

Digital Pressure Regulator SENTRONIC^{LP} - 617 Series with display and controls



IM50279003-R03





INSTALLATION

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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.



CAUTION! Dangerous operating conditions may occur when using the programming interface on the valve as the valve may possibly not react to the analog setpoint any more.
Provide for protection against uncontrolled movement of equipment when putting the valve into operation and before making any modifications to the valve settings.

We herewith declare that the version of the product described in this installation manual is intended to be incorporated into or assembled with other machinery and that it must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of Council Directive 2006/42/EC.

Handling, assembly and putting into service and all settings and adjustments must be done by qualified, authorised personnel only.



This product complies with the essential requirements of the EMC Directive 2014/30/EU and its amendments. It is CE-approved.
A separate Declaration of Conformity is available on request.
Please provide ordering code and serial numbers of products concerned.

NOTICE

The information in this manual is subject to change without notice.

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INSTALLATION



1. DESCRIPTION

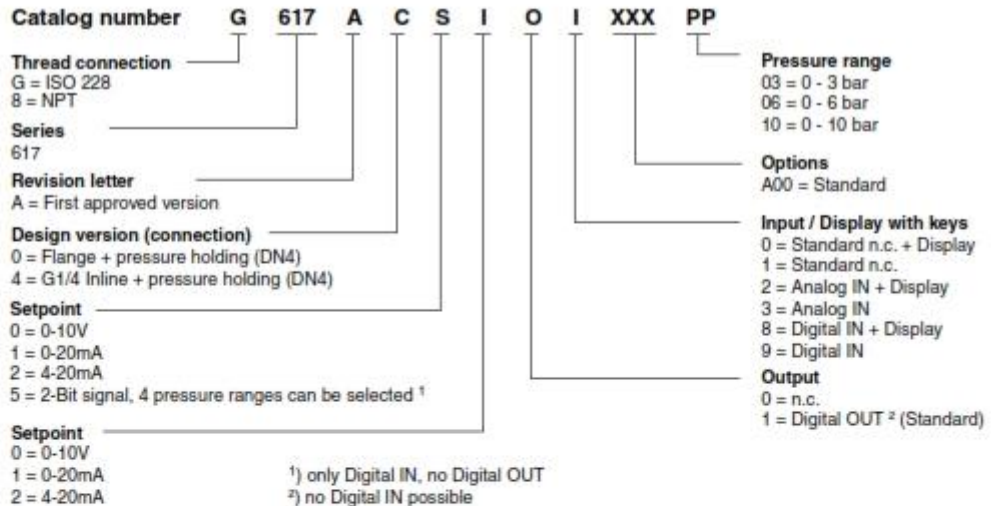
The **SENTRONIC^{LP}** valve operates with pulsed pilot valves which change the pressure in a control chamber. A downstream flow amplifier (pressure booster) converts the control pressure into an output pressure. The output pressure is measured by a pressure sensor and fed to the integrated digital control circuit. The target value is set via the electrical plug connection as a standard signal [0 to 10 V, 0(4) to 20 mA or a 2-bit digital signal].

SENTRONIC^{LP} is particularly suitable for pressure control procedures where a constant pressure is required with different flow rates, such as air dosing via nozzles or turbine rotation speed control.

Using the available **DaS software** (Data Acquisition Software), the valve can be adapted to the application if necessary.

- The pressure connections and the air vent connections are designed in the same size, which results in short response times both for increasing the pressure and for reducing the pressure.
- Digital pressure control in a closed circuit: An internal pressure sensor measures the output pressure. The output pressure is adjusted in real time.
- The control parameters can be changed with the additional **DaS software**. The variability of the parameters used by the valve is ensured by the **DaS software**. This flexibility makes it possible to adapt the valve to a very wide range of applications and to optimize the response time and the precision of the valve and prevent it from overshooting.
- After determining the optimum parameters, these can be saved for personal use in a project file, which can be sent into our Product Support Department for future series production.

1.1 CATALOG NUMBER





INSTALLATION

1.2 OPERATING ELEMENTS



- 1 Power supply, M12 plug
- 2 Pressure output
- 3 Protective ground - M4 connector
- 4 Exhaust
- 5 Pressure supply
- 6 LC display
- 7 Control keys
- 8 Mounting hole

1.3 MANUAL PRESSURE ADJUSTMENT (MANUAL OPERATION - ONLY FOR VERSION WITH A DISPLAY)

If the supply voltage is cut off, after a reconnection of the supply voltage and by pressing the two arrow keys below the display at the same time, the pressure regulator will change to "Manual operation" mode. This operating mode is indicated in the display by the letters "HND".

