

Manual

Digital, Programmable Proportional Pressure Regulator PD



CAUTION

OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC SENSITIVE
DEVICES

This product contains electronic components sensitive to electrostatic discharge. An electrostatic discharge generated by a person or object coming in contact with the electrical components can damage or destroy the product.

To avoid the risk of electrostatic discharge, please observe the handling precautions and recommendations contained in standard EN 100015-1.
Do not connect or disconnect the device while it is energised.

1. DESCRIPTION

A new generation of electronic pressure regulators designed on the basis of an enhanced digital control.

It stands for:

- Digital communication and control
- Display (incorporated)
- Direct operated valve
- Dynamic behaviour (high speed)

Digital control offers many advantages during installation and start-up of the valve and extended possibilities to adapt it to various applications.

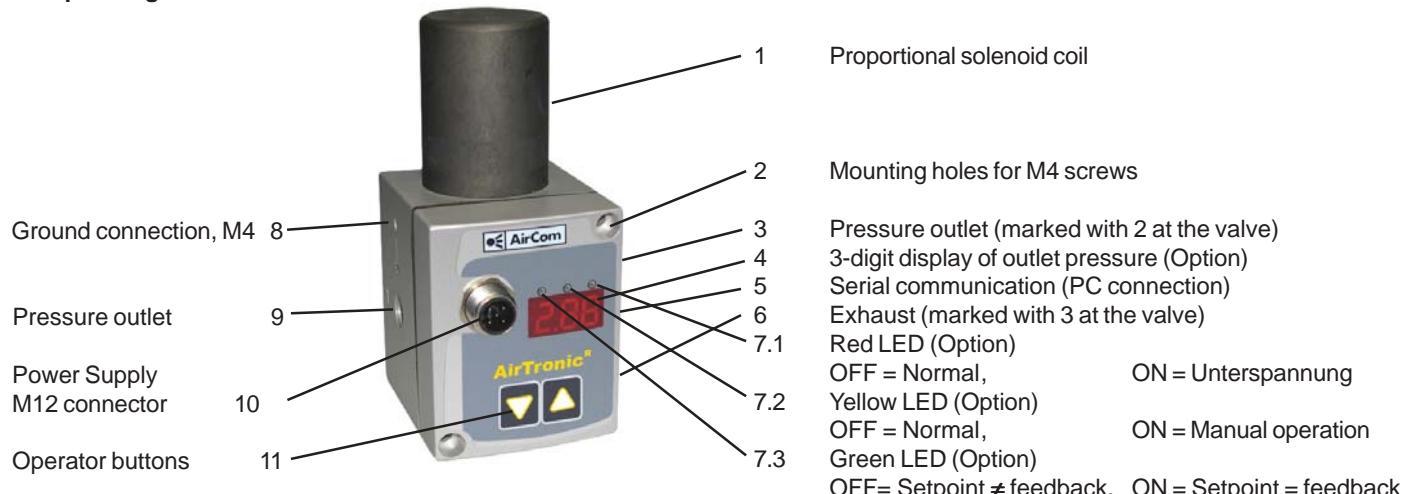
The four following standard versions are available:

- With display and pushbuttons : Pressure display, manual pressure setting and diagnostic LEDs
- Without display and pushbuttons : The economic solution.
- Nominal diameter DN 4mm : with a flow rate of 470 l/min.
- Nominal diameter DN 8mm : with a flow rate of 1300 l/min.

Various pneumatic connections: integral connections (gaz thread), back panel connection (gaz thread) and subbase mount.

- All pressure and exhaust ports are the same size, which allows for short response times when the pressure is increased or decreased.
- Digital pressure control in a closed loop: An internal pressure sensor compares the setpoint at the inlet to the outlet pressure. The outlet pressure is adjusted in real time.
- The control parameters can be changed with the additional software called DaS. The **DaS program** (Data Acquisition Software) ensures that all parameters used by the valve can be changed. This flexibility allows the valve to be adapted to the most various applications and enables the optimisation of its response time, overshoot and precision.
- After having set the optimum parameters you can save them in a project file for your personal use or send them to our Product Support for future serial production.

1.1 Operating Elements



1.2 MANUAL PRESSURE REGULATION (HAND)

After an interruption in the power supply, press both arrow buttons located beneath the display during power up to switch to the manual mode. The operating mode is indicated by the letters "H n d" in the display.

This display disappears after having pressed the arrow buttons again to show the current outlet pressure.

Press the left arrow button or DOWN arrow to reduce the outlet pressure, press the right arrow button or UP arrow to increase the outlet pressure. The yellow LED is on permanently during manual mode.

