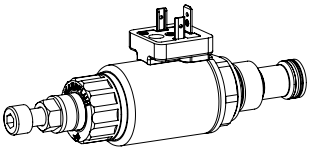
Proportional pressure relief cartridge inverse

- direct operated
- Q_{max} = 25 l/min
- p_{max} = 400 bar
- $p_{N\,max}$ = 350 bar

M22 x 1,5
ISO 7789



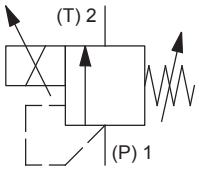
DESCRIPTION

Direct operated proportional pressure relief valve with inverse function in screw-in cartridge construction for cavity according to ISO 7789. Good flow capacity due to the differencial area principle, 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. With the solenoid deenergised, maximum working pressure is present. If the solenoid current increases, the pressure in port P (1) drops. 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. By means of the inverse function, the maximum system pressure is maintained if the electrical valve control falls out (safety function). 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



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 D I PM22 - [ ] - [ ] / [ ] [ ] - [ ] # [ ]

Pressure relief valve				
Direct operated				
Proportional, inverse				
Screw-in cartridge M22 x 1,5				
Nominal pressure range p_N	20 bar	20	200 bar	200
	100 bar	100	315 bar	315
	160 bar	160	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		
Design index (subject to change)				

2.3-548

GENERAL SPECIFICATIONS

Designation	Proprtional pressure relief valve with inverse function
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	0,60 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 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)

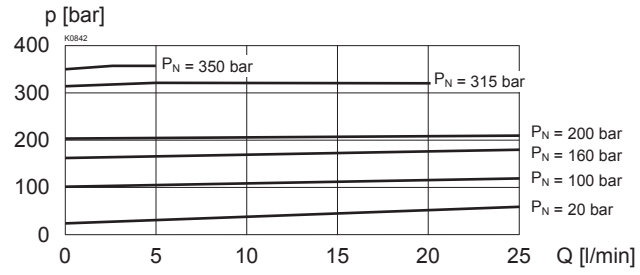
HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 400 bar
Nominal pressure range	P_N = 20 bar, 100 bar, 160 bar, 200 bar, 315 bar, 350 bar Adjustable via adjustment screw (-20 % / +30 %)
Maximum volume flow	Q_{max} = 25 l/min (p_N = 20 / 100 / 160 / 200 bar) Q_{max} = 15 l/min (p_N = 315 / 350 bar) Q_{max} = 5 l/min
Minimum volume flow	Q_{min} = 0,2 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

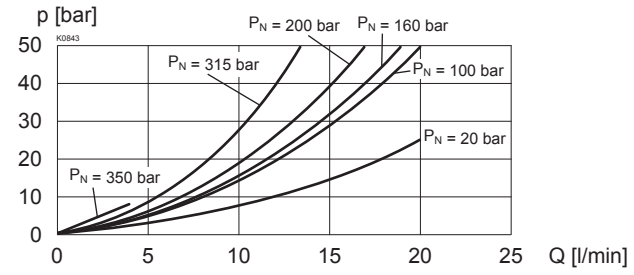
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

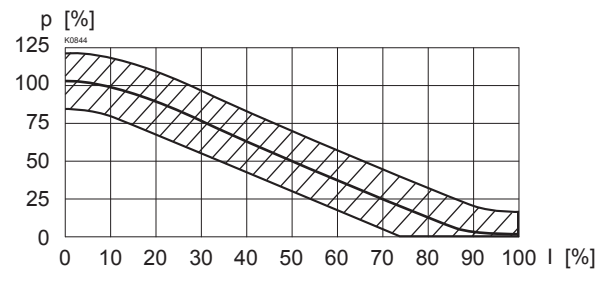
p_{red} = f (Q) **Pressure volume flow characteristics**
Adjusted at Q = 1 l/min at nominal pressure



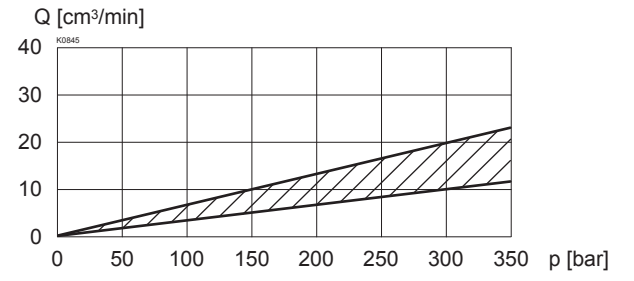
p_{red} = f (Q) **Pressure volume flow characteristics**
Minimal adjustable pressure