The letters "HND" in the display will disappear after the arrow keys are released. The output pressure is shown on the display, followed by the letters "HND" at the top right of the display.

Using the arrow keys, the output pressure can be changed (left arrow key or arrow pointing down => reduce the output pressure, right arrow key or arrow pointing up => increase the output pressure).

This operating mode can be exited by pressing both arrow keys at the same time or by briefly cutting off the supply voltage.

1.4 OPERATING MODES

Shutoff:

If the setpoint is set to less than 0.5%, the air will be released from the valve and the current supplied to the exhaust of valve will be switched off after 10 seconds.

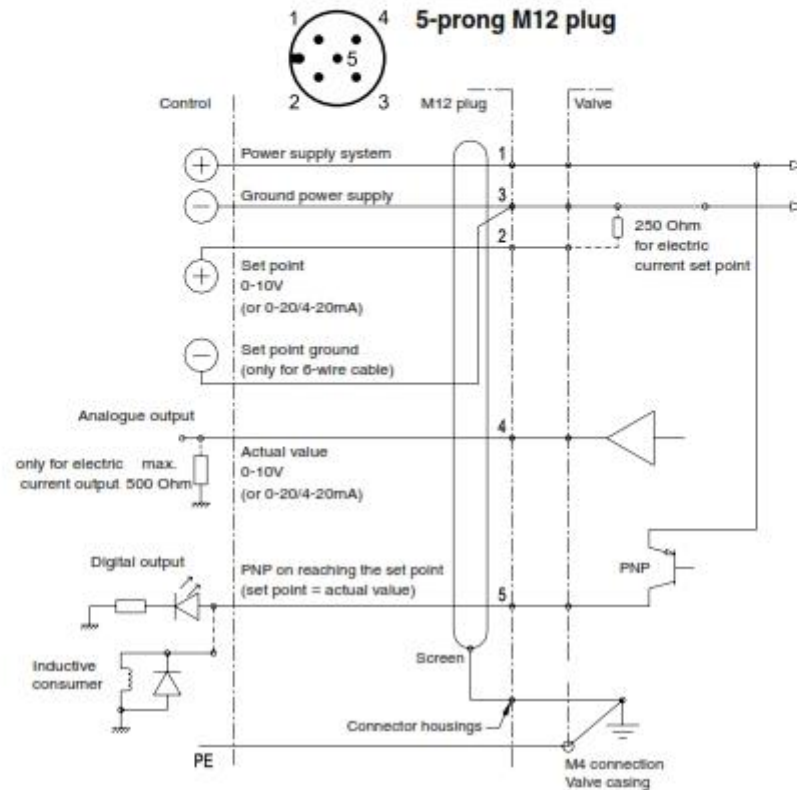
Over temperature:

If the internal control electronics reach a temperature above 100°C, the control function will be restricted in order to prevent any more overheating.

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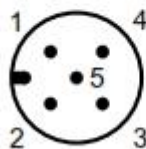


2. ELECTRICAL CONNECTION



1. The valve may only be operated with a supply voltage of 24 VDC $\pm 10\%$ and a maximum ripple effect of 10%. (no supply via diode bridge). Overvoltages or ripple currents exceeding these tolerance limits may result in damage to the electronics of the pressure regulator.
2. The maximum current for the pressure switch is 200 mA / 4.8 W (PNP output). The output is protected against short circuits and overloads.
3. If a relay (inductive load) is connected to the pressure switch output, a free-wheeling diode or a varistor should be used.
4. To protect against electromagnetic interference, a shielded cable must be used.
5. The valve body must be grounded using the grounding terminal (diameter M4).

CONNECTOR PINNING / CABLE WIRING



Pin	Description	5-wire cable (2m)	6-wire cable (5m, 10m)
1	24V power supply	brown	brown
2	Analog Setpoint - input	white	white
3	Supply ground ¹	blue	green
	Analog ground ²		yellow
4	Analog output (feedback)	black	pink
5	Digital output (pressure switch)	gray	gray
Body	EMC screen	Shield	Shield

² For cable lengths greater than 2 meters, a 6-pin cable is used with a separate analog ground to compensate for the voltage drop for the target value.

