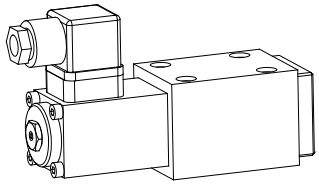
Proportional directional valve
- **pressure compensated**
- **Q_{max} = 20 l/min**
- **p_{max} = 250 bar**

NG6
ISO 4401-03



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, radar controlled vehicles, tool making and paper production machines, in other words anywhere where precise control systems are needed.

CONTENT

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HYDRAULIC SPECIFICATIONS.....1
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TYPE CODE

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

Proportional control valve

Number of control ports

Symbol type see chart on page 1.10-11/2

Nominal volume flows:

Q_N = 2,5 l/min	2,5	Q_N = 10 l/min	10
Q_N = 5 l/min	05	Q_N = 15 l/min	15
Q_N = 20 l/min	20		

Normally closed

Standard nominal voltage U_N: 12 VDC G12; 24 VDC G24

Design-Index (Subject to change)

GENERAL SPECIFICATIONS

Nominal size	NG6 acc. to ISO 4401-03
Designation	4/2-, 4/3-way proportional control valve
Construction	Direct operated spool valve
Mounting	Flange, 4 holes for socket cap screws M5 x 45
Fastening torque	M_D = 5,5 Nm (screw quality 8.8)
Pipe connection	Connection plates, Multi-station flange subplate, Longitudial stacking system
Mounting position	any
Ambient temperature	-20…+50 °C
Weight: 4/2-way	m = 1,85 kg
4/3-way	m = 2,85 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	p_{max} = 250 bar (Ports P, A, B)
Tank pressure	max tank pressure in T p_{max} = 160 bar
Nominal volume flows	Q_N = 2,5 l/min; Q_N = 5 l/min; Q_N = 20 l/min; Q_N = 10 l/min; Q_N = 15 l/min
Min. volume flow	Q_{min} = 0,02 l/min
Leakage volume flow	on request
Resolution	1 mA *
Repeatability	≤ 1 % *
Hysteresis	≤ 2 % *

* by optimal dithersignal

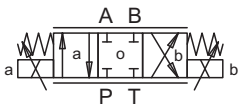
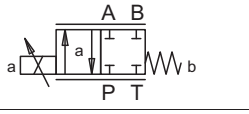
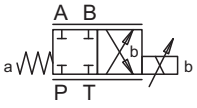
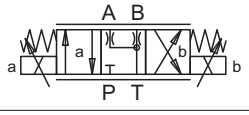
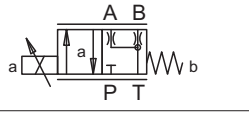
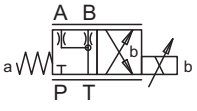
ELECTRICAL SPECIFICATIONS

Construction: Proportional solenoid, wet pin push type, pressure tight.

Standard-Nominal voltage	U = 12 VDC	U = 24 VDC	
Limiting current: PI35V	I_G = 1250 mA	I_G = 680 mA	for VWS4.61 Q_N 2,5…10 l/min for VWS4.62 Q_N 2,5…10 l/min
PI45V	I_G = 1780 mA	I_G = 810 mA	for VWS4.61 Q_N 15…20 l/min for VWS4.62 Q_N 15…20 l/min

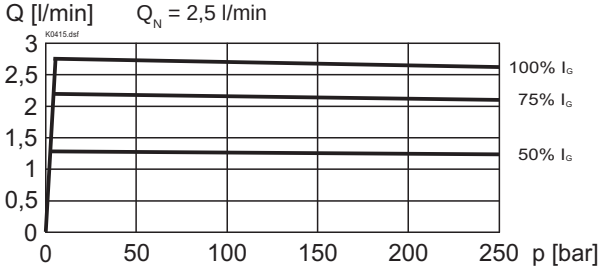
Relative duty factor: 100 % DF (see data sheet 1.1-430)
Prodection class: IP 65 to EN 60 529
Connection / Power supply: Over device plug connection to ISO 4400 / DIN 43650 (2P+E)
Other electrical specifications see data sheet: 1.1-115 (PI35V)
1.1-130 (PI45V)