Exit this operating mode by pressing both arrow buttons simultaneously or by turning off the power supply for a short time.

1.3 OPERATING MODES

Shut-off:

If the setpoint falls below 0.5 %, the coil current is switched off and the valve is fully exhausted.

Overtemperature:

If the temperature of the internal control electronics exceeds 100°C, the operating mode is switched to AUTOSAFE and the green LED starts to flash.

Undervoltage / overvoltage:

If the supply voltage is less than 20 V or more than 30 V, the coil current is switched off and the valve is fully exhausted.

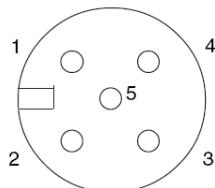
The red LED lights up constantly to indicate undervoltage or flashes to indicate overvoltage.

Autosafe:

If the coil current exceeds 1000 mA (DN8) or 560 mA (DN4) for more than 20 seconds, the output current is limited to max. 70% every 4 seconds to prevent the valve from overheating. The yellow LED flashes.

Connector Pinning / Cable wiring

Analog setpoint: View on soldered side of female connector



PIN	Description	5-wire cable	6-wire cable
1	24V voltage supply	brown	brown
2	Analog setpoint input	white	white
3	Supply ground	blue	green
	Analog ground*		yellow
4	Analog output (feedback)	black	pink
5	Digital output (pressure switch)	grey	grey
Body	EMC shield	shield	shield

* A 6-wire cable with separate analog ground is used for cable lengths over 2 m to set off the voltage drop for the setpoint.

2.1 Pneumatic Connection

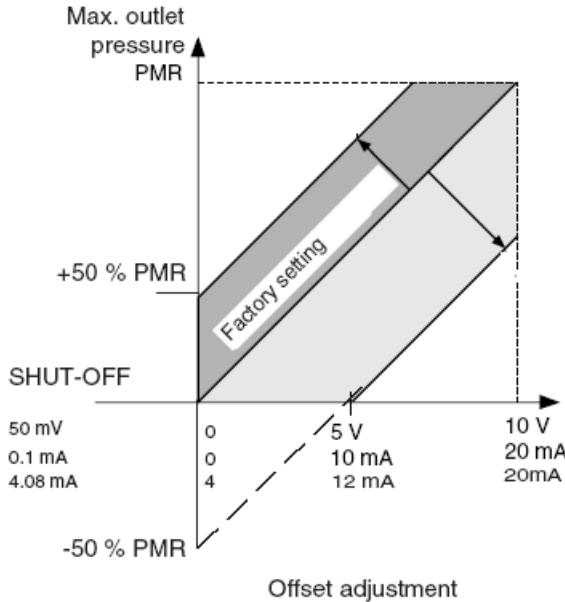


Inch screw connections (pipe threads) must be used. Each screw connection must be lined with a fitting synthetic sealing disc. Do not use Teflon sealing tape or hemp as they may get inside the valve and damage it. Use an appropriate silencer at port (3). The exhaust time may vary depending on the type of silencer used. The diameter of the pneumatic lines must be adjusted to the nominal diameter of the valve. The diameter of outlet line (2) must be larger or equal to that of inlet line (1). The supply pressure must always be less than the value given in the table in section 3 and must always be above the desired outlet pressure.

3. Analog Setpoint - Outlet pressure

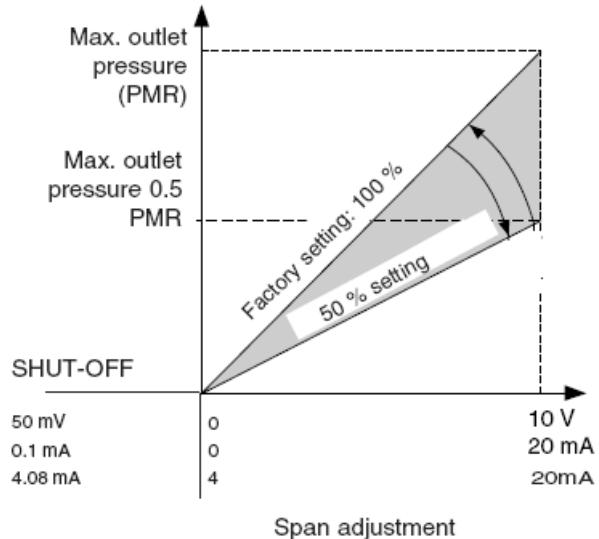
Setpoint offset

The pressure setpoint zero can be changed via the DaS program. Switch to „Custom“ in the „Setpoint setting“ section. The zero range is max. $\pm 50\%$.



