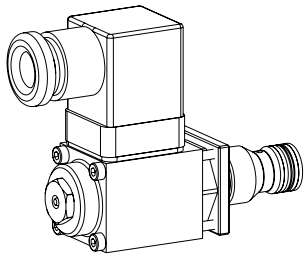
Proportional throttle cartridge

- direct operated
- Q_{max} = 12 l/min
- $Q_{N\,max}$ = 6,3 l/min
- p_{max} = 250 bar

M18 x 1,5
ISO 7789



DESCRIPTION

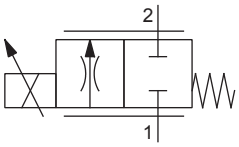
Direct operated proportional throttle valve in screw-in cartridge construction for cavity according to ISO 7789. With the solenoid de-energised, the control spool is held in the closed position (DN) or open position (DO) by a spring. The change of the electric current is followed by a proportional volume flow change. Very sensitive opening and closing characteristics and low hysteresis are characteristics of these valves. For the control, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

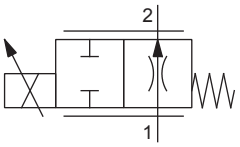
Proportional throttle valves are suitable for smooth control of movements in stationary or mobile systems. The screw-in cartridge is perfectly suitable for installation in control blocks and is installed in sandwich- (vertical stacked systems) and in flange plates (corresponding data sheets in this register). 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.

SYMBOL

„normally closed" DN



„normally open" DO



ACTUATION

Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	PI29V (Data sheet 1.1-90)
Connection	Connector socket EN 175301 – 803

TYPE CODE

D ☐ P PM18 - ☐ - ☐ - ☐ # ☐

Throttle valve		
Normally closed		N
Normally open		O
Proportional		
Screw-in cartridge M18 x 1,5		
Nominal volume flow rate Q_N	4 l/min	4
	6,3 l/min	6,3
Nominal voltage U_N	12 VDC	G12
	24 VDC	G24
Sealing material	NBR	
	FKM (Viton)	D1
Design index (subject to change)		

2.6-510

GENERAL SPECIFICATIONS

Designation	Proportional throttle valve
Construction	Direct operated
Mounting	Screw-in cartridge construction
Nominal size	M18 x 1,5 according to ISO 7789
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C (NBR) -20…+70 °C (FKM)
Weight	0,25 kg
MTTFd	150 years

ELECTRICAL SPECIFICATIONS

Protection class	IP65
Relative duty factor	100 % DF
Service life time	10^7 (number of switching cycles, theoretically)
Voltage tolerance	± 10 % with regard to nominal voltage
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 1080 mA (12 VDC) I_G = 540 mA (24 VDC)

Note! Other electrical specifications see data sheet 1.1-90

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 250 bar
Maximum volume flow	Q_{max} = 12 l/min
Volume flow direction	1 → 2
Leakage oil	See characteristics
Nominal volume flow range	Q_N = 4; 6,3 l/min at 10 bar valve pressure drop
Hysteresis	≤ 2 % at optimal dither signal
Repeatability	≤ 1 % 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

ACCESSORIES

Proportional amplifier	Register 1.13
Mating connector black (B)	Article no. 219.2002
Flange body / sandwich plate NG3-Mini	Data sheet 2.6-700
Threaded body	Data sheet 2.9-205
Technical explanations	Data sheet 1.0-100
Hydraulic fluids	Data sheet 1.0-50
Filtration	Data sheet 1.0-50

MANUAL OVERRIDE

HB4,5 as standard
Optionally: HN (K), HB0 (plugged)
→ see data sheet 1.1-311

SURFACE TREATMENT

◆ The cartridge body and the solenoid are zinc-nickel coated

SEALING MATERIAL

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

STANDARDS

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

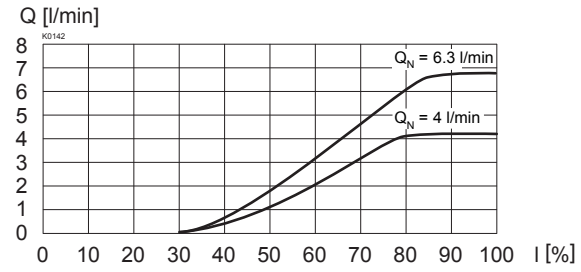
INSTALLATION NOTES

Mounting type	Screw-in cartridge M18 x 1,5
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 40 Nm Screw-in cartridge M_D = 1,2 Nm solenoid screws

