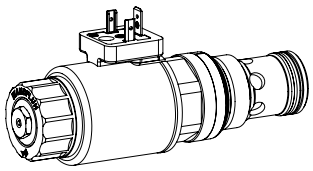
Proportional 2-way flow control cartridge

- direct operated
- Q_{max} = 80 l/min
- $Q_{N\,max}$ = 80 l/min
- p_{max} = 350 bar

1-5/16"-12 UN



DESCRIPTION

Direct operated, load compensated proportional flow control valve as screw-in cartridge for UNF cavity. With the solenoid deenergised, the control spool is held in the closed position by a spring. The change of the electric current is followed by a proportional volume flow change. From the input (1), the fluid flows over the control and throttling spool to the controlled output (2). For the control, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

Proportional flow control valves are suitable for precise speed control, where the load current has to be maintained constant independent of the input and output pressure. For machining the cartridge cavity in steel and aluminum blocks, cavity tools are available for purchase. Please refer to the data sheets in register 2.13.

TYPE CODE

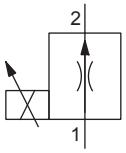
Q N P PU16 - [ ] - [ ] / [ ] [ ] - [ ] HB4,5# [ ]

Flow control valve				
Normally closed				
Proportional				
Screw-in cartridge 1-5/16"-12 UN				
Nominal volume flow rate Q_N	32 l/min	32	80 l/min	80
	63 l/min	63		
Nominal voltage U_N	12 VDC	G12		
	24 VDC	G24		
	without coil	X5		
Slip-on coil	Metal housing round			W
	Metal housing square			M
Connection execution	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				
Design index (subject to change)				

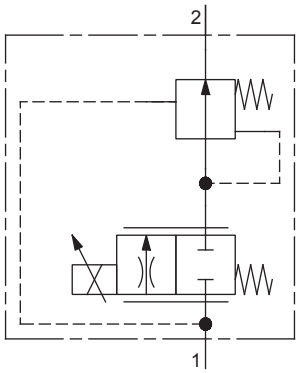
2.6-675

SYMBOL

Simplified



Detailed QN…



ACTUATION

Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	W.S45 / 23 x 50 (data sheet 1.1-180) M.S45 / 23 x 50 (data sheet 1.1-181)
Connection	Connector socket DIN EN 175301 – 803 Connector Deutsch DT04 – 2P Connector socket AMP Junior-Timer axial Connector socket AMP Junior-Timer radial

GENERAL SPECIFICATIONS

Designation	Proportional 2-way flow control valve
Construction	Direct operated
Mounting	Screw-in cartridge construction
Nominal size	1-5/16"-12 UN according to Wandfluh standard
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C
Weight	0,95 kg
MTTFd	150 years

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Maximum volume flow	Q_{max} = 80 l/min
Minimum volume flow	Q_{min} = 0,2 l/min
Volume flow direction	1 → 2
Leakage oil	See characteristics
Nominal volume flow range	Q_N = 32; 63; 80 l/min
Hysteresis	≤ 5 % at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm²/s…320 mm²/s
Temperature range fluid	-25…+70 °C (NBR) -20…+70 °C (FKM)
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade ß 6…10 ≥ 75, see data sheet 1.0-50

MANUAL OVERRIDE

HB4,5
Optionally: Screw plug (HB0), no actuation possible

ELECTRICAL SPECIFICATIONS

Protection class	Connection execution D: IP65 Connection execution G: IP67 and IP69K Connection execution I/ J: IP66
Relative duty factor	100 % DF
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 1560 mA (U_N = 12VDC) I_G = 780 mA (U_N = 24VDC)

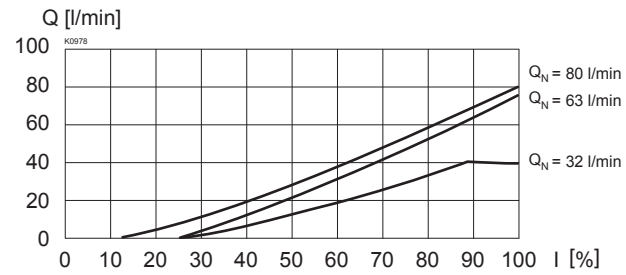
Note!

