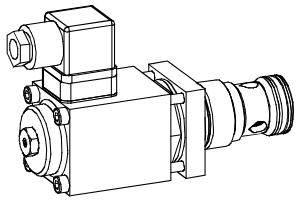
Proportional throttle valve
Screw-in cartridge
- **Direct operated, not pressure compensated**
- **Throttle in one flow direction**
- **Q_{max} = 65 l/min, p_{max} = 250 bar**
- **$Q_{N\ max}$ = 63 l/min**

M33x2
ISO 7789



DESCRIPTION
Direct operated proportional throttle valve. Thread M33x2 and cavity in accordance with ISO 7789. Two flow ranges are available. The volume flow is adjusted by a Wandfluh proportional solenoid (VDE standard 0580). Progressive increase and decrease of volume flow and reduced hysteresis are characteristics of this valve. The cartridge body is made of steel. Its special surface coating protects the outside against corrosion and reduces friction of the control spool. The solenoid is zinc coated.

FUNCTION
The force controlled proportional solenoid running in the fluid acts directly on the control spool which opens or closes the triangular shaped throttling notches in the cartridge body. The throttle opening, and therefore the flow volume, changes proportionally to the current absorption of the proportional solenoid. When the solenoid is without current, the control spool is held in the closed position by a spring. To control the valve proportional amplifiers are available from Wandfluh (see register 1.13).

APPLICATION
Proportional throttle valves are suitable for precise feed control systems. Very sensitive opening and closing characteristics allow smooth control of movements in stationary or mobile installations, e.g. machine tools, public vehicles. Installation of the screw-in cartridge in control blocks as well as in the Wandfluh sandwich plates (vertical stacked systems) and flange valves of the NG10 size. (Please note the separate data sheets in register 2.6). Cavity tools are available for machining the cavities in steel and aluminium (hire or purchase). Please refer to the data sheets in register 2.13.

CONTENT

TYPE CODE
D N P PM33 - [ ] - [ ] # [ ]

Throttle valve		
Normally closed		
Proportional		
Screw-in cartridge M33x2		
Nominal volume flow rates:	Q_N = 63 l/min	63
	Q_N = 32 l/min	32
Standard nominal voltage:	U_N = 12 VDC	G12
	U_N = 24 VDC	G24
Design-Index (Subject to change)		

GENERAL SPECIFICATIONS

Description	Direct operated proportional throttle valve
Construction	Screw-in cavity acc. to ISO 7789
Operations	Proportional solenoid
Mounting	Screw-in thread M33x2
Ambient temperature	-20…50°C
Mounting position	any
Fastening torque	M_D = 80 Nm for screw-in cartridge M_D = 5,2 Nm (Qual. 8.8) for solenoid screws
Weight	m = 1,2 kg
Volume flow direction	1 → 2

HYDRAULIC SPECIFICATIONS

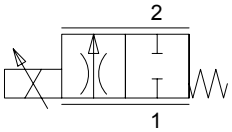
Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß 6…10≥75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70°C
Peak pressure	p_{max} = 250 bar
Nominal volume flow rates	Q_N = 63 l/min, Q_N = 32 l/min
Max. volume flow	Q_{max} = 65 l/min
Leakage volume flow	on request
Hysteresis	≤ 8 % ∗ ∗ at optimal dithersignal

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight	
Standard nominal voltage	U_N = 12 VDC	U_N = 24 VDC
Limiting current	I_G = 1780 mA	I_G = 810 mA
Relative duty factor	100 % DF (see data sheet 1.1-430)	
Protection class	IP 65 acc. to EN 60 529	
Connection/Power supply	Over device plug connection to ISO 4400 / DIN 43 650 (2P+E)	

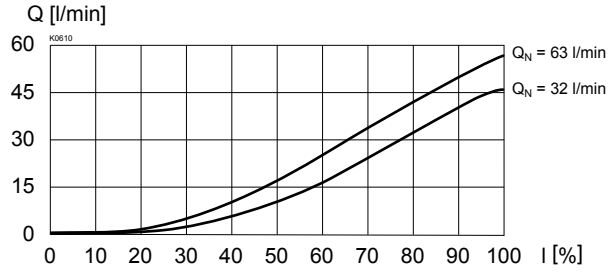
Other electrical specifications see data sheet 1.1-135 (PI45V-M40)

SYMBOL
„normally closed“

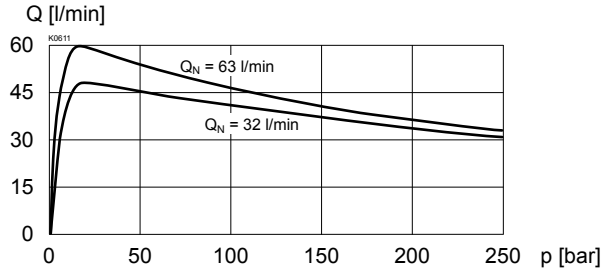


CHARACTERISTICS Oil viscosity υ = 30 mm²/s

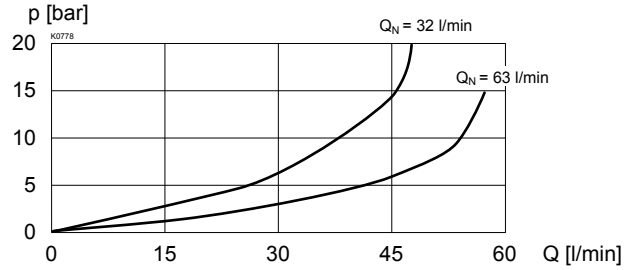
Q = f (I) Volume flow adjustment characteristics (Δp = 20 bar)



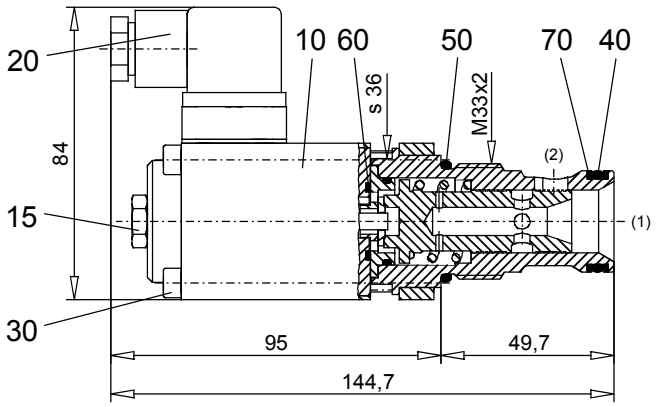
Q = f (p) Volume flow pressure characteristics (I = I_G)



Δp = f (Q) Pressure drop volume flow characteristics (I = I_G)



DIMENSIONS / SECTIONAL DRAWINGS



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

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

PARTS LIST

Position	Article	Description
10	256.4465 256.4420	Proportional solenoid PI45V-G24-M40 Proportional solenoid PI45V-G12-M40
15	253.8001	Mounted screw with integrated manual override HB6
20	219.2002	Plug (black)
30	246.2171	Socket head cap screw M5x70 DIN 912
40	160.2238	O-ring ID 23,81x2,62
50	160.2298	O-ring ID 29,82x2,62
60	160.2188	O-ring ID 18,77x1,78
70	049.3297	Back up ring RD 24,5x29x1,4

ACCESSORIES

Cartridge built-in in flange- or sandwich body
Flange-/sandwich plate register 2.6
Proportional amplifier register 1.13

Technical explanation see data sheet 1.0-100