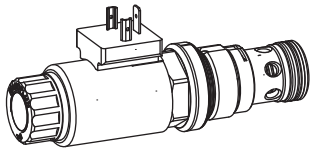
Proportional pressure relief valve
Screw-in cartridge
- **Pilot operated**
- **Q_{max} = 230 l/min**
- **p_{max} = 400 bar**
- **$p_{N\ max}$ = 350 bar**

M33x2
ISO 7789



DESCRIPTION
Pilot operated, proportional pressure relief valve, as screw-in cartridge with a thread M33x2 for cavity according to ISO 7789. 4 standard pressure levels are available: 100 bar, 200 bar, 275 bar and 350 bar. The adjustment takes place by means of a Wandfluh proportional solenoid (VDE-standard 0580). The cartridge body made of steel is zinc coated and therefore rust-protected. The solenoid coil is zinc-/nickel-coated.

FUNCTION
When the operating pressure set by the proportional solenoid is reached, the main spool opens and connects the protected line with the return line to the tank. The back pressure in T influences the pressure in P (1). This pilot operated proportional pressure relief valve can be adjusted very sensitively and is suitable for large volume flows and high pressures. To control the valve, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION
The valve has its application in hydraulic systems, in which the pressure frequently has to be changed. The facility for electric remote controlling of the valve in conjunction with process control systems enables economic problem solutions with repeatable sequences. Installation of the screw-in cartridge in control blocks as well as in flange- and sandwich-valves of the NG10 type. Cavity tools are available for machining cavities in steel and aluminium (hire or purchase). Please refer to the data sheets in register 2.13.

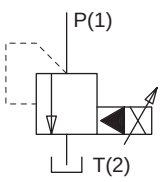
TYPE CODE

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

Pressure relief valve		
Pilot operated		
Proportional		
Screw-in cartridge M33x2		
Standard nominal pressure ranges p_N	100 bar	100
	200 bar	200
	275 bar	275
	350 bar	350
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 1.1-174)

SYMBOLS



GENERAL SPECIFICATIONS

Description	Pilot operated pressure relief valve
Construction	Screw-in cartridge for cavity acc. to ISO 7789
Actuation	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 = 5 Nm for knurled nut
Weight	m = 0,7 kg

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 = 1320 mA	I_G = 660 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 69 K	

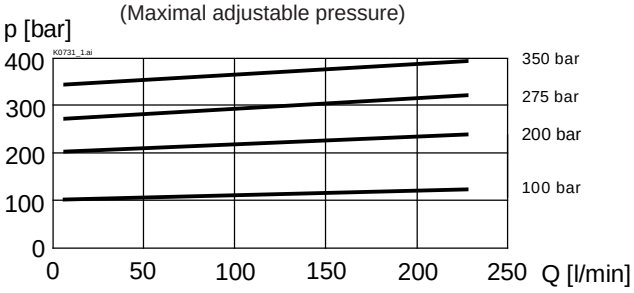
Other electrical specifications see data sheet 1.1-173 (W)
1.1-174 (M)

HYDRAULIC SPECIFICATIONS

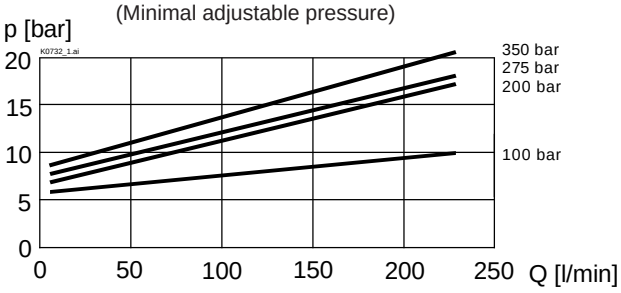
Fluid	Mineral oil, other fluid on request
Contamination	ISO 4406: 1999, class 18/16/13
efficiency	(Required filtration grade ß 6…10 ≥ 75) see data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20...+70 °C
Peak pressure	p_{max} = 400 bar $p_{Tmax} = p_P$+15 bar
Nominal pressure ranges	p_N= 100 bar, 200 bar, 275 bar, 350 bar
Volume flow	Q = 5…230 l/min
Leakage volume flow	see characteristics
Repeatability	≤ 3 % ∗
Hysteresis	≤ 4 % ∗ ∗ at optimal dither signal

