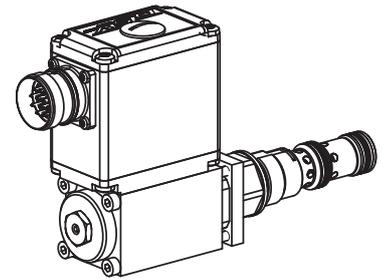


**Proportional pressure reducing valve
Screw-in cartridge**

- Integrated amplifier or controller electronics
- Pilot operated
- Statically controllable under 1 bar
- $Q_{max} = 40$ l/min
- $p_{max} = 400$ bar
- $p_{N\ red\ max} = 340$ bar

M22x1,5
 ISO 7789

DESCRIPTION

Pilot operated proportional pressure reducing 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. Six standard pressure levels are available: 30, 55, 100, 150, 240 and 340 bar. Adjustment by a Wandfluh proportional solenoid (VDE standard 0580). The cartridge and the solenoid made of steel are zinc coated and therefore rustprotected. The housing for the electronics is made of aluminium.

FUNCTION

The proportional pressure reducing valve controls the pressure in port A (1). Proportionally to the solenoid current solenoid force and pressure in port A rise. The valve functions practically independently of the pressure in port P (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. Data are stored in a non volatile memory. Even after an electric power failure settings can easily be reproduced and transmitted. These valves are available with an integrated controller as an option. As feedback signal source sensors with voltage or current output signal can be directly connected. The available controller structure has been optimised for applications with hydraulic actuators.

APPLICATION

Proportional pressure reducing valves with integrated electronics has its application in hydraulic systems, in which the pressure changes frequently and has to be statically controlled to under 1 bar. 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 integrated controller relieves the machine control system and operates the pressure regulation in a closed control loop. The proportional pressure reducing cartridge is very suitable for mounting in control blocks, flange bodies and sandwich plates of the size NG4-Mini, NG6 and NG10. (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

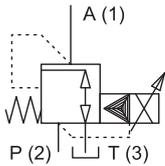
GENERAL SPECIFICATIONS.....	1
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PARTS LIST	4
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TYPE CODE

	M Q V PM22 - <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> # <input type="checkbox"/>												
Pressure reducing valve	<input type="checkbox"/>												
Pilot operated (from connection P)	<input type="checkbox"/>												
Proportional valve with integrated electronics	<input type="checkbox"/>												
Screw-in thread M22x1,5	<input type="checkbox"/>												
Standard nominal pressure ranges $p_{N\ red}$:	<table border="0" style="display: inline-table;"> <tr> <td>30 bar</td><td><input type="checkbox"/></td><td>150 bar</td><td><input type="checkbox"/></td> </tr> <tr> <td>55 bar</td><td><input type="checkbox"/></td><td>240 bar</td><td><input type="checkbox"/></td> </tr> <tr> <td>100 bar</td><td><input type="checkbox"/></td><td>340 bar</td><td><input type="checkbox"/></td> </tr> </table>	30 bar	<input type="checkbox"/>	150 bar	<input type="checkbox"/>	55 bar	<input type="checkbox"/>	240 bar	<input type="checkbox"/>	100 bar	<input type="checkbox"/>	340 bar	<input type="checkbox"/>
30 bar	<input type="checkbox"/>	150 bar	<input type="checkbox"/>										
55 bar	<input type="checkbox"/>	240 bar	<input type="checkbox"/>										
100 bar	<input type="checkbox"/>	340 bar	<input type="checkbox"/>										
Standard nominal voltage U_N :	<table border="0" style="display: inline-table;"> <tr> <td>12 VDC</td><td><input type="checkbox"/></td> </tr> <tr> <td>24 VDC</td><td><input type="checkbox"/></td> </tr> </table>	12 VDC	<input type="checkbox"/>	24 VDC	<input type="checkbox"/>								
12 VDC	<input type="checkbox"/>												
24 VDC	<input type="checkbox"/>												
Hardware configuration:													
With analog signal (0...+10 V factory set)	<input type="checkbox"/> A1												
With CANopen acc. to DSP-408	<input type="checkbox"/> C1												
With Profibus DP in accordance with Fluid Power Technology	<input type="checkbox"/> P1												
With CAN J1939 (on request)	<input type="checkbox"/> J1												
Functions:													
Amplifier	<input type="checkbox"/> no remark												
Controller with current feedback signal (0...20 mA / 4...20 mA)	<input type="checkbox"/> R1												
Controller with voltage feedback signal (0...10 V)	<input type="checkbox"/> R2												
Design-Index (Subject to change)													
Data sheet is valid from design-index #2													