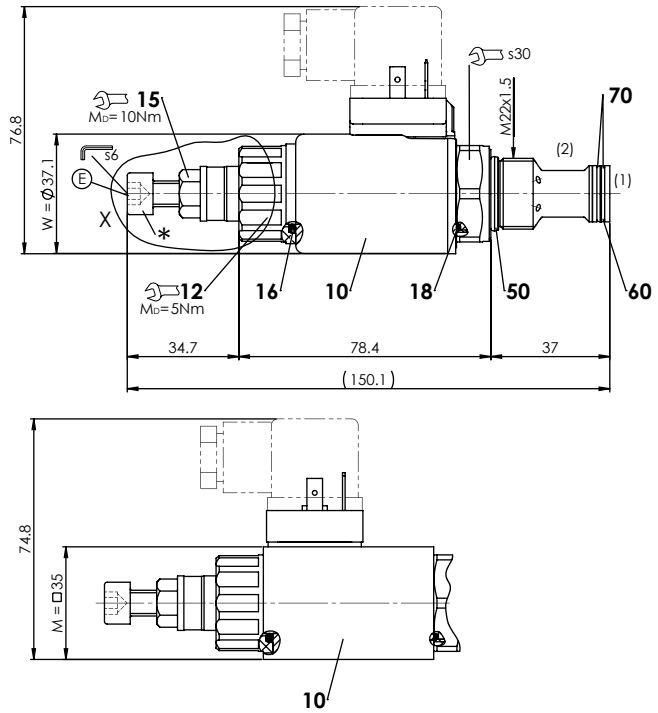
p_{red} = f (n) **Pressure adjustment characteristics**
Measured at Q = 1 l/min



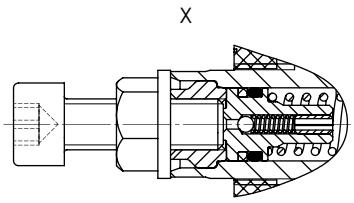
Q_L = f (p) **Leakage volume flow characteristic**



DIMENSIONS

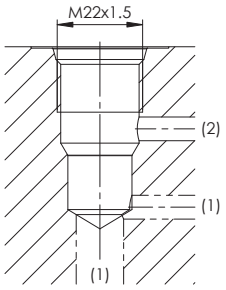


E = Air bleed screw
*Adjustment screw for adjusting the nominal pressure



HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789–22–02–0–98



Note! For detailed cavity drawing and cavity tools see data sheet 2.13-1003

PARTS LIST

Position	Article	Description
10	206.2…	W.S37 / 19 x 50
	260.5…	M.S35 / 19 x 50
	154.2700	Knurled nut
	153.2401	Dichtmutter Norm „Seal-Lock" 8 Zi - Ni M8
	251.5917	Seal kit
	251.5918	Seal kit D1

Seal kit consisting of:

16	O-ring	ID 18,72 x 2,62
18	O-ring	ID 17,17 x 1,78
50	O-ring	ID 18,77 x 1,78
60	O-ring	ID 14,00 x 1,78
70	B.up ring	PTFE rd 14,6 x 17,5 x 1,4

COMMISSIONING

When commissioning, the valve must be vented under pressure as follows (see detail X in Dimensions):

- Loosen lock nut
- Remove screw (E)
- Push the non-return valve (with pin or hex key < 1,3 mm)
- Screw-in the screw (E)
- Adjust the required pressure and tighten the lock nut

Attention! Therewith oil flows out with the corresponding pressure! Cover with a cloth.

MANUAL OVERRIDE

None

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

SURFACE TREATMENT

- The cartridge body made of steel and the slip-on coil are zinc-nickel coated

ACCESSORIES

Proportional amplifier	Register 1.13
Electric plug B (black)	Article no. 219.2002
Flange body / sandwich plate NG4-Mini	Data sheet 2.3-720
Flange body / sandwich plate NG6	Data sheet 2.3-740
Flange body / sandwich plate NG10	Data sheet 2.3-760
Threaded body	Data sheet 2.9-200
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50

INSTALLATION NOTES

Mounting type	Screw-in cartridge M22 x 1,5
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 60 Nm Screw-in cartridge M_D = 5 Nm knurled nut