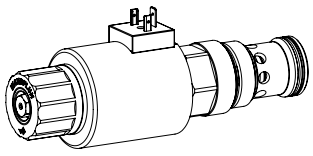
Proportional 2-way flow control cartridge

- direct operated
- Q_{max} = 170 l/min
- $Q_{N\,max}$ = 160 l/min
- p_{max} = 350 bar

M42 x 2
ISO 7789



DESCRIPTION

Direct operated, pressure compensated proportional flow control valve in screw-in cartridge construction for cavity according to ISO 7789. 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. The screw-in cartridge is perfectly suitable for installation in control blocks. 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

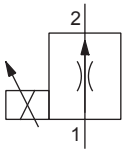
Q N P PM42 - [ ] - [ ] / [ ] [ ] - [ ] [ ] # [ ]

Flow control valve		
Normally closed		
Proportional		
Screw-in cartridge M42 x 2		
Nominal volume flow rate Q_N	100 l/min	100
	160 l/min	160
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		HC8,5
		HB0
Design index (subject to change)		

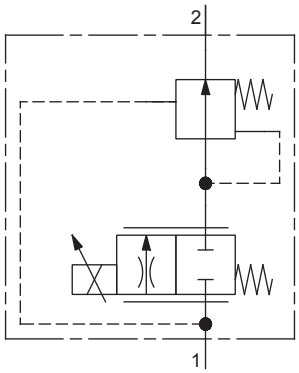
2.6-690

SYMBOL

Simplified



Detailed QN…



ACTUATION

Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	W.E64 / 31 x 72 (data sheet 1.1-190) M.A60 / 31 x 72 (data sheet 1.1-193)
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	M42 x 2 according to ISO 7789
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C
Weight	2,26 kg
MTTFd	150 years

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Maximum volume flow	Q_{max} = 170 l/min
Minimum volume flow	Q_{min} = 0,5 l/min
Volume flow direction	1 → 2
Leakage oil	See characteristics
Nominal volume flow range	Q_N = 100; 160 l/min
Hysteresis	≤ 7 % at optimal dither signal
Repeatability	≤ 3 % 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

HC8,5
Optionally: Screw plug (HB0), no actuation possible

ELECTRICAL SPECIFICATIONS

Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 2255 mA (U_N = 12VDC) I_G = 1105 mA (U_N = 24VDC)

Note!

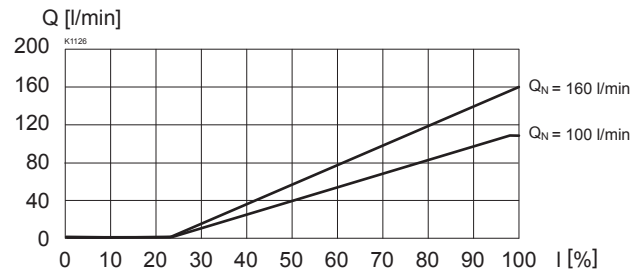


Other electrical specifications see data sheet 1.1-190 (slip-on coil W) and 1.1-193 (slip-on coil M)

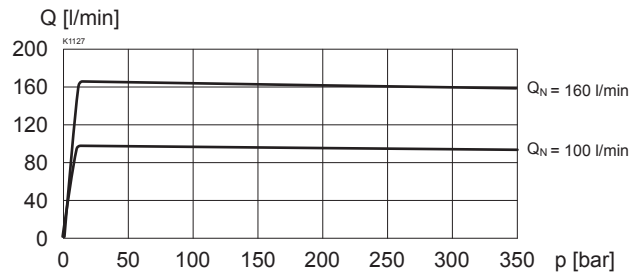
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

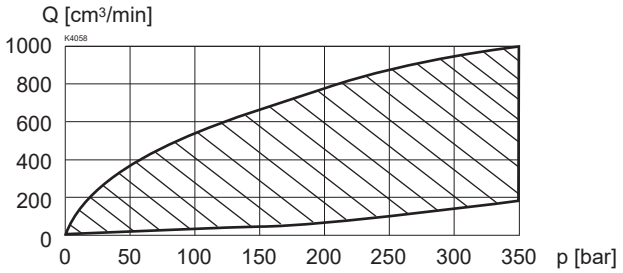
Q = f (I) Volume flow signal characteristics



