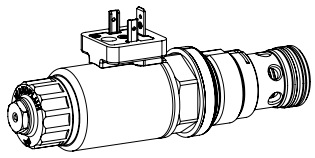
Proportional pressure relief cartridge

- pilot operated
- Q_{max} = 230 l/min
- p_{max} = 400 bar
- $p_{N\,max}$ = 350 bar

M33 x 2
ISO 7789



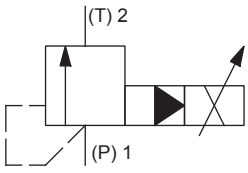
DESCRIPTION

Pilot operated proportional pressure relief valve in screw-in cartridge construction for cavity according to ISO 7789. High flow capacity, very sensitively adjustable. When the operating pressure adjusted by means of the proportional solenoid is reached, the valve opens and connects the protected line with the drain to the tank. The back pressure in T (2) affects the pressure in P (1). For the control, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

The electrical remote control in conjunction with process controls allows economical solutions with repeatable processes. 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.

SYMBOL



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

TYPE CODE

B V P PM33 - [ ] - [ ] / [ ] [ ] - [ ] [ ] # [ ]

Pressure relief valve				
Pilot operated				
Proportional				
Screw-in cartridge M33 x 2				
Nominal pressure range p_N	100 bar	100	275 bar	275
	200 bar	200	350 bar	350
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	Manual override			HB4,5
	Screw plug			HB0
Design index (subject to change)				

2.3-551

GENERAL SPECIFICATIONS

Designation	Proportional pressure relief 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	0,70 kg
MTTFd	150 years

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 400 bar
Tank pressure	$p_{T\,max} = p_P$ + 15 bar
Nominal pressure range	P_N = 100 bar, 200 bar, 275 bar, 350 bar
Volume flow range	Q = 5…230 l/min
Leakage oil	See characteristics
Hysteresis	≤ 4 % at optimal dither signal
Repeatability	≤ 2 % 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

ELECTRICAL SPECIFICATIONS

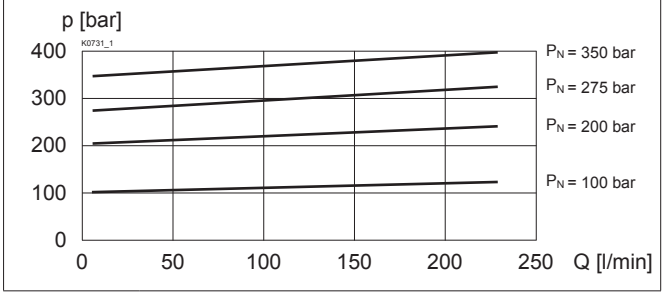
Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 1320 mA (U_N = 12VDC) I_G = 660 mA (U_N = 24VDC)

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

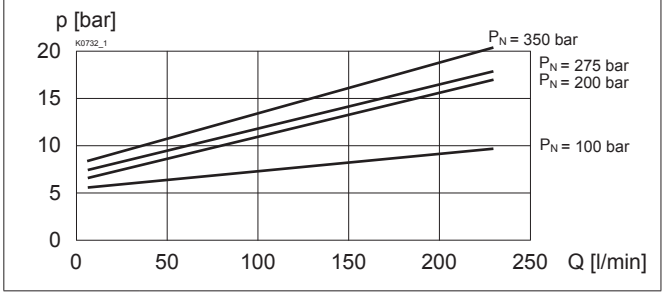
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

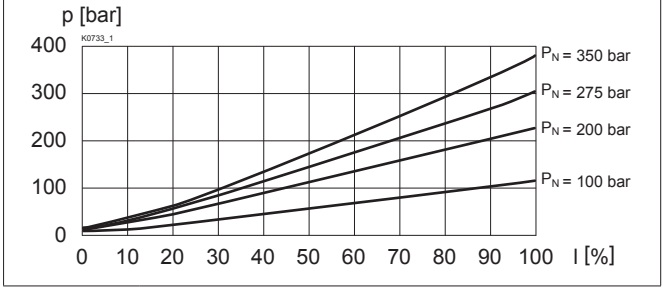
p_{red} = f (Q) **Pressure volume flow characteristics**
Maximal adjustable pressure