¹ An analog input is used for a cascade control system

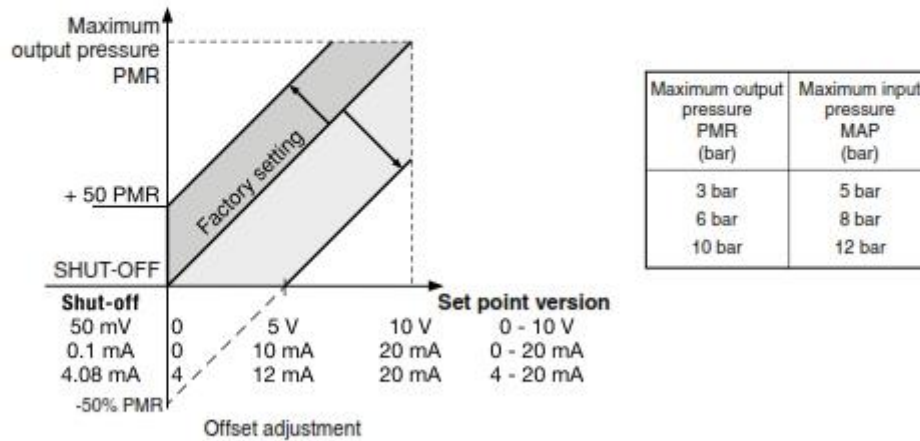


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3. ANALOG TARGET VALUE - OUTPUT PRESSURE

Setpoint offset

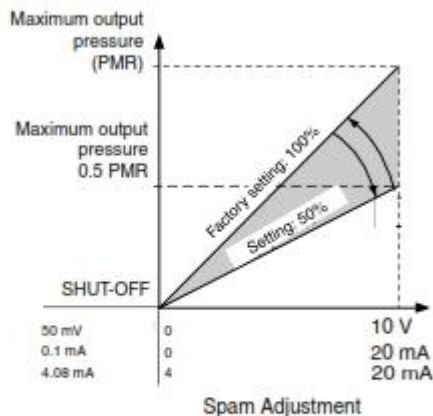
The pressure zero point of the setpoint can be changed using the *DaS* software. To do this, in the section "Setpoint settings" switch to "Customer". The maximum adjustment range for the zero point is from -50% to +100%.



WARNING: Output pressures greater than the PMR (Pressure Maximum Range) will not be regulated by the valve, i.e. the maximum output pressure is limited to the PMR. In order to prevent **damage to the sensor**, the supply pressure should always be less than the maximum input pressure (MAP) (see table).

Setpoint span

The pressure range of the target value can be changed using the *DaS* software. To do this, in the section "Setpoint setting" switch to "Customer". The adjustment range for the pressure is 10% to 200%.



The maximum setting for the pressure range is 200% of the PMR (Pressure Maximum Range).

INSTALLATION



2-bit pressure select

If a 2-bit Setpoint is selected, PIN2 (the analog setpoint input) will become the DIGITAL INPUT 2, and PIN4 (the digital output) will become the DIGITAL INPUT.

DIGITAL IN	DIGITAL IN 2	Setpoint*
0	0	0%
0	1	25%
1	0	50%
1	1	100%

* of the maximum final value
BIT = 0 means 0 VDC
BIT = 1 means 24 VDC

4. PNEUMATIC CONNECTION

The air flow direction is from connection 1 to 2.



- 1 Pressure supply at connection 1
- 2 Pressure output at connection 2
- 3 Air released at connection 3

Inch screw connections (pipe threads) are to be used.
Each screw connection must be lined with a fitting plastic sealing ring.
Teflon sealing tape and hemp may not be used, because some of these materials may end up inside the valve.
A suitable silencer is to be used at port (3). Depending on the type of silencer used, the time required for the air to be released may be extended.
The cross-section of the pneumatic lines must be adjusted to the nominal diameter of the valve. The output line (2) should have a cross-section greater than or equal to the input line (1).
The supply pressure must always be less than the value specified in the table in section 3, but it must always be greater than the desired output pressure.

5. INFORMATION ON THE FACTORY SETTINGS

- Output pressure 0 bar with a setpoint of 0 volts
- Pressure range: 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
- Minimal hysteresis
- The control parameters, the zero point and the pressure range are factory-set.

