


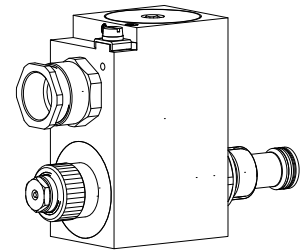


**Proportional pressure relief valve
Screw-in cartridge**

- Direct operated
- $Q_{max} = 25 \text{ l/min}$
- $p_{max} = 400 \text{ bar}$
- $p_{Nmax} = 350 \text{ bar}$

**M22x1,5
ISO 7789**

-  II 2 G Ex d IIC
-  II 2 D Ex tD A21 IP65
-  I M2 Ex d I Mb


DESCRIPTION
For explosion-hazard zones

Direct operated proportional pressure relief valve as a screw-in cartridge with a thread M22x1,5 for cavity according to ISO 7789. Activated with Wandfluh-explosion-proof-solenoid. The cartridge body made of steel is zinc coated for corrosion protection. Solenoid coil in acc. with directive 94/9/EC (ATEX) for explosion-hazard zones. The flameproof enclosures (acc. to EN/IEC 60079-1/31 and EN/IEC 61241-1) prevents an explosion in the interior from getting outside. The design prevents a surface temperature capable of igniting.

FUNCTION

The valve limits the pressure in port P (1) and relieves the volume flow to tank port T (2). The back pressure in T (2) influences the pressure in P (1). When the operating pressure set by the proportional solenoid is reached, the poppet spool opens and connects the protected line to the tank T (2). These pressure relief valves are built according to the differential spool principle and are therefore very sensitive adjustable over the whole pressure range and also suitable for systems with extremely low minimum pressures.

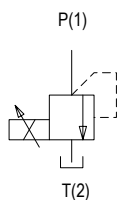
APPLICATION

These valves are suitable for applications in explosion-hazard zones, open cast and also in mines. The valve has its application in hydraulic systems, in which the pressure frequently has to be changed. The facility for remote control and signal processing from process control systems enable elegant, comfortable solutions to problems. 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 NG4-Mini, NG6 and NG10 types. (Please note the separate data sheets in register 2.3). 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.

CERTIFICATES

in accordance with	Surface gas + dust	Mining
ATEX	x	x
IECEX	x	x
GOST Ex	x	x
Australia	x	x
Inmetro	x	x

The certificates can be found on www.wandfluh.com / DOWNLOADS / Accompanying

SYMBOLS

TYPE CODE

Pressure relief valve		B		D		B		PM22-		-		-		/		-		-		#		□	
Direct operated																							
Proportional, explosion proof execution, Ex d																							
Screw-in cartridge M22x1,5																							
Nominal power P_N :		15W / L15		9W / L9																			
Nominal pressure range p_N [bar]		20		200		20		160															
		63		275		50		220															
		100		350		80		280															
Nominal voltage U_N		12 VDC		24 VDC		G12		G24															
Nominal power P_N		9W		15W		L9		L15															
						40 °C		70 °C															
Certificate		ATEX, IECEX, GOST Ex		Australia		AU		Inmetro		IM		NEPSI		NP									
Sealing material		NBR		FKM (Viton)		D1																	
Design-Index (Subject to change)																							

GENERAL SPECIFICATIONS

Description	Direct operated proportional pressure relief valve
Construction	Screw-in cartridge for cavity according to ISO 7789
Operations	Proportional solenoid
Mounting	Screw-in thread M22x1,5
Admissible ambient temp.	Execution L9 -20...+40 °C (operation as T1...T6/T80 °C) Execution L15 -20...+70 °C (operation as T1...T4/T130 °C)
Mounting position	any, preferably horizontal
Fastening torque	$M_D = 50 \text{ Nm}$ for fixing screw $M_D = 5 \text{ Nm}$ for knurled nut
Weight	$m = 2,2 \text{ kg}$

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight
Standard nominal voltage	$U_N = 12 \text{ VDC}, 24 \text{ VDC}$
Limiting current	12VDC 24VDC L9/40 °C $I_G = 625 \text{ mA}$ 305 mA L15/50 °C $I_G = 950 \text{ mA}$ 450 mA L15/70 °C $I_G = 910 \text{ mA}$ 420 mA
Voltage tolerance	+ 10% of rated voltage
Relative duty factor	100% ED
Schutzart	IP67 acc. to EN 60529
Connection/Power supply	Through cable gland for cable $\varnothing 6,5...14 \text{ mm}$ (acc. to EN 60079-0)
Temperature class:	T1...T6
Execution L9:	T1...T4
Execution L15:	T1...T4
Nominal power:	
Execution L9	9W
Execution L15	15W
For further electrical characteristics, refer to the data sheet of the solenoid coil: 1.1-183	

