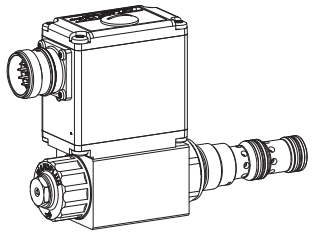
Proportional pressure reducing valve
Screw-in cartridge
- **Integrated amplifier or controller electronics**
- **Pilot operated**
- **Q_{max} = 60 l/min**
- **p_{max} = 400 bar**
- **$p_{N\ red\ max}$ = 350 bar**

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. Seven standard pressure levels are available. 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 elctronics is made of aluminium.
Optionally these valves are available with integrated controller. As feedback value generator sensors with voltage or current output can be directly connected. The available controller structures are optimised for the utilisation with hydraulic drives.

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, 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

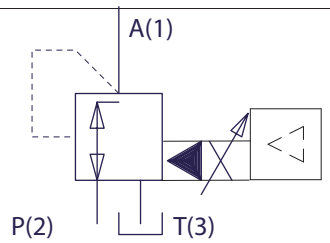
Proportional pressure reducing valves with integrated electronics are well suited for demanding applications, in which the pressure frequently has to be changed. They are implemented in systems calling for good valve-to-valve reproducibility, easy installation, comfortable operation and high precision in industrial hydraulics as well as in mobile hydraulics. The integrated controller reliefs 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.

TYPE CODE

M V P PM22 - [ ] - [ ] / M E [ ] [ ] - [ ] HB4,5 # [ ]

Pressure reducing valve				
Pilot operated				
Proportional				
Screw-in thread M22x1,5				
Nominal pressure range $p_{N\ red}$	20 bar	20	200 bar	200
	63 bar	63	275 bar	275
	100 bar	100	350 bar	350
	160 bar	160		
Nominal voltage U_N	12 VDC		G12	
	24 VDC		G24	
Slip-on coil	Metal housing, square			
Execution connection	Integrated electronics			
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	
Function				
Amplifier				
Controller with current feedback signal (0...20 mA / 4...20 mA)			R1	
Controller with voltage feedback signal (0...10 V)			R2	
Sealing material	NBR			
	FKM (Vitron)		D1	
Manual override				
Änderungs-Index (wird vom Werk eingesetzt)				

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) 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
Nominal pressure ranges	$p_{N\ red}$ = 20 bar, 63 bar, 100 bar, 160 bar, 200 bar, 275 bar, 350 bar
Volume flow range	Q = 0…60 l/min
Pilot- and leakage volume flow	see characteristics
Repeatability	≤ 2 % *
Hysteresis	≤ 4 % * * at optimal dither signal

ELECTRICAL SPECIFICATIONS

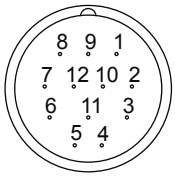
Protection class	IP 67 acc. to EN 60 529 with suitable connector and closed electronic housing
Supply voltage	12 VDC or 24 VDC
Ramps (amplifier only)	separate adjustment for up and down for each solenoid
Preset value generator (controller only)	preset value speed adjustable
Parameterisation	via fieldbus or USB
Interface	USB (Mini B) for parameterisation with «PASO» (under the closing screw of the housing cover, Preset ex-works)
Analog interface (MAIN)*:*	
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

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

CONNECTOR WIRING DIAGRAM

Analog interface:

Device receptacle (male) X1



1 = Supply voltage +
2 = Supply voltage 0 VDC
3 = Stabilisierte Ausgangsspannung
4 = 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)

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

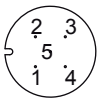
Device receptacle Profibus (female) X3

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

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

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».

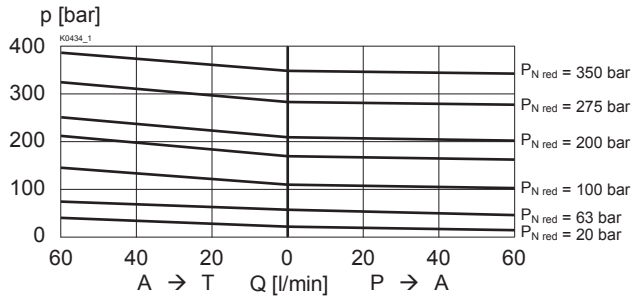
Controllers will be supplied configurated as amplifiers. Switching into controller mode and setting of the adjustments of the controller must be done by the customer using the set-up software (USB interface, Mini B).

