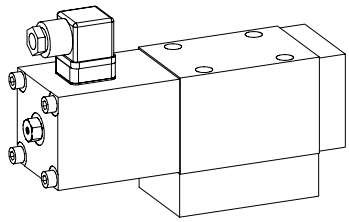
Proportional directional valve
- **pressure compensated**
- **Q_{max} = 60 l/min**
- **p_{max} = 250 bar**

NG10
ISO 4401-05



DISCRIPTION
Directly controlled spool valve, actuated by a Wandfluh proportional solenoid (VDE standard 0580), in five chamber design. Wet solenoid in oil. Spools with precision machined oil passages control the oil volume wich is proportional to the solenoid current. Reduced pressure drop achieved by optimised flow channels. Precise spool fit, long life. Spool made of hardened steel, valve body made of high quality cast iron suitable for hydraulic valves. Flange type, threaded connection by means of a connecting plate.

FUNCTION
Spool stroke, aperture and volume flow increase proportionally to the increase in the electric current at the proportional solenoid. This special design senses and compensales load induced flow changes. Flow remains constant with varying pressure. The optimised shape of the spool results in a good resolution of flowimportant for sensitive motion control. To control the valve Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION
Because of the high resolution and low hysteresis, these valves are particularly suitable for demanding tasks. Applications:
handling operations, robots, actuators, remote controlled vehicles, tool making and paper production machines, in other words anywhere where precise control systems are needed.

TYPE CODE

VWS 4 [ ] - [ ] - TF - [ ] # [ ]

Control valve, proportional

Number of control ports

Description of symbols acc. to table

Nominal volume flow Q_N

30 l/min	30	50 l/min	50
40 l/min	40	60 l/min	60

Normally closed

Nominal voltage U_N

12 VDC	G12
24 VDC	G24

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	Direct operated spool valve
Mounting	Flange, 4 holes for socket cap screws M6 x 90
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
Ambient temperature	-20…+50 °C
Weight: 4/2-way	m = 5,5 kg
4/3-way	m = 6,9 kg

HYDRAULIC SPECIFICATIONS

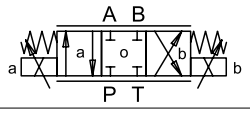
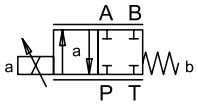
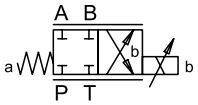
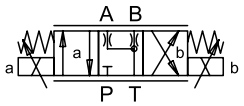
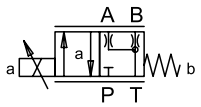
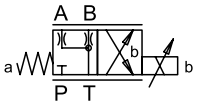
Fluid	Mineral oil, other fluid on request	
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß6…10≥75) refer to data sheet 1.0-50/2	
Viscosity range	12 mm²/s…320 mm²/s	
Fluid temperature	-20…+70 °C	
Working pressure in port P, A, B	p_{max} = 250 bar	
Tank pressure in port T	p_{max} = 100 bar	
Nominal volume flows	Q_N = 30 l/min	Q_N = 50 l/min
	Q_N = 40 l/min	Q_N = 60 l/min
Min. volume flow	Q_{min} = 0,5 l/min	
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 = 2300 mA	I_G = 1150 mA
Relative duty factor	100% DF (see data sheet 1.1-430)	
Protection class	IP 65 to EN 60 529	
Connection / Power supply	Over device plug connection to ISO 4400 / DIN 43650 (2P+E)	

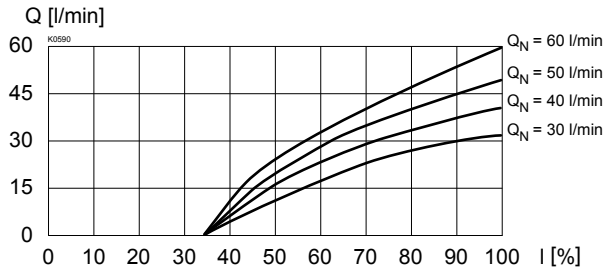
Other electrical specifications see data sheet 1.1-155 (PI60V)

TYPE CHARTS / DESIGNATIONS OF SYMBOLS

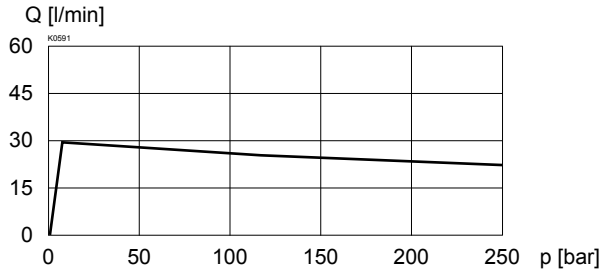
	D101
	Z101a
	Z101b
	D102
	Z102a
	Z102b

CHARACTERISTICS oil viscosity υ = 30 mm²/s

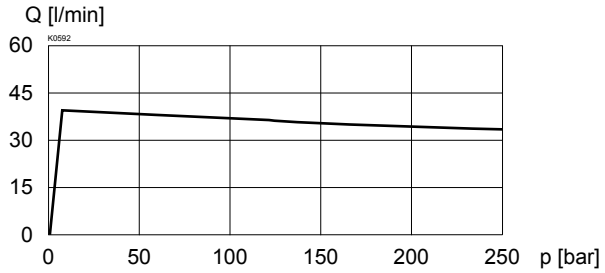
Q = f (I) Volume flow-signal-characteristics



