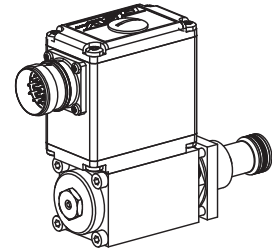


**Proportional pressure relief valve  
Screw-in cartridge**

- Integrated electronics
- Direct operated
- $Q_{\max} = 25 \text{ l/min}$
- $p_{\max} = 400 \text{ bar}$
- $p_{N \max} = 315 \text{ bar}$

**M22x1,5**  
ISO 7789

**DESCRIPTION**

Direct operated proportional pressure relief valve with integrated electronics as a screw-in cartridge. 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. Four standard pressure levels are available: 20, 100, 200 and 315 bar. Adjustment by a Wandfluh proportional solenoid (VDE standard 0580). The cartridge and the solenoid made of steel are zinc coated and therefore rust-protected.

**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 is reached, the poppet spool opens and connects the protected line to the tank T (2). 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.

**CONTENT**

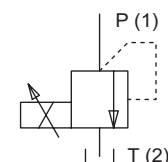
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**TYPE CODE**

			B	D	V	PM22	-		-		#	
Pressure relief valve												
Direct operated												
Proportional valve with integrated electronics												
Screw-in cartridge M22x1,5												
Standard nominal pressure ranges:	$p_N = 20 \text{ bar}$									20		
	$p_N = 100 \text{ bar}$									100		
	$p_N = 200 \text{ bar}$									200		
	$p_N = 315 \text{ bar}$									315		
Standard nominal voltage $U_N$ :	12 VDC									12		
	24 VDC									24		
Hardware configuration:												
With analog signal (0...+10 V factory set)										A1		
With CANopen acc. to DSP-408										C1		
With Profibus DP in accordance with Fluid Power Technology										P1		
With CAN J1939 (on request)										J1		
Design-Index (Subject to change)												
• Data sheet is valid from design-index # 3 on												

**GENERAL SPECIFICATIONS**

Description	Direct operated proportional pressure relief valve with integrated electronics
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
Fastening torque	$M_D = 50 \text{ Nm}$ for screw-in cartridge $M_D = 2,6 \text{ Nm}$ (qual. 8.8) for solenoid screws
Weight	$m = 0,9 \text{ kg}$

**SYMBOL**


## HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade $\beta_{6...10} \geq 75$ ) refer to data sheet 1.0-50/2
Viscosity range	12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s
Fluid temperature	-20...+70 °C
Peak pressure	$p_{max} = 400$ bar
Nominal pressure ranges	$p_N = 20$ bar, $p_N = 100$ bar, $p_N = 200$ bar, $p_N = 315$ bar
Min. volume flow	$Q_{min} = 0,1$ l/min
Max. volume flow	$Q_{max} = 25$ l/min for $p_N = 20/100/200$ bar $Q_{max} = 20$ l/min for $p_N = 315$ bar
Leakage volume flow	see characteristics
Repeatability	$\leq 1,5\%$
Hysteresis	$\leq 3\%$

## ELECTRICAL SPECIFICATIONS

Protection class	IP 67 acc. to EN 60 529 with suitable connector and closed electronic 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, factory set parameters)

### Analogue interface:

Device receptacle (male)	M23, 12-poles
Mating connector	Plug (female), M23, 12-poles (not incl. in delivery)
Preset value signal	Voltage / Current

### 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 DRP303-1)
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



### NOTE!

Detailed electrical characteristics and description of «DSV» electronics are shown on data sheet **1.13-75**.

## START-UP

Normally there is no need to adjust settings by the customer. The connector has to be wired according to the chapter «Connector wiring diagram».

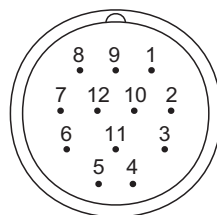
Additional information can be found on our website:  
«[www.wandfluh.com](http://www.wandfluh.com)»

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».