GENERAL SPECIFICATIONS

Description	Pilot operated proportional pressure reducing valve with integrated electronics	Ambient temperature	-20...+65 °C (typical) <small>(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».)</small>
Construction	Screw-in cartridge for cavity acc. to ISO 7789	Mounting position	any
Operations	Proportional solenoid, wet pin push type, pressure tight	Fastening torque	$M_D = 50$ Nm for screw-in cartridge $M_D = 2,6$ Nm (qual. 8.8) for solenoid screws
Mounting	Screw-in thread M22x1,5	Weight	$m = 1,05$ kg

SYMBOL

HYDRAULIC SPECIFICATIONS

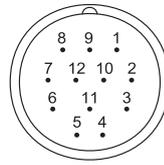
Fluid	Mineral oil, other fluids on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade $\beta_{6...10} \geq 75$) refer to data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Fluid temperature	-20...+70 °C
Peak pressure	$p_{max} = 400$ bar (connection P) $p_{max} = 100$ bar (connection T) $p_{Tmax} = p_P + 20$ bar
Nominal pressure ranges	$p_{Nred} = 30, 55, 100, 150, 240, 340$ bar
Supply pressure	$p_P \geq p_{red} + 10$ bar (statically) $p_P \geq p_{red} + 80$ bar (at 40 l/min)
Volume flow range	see characteristics
Pilot- and leakage volume flow	see characteristics
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 (amplifier only)	separate adjustment for up and down
Preset value generator (controller only)	preset value speed adjustable
Parameterisation Interface	via fieldbus or USB USB (Mini B) for parameterisation with «PASO» (under the closing screw of the housing cover, factory set parameters)
<i>Analog interface (MAIN):</i>	
Device receptacle (male)	M23, 12-poles
Mating connector	Plug (female), M23, 12-poles (not incl. in delivery)
Preset value signal:	Voltage/current selected with software
<i>Fieldbus interface:</i>	
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 (controller only)	Analog voltage/current
<i>Sensor interface:</i> (controller only)	
Device receptacle sensor (female)	M12, 5-poles
Mating connector	Plug (male), M12, 5-poles (not incl. in delivery)
Preset value signal:	Voltage/current, state when ordering


NOTE!

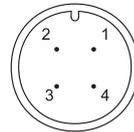
Detailed electrical characteristics and description of «DSV» electronics are shown on data sheet **1.13-75**.

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 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

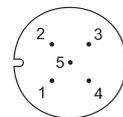
Device receptacle Profibus (female) X3

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

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


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


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 connectors have to be wired according to the chapter «Connector wiring diagram».

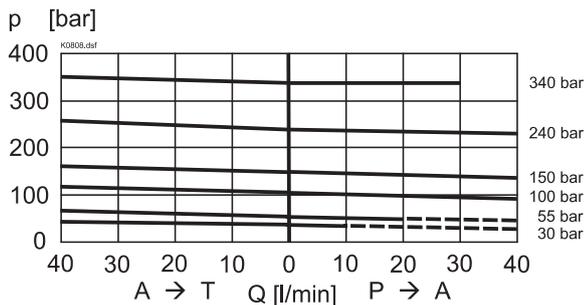
Controllers will be supplied configured as amplifiers. Switching into controller mode and setting of the adjustments of the controller must be done by the customer using the set-up software (USB interface, Mini B)

Additional information can be found on our website:
«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** protocol eg. **Profibus DP** protocol with device profile DSP-408 for «DSV»

