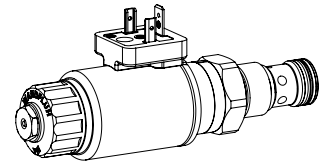


Proportional throttle cartridge

- ◆ direct operated
- ◆ $Q_{max} = 32$ l/min
- ◆ $Q_{Nmax} = 25$ l/min
- ◆ $p_{max} = 350$ bar

M22 x 1,5
ISO 7789

DESCRIPTION

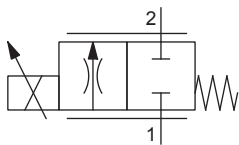
Direct operated proportional throttle valve in screw-in cartridge construction for cavity according to ISO 7789. With the solenoid deenergised, the control spool is held in the closed position (DN) or open position (DO) by a spring. The change of the electric current is followed by a proportional volume 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

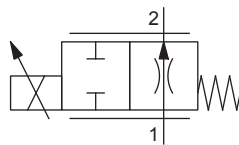
Proportional throttle valves are suitable for smooth control of movements in stationary or mobile systems. The screw-in cartridge is perfectly suitable for installation in control blocks and is installed in sandwich- (vertical stacked systems) and in flange plates (corresponding data sheets in this register).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


TYPE CODE

Throttle valve		D	P	PM22	-		-		/			-		HB4,5	#	
Normally closed																
Normally open																
Proportional																
Screw-in cartridge M22 x 1,5																
Nominal volume flow rate Q_N	6,3 l/min															
	10 l/min															
	25 l/min															
Nominal voltage U_N	12 VDC															
	24 VDC															
	without coil															
Slip-on coil	Metal housing round															
	Metal housing square															
Connection execution	Connector socket EN 175301-803/ISO 4400															
	Connector socket AMP Junior - Timer															
	Connector Deutsch DT04-2P															
Sealing material	NBR															
	FKM (Viton)															
Manual override																
Design index (subject to change)																

2.6-531

GENERAL SPECIFICATIONS

Designation	Proportional throttle valve
Construction	Direct operated
Mounting	Screw-in cartridge construction
Nominal size	M22 x 1,5 according to ISO 7789
Actuation	Proportional solenoid
Ambient temperature	-25...+70 °C
Weight	0,57 kg
MTTFd	150 years

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	$I_G = 1320 \text{ mA}$ ($U_N = 12\text{VDC}$) $I_G = 660 \text{ mA}$ ($U_N = 24\text{VDC}$)

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


ACTUATION

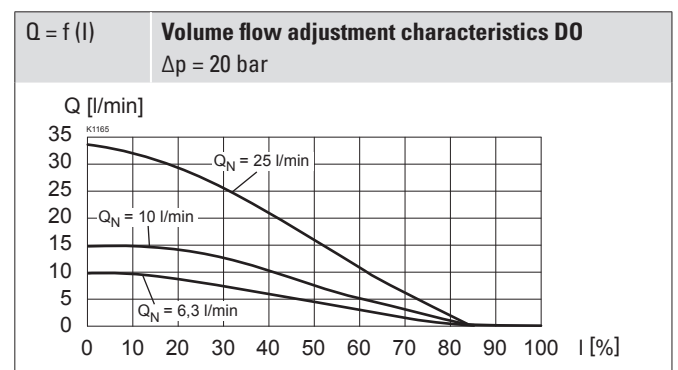
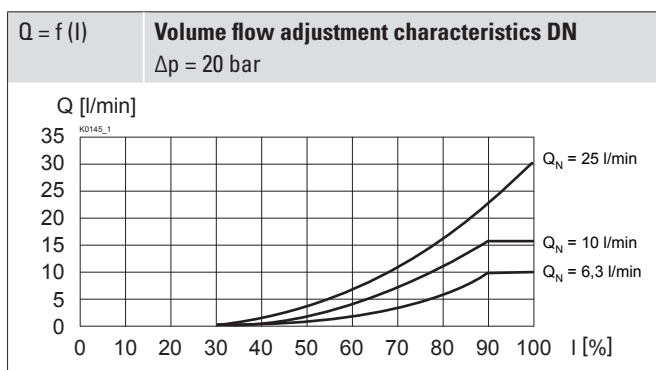
Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	W.S37 / 19 x 50 (Data sheet 1.1-173) M.S35 / 19 x 50 (Data sheet 1.1-174)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 – 2P

