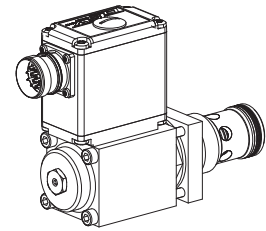


**Proportional 2-way flow control valve  
Screw-in cartridge**

- Integrated electronics
- Direct operated, pressure compensated
- $Q_{max} = 63 \text{ l/min}$ ,  $p_{max} = 350 \text{ bar}$
- $Q_{Nmax} = 63 \text{ l/min}$

**M33x2**  
 ISO 7789

**DESCRIPTION**

Direct operated, pressure compensated proportional flow control valve with integrated electronics as a screw-in cartridge. Thread M33x2 for cavity according to ISO 7789. These plug & play valves are factory set and adjusted. High valve-to-valve reproducibility. Housing for electronic with protection class IP67 for harsh environment. The volume flow is adjusted by a Wandfluh proportional solenoid (VDE standard 0580). Allmost linear flow increase and low hysteresis are typical for this valve. The cartridge body made of steel is special surface coated for corrosion rust protection and low friction of control- and throttle spools. The solenoid is zinc coated.

**FUNCTION**

The 2-way flow control valve is designed to keep the oil flow to any actuator constant irrespective of the load. The throttle opening, and therefore the flow volume changes proportionally to the current absorption of the proportional solenoid. If the pressure in the system changes, the pressure compensator will change the diameter of the oil passage to keep the pressure drop over the restrictor constant. The control connection is provided by an analog interface or 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 electronics 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 flow control valves with integrated electronics are well suited for precise feed control systems where the supply volume flow has to be kept constant even when the load fluctuates. 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 flow control cartridge is very suitable for mounting in control blocks, flange bodies and sandwich plates of the size NG10. 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.

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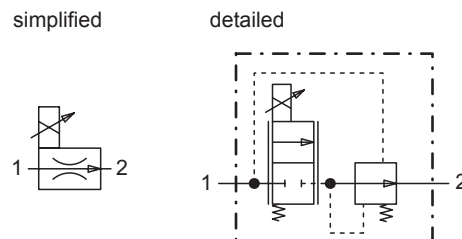
**TYPE CODE**

		Q	N	V	PM33	-	63	-	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>
Flow control valve												
Normally closed												
Proportional valve with integrated electronics												
Screw-in cartridge M33x2												
Nominal volume flow rate $Q_N$ :	63 l/min											
Standard nominal voltage $U_N$ :	12 VDC								<input type="checkbox"/>	<input type="checkbox"/>		
	24 VDC								<input type="checkbox"/>	<input type="checkbox"/>		
Hardware configuration:												
With analog signal (0...+10 V factory set)									<input type="checkbox"/>	<input type="checkbox"/>		
With CANopen acc. to DSP-408									<input type="checkbox"/>	<input type="checkbox"/>		
With Profibus DP in accordance with Fluid Power Technology									<input type="checkbox"/>	<input type="checkbox"/>		
With CAN J1939 (on request)									<input type="checkbox"/>	<input type="checkbox"/>		
Design-Index (Subject to change)												

• Data sheet is valid from design-index # 1 on

**GENERAL SPECIFICATIONS**

Description	Proportional 2-way flow control 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
Fastening torque	$M_D = 80 \text{ Nm}$ for screw-in cartridge $M_D = 5,2 \text{ Nm}$ (qual. 8.8) for solenoid screws
Weight	$m = 1,5 \text{ kg}$
Volume flow direction	1 → 2

**SYMBOLS**


**HYDRAULIC SPECIFICATIONS**

Fluid	Mineral oil, other fluids 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	$p_{max} = 350$ bar
Nominal volume flow	$Q_N = 63$ l/min
Max. volume flow	$Q_{max} = 63$ l/min
Min. volume flow	$Q_{min} = 0,2$ l/min
Leakage volume flow	see characteristics
Repeatability	≤ 2%
Hysteresis	≤ 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 cover screw of the housing cover factory set parameters)

**Analog interface:**

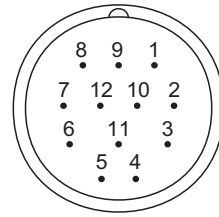
Device receptacle (male)	M23, 12-poles
Mating connector	Plug (female), M23, 12-poles (not incl. in delivery)
Preset value signal	Voltage/Current

**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 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


**NOTE!**

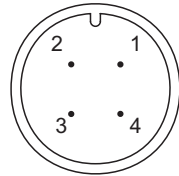
Detailed electrical characteristics and description of «DSV» electronics are shown on data sheet 1.13-75.