Setpoint span

The pressure span of the setpoint can be changed via the DaS program. Switch to „Custom“ in the „Setpoint setting“ section. The span is between 50 and 100%.



CAUTION: Outlet pressures above the maximum outlet pressure (PMR) are not controlled by the valve, i.e. the max. outlet pressure is limited to the PMR. In order to avoid damaging the sensor, **the supply pressure must always be less than the maximum inlet pressure (MAP) defined above** (see table).

max. outlet pressure PMR (bar)	max. inlet pressure MAP (bar)
3 bar	6 bar
6 bar	9 bar
10 bar	13 bar

4. FACTORY SETTINGS FOR A STANDARD VALVE

- 0 bar outlet pressure at a setpoint of 0 V / 0 mA / 4 mA.
- Span: 3 bar device: = 3 bar at 10 V / 20 mA
 6 bar device: = 6 bar at 10 V / 20 mA
 10 bar device: = 10 bar at 10 V / 20 mA
- Minimum hysteresis.
- The control parameters, setpoint offset, setpoint span and window size of the digital output (pressure switch) are factory-programmed.

Parameter set: factory settings

- Setpoint offset: 0 %
 Setpoint span: 100 %
 Setpoint ramp: no ramp
 Shut-off: ON; the valve is exhausted at a setpoint below 0.5%
 Controller structure: PID
 Proportional gain: 4,0
 Integration time: 0.1 sec
 Derivation time: 30 msec

5. FIELD-PROGRAMMABLE SETTINGS

DISPLAY / PRESSURE READINGS

The actual outlet pressure is displayed during normal operation. See „Parameters/Display“ section.

Other displays:

- Hnd indicates that the Manual mode has been selected.
 SOF Internal error of pressure control. Replace valve or contact our Product Support.
 Err Internal overflow.
 AEr Autozero overflow. Contact our Product Support.

PUSHBUTTONS

To enter the Manual mode, press and hold both pushbuttons simultaneously during power up. „Hnd“ appears in the display. Use the UP button to increase the outlet pressure and the DOWN button to decrease it. The actual outlet pressure is displayed. Quick presses on the buttons allow you to make slight changes in the pressure rating. Longer presses allow you to make quick pressure changes. Press both pushbuttons simultaneously to exit the manual mode.

6. TECHNICAL CHARACTERISTICS

CONSTRUCTION

Directly operated valve

Body: Aluminium

Internal parts: POM

Seals: Perbunan (NBR), Fluorelastomer (FKM)

Degree of protection: IP 65

INSTALLATION

Assembly position: any; for optimum performance vertically with solenoid at the top.

Air: filtered at 50 µm, free of condensate

Connections: Hemp or Teflon tape must not be used.

Electrical connection: Select a wire section that will give a voltage drop of less than 2 volts at 2A.

6.1 FLUID CHARACTERISTICS

FLUIDS :	Air or neutral gas, filtered at 50 µm, free of condensate, lubricated or not
PORTS :	G1/8-G1/4-G3/8, see section 3
MAX. INLET PRESSURE :	see section 3
TEMPERATURE / FLUID :	0...60 °C
TEMPERATURE / AMBIENT :	0...50 °C
HYSTERESIS:	<1% of span
LINEARITY:	<0.5% of span
REPEATABILITY:	<0.5% of span
MINIMUM SETPOINT :	100mV (0.2 mA/4.2mA) with shut-off function
MINIMUM OUTLET PRESSURE :	<1% of span

6.2 SPECIFICATIONS

Nominal diameter DN (mm)	Supply voltage (stabilised) *	Max. power (W)	Max. current (mA)	Isolation class	Degree of protection	Kv Nm³/h	Flow l/min	Electrical connection
4	24 V = +15%/-10%	21	850			0.25	470	
8		40	1650	H	IP 65	0.7	1300	5-pin female M12 connector

* Residual ripple: 10 %

Setpoint input :	0 ... 10 V (100 kOhm input resistance) 0 ... 20 mA / 4 ... 20 mA (250 Ohm input resistance)
Feedback output :	0 ... 10 V (max. 10 mA), short-circuit protected 0 ... 20 mA / 4 ... 20 mA (max. 24 VDC)
Digital output :	pnp; open collector; max. 500 mA, short-circuit protected HIGH (24 VDC) if feedback=setpoint LOW (open) if feedback'>setpoint
Overvoltage :	Shut-off at a voltage level higher than 30 volts (+10%).
Low voltage :	Shut-off at a voltage level lower than 20 volts (-10 %).

7 Ordering Code