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

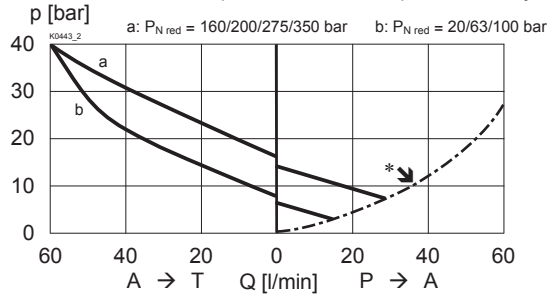
Free-of-charge download of the «PASO»-software and the instruction manual for the **«DSV»** hydraulic valves as well as the operation instruction **CANopen** protocol eg. **Profibus DP** protocol with device profile DSP-408 for **«DSV»**.

CHARACTERISTICS Oil viscosity ν = 30 mm²/s

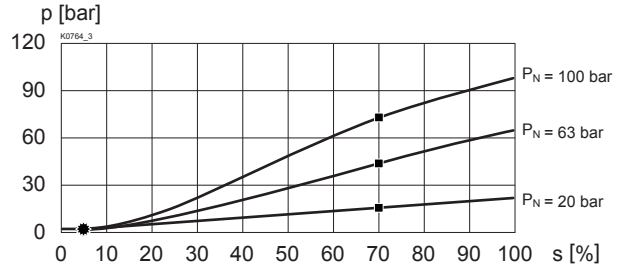
$p_{red} = f(Q)$ Pressure volume flow characteristics
(Maximal adjustable pressure)



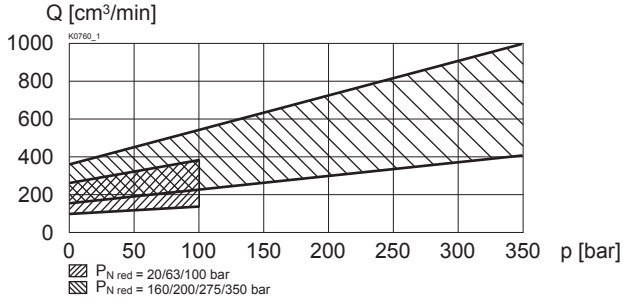
$p_{red} = f(Q)$ Pressure volume flow characteristics
(Minimal adjustable pressure)
* Consumption resistance dependent on system



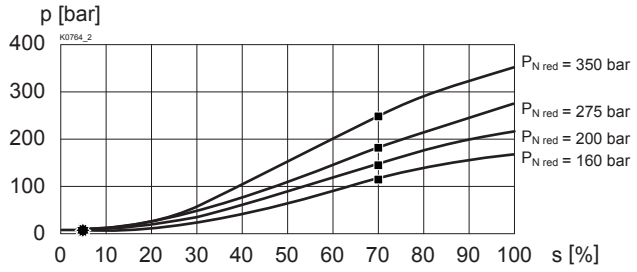
$p_{red} = f(I)$ Pressure adjustment characteristics
[at Q = 0 l/min]/(s corresponds to preset value signal)
Inlet pressure: p_N +10 %
Mesured with closed port A



$Q_{st+L} = f(p)$ Pilot- and leakage volume flow characteristic [A (1) → T (3)]
(Pressure in P (2) = 350 bar)



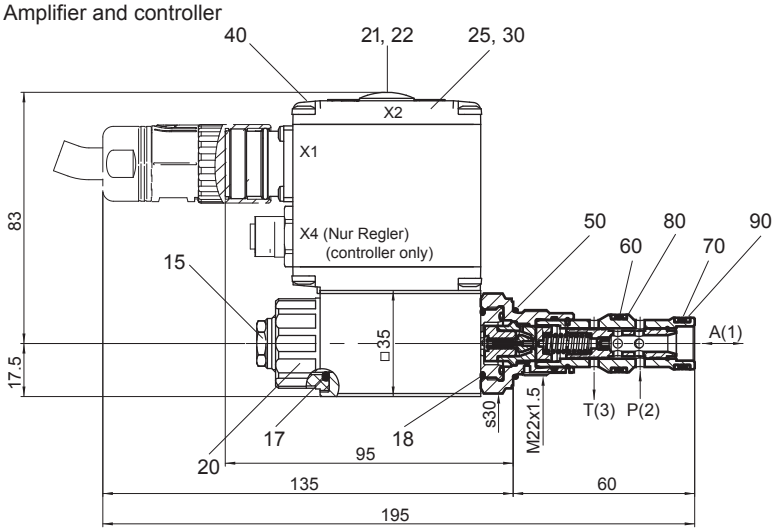
$p_{red} = f(I)$ Pressure adjustment characteristics
[at Q = 0 l/min]/(s corresponds to preset value signal)
Inlet pressure: p_N +10 %
Mesured with closed port A