Other electrical specifications see data sheet 1.1-180 (slip-on coil W) and 1.1-181 (slip-on coil M)

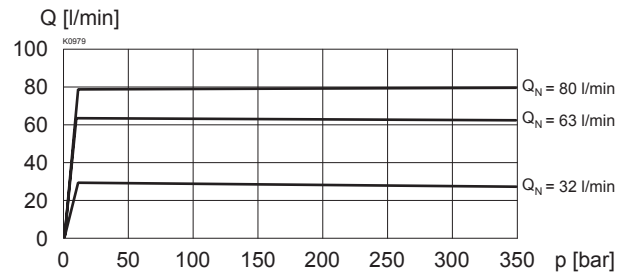
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

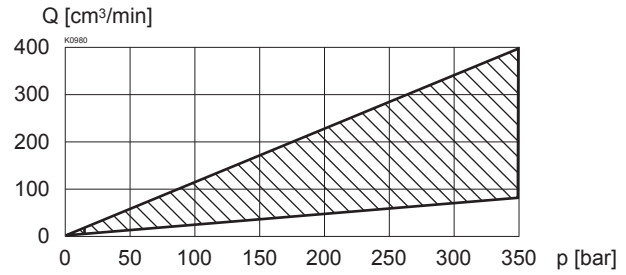
Q = f (I) Volume flow signal characteristics



Q = f (p) Volume flow pressure characteristics



Q_L = f (p) Leakage volume flow characteristics



ACCESSORIES

Proportional amplifier	Register 1.13
Electric plug B (black)	Article no. 219.2002
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50

SURFACE TREATMENT

- The cartridge body is gas-nitro-carburised
- The armature tube and the slip-on coil are zinc- / nickel-coated

SEALING MATERIAL

NBR or FKM (Viton) as standard, choice in the type code

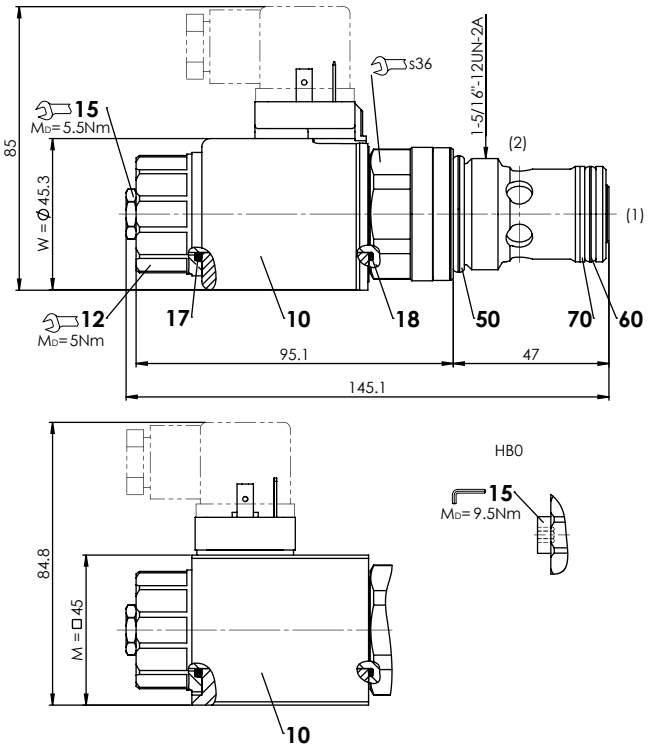
INSTALLATION NOTES

Mounting type	Screw-in cartridge 1-5/16"-12 UN
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 80 Nm Screw-in cartridge M_D = 5 Nm knurled nut M_D = 9,5 Nm HB0 M_D = 5,5 Nm HB4,5

STANDARDS

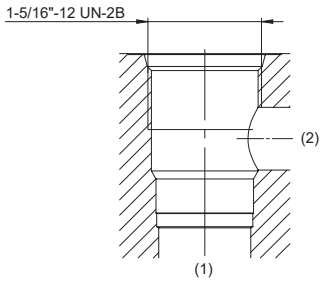
Cartridge cavity	ISO 7789
Solenoids	DIN VDE 0580
Connection execution D	DIN EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to Wandfluh standard



Attention! For detailed cavity drawing and cavity tools see data sheet 2.13-1049

PARTS LIST

Position	Article	Description
10	206.12.. 206.7...	W.S45 / 23 x 50 M.S45 / 23 x 50
12	154.2701	Knurled nut M23 x 1,5 x 19,7
15	253.8000 239.2033	HB4,5 manual override HB0 Screw plug
17	160.2222	O-ring ID 22,22 x 2,62 (NBR)
18	160.2220	O-ring ID 21,95 x 1,78 (NBR)
50	160.2298 160.6296	O-ring ID 29,82 x 2,62 (NBR) O-ring ID 29,82 x 2,62 (FMK)
60	160.2238 160.6238	O-ring ID 23,81 x 2,62 (NBR) O-ring ID 23,81 x 2,62 (FMK)
70	049.3297	Backup ring rd 24,5 x 29 x 1,4

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