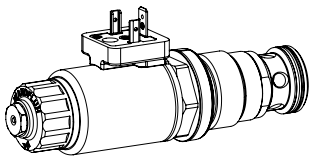
Proportional 2-way flow control poppet cartridge

- pilot operated
- Q_{max} = 100 l/min
- $Q_{N\,max}$ = 80 l/min
- p_{max} = 350 bar

M33 x 2
ISO 7789



DESCRIPTION

Pilot operated, load-compensated proportional flow control poppet valve as screw-in cartridge for cavity according to ISO 7789. When the solenoid is deenergised, the control spool closes practically leakage-free. With increasing solenoid current, the volume flow from the inlet port (2) to the regulated outlet port (1) increases almost independently of the load pressure. For the control, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

These valves are used in hydraulic systems, in which the positioning of loads and the simultaneous controlling of the lowering of these loads are demanded. The insensitivity to load changes and the very small leakage are a great advantage for this purpose. They are ideally used in the bypass to the pump. 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 (hire or purchase). Please refer to the data sheets in register 2.13.

TYPE CODE

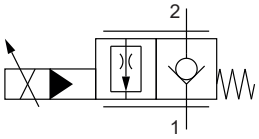
Q S P PM33 - 80 - [ ] / [ ] [ ] - [ ] HB4,5 # [ ]

Flow control valve			
Seat construction			
Proportional			
Screw-in cartridge M33 x 2			
Nominal volume flow rate Q_N	80 l/min		
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)			

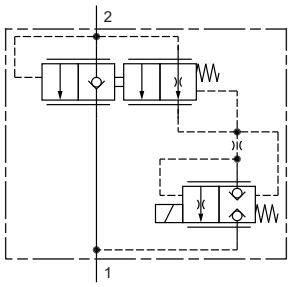
2.6-661

SYMBOL

Simplified



Detailed



ACTUATION

Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	W.S37 / 19 x 50 (Data sheet 1.1-173) M.S35 / 19 x 50 (Data sheet 1.1-174)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 – 2P

GENERAL SPECIFICATIONS

Designation	Proportional 2-way flow control poppet valve
Construction	Pilot operated
Mounting	Screw-in cartridge construction
Nominal size	M33 x 2 according to ISO 7789
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C
Weight	0,71 kg
MTTFd	150 years

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Maximum volume flow	See characteristic
Minimum volume flow	See characteristic
Volume flow direction	2 → 1
Leakage oil	See characteristic
Nominal volume flow range	Q_N = 80 l/min
Hysteresis	≤ 5 % at optimal dither signal (100 bar)
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

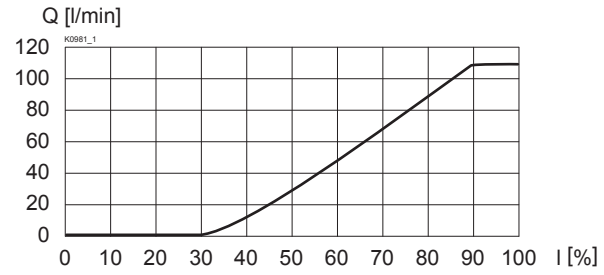
Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 1320 mA (U_N = 12VDC) I_G = 660 mA (U_N = 24VDC)

Note! Other electrical specifications see data sheet 1.1-173 (slip-on coil W) and 1.1-174 (slip-on coil M)

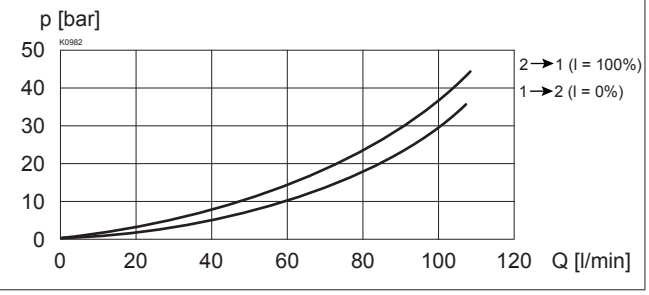
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