## CONNECTOR WIRING DIAGRAM

### Analog interface:

#### Device receptacle (male) X1



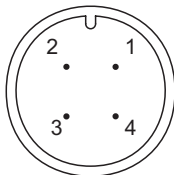
- 1 = Supply voltage +
- 2 = Supply voltage 0 VDC
- 3 = Stabilised output voltage
- 4 = Preset value voltage +
- 5 = Preset value voltage -
- 6 = Preset value current +
- 7 = Preset value current -
- 8 = Reserved for extensions
- 9 = Reserved for extensions
- 10 = Enable control (Digital input)
- 11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

Factory setting: Voltage (0...+10 V), (PIN 4/5)

### Fieldbus interface:

#### Device receptacle supply (male) X1



#### MAIN

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

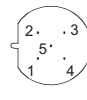
#### Device receptacle CANopen (male) X3



#### 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 = Rx/D/TxD - N
- 3 = DGND
- 4 = Rx/D/TxD - P
- 5 = Shield

### Parameterisation interface (USB, Mini B) X2

Under the closing screw of the housing cover

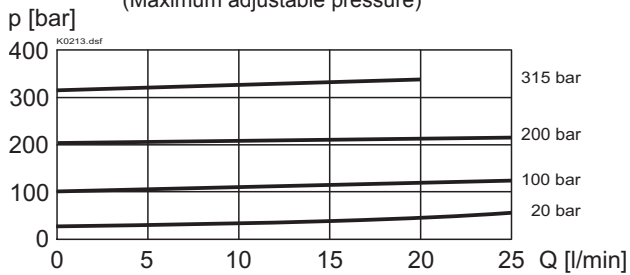


### NOTE!

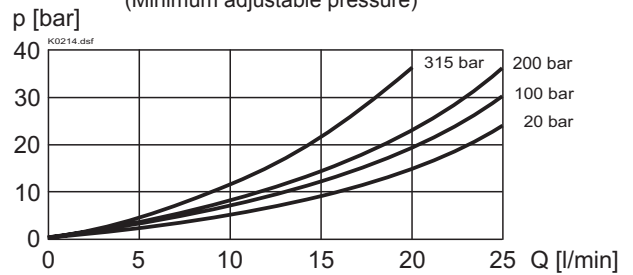
The mating connectors and the cable to adjust the settings are not part of the delivery. To order the cable, look up the article no. in the chapter «Accessories».

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

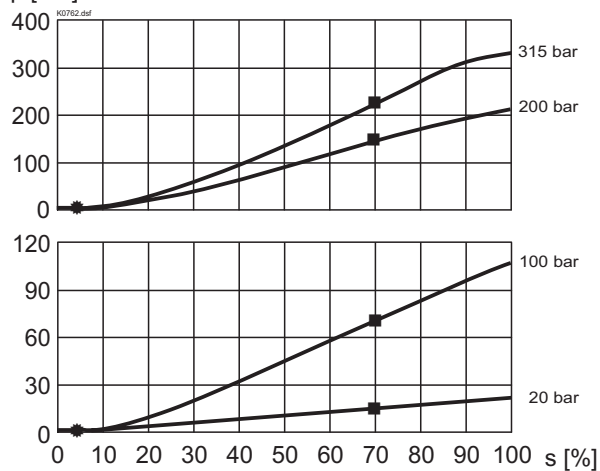
$p = f(Q)$  Pressure volume flow characteristics  
(Maximum adjustable pressure)



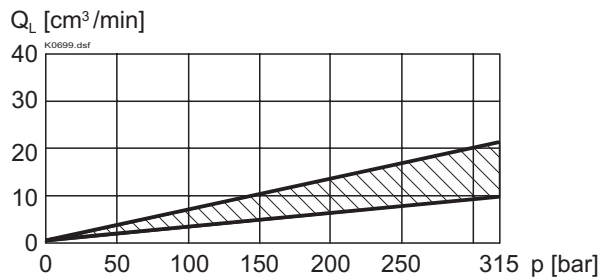
$p = f(Q)$  Pressure volume flow characteristics  
(Minimum adjustable pressure)



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



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



**Factory settings:**

Dither set for optimal hysteresis

- = Deadband: Solenoid switched off  
with command preset value signal < 5 %
- = Limited pressure in port P (1) at 70 % of preset value signal:  
225 bar with pressure range 315 bar  
143 bar with pressure range 200 bar  
72 bar with pressure range 100 bar  
14,5 bar with pressure range 20 bar

