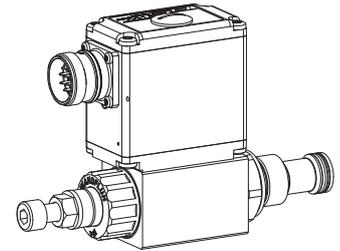


**Proportional pressure relief valve inverse
Screw-in cartridge**

- Integrated amplifier or controller electronics
- Direct operated
- $Q_{max} = 20$ and 25 l/min
- $p_{max} = 400$ bar
- $p_{Nmax} = 350$ bar

M22x1,5
 ISO 7789

DESCRIPTION

Direct operated proportional pressure relief valve with integrated electronics and inverse function. Thread M22x1,5 for cavity according to ISO 7789. These plug & play valves are factory set and adjusted. High valve-to-valve reproducibility. Housing for electronics with protection class IP67 for harsh environment. As standard versions, 6 pressure ranges are available: 20, 40, 63, 100, 160, 200, 315 and 350 bar. Good flow performance due to the differential area principle. Small leakage along the poppet guide. Adjustment by a Wandfluh (VDE-Norm 0580) proportional solenoid. The cartridge and the solenoid made of steel are zinc coated and therefore rust-protected.

FUNCTION

The valve limits the pressure in the 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). The relieved pressure drops with rising solenoid current (inverse function), and the with deenergised solenoid, a maximum pressure is present. The control connection is provided by an analog interface or a fieldbus interface (CANopen or Profibus DP). Parameter setting and diagnosis with the free-of-charge software «PASO» or via fieldbus interface. After taking off the cover of the electronic housing, the serial interface to adjust the settings is accessible. The menu controlled Windows program «PASO» allows easy adjustment of all variable settings. Data are stored in a non-volatile memory. Even after an electric power failure settings can easily be reproduced and transmitted.

APPLICATION

Proportional pressure relief valves with integrated electronics are well suited for demanding applications, in which the pressure frequently has to be changed. They are implemented in systems calling for good valve-to-valve reproducibility, easy installation, comfortable operation and high precision in industrial hydraulics as well as in mobile hydraulics. The proportional pressure relief cartridge is very suitable for mounting in control blocks, flange bodies and sandwich plates size NG4-Mini and NG6. (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.

TYPE CODE

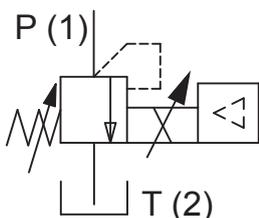
		B	D	I	PM22 -	-	/	M	E	-	#	
Pressure relief valve												
Direct operated												
Proportional, inverse												
Screw-in cartridge M22x1,5												
Nominal pressure rang p_N	20 bar	<input type="text" value="20"/>			200 bar	<input type="text" value="200"/>						
	100 bar	<input type="text" value="100"/>			315 bar	<input type="text" value="315"/>						
	160 bar	<input type="text" value="160"/>			350 bar	<input type="text" value="350"/>						
Nominal voltage U_N	12 VDC				<input type="text" value="G12"/>							
	24 VDC				<input type="text" value="G24"/>							
Slip-on coil	Metal housing, square											
Execution connection	Integrated electronics											
Hardware configuration												
With analog signal (0...+10 V factory set)					<input type="text" value="A1"/>							
With CANopen acc. to DSP-408					<input type="text" value="C1"/>							
With Profibus DP in accordance Fluid Power Technology					<input type="text" value="P1"/>							
With CAN J1939 (on request)					<input type="text" value="J1"/>							
Function												
Amplifier					<input type="text" value=""/>							
Controller with current feedback signal (0...20 mA / 4...20 mA)					<input type="text" value="R1"/>							
Controller with voltage feedback signal (0...10 V)					<input type="text" value="R2"/>							
Sealing material	NBR				<input type="text" value=""/>							
	FKM (Vitron)				<input type="text" value="D1"/>							
Design-Index (Subject to change)												

GENERAL SPECIFICATIONS

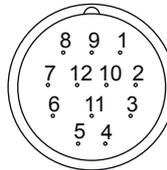
Description	Direct operated proportional pressure relief valve with integrated electronics inverse function
Construction	Screw-in cartridge for cavity acc. to ISO 7789
Operations	Proportional solenoid wet pin push type, pressure tight
Mounting	Screw-in thread M22x1,5
Ambient temperature	-20...+65°C (typical) (The upper temperature limit is a guideline value for typical applications, in individual cases it may also be higher or lower. The electronics of the valve limit the power in case of a too high electronics temperature. More detailed information can be obtained from the operating instructions «DSV».)
Mounting position	any, preferably horizontal
Fastening torque	M _D = 50 Nm for screw-in cartridge M _D = 5 Nm for knurled nut
Weight	m = 1,0 kg

