

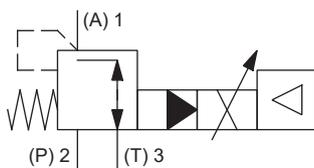
Proportional pressure reducing cartridge with integrated electronics

- ◆ pilot operated
- ◆ $Q_{\max} = 40 \text{ l/min}$
- ◆ $p_{\max} = 400 \text{ bar}$
- ◆ $p_{N \text{ red max}} = 350 \text{ bar}$

DESCRIPTION

Pilot operated proportional pressure reducing valve with integrated electronics in screw-in cartridge construction for cavity according to ISO 7789. Proportionally to the solenoid current, the solenoid force and the pressure in port A (1) rise. The valve functions practically independently of the pressure in port P (2). Pressure increase in the consumer port A (1) to above the adjusted value, e.g. through an active consumer, is avoided by discharging excess oil to the tank T (3). With the solenoid deenergised, the oil flows freely from consumer port A (1) to port T (3). The Plug & Play valves are factory set and adjusted and have therefore a high valve-to-valve reproducibility. The control takes place via an analogue interface or a fieldbus interface (CANopen, J1939 or Profibus DP). The parameterisation takes place by means of the free of cost parameterisation and diagnostics software «PASO» or via fieldbus interface. The USB parameterisation interface is accessible through a screw plug. As an option, these valves are available with integrated controller. As feedback value generators sensors with voltage or current output can be connected directly. The available controller structures are optimised for applications with hydraulic actuations.

SYMBOL



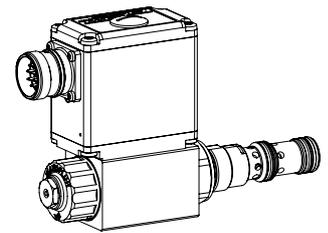
ELECTRICAL SPECIFICATIONS

Protection class	IP67 with suitable mating connector and closed housing cover
Ramps	Adjustable
Parameterisation	Via fieldbus or USB
Supply voltage	12 VDC, 24 VDC

Note! Exact electrical specifications and detailed description of «DSV» electronics can be found on data sheet 1.13-76.



M22 x 1,5
ISO 7789



APPLICATION

Proportional pressure reducing valves with integrated electronics are perfectly suitable for demanding applications in which the pressure frequently has to be changed. They are used in applications where high valve-to-valve reproducibility, easy installation, comfortable operation and high precision are very important. The integrated controller relieves the machine control and operates the pressure control in a closed loop circuit. The applications are in the industrial as well as in the mobile hydraulics for the smooth control of hydraulic actuations. The screw-in cartridge is perfectly suitable for installation in control blocks and is installed in sandwich- (vertical stacked systems) and in flange plates (corresponding data sheets in this register). For machining the cartridge cavity in steel and aluminum blocks, cavity tools are available (hire or purchase). Please refer to the data sheets in register 2.13.

Note!



„PASO“ is a Windows program in the flow diagram style, which enables the intuitive adjustment 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 DSV.

ACTUATION

Actuation	Proportional solenoid, wet pin push type, pressure tight
Connection	Via device receptacle