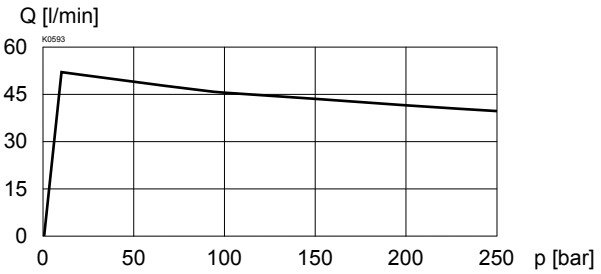
Q = f (p) Volume flow-pressure-characteristics
Q_N = 30 l/min



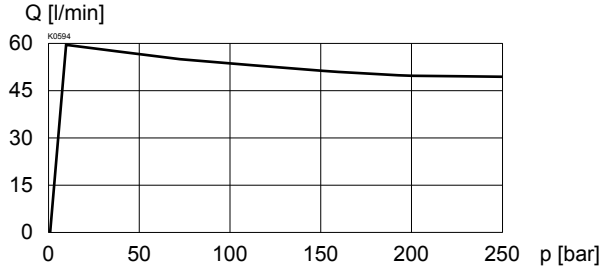
Q = f (p) Volume flow-pressure-characteristics
Q_N = 40 l/min



Q = f (p) Volume flow-pressure-characteristics
Q_N = 50 l/min

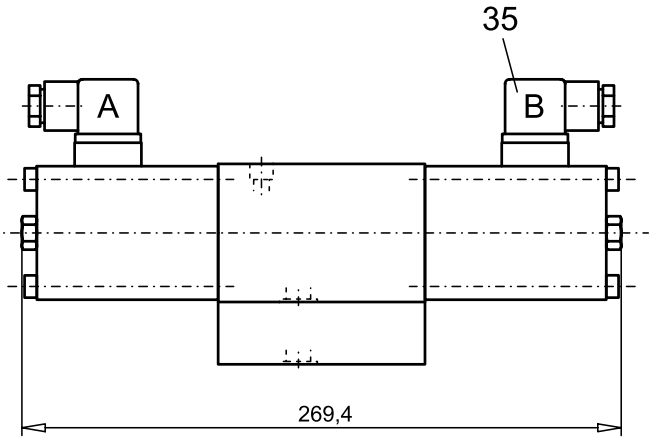


Q = f (p) Volume flow-pressure-characteristics
Q_N = 60 l/min

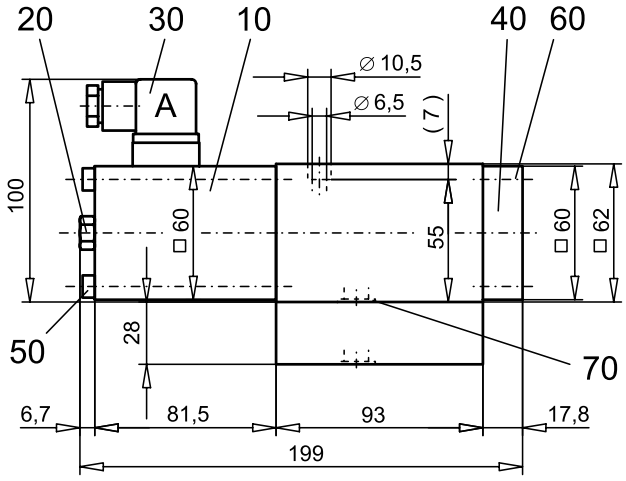


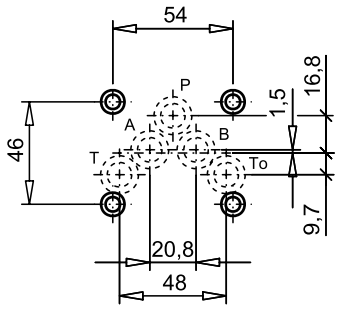
DIMENSIONS

4/3-way valve



4/2-way valve





PARTS LIST

Position	Article	Description
10	256.5454 256.5418	Proportional solenoid PI60V-G24-M40 Proportional solenoid PI60V-G12-M40
20	253.8002	Plug with integrated manual override HB8,5
30	219.2001	Plug A (grey)
35	219.2002	Plug B (black)
40	059.2205	Cover
50	246.3190	Socket head cap screw M6 x 90 DIN 912
60	246.3121	Socket head cap screw M6 x 20 DIN 912
70	160.2140	O-ring ID 14,00 x 1,78

ACCESSORIES

Sub-plates register 2.9
Proportional-amplifier register 1.13

Technical explanation see data sheet 1.0-100