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade $\beta_{6...10} \geq 75$) see data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Admissible fluid temp.	Execution L9 -20...+40 °C (operation as T1...T6/T80 °C) Execution L15 -20...+70 °C (operation as T1...T4/T130 °C)
Peak pressure	$p_{max} = 400$ bar
Nominal pressure ranges	Execution L9 $p_N = 20$ bar, 80 bar, 160 bar, 250 bar, 280 bar Execution L15 $p_N = 20$ bar, 100 bar, 200 bar, 315 bar, 350 bar
Min. volume flow	$Q_{min} = 0,1$ l/min
Max. volume flow	see characteristics
Leakage volume flow	see characteristics
Repeatability	≤ 2% *
Hysteresis	≤ 5% *
	* at optimal dither signal

SECURITY OPERATED


The solenoid coil must only be put into operation, if the requirements of the operating instructions supplied are observed to their full extent.
 In case of non-observance, no liability can be assumed.

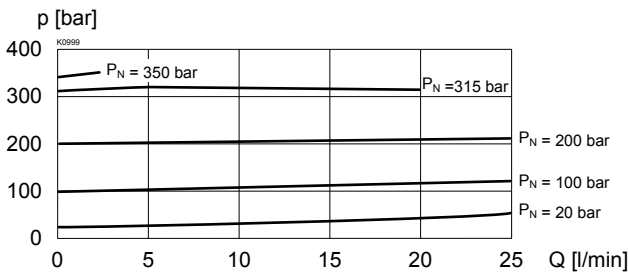
INSTALLATION

For stack assembly please observe the remarks in the operating instructions.

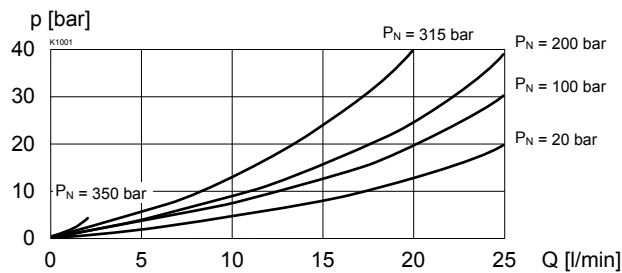
CHARACTERISTICS oil viscosity $\nu = 30$ mm²/s

Execution L15 (measured at 50 °C)

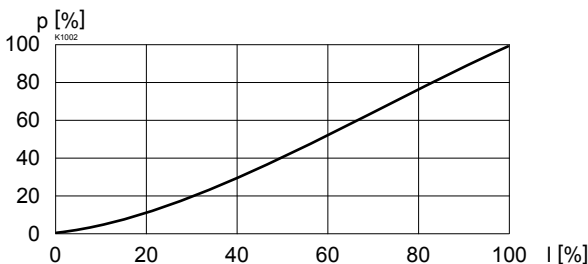
$p = f(Q)$ Pressure volume flow characteristics
 (Maximum adjustable pressure)



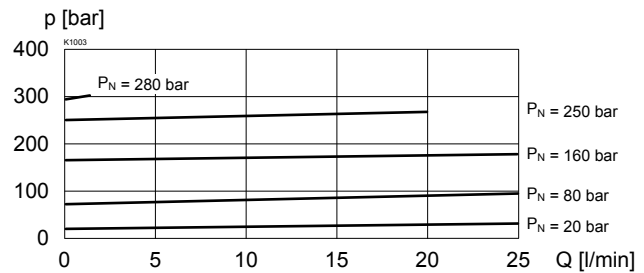
$p = f(Q)$ Pressure volume flow characteristics
 (Minimum adjustable pressure)



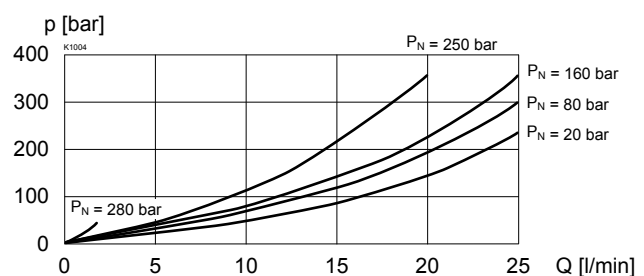
$p = f(I)$ Pressure signal characteristics
 (Q = 1 l/min)