TYPE CODE

Pressure reducing valve		M		Q	P	PM22	-	<input type="text"/>	-	<input type="text"/>	/	M	E	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	HB4,5	#	<input type="text"/>
Pilot operated																				
Proportional																				
Screw-in cartridge M22 x 1,5																				
Nominal pressure range $p_{N\text{red}}$	40 bar	<input type="text" value="40"/>	200 bar	<input type="text" value="200"/>																
	63 bar	<input type="text" value="63"/>	275 bar	<input type="text" value="275"/>																
	100 bar	<input type="text" value="100"/>	350 bar	<input type="text" value="350"/>																
	160 bar	<input type="text" value="160"/>																		
Nominal voltage U_N	12 VDC	<input type="text" value="G12"/>																		
	24 VDC	<input type="text" value="G24"/>																		
Slip-on coil	Metal housing square																			
Connection execution	Integrated electronics																			
Hardware configuration																				
Analog command value signal	12 pole	<input type="text" value="A1"/>	7 pole	<input type="text" value="D1"/>	(0 ... 10 V preset)															
Analog command value signal	12 pole	<input type="text" value="A4"/>	7 pole	<input type="text" value="D4"/>	(4 ... 20 mA preset)															
CANopen according to DSP-408		<input type="text" value="C1"/>																		
Profibus DP according to Fluid Power Technology		<input type="text" value="P1"/>																		
CAN J1939 (on request)		<input type="text" value="J1"/>																		
Function																				
Amplifier				<input type="text"/>																
Controller with current feedback value signal (0...20 mA / 4... 20 mA)				<input type="text" value="R1"/>																
Controller with voltage feedback value signal (0...10 V)				<input type="text" value="R2"/>																
Sealing material	NBR	<input type="text"/>																		
	FKM (Viton)	<input type="text" value="D1"/>																		
Manual override																				
Design index (subject to change)																				

2.3-643

GENERAL SPECIFICATIONS

Designation	Proportional pressure reducing valve
Construction	Pilot operated
Mounting	Screw-in cartridge construction
Nominal size	M22 x 1,5 according to ISO 7789
Actuation	Proportional solenoid
Ambient temperature	-20...+65 °C The upper temperature limit is a guideline 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“.
Weight	1,05 kg
MTTFd	150 years

HYDRAULIC SPECIFICATIONS

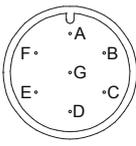
Working pressure	$p_{\text{max}} = 400 \text{ bar}$ (port P) $p_{\text{max}} = 100 \text{ bar}$ (port T)
Tank pressure	$p_{T\text{max}} = p_P + 20 \text{ bar}$
Supply pressure	$p_P \geq p_{\text{red}} + 10 \text{ bar}$ (static) $p_P \geq p_{\text{red}} + 80 \text{ bar}$ (at 40 l/min)
Nominal pressure range	$p_{N\text{red}} = 40 \text{ bar}, 63 \text{ bar}, 100 \text{ bar}, 160 \text{ bar}, 200 \text{ bar}, 275 \text{ bar}, 350 \text{ bar}$
Minimum adjustable pressure	< 1 bar
Volume flow range	See characteristics
Leakage oil	See characteristics
Hysteresis	≤ 5 % at optimal dither signal
Repeatability	≤ 3 % at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm ² /s...320 mm ² /s
Temperature range fluid	-25...+70 °C (NBR) -20...+70 °C (FKM)
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade $\beta_{6...10} \geq 75$, see data sheet 1.0-50

ELECTRICAL CONNECTION

X1	Analog interface (Main)
Device receptacle	M23, 12 pole male
	1 = Supply voltage + 2 = Supply voltage 0 VDC 3 = Stabilised output voltage 4 = Command value signal voltage + 5 = Command value signal voltage - 6 = Command value signal current + 7 = Command value signal current - 8 = Reserved for extensions 9 = Reserved for extensions 10 = Enable signal (Digital input) 11 = Error signal (Digital output) 12 = Chassis
Command value signal voltage (PIN 4/5) resp. current (PIN 6/7) are selected with parameterisation and diagnostics software PASO.	

X1	Fieldbus interface (Main)
Device receptacle	M12, 4 pole male
	1 = Supply voltage + 2 = Reserved for extensions 3 = Supply voltage 0 VDC 4 = Chassis

X2	Parameterisation interface
USB, Mini B	Under the screw plug of the housing cover
	Factory set

X1	Analog interface (Main)
	Connector DIN EN 175201 - 804
Device receptacle	7 pole male
	A = Supply voltage + B = Supply voltage 0 VDC C = Not connected D = Command value signal + E = Command value signal - F = Not connected G = Chassis
Command value signal: current (D4) or voltage (D2) to specify when placing the order	

X3	Profibus interface according to IEC 947-5-2
Device receptacle	M12, 5 pole female B-coded
	1 = VP 2 = RxD / TxD - N 3 = DGND 4 = RxD / TxD - P 5 = Shield