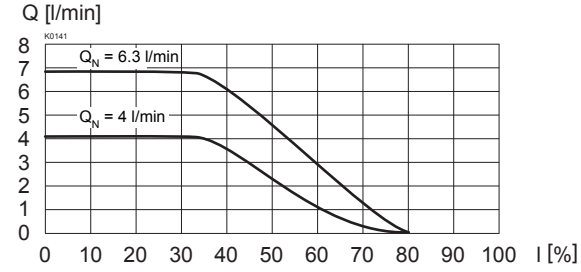
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

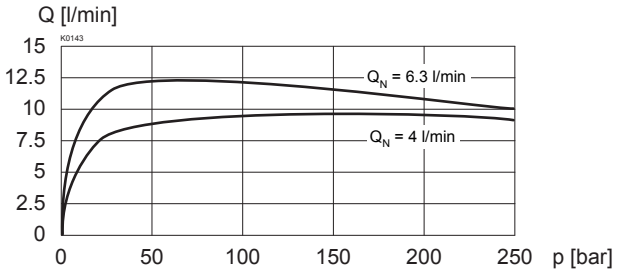
Q = f (I) Volume flow adjustment characteristics DN



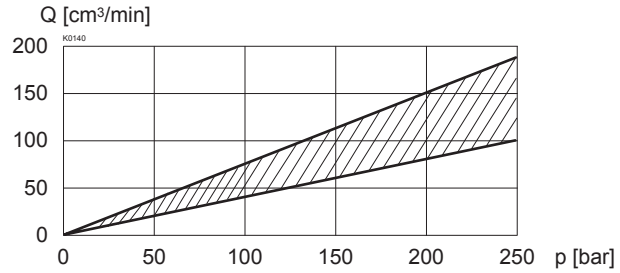
Q = f (I) Volume flow adjustment characteristics DO



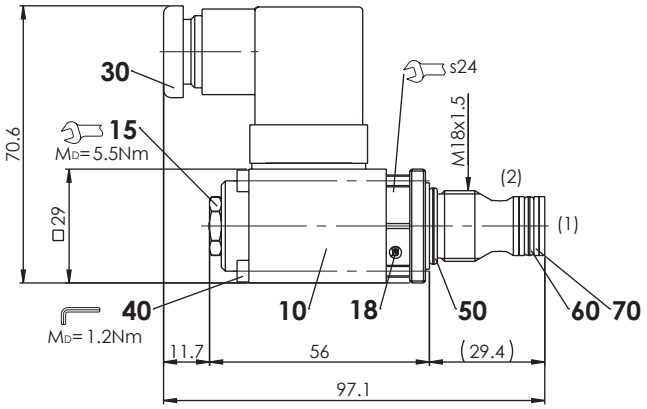
Q = f (p) Volume flow pressure characteristics DN



Q_L = f (p) Leakage volume flow characteristics

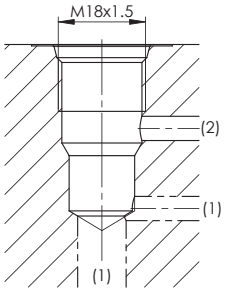


DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789–18–01–0–98



Note! For detailed cavity drawing and cavity tools see data sheet 2.13-1002

PARTS LIST

Position	Article	Description
10	256.2418	Proportional solenoid PI29V-G12
	256.2453	Proportional solenoid PI29V-G24
15	253.8000	Manual override HB4,5
18	160.2120	O-ring ID 12,42 x 1,78 (NBR)
30	219.2002	Electric plug B (black)
40	246.0146	Socket head screw M3 x 45 DIN 912
50	160.2156	O-ring ID 15,60 x 1,78 (NBR)
	160.6156	O-ring ID 15,60 x 1,78 (FKM)
60	160.2111	O-ring ID 11,11 x 1,78 (NBR)
	160.6111	O-ring ID 11,11 x 1,78 (FKM)
70	049.3156	Backup ring rd 12,1 x 15 x 1,4