HYDRAULIC SPECIFICATIONS

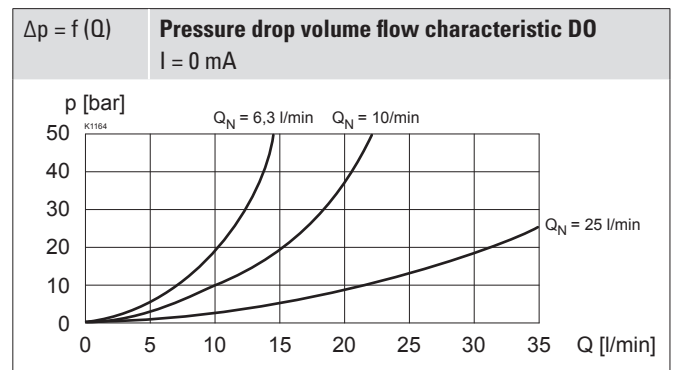
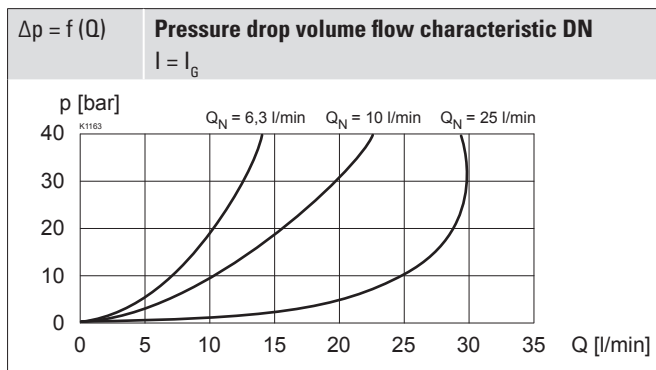
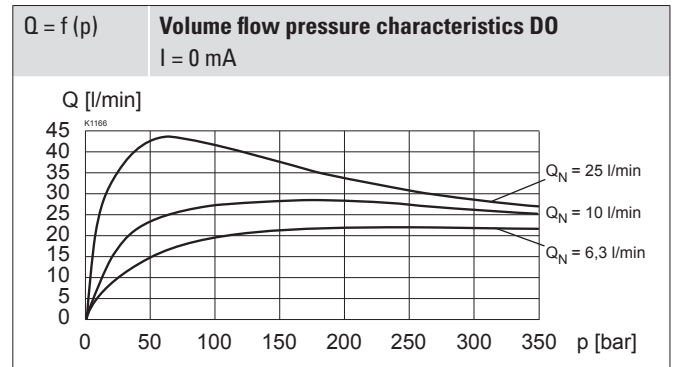
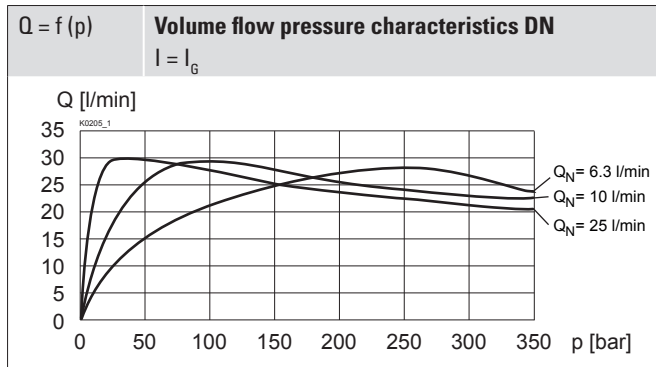
Working pressure	$p_{max} = 350 \text{ bar}$
Maximum volume flow	$Q_{max} = 32 \text{ l/min}$
Volume flow direction	1 → 2
Leakage oil	On request
Nominal volume flow range	$Q_N = 6,3; 10; 25 \text{ l/min}$ at 10 bar valve pressure drop
Hysteresis	≤ 8 % (DN); 10-12 % (DO) at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm ² /s...320 mm ² /s
Temperature range fluid	-25...+70 °C (NBR) -20...+70 °C (FKM)
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade $\beta_{6...10} \geq 75$, see data sheet 1.0-50