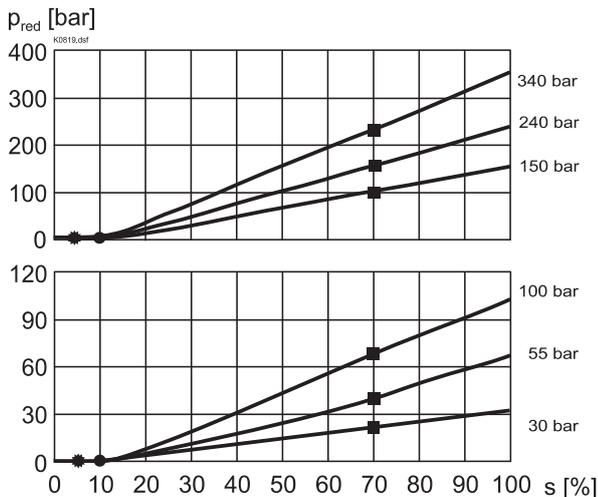
CHARACTERISTICS Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$

$p_{\text{red}} = f(Q)$ Pressure volume flow characteristics
 (Maximal adjustable pressure)



--- permissible with $p_p \leq 200 \text{ bar}$

$p_{\text{red}} = f(I)$ Pressure adjustment characteristics
 [at $Q = 0 \text{ l/min}$]/(s corresponds to preset value signal)



Inlet pressure: $p_N + 15\%$

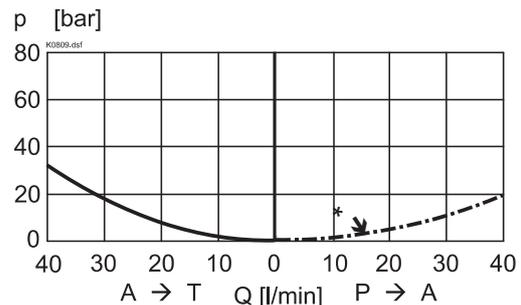
Mesured with closed port A (static conditions).

Factory settings:

Dither set for optimal hysteresis

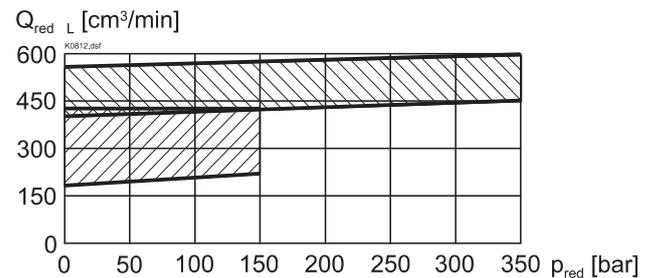
- * = Deadband: Solenoid switched off with command preset value signal 5 - 10%
- = Open point: preset value signal + 10%
- = Regulated pressure in port A (1) at 70% of preset value signal:
 - 230 bar with pressure range 340 bar
 - 162 bar with pressure range 240 bar
 - 102 bar with pressure range 150 bar
 - 68 bar with pressure range 100 bar
 - 38 bar with pressure range 55 bar
 - 21 bar with pressure range 30 bar

$p_{\text{red}} = f(Q)$ Pressure volume flow characteristics
 (Minimal adjustable pressure)