TYPE CHARTS / DESIGNATIONS OF SYMBOLS

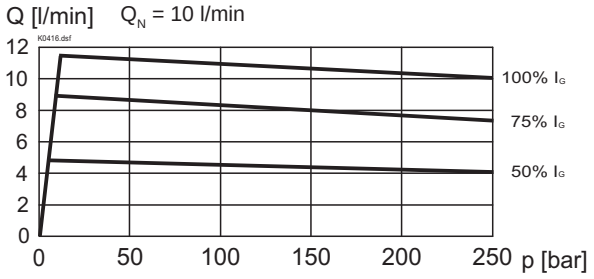
	D61
	Z61a
	Z61b
	D62
	Z62a
	Z62b

CHARACTERISTICS oil viscosity υ = 30 mm²/s

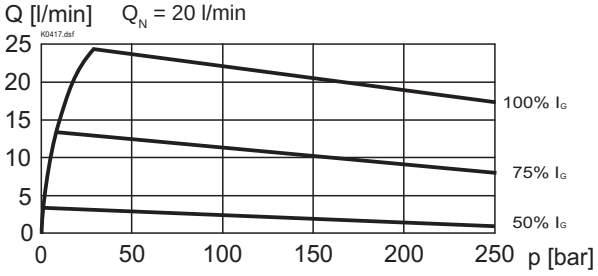
Q = f (p) Volume flow-pressure-characteristics



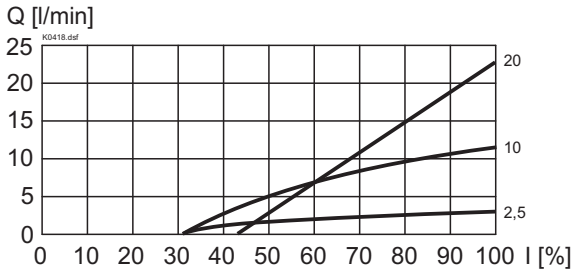
Q = f (p) Volume flow-pressure-characteristics



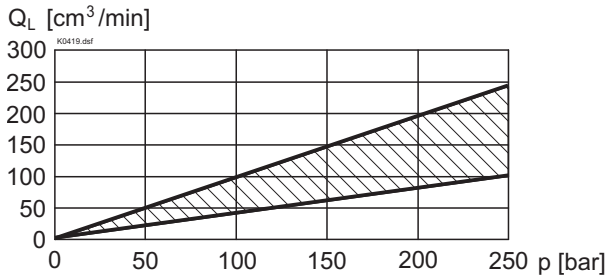
Q = f (p) Volume flow-pressure-characteristics