Execution L9 (measured at 40 °C)

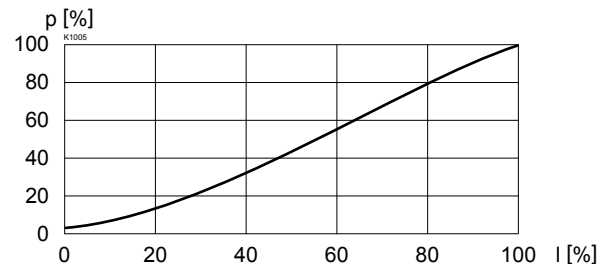
$p = f(Q)$ Pressure volume flow characteristics
 (Maximum adjustable pressure)

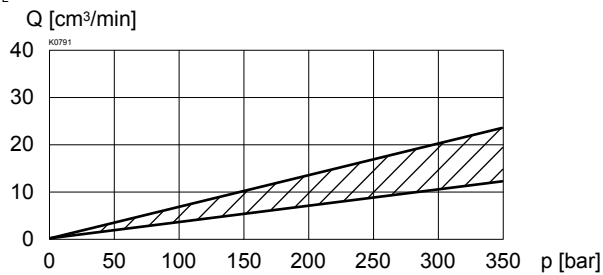
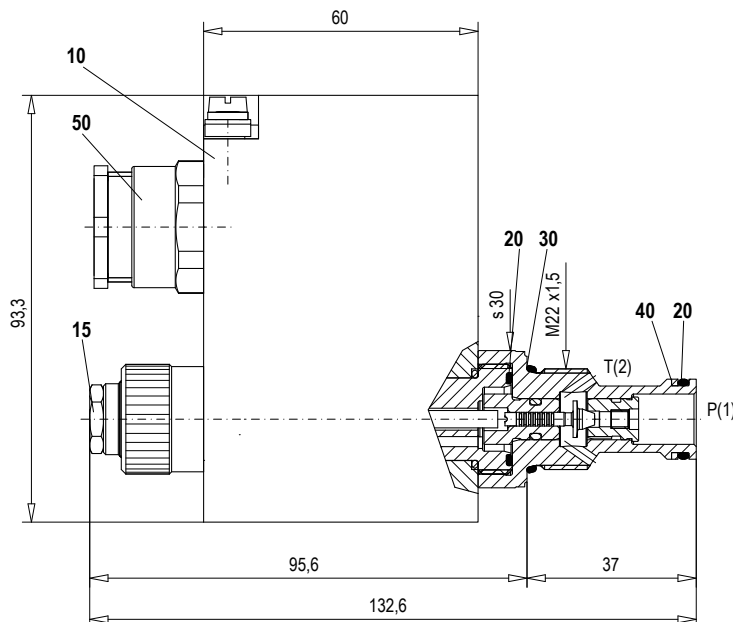
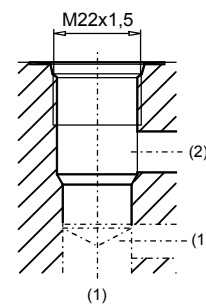


$p = f(Q)$ Pressure volume flow characteristics
 (Minimum adjustable pressure)



$p = f(I)$ Pressure signal characteristics
 (Q = 1 l/min)



Execution L9/40 °C
L15/70 °C
 $Q_L = f(p)$ Leakage volume flow characteristics

DIMENSIONS/SECTIONAL DRAWING

 Cavity drawing acc. to
 ISO 7789-22-02-0-98

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

Dimensions of the solenoid coil refer to data sheet 1.1-183

PARTS LIST

Position	Article	Description
10	263.6...	Slip-on coil MKY45/18 x 60-...
15	253.8000	Plug with integrated manual override HB4,5
20	160.2140 160.8140	O-ring ID 14,00 x 1,78 (NBR) O-ring ID 14,00 x 1,78 (FKM)
30	160.2188 160.8188	O-ring ID 18,77 x 1,78 (NBR) O-ring ID 18,77 x 1,78 (FKM)
40	049.3177	Back-up ring RD 14,6 x 17,5 x 1,4
50	111.1080	Cable gland brass M20

ACCESSORIES

Flange-/sandwich plate NG4-Mini	Data sheet 2.3-720
Flange-/sandwich plate NG6	Data sheet 2.3-740
Flange-/sandwich plate NG10	Data sheet 2.3-760
Line mount body	Data sheet 2.9-200

Technical explanation see data sheet 1.0-100