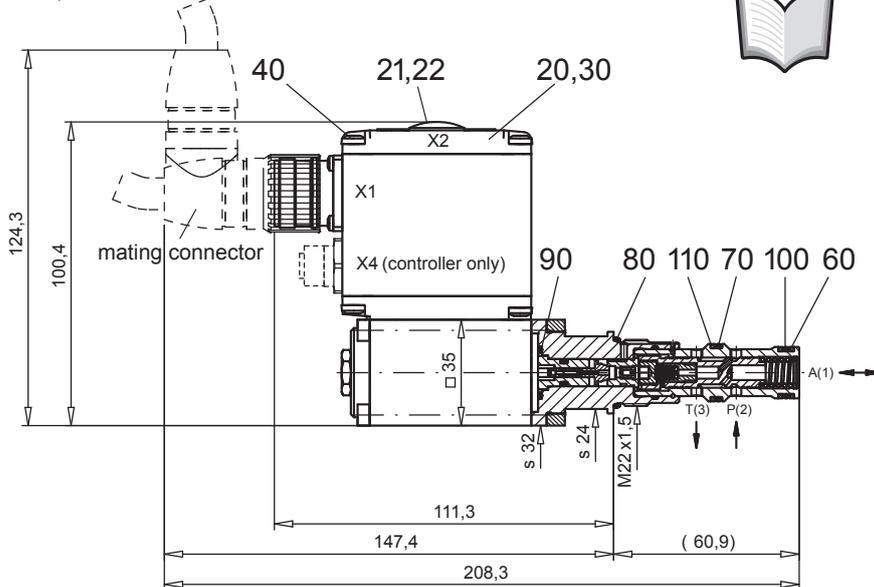


* Consumption resistance dependent on system

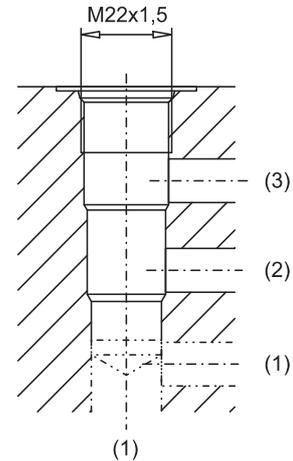
$Q_{\text{st}+L} = f(p)$ Pilot- and leakage volume flow characteristic [P (2) → T (3)]
 (Pressure in P (2) = 350 bar)

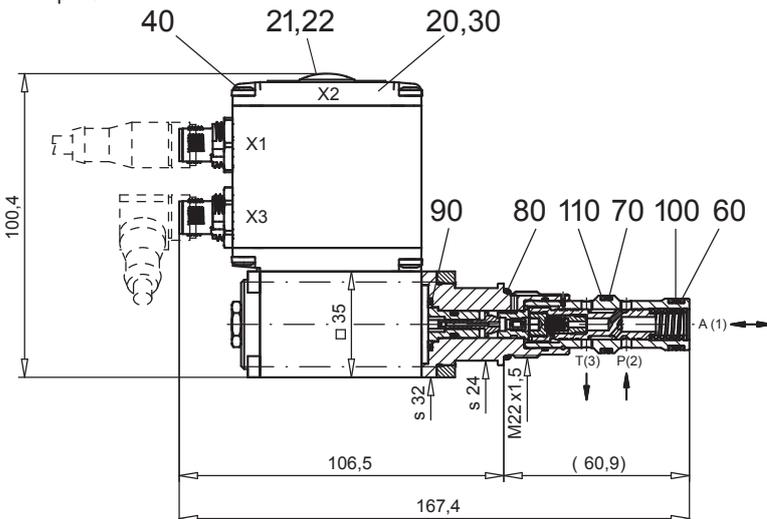
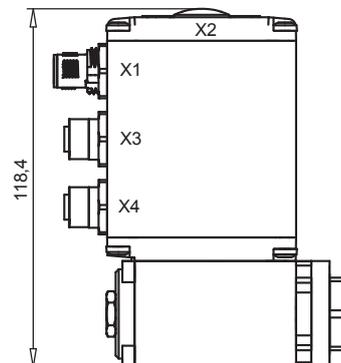


-  Pressure ranges: 240 / 340 bar
-  Pressure ranges: 30/55/100/150 bar

DIMENSIONS
With analog interface
 Amplifier and controller

NOTE!

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

 Cavity drawing acc. to
 ISO 7789-22-04-0-98

 For detailed cavity drawing
 and cavity tools see data
 sheet 2.13-1004

With fieldbus interface
 Amplifier

With fieldbus interface
 Controller

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 33x2x59,9x2
40	208.0100	Socket head cap screw M4x10
50	249.1007	Socket head cap screw M4x63
60	160.2140	O-ring ID 14,00x1,78
70	160.2156	O-ring ID 15,60x1,78
80	160.2188	O-ring ID 18,77x1,78
90	160.2140	O-ring ID14,00x1,78
100	049.3176	Back-up ring RD 14,1x17x1,4
110	049.3196	Back-up ring RD 16,1x19x1,4

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 mm²
 - Recommended wire size:
 - 0...25 m = 0,75 mm² (AWG18)
 - 25...50 m = 1 mm² (AWG17)

Technical explanation see data sheet 1.0-100D