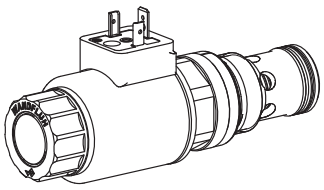
Proportional 2-way flow control valve
Screw-in cartridge

- **Direct operated, pressure compensated**
- **Q_{max} = 80 l/min, p_{max} = 350 bar**
- **$Q_{N\ max}$ = 80 l/min**

$1^5/_{16}$"-12 UN
Wandfluh standard



DESCRIPTION

Direct operated, pressure compensated proportional flow control valve, as a screw-in cartridge with a thread $1^5/_{16}$"-12 UN for cavity acc. to Wandfluh standard. Three flow ranges are available. The volume flow is adjusted by a Wandfluh proportional solenoid (VDE standard 0580). Allmost linear flow increase and low hysteresis are typical for this valve. The cartridge body made of steel is special surface coated for corrosion rust protection and low friction of control- and throttle spools. The solenoid coil is zinc-/nickel-coated.

FUNCTION

The 2-way flow control valve is designed to keep the oil flow to any actuator constant irrespective of the load. The force controlled proportional solenoid running in the fluid acts directly on the restrictor spool wich opens the throttling notches in the cartridge body. The throttle opening, and therefore the flow volume changes proportionally to the current absorption of the proportional solenoid. If pressure in the system changes the pressure compensator will change the area of the oil passage to an extend as to keep the pressure drop over the restrictor constant. When the solenoid is with-out courrent, the restrictor spool is held in the closed position by a spring. To control the valve Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

Proportional flow control valves are suitable for precise feed control system where the supply volume flow needs to be kept constant even when the load fluctuates. The screw-in cartridge is very suitable for mounting in control blocks.

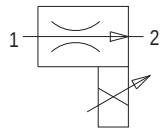
TYPE CODE

Q N P PU16-☐☐ / ☐☐ - ☐☐ # ☐

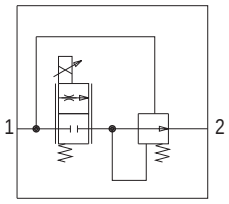
Flow control valve			
Normally closed			
Proportional			
Screw-in cartridge $1^5/_{16}$"-12 UN			
Nominal volume flow rates Q_N	32 l/min	32	
	63 l/min	63	
	80 l/min	80	
Standard nominal voltage U_N	12 VDC	G12	
	24 VDC	G24	
	without solenoid coil	X5	
Slip-on coil	Metal housing, round	W	
	Metal housing, square	M*	
Electric connection	Connector socket EN 175301-803 / ISO 4400		D
	Connector socket AMP Junior-Timer		J
	Connector Deutsch DT04-2P		G
Sealing material	NBR		
	FKM (Viton)		D1
Manual override	Armature tube closed (standard)		
	With screwed sealing plug		HB0
	With manual emergency actuation		HB4.5
Design-Index (Subject to change)			

* Only available in conjunction with other nominal voltages and connection versions. (see data sheet 1.1-181)

SYMBOLS



simplified



detailed

GENERAL SPECIFICATIONS

Description	2-way proportional flow control valve
Construction	Screw-in cartridge for cavity acc. to ISO 7789
Operations	Proportional solenoid
Mounting	Screw-in thread $1^5/_{16}$"-12 UN
Ambient temperature	-20…50 °C
Mounting position	any
Fastening torque	M_D = 80 Nm for screw-in cartridge
	M_D = 7 Nm for knurled nut
Weight	m = 0,90 kg
Volume flow direction	1 → 2

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight	
Standard nominal voltage	U = 12 VDC	U = 24 VDC
Limiting current	I_G = 1560 mA	I_G = 780 mA
Relative duty factor	100 % ED / DF (see data sheet 1.1-430)	
Protection class acc. to EN 60 529	Connection version D: IP65 J: IP66 G: IP67 and 69K	

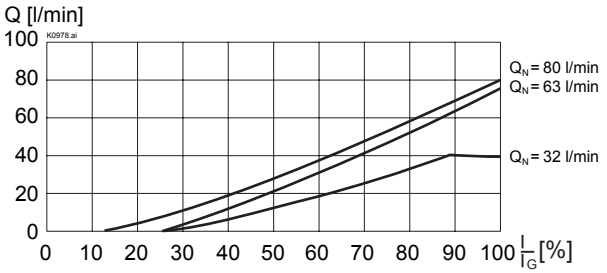
For further electrical specifications see data sheet 1.1-180 (W)
1.1-181 (M)

