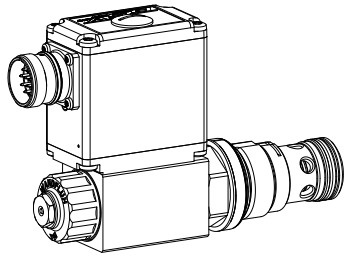
Proportional pressure relief valve
Screw-in cartridge
- **Integrated amplifier electronics**
- **Pilot operated**
- **Q_{max} = 230 l/min**
- **p_{max} = 400 bar**
- **$p_{N\ max}$ = 315 bar**

M33x2
ISO 7789



DESCRIPTION

Pilot operated proportional pressure relief valve with integrated electronics as a screw-in car-tridge. Thread M33x2 for cavity according to ISO 7789. These plug & play valves are factory set and adjusted. High valve-to-valve repro-ducibility. Housing for electronics with protection class IP67 for harsh environment. Four standard pressure levels are available: 100, 200, 275 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 rustprotected.

FUNCTION

When the operating pressure set by the proportional solenoid is reached, the main spool opens and connects the protected line with the return line to the tank. The back pressure in T (2) influences the pressure in P (1). The control connection is provided by an analog interface or a fieldbus interface (CANopen, J1939 or Profibus DP). Parameter setting and diagnosis with the free-of-charge software «PASO» or via fieldbus interface. The USB parameterisation interface is accessible through a cover flap. “PASO” is a Windows program in the flow diagram style, which enables the intuitive setting and storing of all variable parameters. The data remain saved in case of a power failure and can also be reproduced and transferred to other DSVs.

APPLICATION

Proportional pressure relief valves with inte-grated 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 catridge is very suitable for mounting in control blocks.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

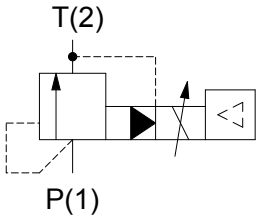
B V P PM33 - ☐ - ☐ / M E ☐ - ☐ ☐ # ☐

Pressure relief valve			
Pilot operated			
Proportional			
Screw-in thread M33x2			
Nominal pressure range p_N		100 bar	100
		200 bar	200
		275 bar	275
		350 bar	350
Nominal voltage U_N	12 VDC		G12
	24 VDC		G24
Slip-on coil	Metal housing, square		
Connection execution	Integrated electronics		
Hardware configuration			
With analog signal (0…+10 V voreingestellt)			A1
With CANopen acc. to DSP-408			C1
With Profibus DP in accordance with Fluid Power Technology			P1
With CAN J1939 (on request)			J1
Sealing material	NBR		
	FKM (Vitron)		D1
Manual override	Armature tube closed (standard)		
	Screwed sealing plug		HB0
	Manual emergency actuation		HB4.5
Design-Index (Subject to change)			

GENERAL SPECIFICATIONS

Description	Pilot 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 M33x2
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 = 80 Nm for screw-in cartridge M_D = 5 Nm for knurled nut
Masse	m = 1,25 kg

SYMBOL



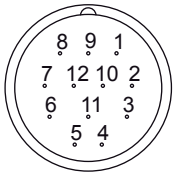
HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß 6…10≥75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70 °C
Peak pressure	p_{max} = 400 bar $p_{Tmax} = p_P$+15 bar
Nominal pressure ranges	p_N= 100 bar, 200 bar and 315 bar
Volume flow	Q = 5…230 l/min
Leakage volume flow	see characteristics
Repeatability	≤ 3 %
Hysterese	≤ 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…+10 V), (PIN 4/5)

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 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

Fieldbus interface:

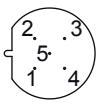
Device receptacle supply (male) X1

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 = 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

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**».

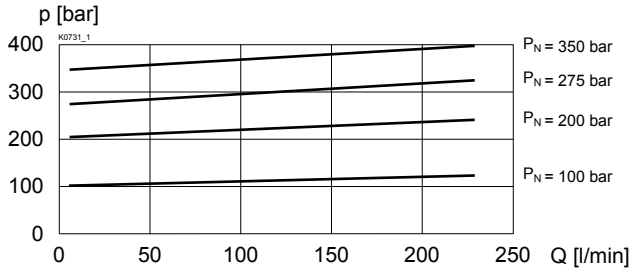
INBETRIEBNAHME
For DSV amplifiers as a rule no parameter settings by the customer are required. The plugs have to be connected in accordance with the chapter «Pin assignment».

Additional information can be found on our website:
«www.wandfluh.com»

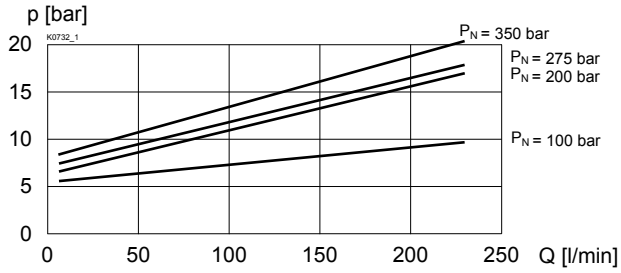
NOTE!
The mating connectors and the cable to adjust the settings are not part of the delivery. Refer to chapter «Accessories».