ELECTRICAL SPECIFICATIONS

Protection class	IP 67 acc. to EN 60 529 with suitable connector and closed electronics housing
Supply voltage	12 VDC or 24 VDC
Ramps	adjustable
Parameterisation	via Fieldbus or USB
Interface	USB (Mini B) for parameterisation with «PASO» (under the closing screw of the housing cover, Preset ex-works)
Analog interface:	
Device receptacle (male) M23, 12-poles	
Mating connector	Plug (female), M23, 12-poles (not incl. in delivery)
Preset value signal	Input voltage / current as well as signal range can be set by software.
Fieldbus interface:	
Device receptacle supply (male)	M12, 4-poles
Mating connector	Plug (female), M12, 4-poles (not incl. in delivery)
Device receptacle CANopen (male)	M12, 5-poles (acc. to DRP 303-1)
Mating connector	Plug (female), M12, 5-poles (not incl. in delivery)
Device receptacle Profibus (female)	M12, 5-poles, B-coded (acc. to IEC 947-5-2)
Mating connector	Plug (male), M12, 5-poles, B-coded (not incl. in delivery)
Preset value signal	Fieldbus
Feedback signal interface (Sensor): (controller only)	
Device receptacle (female) M12, 5-poles	
Mating connector	Plug (male), M12, 5-poles (not incl. in delivery)
Feedback signal::	Voltage/current state when ordering

SYMBOL

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluids on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade β 6...10≥75) see data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Fluid temperature	-20...+70°C
Peak pressure	p _{max} = 400 bar
Nominal pres. ranges	p _N = 20 bar, 100 bar, 160 bar, 200 bar, 315 bar, 350 bar
Min. volume flow	Q _{min} = 0,1 l/min
Max. volume flow	Q _{max} = 25 l/min for p _N = 20 bar / 100 bar / 160 bar / 200 bar Q _{max} = 20 l/min for p _N = 315 bar Q _{max} = 5 l/min for p _N = 350 bar
Leakage volume flow	see characteristics
Repeatability	≤ 3%
Hysteresis	≤ 5%

CONNECTOR WIRING DIAGRAM
Analog interface:
Device receptacle (male) X1


- 1 = Supply voltage +
- 2 = Supply voltage 0 VDC
- 3 = Stabilised output voltage
- 4 = Preset value voltage +
- 5 = Preset value voltage -
- 6 = Preset value current +
- 7 = Preset value current -
- 8 = Reserved for extensions
- 9 = Reserved for extensions
- 10 = Enable control (Digital input)
- 11 = Error signal (Digital output)
- 12 = Chassis

Preset value voltage (PIN 4/5) resp. current (PIN 6/7) are selected with set-up and diagnosis software PASO.
 Factory setting: Voltage (0...+10V), (PIN 4/5)

CANopen interface:
Device receptacle supply (male) X1


- MAIN**
- 1 = Supply voltage +
 - 2 = Reserved for extensions
 - 3 = Supply voltage 0 VDC
 - 4 = Chassis

Device receptacle CANopen (male) X3

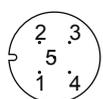

- CAN**
- 1 = not connected
 - 2 = not connected
 - 3 = CAN Gnd
 - 4 = CAN High
 - 5 = CAN Low

Device receptacle Profibus (female) X3


- PROFIBUS**
- 1 = VP
 - 2 = RxD/TxD - N
 - 3 = DGND
 - 4 = RxD/TxD - P
 - 5 = Shield

Parameterisation interface (USB, Mini B) X2

Under the closing screw of the housing cover

Feedback signal interface (Sensor)
Device receptacle (female) X4 (only controller)


- 1 = Supply voltage (output) +
- 2 = Feedback signal +
- 3 = Supply voltage 0 VDC
- 4 = not connected
- 5 = stab. output voltage


NOTE!

Detailed electrical characteristics and description of «DSV» electronics are shown on data sheet 1.13-76.

 Free-of-charge download of the «PASO»-software and the instruction manual for the «DSV» hydraulic valves as well as the operation instruction **CANopen** eg. **Profibus DP** protocol with device profile DSP-408 for «DSV».

