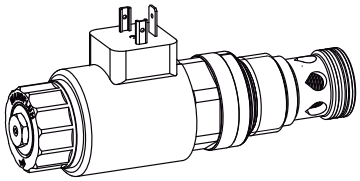
Proportional throttle valve
Screw-in cartridge

- **Direct operated, not pressure compensated**
- **Throttle in one flow direction**
- **Q_{max} = 65 l/min, p_{max} = 350 bar**
- **$Q_{N\,max}$ = 63 l/min**

M33x2
ISO 7789



DESCRIPTION

Direct operated proportional throttle valve with thread M33x2 and cavity in accordance with ISO 7789. Two nominal flow rates 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 coil is zinc-/nickel-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.

TYPE CODE

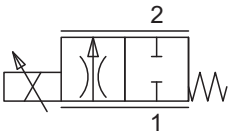
D N P PM33 - ☐ - ☐ / ☐ ☐ - ☐ ☐ # ☐

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
	24 VDC	G24
	without solenoid coil	X5
Slip-on coil	Metal housing, round	W
	Metal housing, square	M*
Electric connection	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	Armature tube closed (standard)	
	With screwed sealing plug	HB0
	With manual emergency actuation	HB4.5
Design-Index (Subject to change)		

* Only available in conjunction with other nominal voltages and connection versions. (See data sheet 1.1-181)

SYMBOL

«normally closed»



GENERAL SPECIFICATIONS

Description	Direct operated proportional throttle valve
Construction	Screw-in cavity acc. to ISO 7789
Operation	Proportional solenoid
Mounting	Screw-in thread M33x2
Ambient temperature	-20…70 °C
Mounting position	any, preferably horizontal
Fastening torque	M_D = 80 Nm for screw-in cartridge
	M_D = 7 Nm for knurled nut
Weight	m = 0,9 kg
Volume flow direction	1 → 2

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight	
Standard nominal voltage	U = 12 VDC	U = 24 VDC
Limiting current	I_G = 1560 mA	I_G = 780 mA
Relative duty factor	100 % ED / DF (see data sheet 1.1-430)	
Protection class acc. to EN 60 529	Connection version D: IP 65 J: IP 66 G: IP 67 and 69K	

For further electrical specifications see data sheet 1.1-180 (W)
1.1-181 (M)

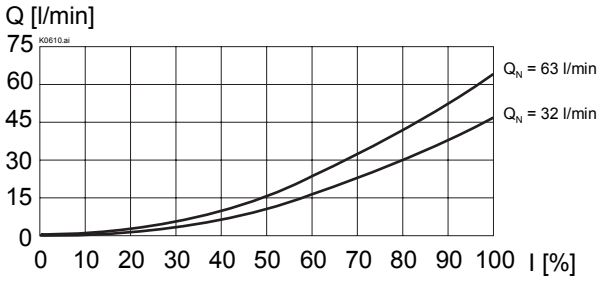
HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade β 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} = 350 bar
Nominal volume flow rates	Q_N = 32 l/min, 63 l/min
Max. volume flow	Q_{max} = 65 l/min
Leakage volume flow	on request
Hysteresis	≤ 8 %*

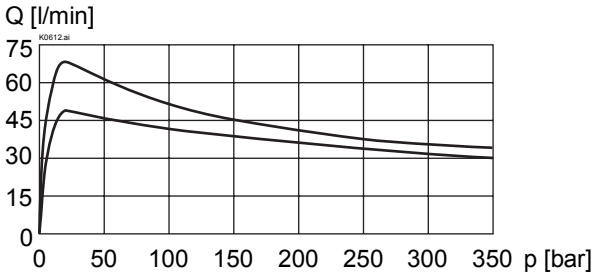
* at optimal dither signal

CHARACTERISTICS Oil viscosity υ = 30 mm²/s

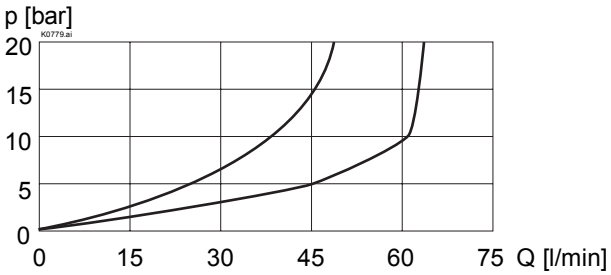
Q = f (I) Volume flow adjustment characteristics (Δp = 20 bar)



