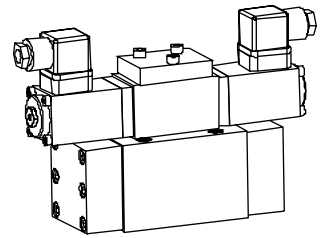


Proportional directional valve

- pilot operated
- not pressure compensated
- $Q_{max} = 220$ l/min
- $p_{max} = 315$ bar

**NG10
ISO 4401-05**

DESCRIPTION

Pilot controlled spool valve, in five chamber design actuated by a proportional solenoid. Wet solenoid in oil. Spool with precisely machined notches on control edges produce a progressive volume flow characteristic similar to proportional flow valves. Valve body with paint coating, the other external surfaces are phos-phated.

FUNCTION

Depending on selected spool, the valve controls flow symmetrically or in meter-in or in meter-out mode. The spool is piloted by a proportional pressure relief valve. Set-up, function and interaction of main and pilot stage are shown with the hydraulic diagram. To control proportional valves use Wandfluh proportional amplifiers (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 plastic industry, mobile applications.

CONTENT

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TYPE CODE

International mounting interface ISO	A	V	P	W		4		- 80 -			#
Pilot operated proportional spool valve											
Control mode:											
Symmetrical	S	(see control mode on page 2.)									
Meter-in	V										
Meter-out	R										
Number of control ports											
Description of symbols acc. to table 1.10-95/2											
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										
Supply voltage	12 VDC	G12									
	24 VDC	G24									
Design-Index (Subject to change)											

GENERAL SPECIFICATIONS

Nominal size	NG10 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 any, preferably horizontal
Mounting position	
Ambient temperature	-20...+50°C
Weight: 4/2-way	m = 4,9 kg
4/3-way	m = 5,3 kg

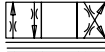
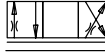

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406, class 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	$p_{max} = 315$ 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. For values which deviate from the nominal flow Q_N the valve pressure drop Δp can be calculated by following formula:
	$\Delta p = \Delta p_N \cdot \left(\frac{Q}{Q_N}\right)^2$
	Q_N = Nominal volume flow
	Q = Effective volume flow
	Δp_N = Nominal pressure drop 10 bar
Pilot pressure	$p_v = 25...315$ bar
Min. volume flow	$Q_{min} = 0,05$ l/min
Leakage volume flow	on request
Resolution	1 mA *
Repeatability	≤ 1 % *
Hysteresis	≤ 2 % *
	* by optimal dithersignal

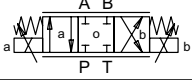
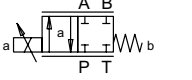
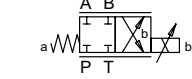
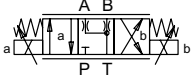
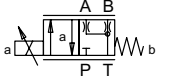
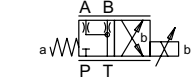
ELECTRICAL SPECIFICATIONS

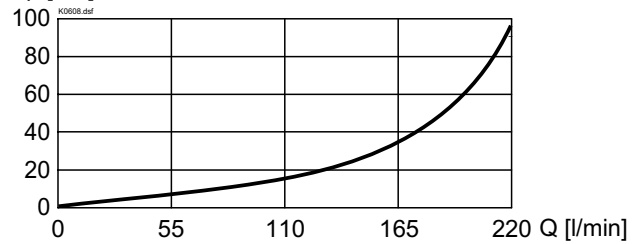
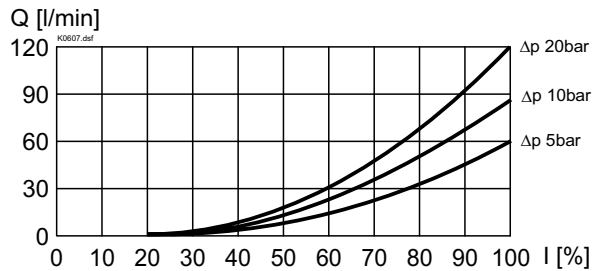
Construction	Proportional solenoid, wet pin push type, pressure tight.	
Standard-Nominal voltage	U = 12 VDC	U = 24 VDC
Limiting current	I _G = 1250 mA	I _G = 680 mA
Relative duty factor	100% DF (see data sheet 1.1-430)	
Protection class	IP 65 to DIN 40050	
Connection / Power supply	Over device plug connection to ISO 4400 / DIN 43650 (2P+E)	
Other electrical specifications	see data sheet 1.1-116 (PI35V-M40)	