Set of parameters: factory settings

Zero point: 0%
Pressure range: 100%
Setpoint ramp: none
Shut-off point: ONE; with a target value of less than 0.5%, the air will be released from the valve
Control system: PID



INSTALLATION

6. TECHNICAL CHARACTERISTICS

CONSTRUCTION

Housing: aluminum
Internal parts: POM (polyacetal)
Seals: NBR (nitrile rubber)
Protection class: IP65

6.1 FLUID CHARACTERISTICS

FLUID	: Class 5 according to ISO 8573-1:2010 [7:4:4]
CONNECTION	: G1/4
MAX. INPUT PRESSURE	: At least 1 bar higher than the maximum output pressure
PRESSURE RANGE	: 0-3 bar, 0-6 bar, 0-10 bar
FLUID TEMPERATURE	: 0°C to +60°C
AMBIENT TEMPERATURE	: 0°C to +50°C
FLOW RATE (Q _v at 6 bar)	: 470 NI/min
ELECTRICAL SETPOINT	: 0 - 10 V (input resistance 100 kΩ) 0 - 20 mA / 4 - 20 mA (input resistance 250 Ω)
HYSTERESIS	: 1% of the final value
LINEARITY	: 1% of the final value
REPEATABILITY	: 1% of the final value
MINIMUM SETPOINT	: 100mV (0.2 mA/4.2mA) with a shut-off function
MINIMUM OUTPUT PRESSURE	: 1% of the final value
FAILSAFE BEHAVIOUR	: Retaining pressure in the event of a power failure, without regulation

6.2 KEY VALUES

Nominal size DN (mm)	Voltage (compensated)	Power consumption (W)	Current consumption (mA)	Insulation class	Protection class	Flow rate		Cable connection
						K _v value (Nm ³ /h)	at 6 bar (NI/min)	
4	24VDC	3.8 W (< 1W compensated)	160	H	IP 65	0.43	470	5-pin cable socket M12 (to be ordered separately)

* Residual ripple 10%

Test conditions according to ISO 8778: temperature: 20°C, relative input pressure: 6 bar, relative output pressure: 5 bar

Target Setpoint : 0 to 10 Volts (input resistance 100 kΩ)
0 to 20 mA / 4 to 20 mA (input resistance 250 Ω)

Actual value output : 0 to 10 Volts (max. 10 mA), with short-circuit protection
0 to 20 mA / 4 to 20 mA (max. 24 VDC)

7. ACCESSORIES

Description	Catalog number
M12 straight cable socket, 5 pins, with screw terminals	88100256
M12 right-angle cable socket, 5 pins, with screw terminals	88100725
Power supply cable 2 m, 5 x 0.25 mm ² , straight cable socket	88100726
Power supply cable 2 m, 5 x 0.25 mm ² , right-angle cable socket	88100727
Power supply cable 5 m, 6 x 0.56 mm ² , straight cable socket	88100728
Power supply cable 5 m, 6 x 0.56 mm ² , right-angle cable socket	88100729
Power supply cable 10 m, 6 x 0.56 mm ² , straight cable socket	88100730
Power supply cable 10 m, 6 x 0.56 mm ² , right-angle cable socket	88100731
RS-232 converter, 2 m cable with 9-pin sub-D plug connector (which can be plugged in)	88100732
Parameter adapter, USB, 2 m cable	N50930300100000
Attachable baseplate for 617 DN4 pressure regulator with G 3/8" compressed air supply	N50781800000000

INSTALLATION



8. CARE AND MAINTENANCE

INSTALLATION AND OPERATING INSTRUCTIONS

1. Before putting the pressure regulator into operation, carry out a careful inspection of the electrical connections and the supply voltage (24 VDC $\pm 10\%$). An overvoltage can damage the electronic systems.
Recommended fuse protection T 2.0 A
2. The electrical connection is made using a circular plug connector M12x1. The connector used must comply with the requirements of German standard DIN 60079-15. The device was tested using the plug with catalog item number 88100729.

Safety notice:

The plug must not be pulled out when a voltage is running through it!

When the connector plug is removed from its socket, in order to maintain the IP protection class, the protective cap supplied with the device must be fitted.