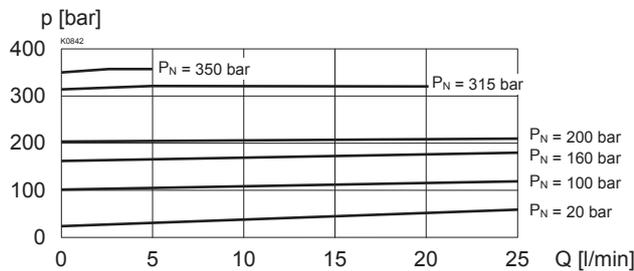
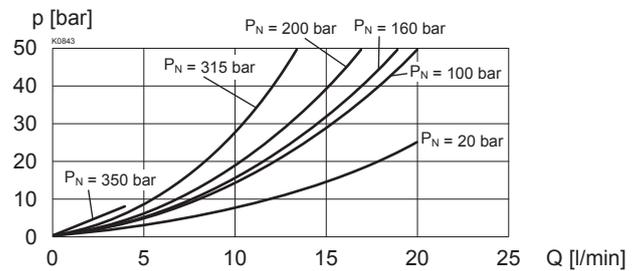
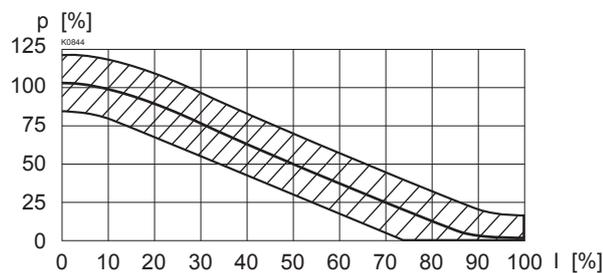
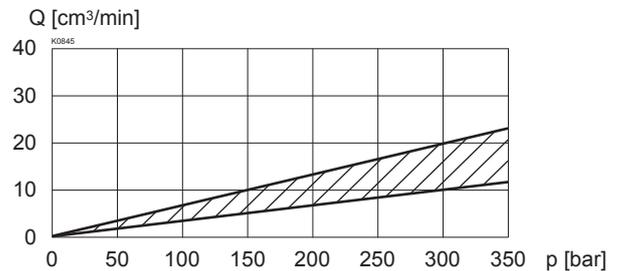
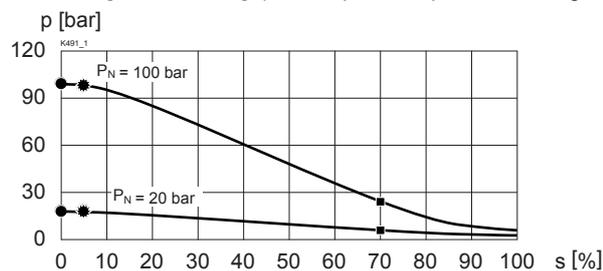
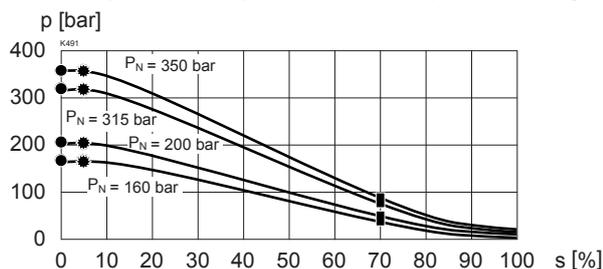
START-UP

For DSV amplifiers as a rule no parameter settings by the customer are required. The plugs have to be connected in accordance with the chapter «Pin assignment».


NOTE!

The mating connectors and the cable to adjust are settings is not part of the delivery. Refer to chapter «Accessories».

Controllers are supplied configured as amplifiers. The setting of the mode of control and the setting of the controller are done by the customer by software setting (USB interface, Mini B).

 Additional information can be found on our website:
«www.wandfluh.com»
CHARACTERISTICS Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$
 $p = f(Q)$ Pressure volume flow characteristics
 (Maximum adjustable pressure)

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

 $p_{\text{red}} = f(I)$ Pressure adjustment characteristics
 [at $Q = 10 \text{ l/min}$] / (s corresponds to preset value signal)

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

 $p = f(I)$ Pressure adjustment characteristics
 [at $Q = 5 \text{ l/min}$] / (s corresponds to preset value signal)

 $p = f(I)$ Pressure adjustment characteristics
 [at $Q = 5 \text{ l/min}$] / (s corresponds to preset value signal)

Factory settings:

Dither set for optimal hysteresis

- ☛ = Deadband: Solenoid switched off with command preset value signal <5%
- = p_N mechanically pre-set at $Q = 5 \text{ l/min}$
- = Limited pressure in port P (1) at 70 % of preset value signal:
 95 bar with pressure range 350 bar
 65 bar with pressure range 315 bar
 56 bar with pressure range 200 bar
 32 bar with pressure range 160 bar
 25 bar with pressure range 100 bar
 4 bar with pressure range 20 bar