**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 (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!**

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».

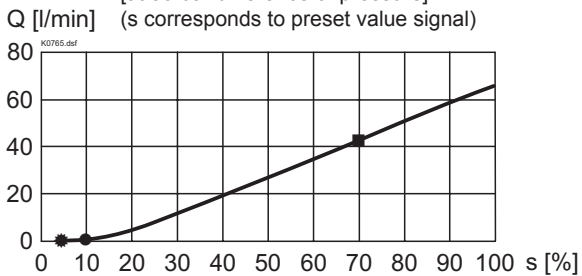
**START-UP**

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:

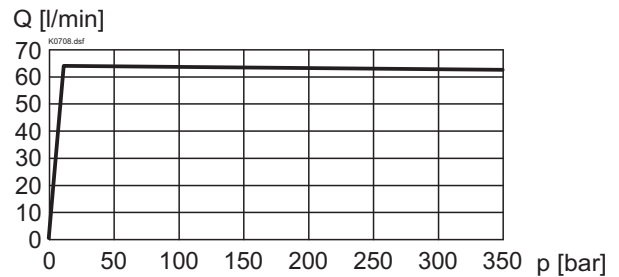
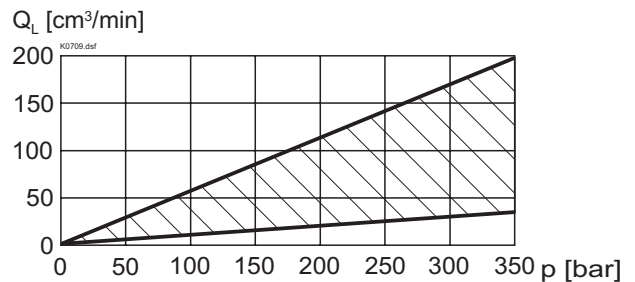
«[www.wandfluh.com](http://www.wandfluh.com)»

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».

**CHARACTERISTICS** Oil viscosity  $\nu = 30\text{mm}^2/\text{s}$ 
 $Q = f(I)$  Volume flow adjustment characteristics  
 [at 50 bar difference of pressure]

**Factory settings:**

Dither set for optimal hysteresis

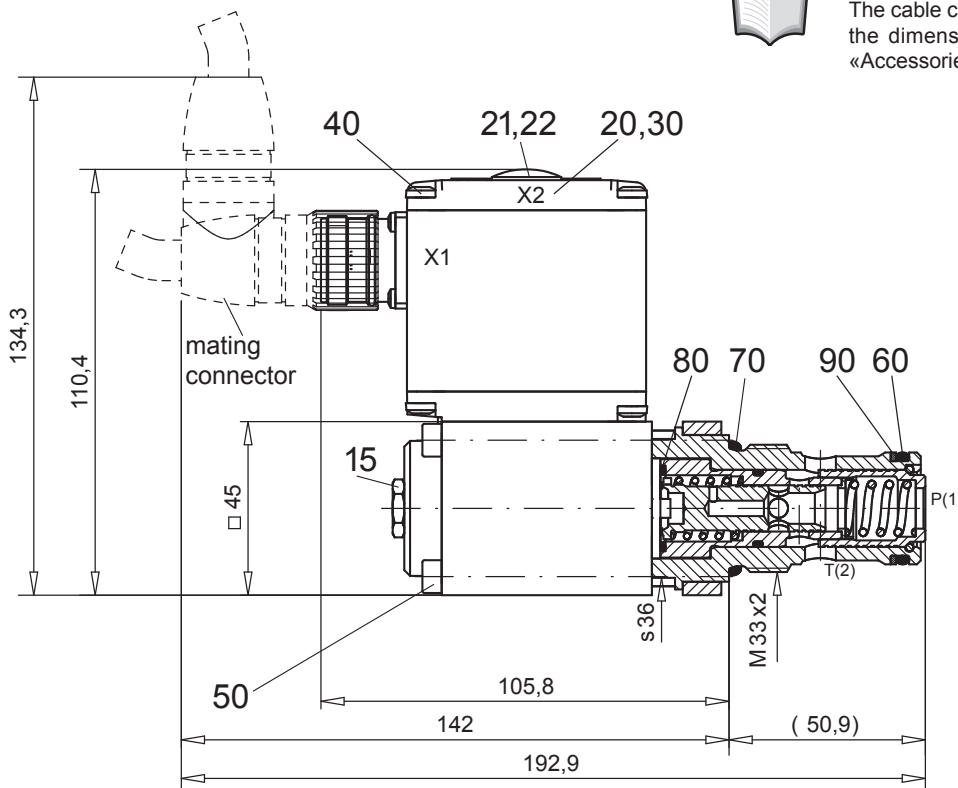
- = Deadband: Solenoid switched off with command preset value signal < 5%
- = Beginning of control: at 10% of preset value signal
- = Regulated volume flow at 70% of preset value signal: 42 l/min