3. For the electrical connection of the valve, shielded cables must be used. The shielded connection, plug and switch cabinet must comply with EMC requirements. The valve body must be electrically grounded (protective earthing, machine grounding). Do not install control cables parallel to power cables or control cables of servomotors etc.
4. The cable cross-section area of the supply voltage cable should be at least 0.25 mm².
If long supply cables are used, it may be appropriate for them to have an even larger cable cross-section area.
5. Make sure that the valve is subjected to pressure as soon as a target value signal is sent to the valve (if a target value setting is sent to the valve without the valve being under pressure, this will result in unacceptable excessive heating of the valve).
6. The device is calibrated with factory settings.
7. The device must be sent to the factory if repairs are needed.

SAFETY INSTRUCTIONS

These products must only be used in industrial compressed air systems. These products are to be used in locations where the pressures and temperatures listed under "Specifications" are not exceeded. Please take note of the relevant page in the instruction manual.

Before using these products with fluids other than those specified in the manual, or in non-industrial applications, life-support systems, or in other systems which are not specified in the published instruction manuals, please contact ASCO Numatics directly.

The components used in fluid power systems can fail in various ways due to misuse, wear or system malfunctions.

System designers are warned to make it a priority to take into account the possible types of faults of all component parts used in fluid power systems, and to provide adequate safeguards to prevent injuries to staff or damage to equipment in the event of such faults.

System designers must provide safety instructions for the end users in the operating manual if protection against faults cannot be sufficiently guaranteed.

System designers and end users are strongly advised to comply with the safety instructions provided with these products.



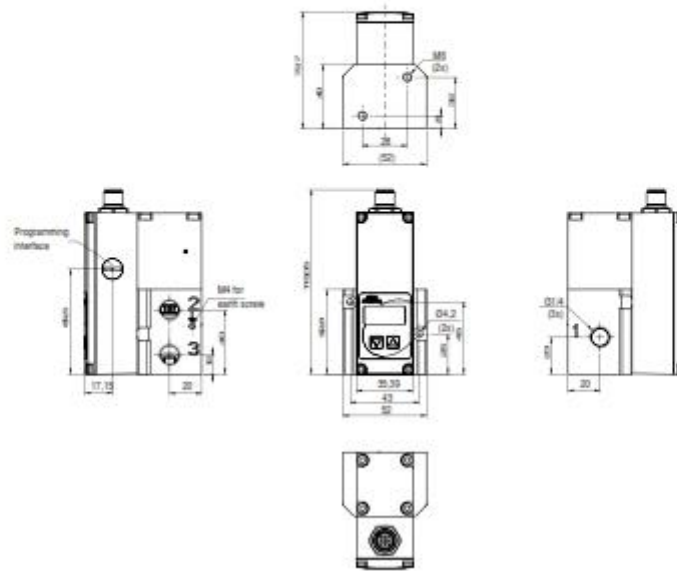
INSTALLATION

9. DIMENSIONS AND WEIGHTS

Inline version

DN 4

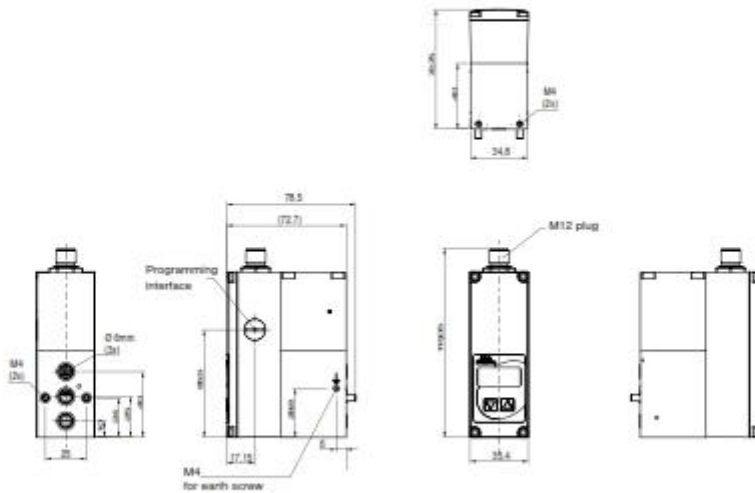
Weight: 0.49 kg



With flange subbase mounting

DN 4

Weight: 0.49 kg



INSTALLATION



Mountingplate

DN 4

Weight: 0.3 kg