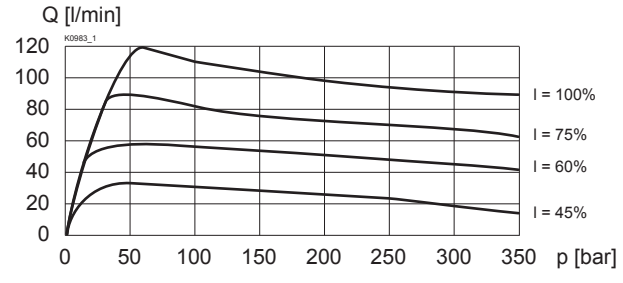
Q = f (I) — Volume flow adjustment characteristics DN
Δp = 100 bar



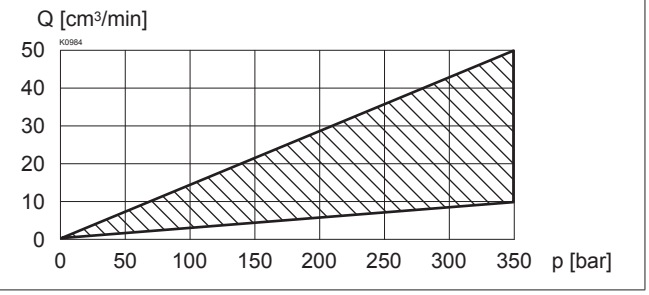
Δp = f (Q) — Pressure drop volume flow characteristic



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
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, the slip-on coil and the armature tube are zinc-nickel coated

SEALING MATERIAL

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

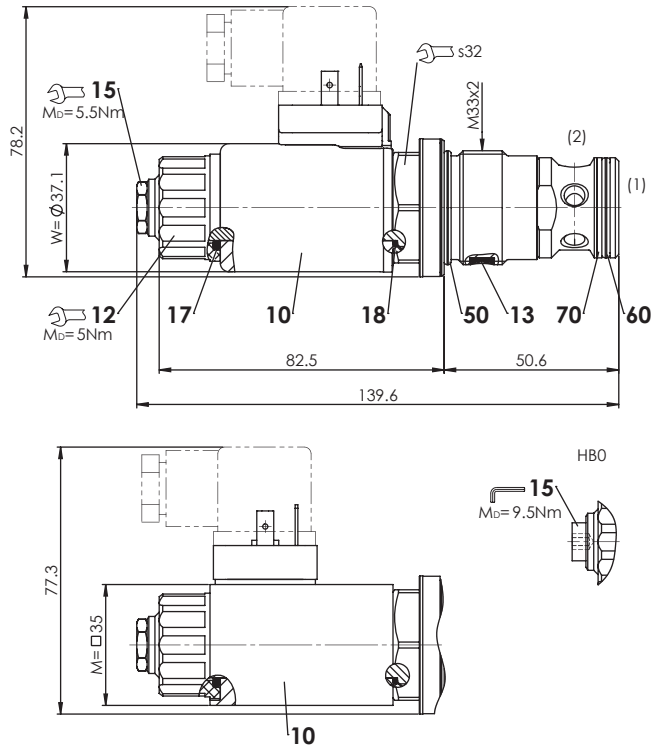
INSTALLATION NOTES

Mounting type	Screw-in cartridge M33 x 2
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 130 Nm Screw-in cartridge M_D = 5 Nm knurled nut M_D = 9,5 Nm HB0 M_D = 5,5 Nm HB4,5

STANDARDS

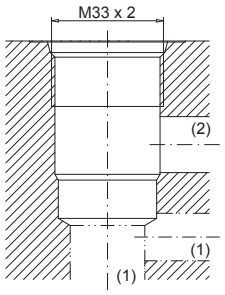
Cartridge cavity	ISO 7789
Solenoids	DIN VDE 0580
Connection execution D	EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789–33–01–0–98



Note! For detailed cavity drawing and cavity tools see data sheet 2.13-1005

PARTS LIST

Position	Article	Description
10	206.2… 260.5…	W.S37 / 19 x 50 M.S35 / 19 x 50
12	154.2700	Knurled nut
13	212.0013	Plastic disc rd 7 x 1,5
15	253.8000 239.2033	HB4,5 manual override HB0 Screw plug
17	160.2187	O-ring ID 18,72 x 2,62 (NBR)
18	160.2170	O-ring ID 17,17 x 1,78 (NBR)
50	160.2298 160.8298	O-ring ID 29,82 x 2,62 (NBR) O-ring ID 29,82 x 2,62 (FMK)
60	160.2252 160.8252	O-ring ID 25,12 x 1,78 (NBR) O-ring ID 25,12 x 1,78 (FKM)
70	049.3296	Back-up ring rd 26,1 x 29,4 x 1,4