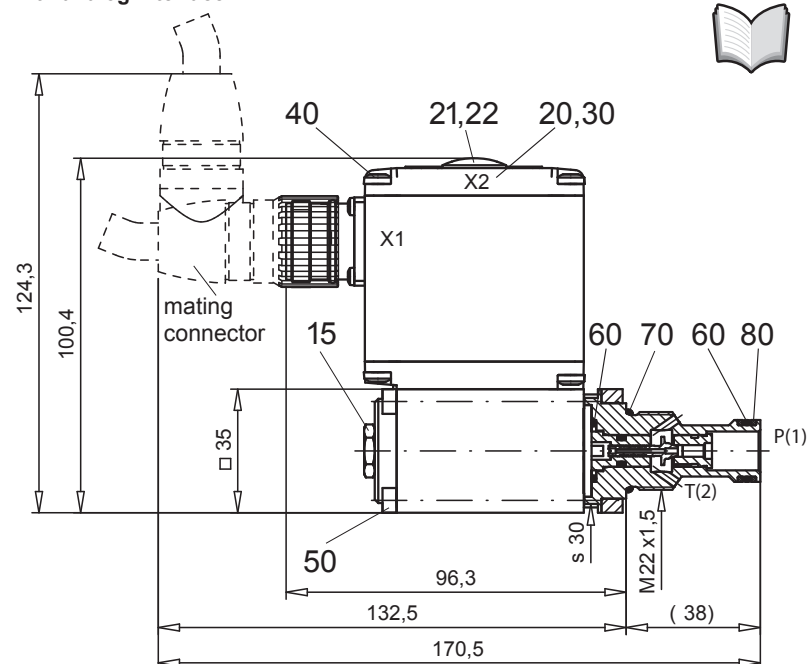
## DIMENSIONS/SECTIONAL DRAWINGS

### With analog interface

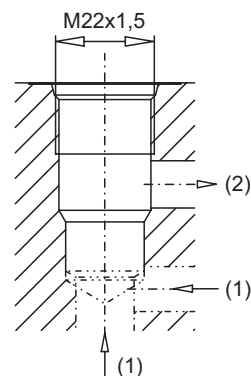


**NOTE!**

The cable connector is not part of the delivery. Regarding the dimensions see also the connector in the chapter «Accessories».

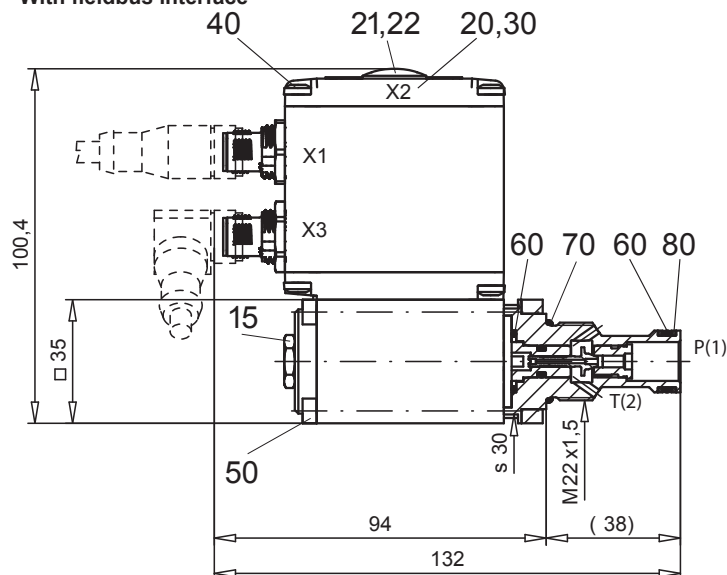


Cavity drawing according to  
ISO 7789-22-02-0-98



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

### With fieldbus interface



## PARTS LIST

Position	Article	Description
15	253.8000	Mounted screw with integrated manual override HB4,5
20	062.0102	Cover square
21	223.1317	Dummy plug M16 x 1,5
22	160.6131	O-ring ID 13,00 x 1,5
30	072.0021	Gasket 33,2 x 59,9 x 2
40	208.0100	Socket head cap screw M4 x 10
50	249.1007	Socket head cap screw M4 x 63 DIN 912
60	160.2140	O-ring ID 14,00 x 1,78
70	160.2188	O-ring ID 18,77 x 1,78
80	049.3177	Back-up ring RD 14,6 x 17,5 x 1,4

## ACCESSORIES

- Cartridge built in:
    - flange and sandwich bodies see register 2.3
  - Set-up software see start-up
  - Cable to adjust the settings through interface USB  
(from plug type A to Mini B, 3 m) article no. 219.2896
  - Cable connector for analog interface:
    - straight, soldering contact article no. 219.2330
    - 90°, soldering contact article no. 219.2331
- Recommended cable size:*
- Outer diameter 9...10,5 mm
  - Single wire max. 1 mm<sup>2</sup>
  - Recommended wire size:
- 0...25 m = 0,75 mm<sup>2</sup> (AWG18)  
25...50 m = 1 mm<sup>2</sup> (AWG17)

Technical explanation see data sheet 1.0-100E