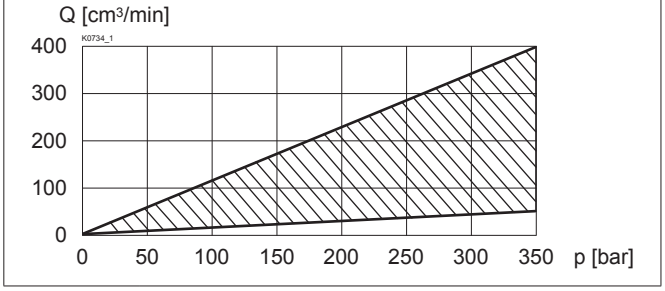
p_{red} = f (Q) **Pressure volume flow characteristics**
Minimal adjustable pressure



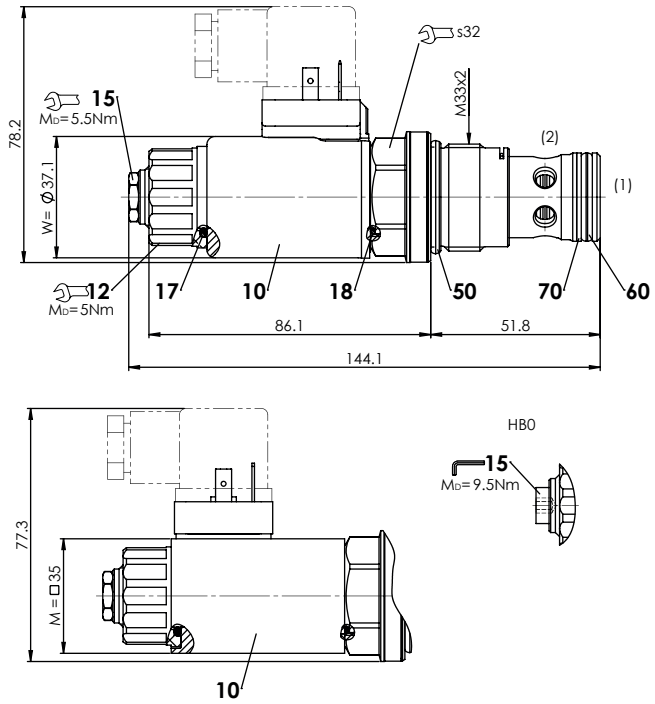
p_{red} = f (n) **Pressure adjustment characteristics**
Measured at Q = 30 l/min



Q_L = f (p) **Leakage volume flow characteristic**

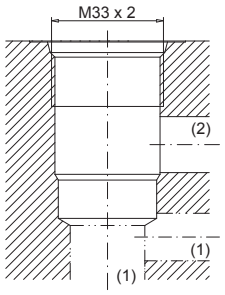


DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789–33–02–0–98



Note! For detailed cavity drawing and cavity tools see data sheet 2.13-1041

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
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 160.6296	O-ring ID 29,82 x 2,62 (NBR) O-ring ID 29,82 x 2,62 (FMK)
60	160.2219 160.6216	O-ring ID 21,89 x 2,62 (NBR) O-ring ID 21,89 x 2,62 (FKM)
70	049.3277	Backup ring rd 22,5 x 27 x 1,4

ACCESSORIES

Proportional amplifier	Register 1.13
Electric plug B (black)	Article no. 219.2002
Threaded body	Data sheet 2.9-200
Technical explanations	Data sheet 1.0-100
Hydraulic fluids	Data sheet 1.0-50
Filtration	Data sheet 1.0-50

MANUAL OVERRIDE

HB4,5
Optionally: Screw plug (HB0), no actuation possible

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

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 M33 x 2
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 80 Nm Screw-in cartridge M_D = 5 Nm knurled nut M_D = 9,5 Nm HB0 M_D = 5,5 Nm HB4,5