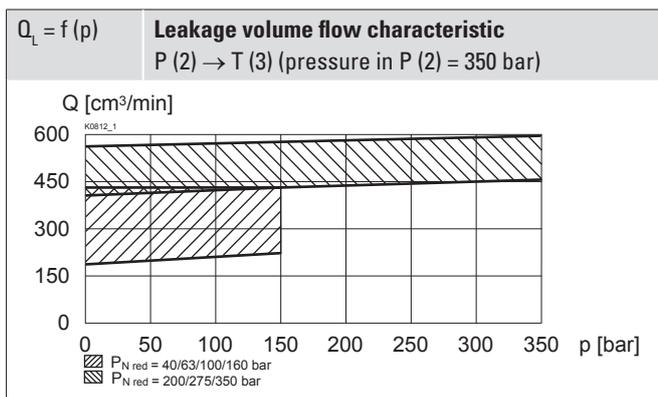
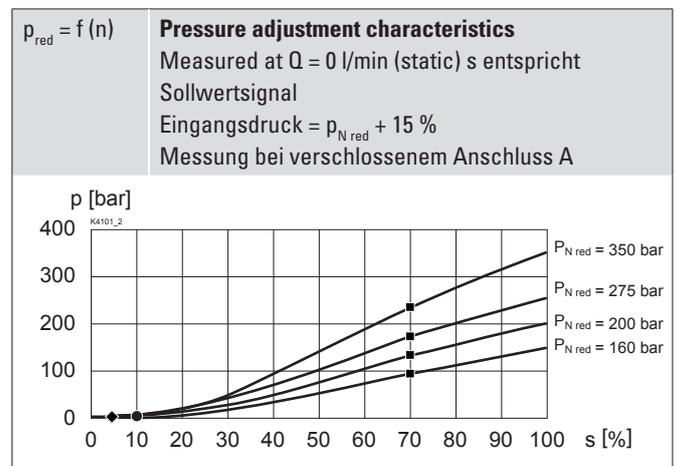
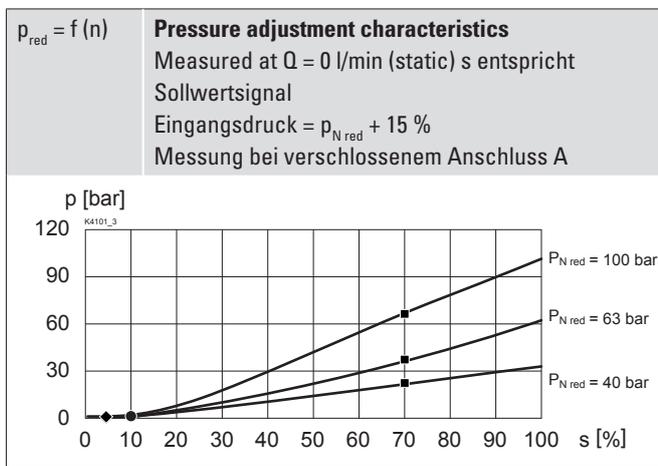
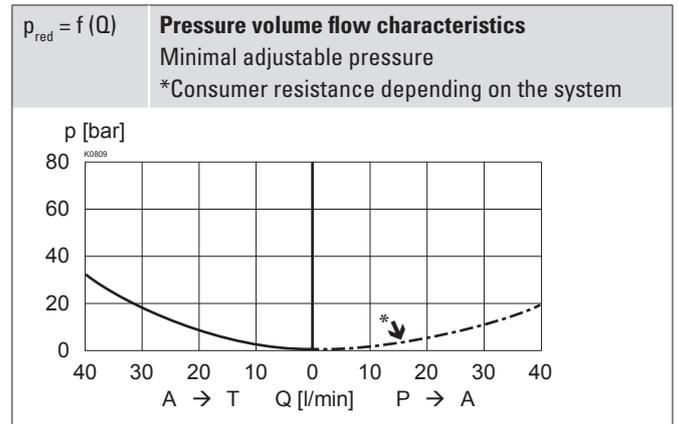
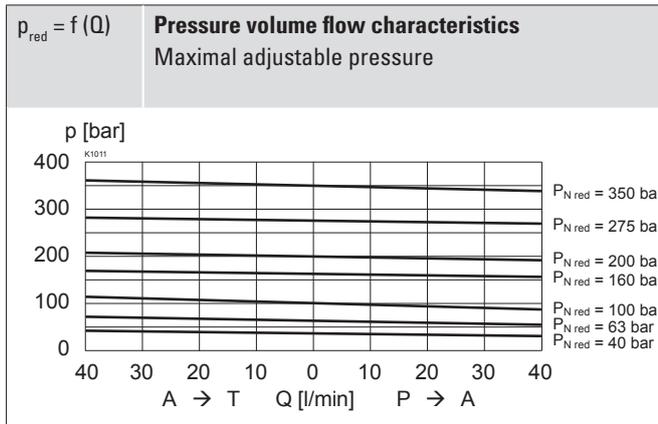
X3	CANopen interface according to DRP 303-1
Device receptacle	M12, 5 pole male
	1 = Not connected 2 = Not connected 3 = CAN Gnd 4 = CAN High 5 = CAN Low