CHARACTERISTICS Oil viscosity υ = 30 mm²/s

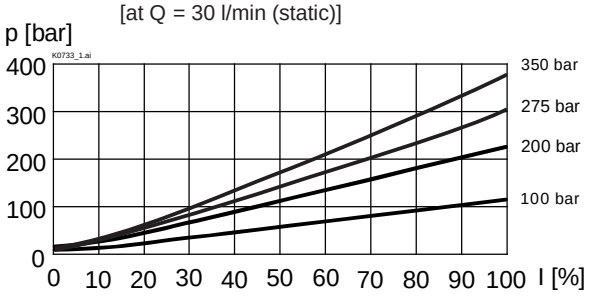
p = f (Q) Pressure volume flow characteristics (Maximal adjustable pressure)



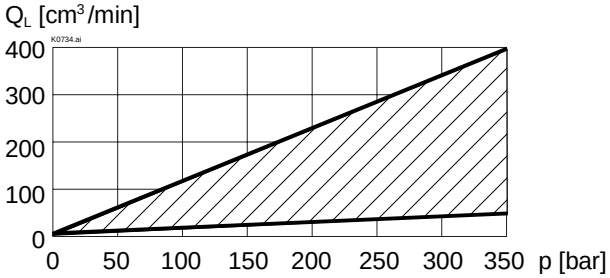
p = f (Q) Pressure volume flow characteristics (Minimal adjustable pressure)



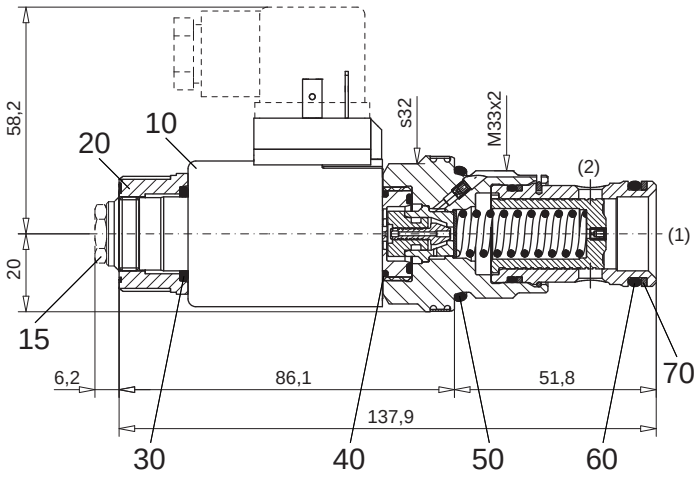
p = f (l) Pressure adjustment characteristics [at Q = 30 l/min (static)]



Q_L = f (p) Leakage volume flow characteristics

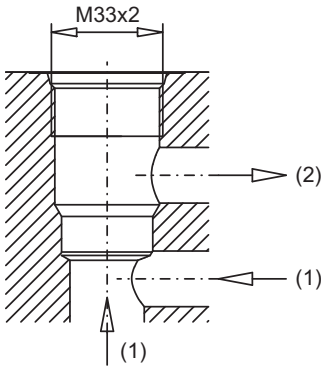


DIMENSIONS / SECTIONAL DRAWING



Dimensions of the other connection versions see data sheet 1.1-173

Cavity drawing acc. to
ISO 7789–33–02–0–98



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

PARTS LISTE

Position	Ariticle	Description
10		EN 175301
	206.2201	Solenoid coil WD37/19x50-G24
	206.2200	Solenoid coil WD37/19x50-G12
		Junior-Timer
	206.2203	Solenoid coil WJ37/19x50-G24
	206.2202	Solenoid coil WJ37/19x50-G12
		Deutsch
	206.2205	Solenoid coil WG37/19x50-G24
	206.2204	Solenoid coil WG37/19x50-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	154.2700	Knurled nut
30	160.2187	O-ring ID 18,72x2,62 (NBR)
	160.6187	O-ring ID 18,72x2,62 (FKM)
40	160.2170	O-ring ID 17,17x1,78 (NBR)
	160.6172	O-ring ID 17,17x1,78 (FKM)
50	160.2298	O-ring ID 29,82x2,62 (NBR)
	160.6296	O-ring ID 29,82x2,62 (FKM)
60	160.2219	O-ring ID 21,89x2,62 (NBR)
	160.6216	O-ring ID 21,89x2,62 (FKM)
70	049.3277	Backup ring RD 22,5x27x1,4

ACCESSORIES

Line mount body	Data sheet 2.9-200
Proportional amplifier	register 1.13
Mating connector EN 175301-803	Article no. 219.2002

Technical explanation see data sheet 1.0-100