CHARACTERISTICS Oil viscosity υ = 30 mm²/s

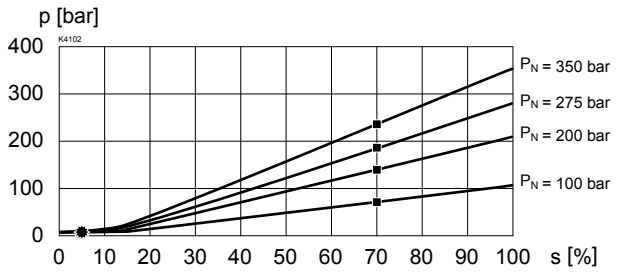
p = f (Q) Pressure volume flow characteristics (Maximal adjustable pressure)



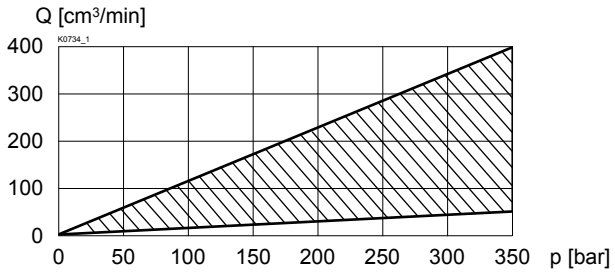
p = f (Q) Pressure volume flow characteristics (Minimal adjustable pressure)



p = f (I) Pressure adjustment characteristics [at Q = 30 l/min] / (s corresponds to preset value signal)



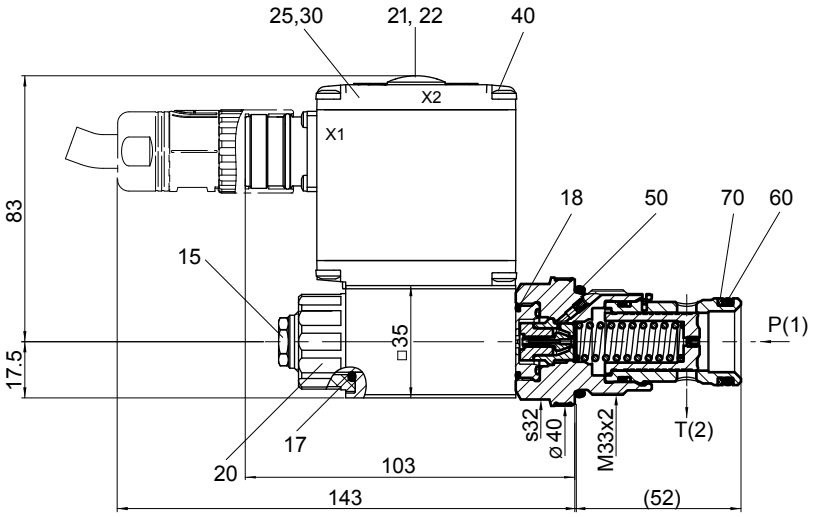
Q_L = f (p) Leakage volume flow characteristics



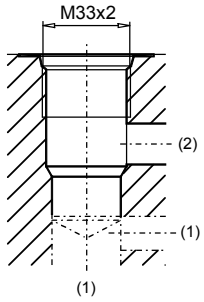
Factory settings:
Dither set for optimal hysteresis
✹ = Deadband: Solenoid switched off with command preset value signal < 5 %
■ = Limited pressure in port P (1) at 70 % of preset value signal:
72 bar with pressure range 100 bar
143 bar with pressure range 200 bar
192 bar with pressure range 275 bar
233 bar with pressure range 350 bar

DIMENSIONS / SECTIONAL DRAWINGS

With analogue interface

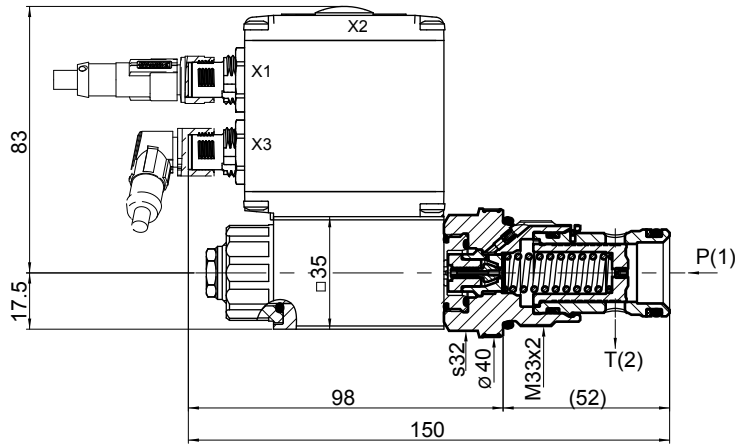


Cavity drawing according to ISO 7789–33–02–0–98



For detailed cavity drawing and cavity tools see data sheet 2.13-1041

With fieldbus interface



PARTS LIST

Position	Article	Description
15	253.8000 239.2033	HB 4,5 Manual override (data sheet 1.1-300) HB 0 Plug screw (data sheet 1.1-300)
17	160.2187	O-ring ID 18,72 x 2,62 (NBR)
18	160.2170	O-ring ID 17,17 x 1,78 (NBR)
20	154.2700	Knurled nut
21	223.1317	Dummy plug M16 x 1,5
22	160.6131	O-ring ID 13,00 x 1,5
25	062.0102	Cover square
30	072.0021	Gasket 33,2 x 59,9 x 2
40	208.0100	Socket head cap screw M4 x 10
50	160.2298 160.6296	O-ring ID 29,82 x 2,62 (NBR) O-ring ID 29,82 x 2,62 (FKM)
60	160.2219 160.6216	O-ring ID 21,89 x 2,62 (NBR) O-ring ID 21,89 x 2,62 (FKM)
70	049.3277	Back-up ring RD 22,5 x 27 x 1,4

ACCESSORIES

Line mount body — Data sheet 2.9-200

- 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
- Mating connector (plug female) for the analogue interface:
  – streight, 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 mm²
  – Recommended wire size:
  0…25 m = 0,75 mm² (AWG18)
  25…50 m = 1 mm² (AWG17)

Technical explanation see data sheet 1.0-100