PERFORMANCE SPECIFICATIONS

Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$



PERFORMANCE SPECIFICATIONS

 Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$

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 M22 x 1,5
Mounting position	Any, preferably horizontal
Tightening torque	$M_D = 60 \text{ Nm}$ Screw-in cartridge $M_D = 5 \text{ Nm}$ knurled nut $M_D = 9,5 \text{ Nm}$ HB0 $M_D = 5,5 \text{ Nm}$ 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

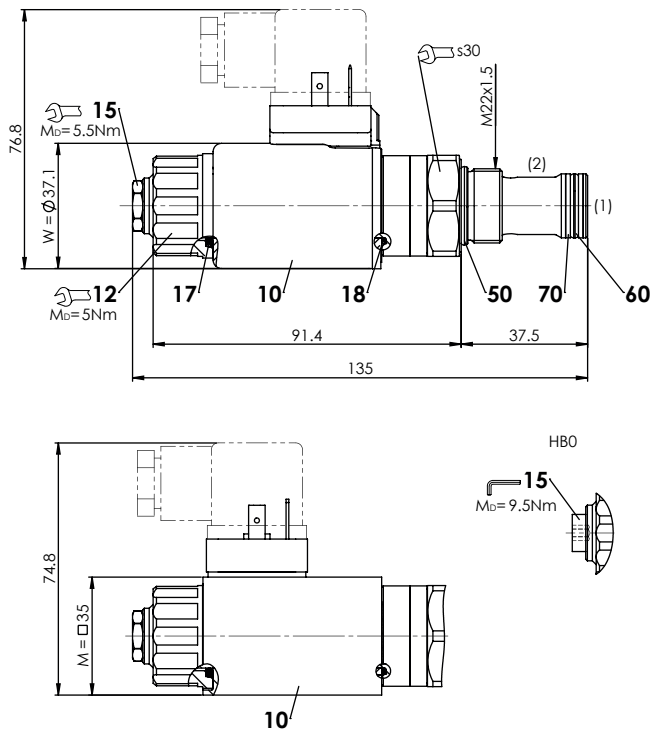
ACCESSORIES

Proportional amplifier	Register 1.13
Mating connector black (B)	Article no. 219.2002
Flange body / sandwich plate NG4-Mini	Data sheet 2.6-720
Flange body / sandwich plate NG6	Data sheet 2.6-740
Threaded body	Data sheet 2.9-205
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

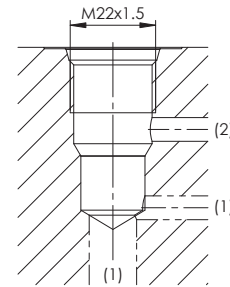
MANUAL OVERRIDE

HB4,5

Optionally: Screw plug (HB0), no actuation possible

DIMENSIONS

HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789-22-01-0-98


Note!


For detailed cavity drawing and cavity tools see data sheet 2.13-1008

PARTS LIST

Position	Article	Description
10	206.2...	W.S37 / 19 x 50
	260.5...	M.S35 / 19 x 50
12	154.2700	Knurled nut
15	253.8000	HB4,5 manual override
	239.2033	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	160.2188	O-ring ID 18,77 x 1,78 (NBR)
	160.6188	O-ring ID 18,77 x 1,78 (FKM)
60	160.2156	O-ring ID 15,60 x 1,78 (NBR)
	160.6156	O-ring ID 15,60 x 1,78 (FKM)
70	049.3196	Backup ring rd 16,1 x 19 x 1,4