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

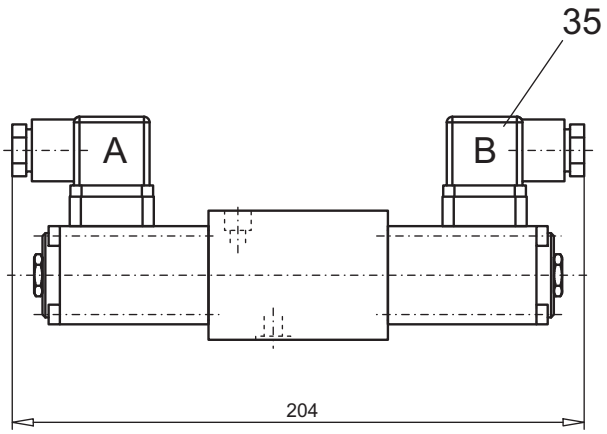


Q_L = f (p) Leakage volume flow characteristics per control edge

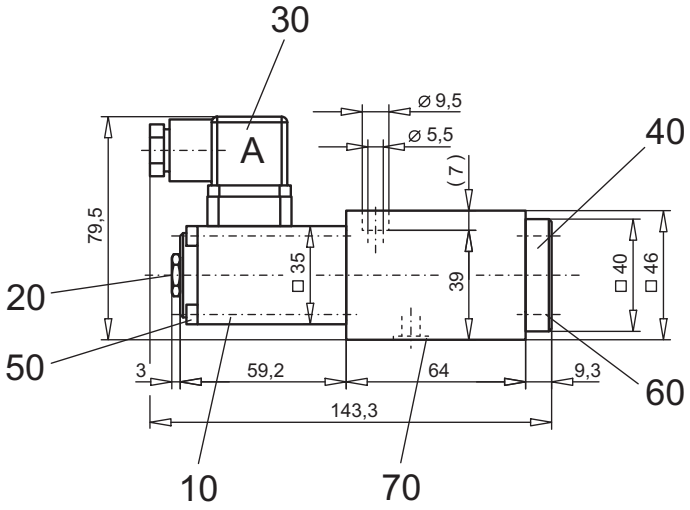


DIMENSIONS

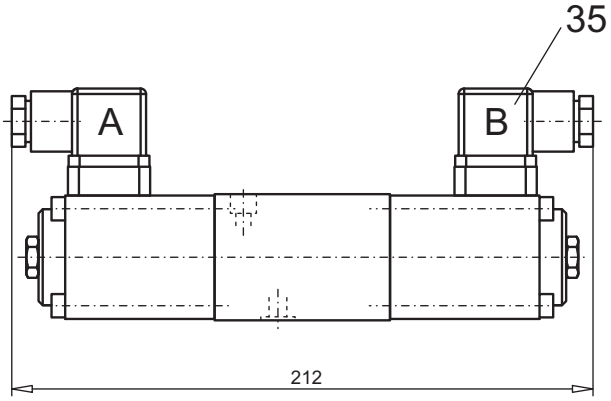
4/3-way valve VWS4.61 for Q_N 2,5…10 l/min
4/3-way valve VWS4.62 for Q_N 2,5…10 l/min



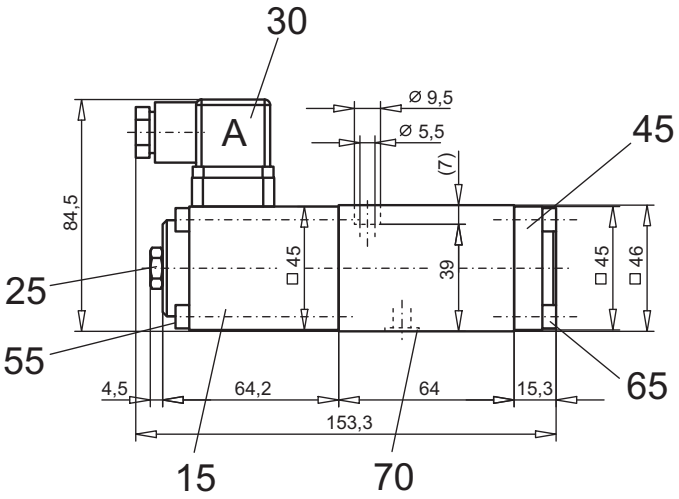
4/2-way valve VWS4.61 for Q_N 2,5…10 l/min
4/2-way valve VWS4.62 for Q_N 2,5…10 l/min

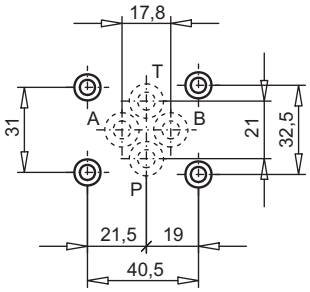


4/3-way valve VWS4.61 for Q_N 15…20 l/min
4/3-way valve VWS4.62 for Q_N 15…20 l/min



4/2-way valve VWS4.61 for Q_N 15…20 l/min
4/2-way valve VWS4.62 for Q_N 15…20 l/min





PARTS LIST

Position	Article	Description
10	256.3454 256.3426	Proportional solenoid PI35V-G24 Proportional solenoid PI35V-G12
15	256.4454 256.4418	Proportional solenoid PI45V-G24 Proportional solenoid PI45V-G12
20	253.8000	Plug with integrated manual override HB4,5
25	253.8001	Plug with integrated manual override HB6
30	219.2001	Plug A (grey)
35	219.2002	Plug B (blac)
40	060.2200	Cover
45	058.4100	Cover
50	246.1161	Socket head cap screw M4 x 60 DIN 912
55	246.2160	Socket head cap screw M5 x 60 DIN 912
60	246.1111	Socket head cap screw M4 x 10 DIN 912
65	246.2117	Socket head cap screw M5 x 16 DIN 912
70	160.2093	O-ring ID 9,25 x 1,78

ACCESSORIES

Sub-plates register 2.9
Proportional-amplifier register 1.13

Explications techniques voir feuille 1.0-100