X4 (controller only)	Feedback value interface (sensor)
Device receptacle	M12, 5 pole female
	1 = Supply voltage (output) + 2 = Feedback value signal + 3 = Supply voltage 0 VDC 4 = Not connected 5 = Stabilised output voltage
Feedback value signal: current (R1) or voltage (R2) to specify when placing the order	

Note! The mating connector is not included in the delivery



PERFORMANCE SPECIFICATIONS

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

FACTORY SETTINGS

Dither set for optimum hysteresis

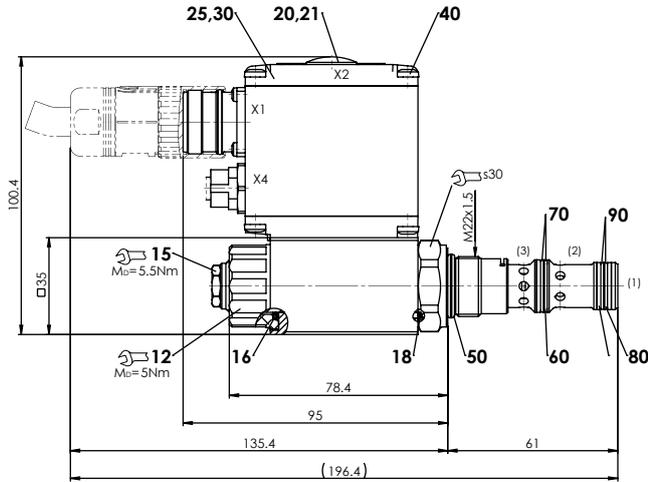
◆ = Deadband: Solenoid switched off at command value signal 5-10 %

● = Opening pressure at command value signal + 10 %

Pressure [bar]	at nominal pressure range p_N	at nominal pressure range p_N
230	350	350
180	275	275
130	200	200
102	160	160
68	100	100
38	63	63
21	40	40

DIMENSIONS
With analog interface, 12 pole connector

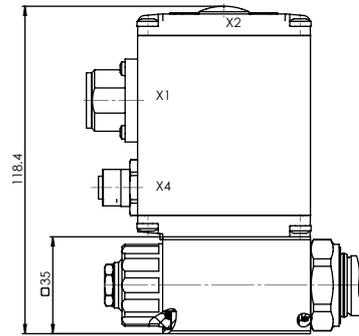
Amplifier and controller



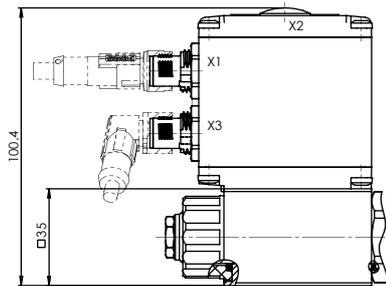
X4 (controller only)