 $Q = f(p)$  Volume flow pressure characteristics

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

**DIMENSIONS/SECTIONAL DRAWINGS**

With analog interface

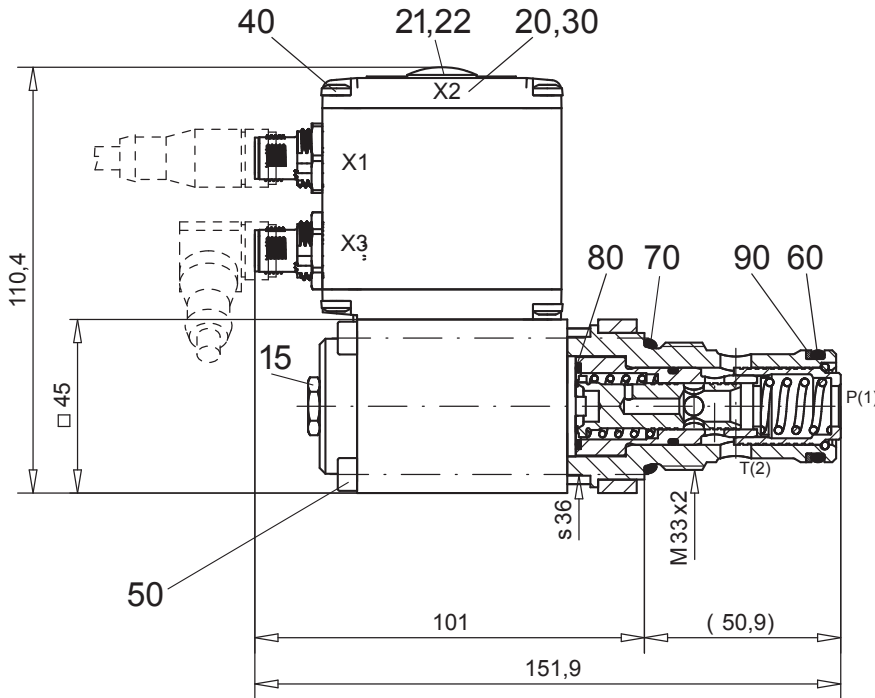
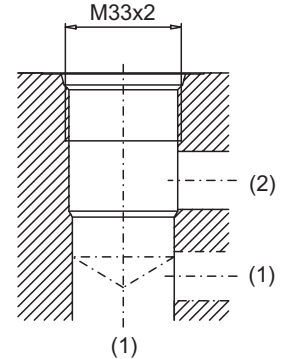

**NOTE!**

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



**DIMENSIONS / SECTIONAL DRAWINGS**

With fieldbus interface


 Cavity drawing acc. to  
 ISO 7789-33-01-0-98

 For detailed cavity drawing  
 and cavity tools see data  
 sheet 2.13-1005.

**PARTS LIST**

Position	Article	Description
15	253.8001	Mounted screw with integrated manual override HB6
20	062.0102	Cover square
21	223.1317	Dummy plug M16x1,5
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	246.2171	Socket head cap screw M5 x 70 DIN 912
60	160.2238	O-ring ID 23,81 x 2,62
70	160.2298	O-ring ID 29,82 x 2,62
80	160.2188	O-ring ID 18,77 x 1,78
90	049.3297	Back-up ring RD 24,5 x 29 x 1,4

**ACCESSORIES**

- 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