

Proportional pressure relief valve

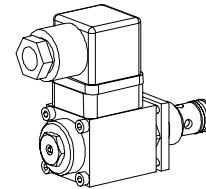
Screw-in cartridge (M 18x1,5)

• Direct operated

- $Q_{max} = 8 \text{ l/min}$
- $p_{max} = 400 \text{ bar}$
- $p_{Nmax} = 315 \text{ bar}$

DESCRIPTION

Direct operated, proportionally actuated pressure relief valve as a screw-in cartridge with a thread M18x1,5 and cavity according to ISO draft 7789. 4 standard pressure levels are available: 20, 100, 200 and 315 bar. The cartridge body made of steel is galvanized and therefore rust-protected. Matching the miniature size of the pressure relief cartridge, a narrow electrical power amplifier in plug form is available. Protection class IP54.



FUNCTION

When operating pressure set by the force controlled proportional solenoid operating immersed in the oil is reached, the poppet spool opens and connects the protected line with the return line to the tank. These pressure relief valves are built according to the differential spool principle and are therefore very sensitive adjustable over the whole pressure range and additionally suitable for systems with extremely low minimum pressures. The operating characteristics curve $p = f(l)$ is almost linear and the hysteresis low. Thanks to the poppet/spool principle and the direct operation, this proportional pressure relief valve is free from leakage oil.

APPLICATION

By changing the electric current at the proportional solenoid the operating pressure in hydraulic systems is limited by releasing the oil from the protected oil line P (resp. 1) to the outlet/tank line T (resp. 2). The facility for remote control and signal processing from process control systems enable elegant, comfortable solutions to problems. Installation of the proportional pressure relief cartridge in control blocks, as well as in the Wandfluh vertical combination and flange valves NG3 (please refer to separate data sheets in register 2.3). Stepped tools are available for making the receptacle bores in steel and aluminium (Hire or purchase). Please refer to the data sheets in register 2.13.

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TYPE CODE

Pressure relief valve	B	D	P	PM18	-	[]	-	[]	#	[]
Direct operated	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Proportional	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Screw- in cartridge M18x1,5	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Nominal Pressure range:	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
$p_N = 20 \text{ bar}$	[20]	[]	[]	[]	[]	[]	[]	[]	[]	[]
$p_N = 100 \text{ bar}$	[100]	[]	[]	[]	[]	[]	[]	[]	[]	[]
$p_N = 200 \text{ bar}$	[200]	[]	[]	[]	[]	[]	[]	[]	[]	[]
$p_N = 315 \text{ bar}$	[315]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Nominal voltage, current type	U=12 VDC	[G12]	[]	[]	[]	[]	[]	[]	[]	[]
	U=24 VDC	[G24]	[]	[]	[]	[]	[]	[]	[]	[]
Design-Index (Subject to change)	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]

GENERAL SPECIFICATIONS

Description	Direct operated proportional pressure relief valve
Construction	Screw-in cavity to ISO 7789
Operations	Proportional solenoid
Befestigungsart	Screw-in-thread M18x1,5
Ambient temperature	-20...50°C
Mounting position	any
Fastening torque	$M_D = 30 \text{ Nm}$ for cartridge $M_D = 1,2 \text{ Nm}$ (Qual. 8.8) for solenoid screws
Weight	$m = 0,25 \text{ kg}$

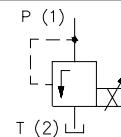
HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406, classe 16/13 (Required filtration grade $\beta_{6...10} \geq 75$) see data sheet 1.0-50/2
Viscosity range	12 mm²/s...320 mm²/s
Fluid temperature	-20...+70°C
Peak pressure	$p_{max} = 400 \text{ bar}$
Nominal pressure ranges	$p_N = 20 \text{ bar}, p_N = 100 \text{ bar},$ $p_N = 200 \text{ bar}, p_N = 315 \text{ bar}$
Min. Volume flow	$Q_{min} = 0,1 \text{ l/min}$
Max. Volume flow	$Q_{max} = 8 \text{ l/min}$ für $p_N = 20 / 100 \text{ bar}$ $Q_{max} = 6 \text{ l/min}$ für $p_N = 200 \text{ bar}$ $Q_{max} = 3 \text{ l/min}$ für $p_N = 315 \text{ bar}$ see characteristics
Leakage volume flow	1 mA
Resolution	$\leq 1\%*$
Repeatability	$\leq 2\%*$
Hysteresis	* at optimal dither signal