With analog interface, 7 pole connector

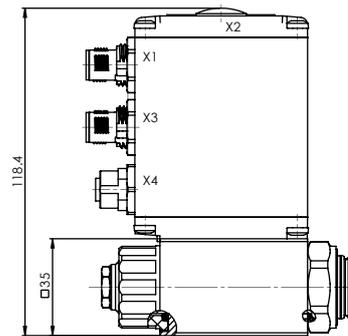
Amplifier and controller


With fieldbus interface

Amplifier


With fieldbus interface

Controller


PARTS LIST

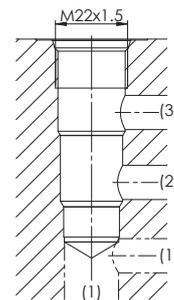
Position	Article	Description
12	154.2700	Knurled nut
15	253.8000	Manual override HB4,5
20	223.1317	Dummy plug M16 x 1,5
25	062.0102	Cover
30	072.0021	Gasket 33,2 x 59,9 x 2
40	208.0100	Socket head screw M4 x 10
	251.3106	Seal kit NBR
	251.3115	Seal kit D1

Seal kit consisting of:

16	O-ring	ID 18,72 x 2,62
18	O-ring	ID 17,17 x 1,78
50	O-ring	ID 18,77 x 1,78
60	O-ring	ID 15,60 x 1,78
70	Back. ring	PTFE rd 16,1 x 19 x 1,4
80	O-ring	ID 14,00 x 1,78
90	Back. ring	PTFE rd 14,1 x 17 x 1,4

HYDRAULIC CONNECTION

Cavity drawing according to ISO 7789-22-04-0-98


Note!


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

COMMISSIONING

For DSV amplifiers as a rule no parameter adjustments by the customer are required. The plugs have to be connected in accordance with the chapter «Electrical connection».

Controllers are supplied configured as amplifiers. The adjustment of the mode of control and of the controller are carried out by the customer by means of the software adjustment (USB interface, Mini B).

Further information can be found on: «www.wandfluh.com».

Free- of charge download of the «PASO» software and the operation instructions for «DSV» hydraulic valves as well as the operation instructions CANopen Protocol resp. Profibus DP Protocol, with Device Profile DSP-408 for «DSV».

Note!



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

INSTALLATION NOTES

Mounting type	Screw-in cartridge M22 x 1,5
Mounting position	Any, preferably horizontal
Tightening torque	$M_D = 60 \text{ Nm}$ Screw-in cartridge $M_D = 5 \text{ Nm}$ knurled nut

SEALING MATERIAL

NBR or FKM (Viton) as standard, choice in the type code

SURFACE TREATMENT

- ◆ The cartridge body and the solenoid are zinc-nickel coated
- ◆ The electronics housing is made of aluminium.

ACCESSORIES

Parameterisation software	See start-up
Parameterisation cable for interface USB (from plug type A on Mini B, 3 m)	Article no. 219.2896
Mating connector (plug female) for analog interface	
straight, soldering contact M23, 12 pole	Article no. 219.2330
angled, soldering contact M23, 12 pole	Article no. 219.2331
straight, soldering contact, 7 pole	Article no. 219.2335
Flange body / sandwich plate	
NG4-Mini	Data sheet 2.3-820
Flange body / sandwich plate NG6	Data sheet 2.3-840
Flange body / sandwich plate NG10	Data sheet 2.3-860
Threaded body	Data sheet 2.9-210
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

Note!



Auxiliary conditions for the cable:

- External diameter 12 pol: 3,5...14,7 mm
- External diameter 7 pol: 8...10 mm
- Wire cross section max. 1 mm²
- Recommended wire cross section:
0...25 m = 0,75 mm² (AWG18)
25...50 m = 1 mm² (AWG17)

STANDARDS

Cartridge cavity	ISO 7789
CANopen	DRP 303-1
Profibus DP	IEC 947-5-2
Protection class	EN 60 529
Contamination efficiency	ISO 4406

MANUAL OVERRIDE

Standard: HB4,5

Optionally: HN 17,5 s (K) or HG 17,5 s (K) -> see data sheet 1.1-311

HBO: with screw plug, no actuation possible