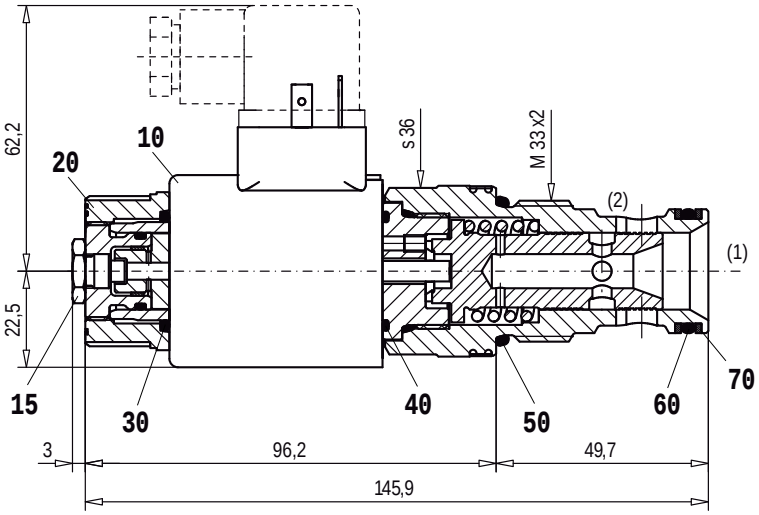
Q = f (p) Volume flow pressure characteristics (I = I_G)



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

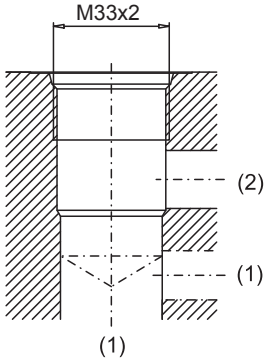


DIMENSIONS / SECTIONAL DRAWINGS



Dimensions of the other connection versions see data sheet 1.1-180

Cavity drawing accorging 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		EN 175301
	206.1200	Solenoid coil WD45 / 23 x 50-G24
	206.1203	Solenoid coil WD45 / 23 x 50-G12
		Junior-Timer
	206.1201	Solenoid coil WJ45 / 23 x 50-G24
	206.1204	Solenoid coil WJ45/ 23 x 50-G12
		Deutsch
	206.1202	Solenoid coil WG45 / 23 x 50-G24
	206.1205	Solenoid coil WG45 / 23 x 50-G12
15	253.8000	HB 4,5 Manual override (data sheet 1.1-300)
	239.2033	HB 0 Plug screw (data sheet 1.1-300)
20	154.2701	Knurled nut
30	160.2222	O-ring ID 22,12 x 2,62 (NBR)
	160.6222	O-ring ID 22,12 x 2,62 (FKM)
40	160.6218	O-ring ID 21,95 x 1,78 (FKM)
50	160.2298	O-ring ID 29,82 x 2,62 (NBR)
	160.6296	O-ring ID 29,82 x 2,62 (FKM)
60	160.2238	O-ring ID 23,81 x 2,62 (NBR)
	160.6238	O-ring ID 23,81 x 2,62 (FKM)
70	049.3297	Back up ring RD 24,5 x 29 x 1,4

ACCESSORIES

Flange-/sandwich plate	Register 2.6
Line mount body	Data sheet 2.9-205
Proportional amplifier	Register 1.13
Mating connector EN 175301-803	Article no. 219.2002

Technical explanation see data sheet 1.0-100