CONTROL MODE

Symmetrical	S	
Meter-in	V	
Meter-out	R	

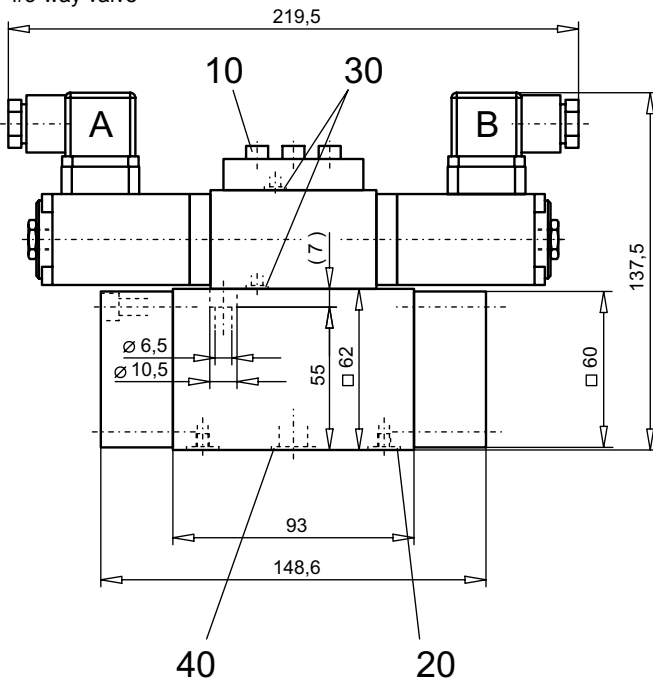
TYPE CHARTS / DESIGNATIONS OF SYMBOLS

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

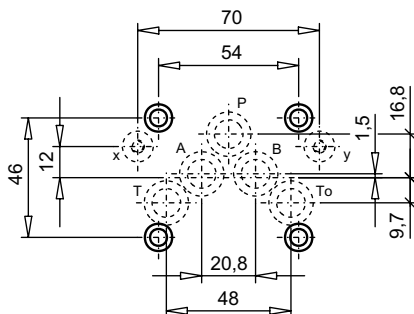
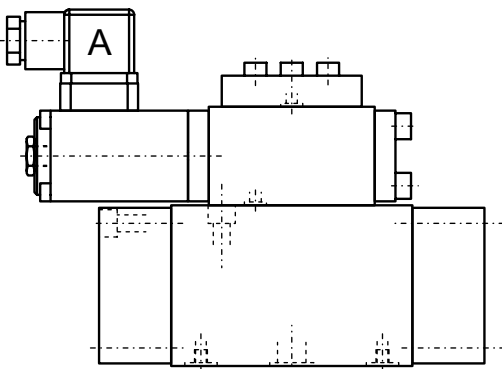
CHARACTERISTICS oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$
 $\Delta p = f(Q)$ Pressure loss/flow-characteristic over 2 metering edges
 Δp [bar]

 $Q = f(I)$ Volume flow-signal-characteristics


DIMENSIONS

4/3-way valve



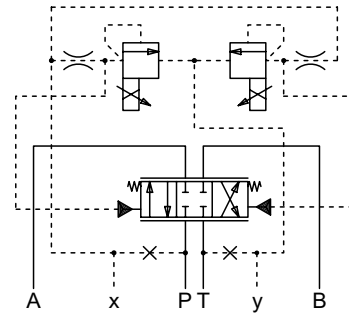
4/2-way valve


Mounting instruction

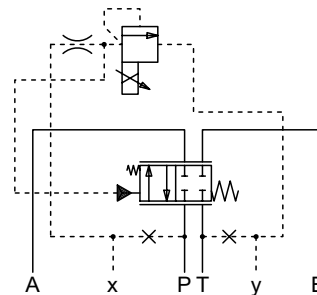
To screw the main valve body to the base plate the pilot valve must be taken off ($M_D = 9,5 \text{ Nm}$, quality 8.8).

HYDRAULIC DIAGRAM

4/3-way valve



4/2-way valve


PARTS LIST

Position	Article	Description
10	246.2155	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

ACCESSORIES

Sub-plates
 Proportional-amplifier

Register 1.9
 Register 1.13

Technical explanation see data sheet 1.0-100E