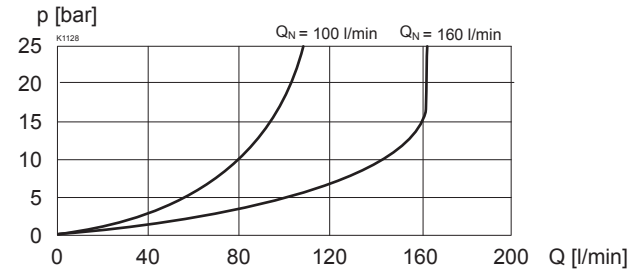
Q = f (p) Volume flow pressure characteristics



Q_L = f (p) Leakage volume flow characteristics



Δp = f (Q) Pressure drop volume flow characteristic



ACCESSORIES

Proportional amplifier	Register 1.13
Electric plug B (black)	Article no. 219.2002
Threaded body	Data sheet 2.9-205
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

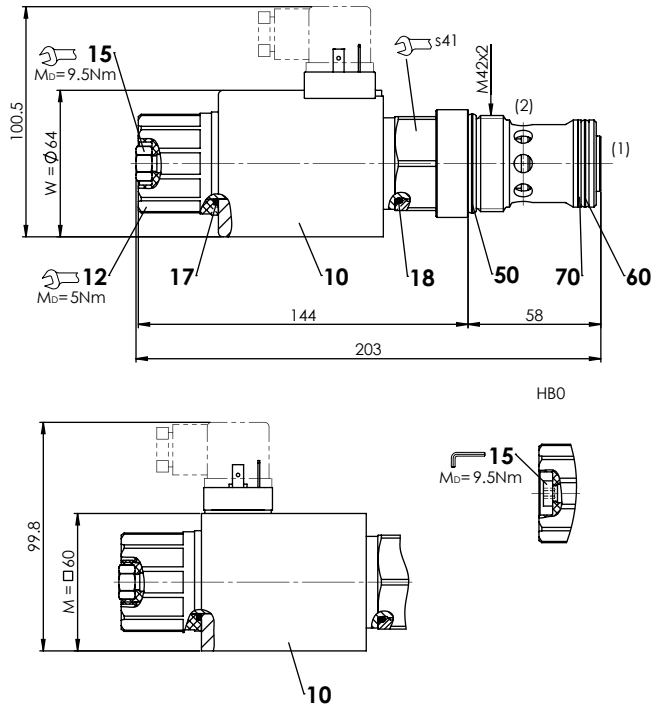
INSTALLATION NOTES

Mounting type	Screw-in cartridge M42 x 2
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 280 Nm Screw-in cartridge M_D = 5 Nm knurled nut M_D = 9,5 Nm HB0 M_D = 5,5 Nm HC8,5

STANDARDS / TECHNICAL INFORMATION

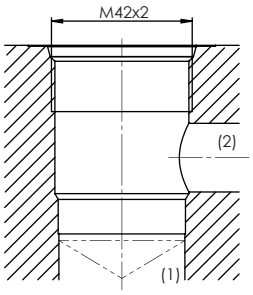
Cartridge cavity	ISO 7789
Solenoids	DIN VDE 0580
Connection execution D	DIN EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789–42–01–0–07



Note! For detailed cavity drawing and cavity tools see data sheet 2.13-1050

PARTS LIST

Position	Article	Description
10	206.3… 260.9…	W.E64 / 31 x 72 M.A60 / 31 x 72
12	154.2706	Knurled nut
15	253.8022 239.2033	HC8,5 manual override HB0 Screw plug
17	160.2282	O-ring ID 28.24 x 2.62 (NBR)
50	160.2377 160.8378	O-ring ID 37,77 x 2,62 (NBR) O-ring ID 37,77 x 2,62 (FKM)
60	160.2329 160.6325	O-ring ID 32,99 x 2,62 (NBR) O-ring ID 32,99 x 2,62 (FKM)
70	049.3384	Backup ring rd 33,5 x 38 x 1 ,4