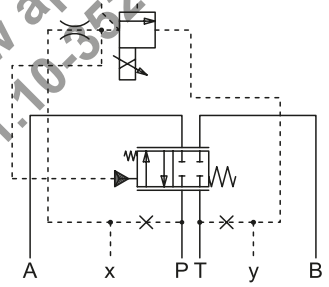


HYDRAULIC DIAGRAM

4/3-way valve



4/2-way valve



PARTS LIST

Position	Article	Description
10	246.2156	Cyl. screw M5x55 DIN 912
20	160.2093	O-ring ID 9,25x1,78
30	160.2052	O-ring ID 5,28x1,78
40	160.2140	O-ring ID 14,00x1,78

Mounting instruction

To screw the main valve body (M_D = 9,5 Nm, quality 8.8) to the base plate the pilot valve (M_D = 5,5 Nm, quality 8.8). must be taken off.

ACCESSORIES

Sub-plates	Register 1.9
Proportional-amplifier	Register 1.13

Technical explanation see data sheet 1.0-100E