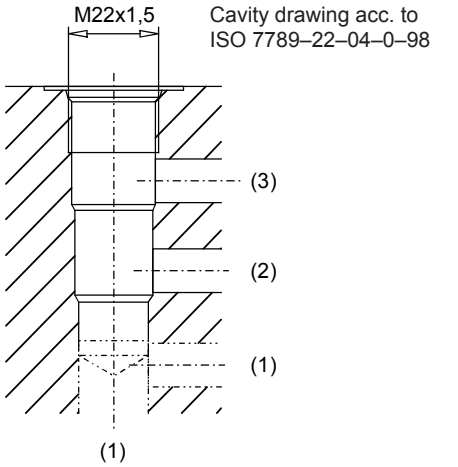


Factory settings:
Dither set for optimal hysteresis
✹ = Deadband: Solenoid switched off
with command preset value signal < 5 %
■ = Regulated pressure in port A (1) at 70 % of preset value signal::
250 bar with pressure range 350 bar
192 bar with pressure range 275 bar
143 bar with pressure range 200 bar
112 bar with pressure range 160 bar
72 bar with pressure range 100 bar
45 bar with pressure range 63 bar
14,5 bar with pressure range 20 bar

DIMENSIONS

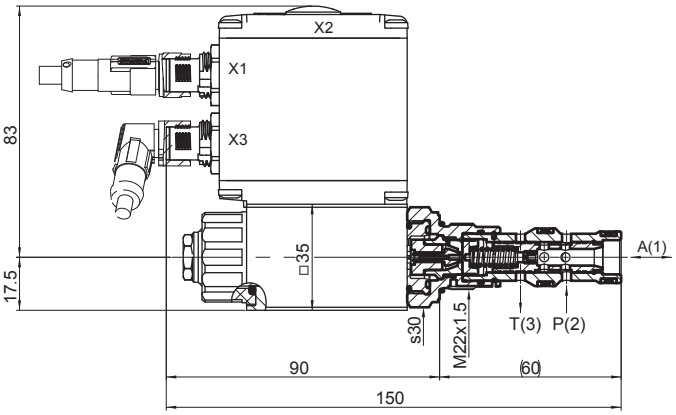
With analog interface
Amplifier and controller



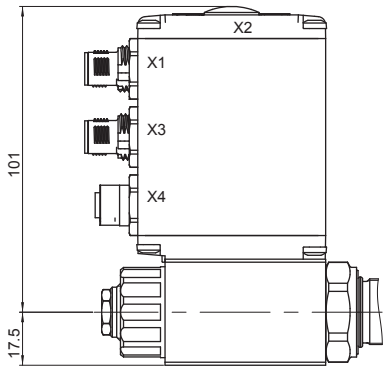


For detailed cavity drawing
and cavity tools see data sheet 2.13-1004

With fieldbus interface
Amplifier



With fieldbus interface
Controller



PARTS LIST

Position	Article	Description
15	253.8000	HB 4,5 Manual override (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	160.2188 160.6188	O-ring ID 18,77 x 1,78 (NBR) O-ring ID 18,77 x 1,78 (FKM)
60	160.2156 160.6156	O-ring ID 15,60 x 1,78 (NBR) O-ring ID 15,60 x 1,78 (FKM)
70	160.2140 160.6141	O-ring ID 14,00 x 1,78 (NBR) O-ring ID 14,00 x 1,78 (FKM)
80	049.3196	Backup ring RD 16,1 x 19 x 1,4
90	049.3176	Backup ring RD 14,1 x 17 x 1,4

ACCESSORIES

Flange-/sandwich plate NG4-Mini	Data sheet 2.3-820
Flange-/sandwich plate NG6	Data sheet 2.3-840
Flange-/sandwich plate NG10	Data sheet 2.3-860
Line mount body	Data sheet 2.9-210

- 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 1.0-100