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight.
Standard-Nominal voltage	$U = 12 \text{ VDC}$ $U = 24 \text{ VDC}$
Limiting current	$I_G = 1080 \text{ mA}$ $I_G = 540 \text{ mA}$
Relative duty factor	100% ED (see data sheet 1.1-430)
Protection class	IP 65 to DIN 40050
Connection/Power supply	Over device plug connection to ISO 4400/DIN 43650 (2P+E)
Other electrical specifications	see data sheet 1.1-90 (PI29)

SYMBOLS

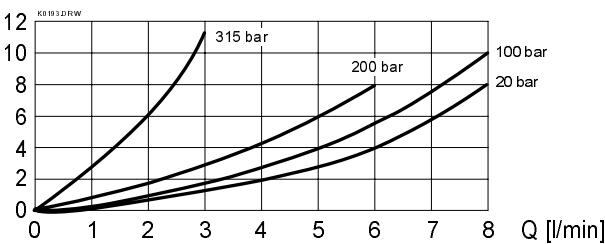


CHARACTERISTICS oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$

$p = f(Q)$ Pressure volume flow characteristics
 p [bar] Maximal adjustable pressure



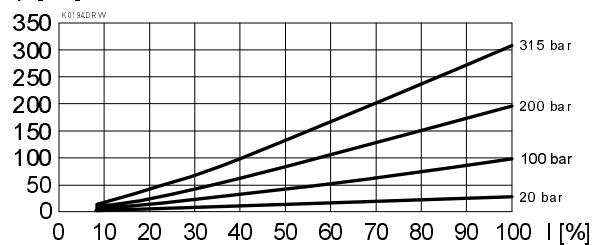
$p = f(Q)$	Pressure volume flow characteristics
p [bar]	Minimal adjustable pressure



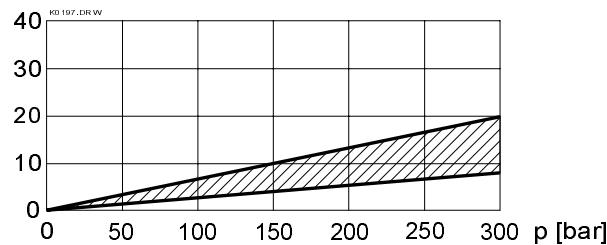
$p = f(l)$ Pressure adjustable characteristics

$Q_l = f(p)$ Leakage volume flow characteristics

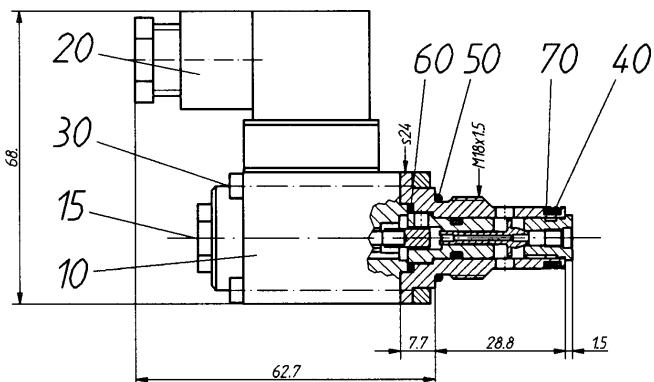
p [bar]



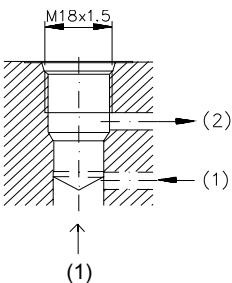
Q_L [cm³/min]



DIMENSIONS / SECTIONAL DRAWING



Cavity drawing to
ISO 7789-18-02-0-98



For detailed cavity drawing
and cavity tools
see data sheet 2.13-1001

PARTS LIST

Position	Article	Description
10	256.2453 256.2418	Proportional solenoid PI29V-G24 Proportional solenoid PI29V-G12
15	253.8000	Mounted screw with integrated manual override HB4,5
20	219.2002	Plug (black)
30	249.0006	Zyl. screw M3x42
40	160.2093	O-ring ID 9,25x1,78
50	160.2156	O-ring ID 15,60x1,78
60	160.2120	O-ring ID 12,42x1,78
70	49.3137	Back up ring RD 10,6x13,5x1,4

ACCESSORIES

Accessories
Cartridge built-in flange- or sandwich body
Flange/Sandwichplate
Proportional amplifier

Register 2.6
Register 1.13

Technical explanation see data sheet 1.0-100E