HYDRAULIC SPECIFICATIONS

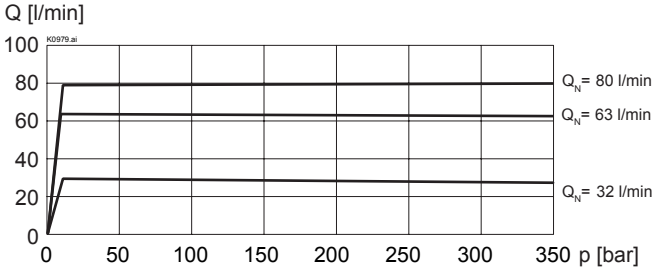
Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß 6...10 ≥ 75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70 °C
Peak pressure	p_{max} = 350 bar
Nominal volume flow rates	Q_N = 32 / 63 / 80 l/min
Max. volume flow	Q_{max} = 80 l/min
Min. volume flow	Q_{min} = 0,2 l/min
Leakage volume flow	see characteristics
Repeatability	≤ 2 %*
Hysterese	≤ 5 %*
	* at optimal dither signal

CHARACTERISTICS Oil viscosity ν = 30 mm²/s

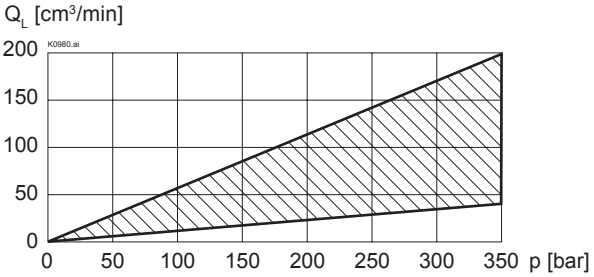
Q = f (I) Volume flow adjustment characteristics



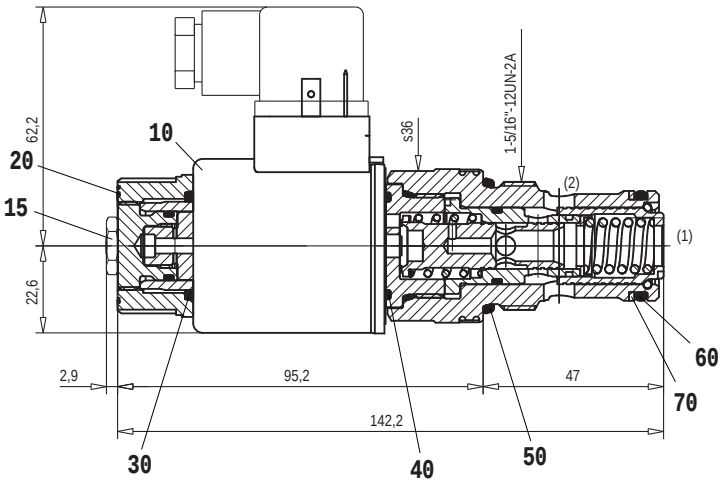
Q = f (p) Volume flow pressure characteristics



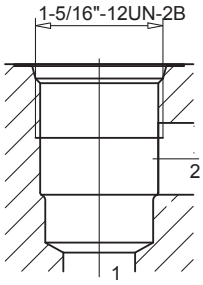
Q_L = f (p) Leakage volume flow characteristics



DIMENSIONS / SECTIONAL DRAWINGS



Cavity drawing accorging to Wandfluh standard



For detailed cavity drawing see data sheet 2.13-1049

PARTS LIST

Position	Article	Description
10		EN 175301
	206.1200	Solenoid coil WD45 / 23 x 50-G24
	206.1203	Solenoid coil WD45 / 23 x 50-G12
		Junior-Timer
	206.1201	Solenoid coil WJ45 / 23 x 50-G24
	206.1204	Solenoid coil WJ45 / 23 x 50-G12
		Deutsch
	206.1202	Solenoid coil WG45 / 23 x 50-G24
	206.1205	Solenoid coil WG45 / 23 x 50-G12
15	253.8000	HB 4,5 Manual override (data sheet 1.1-300)
	239.2033	HB 0 Plug screw (data sheet 1.1-300)
20	154.2701	Knurled nut
30	160.6222	O-ring ID 22,22 x 2,62 (FKM)
40	160.6218	O-ring ID 21,95 x 1,78 (FKM)
50	160.2298	O-ring ID 29,82 x 2,62 (NBR)
	160.6296	O-ring ID 29,82 x 2,62 (FKM)
60	160.2238	O-ring ID 23,81 x 2,62 (NBR)
	160.6238	O-ring ID 23,81 x 2,62 (FKM)
70	049.3297	Back up ring RD 24,5 x 29 x 1,4

ACCESSORIES

Proportional amplifier	Register 1.13
Mating connector EN 175301-803	Article no. 219.2002

Technical explanation see data sheet 1.0-100