Sentronic^{HD}

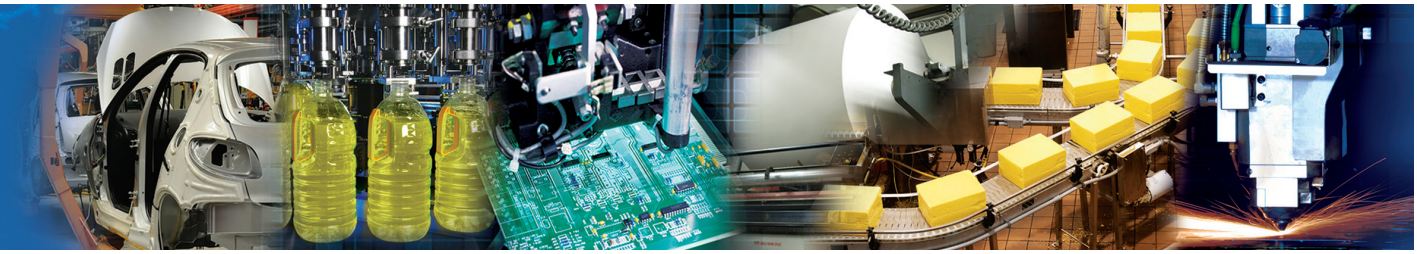
Digital Electronic Pressure Regulator

Series 616

Installation Manual

GB

IM14277-GB/R01



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Sentronic^{D}

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.

DECLARATION OF INCORPORATION

according to Machinery Directive 89/392/EEC, Annex II B

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 89/392/EEC, Annex IIB.
Handling, assembly and putting into service and all settings and adjustments must be done by qualified, authorised personnel only.

CE

This product complies with the essential requirements of the EMC Directive 89/336/EEC and its amendments. It is CE-approved. A separate Declaration of Conformity is available on request.
A separate Declaration of Incorporation relating to the EU Directive 89/392/EEC Annex II B 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.
In no event shall ASCO NUMATICS be liable for technical or editorial errors or omissions. Neither is any liability assumed for accidental or consequential damages arising out of or in connection with the supply or use of the information contained herein.

1. Description

The **Sentronic^{HD}** with integrated digital control loop combines the latest in pneumatics technology with intelligent electronics. The **Sentronic^{HD}** series allows precise control of pressure, flow, force, velocity and displacement or angle positions.

Cascaded control allows setting up complex control loops using the ***DaS-HD Software*** (Data Acquisition Soft-ware). Digital control offers many advantages during installation and start-up of the **Sentronic^{HD}** valve and ex-tended possibilities to adapt it to various applications.

- Digital pressure control in a closed loop: An internal pressure sensor measures the inlet/ outlet pressure. The outlet pressure is adjusted in real time.
- The control parameters can be changed with the ***DaS software:*** This flexibility allows the valve to be adapted to the most various applications, and its response time, overshoot and precision to be optimised.
- 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 How to Order

Sentronic^{HD} - Digital Electronic Pressure Regulator

G 616 A 4 0 0 0 0 A00 06

Thread Connection
G = ISO 228

Product Series
616

Revision
A = Initial Release

Size
4 = G1/4 + pressure hold
5 = G1/4 + pressure release

Setpoint
0 = 0-10V
1 = 0-20mA
2 = 4-20mA
3 = PWM - Frequency*

Feedback
0 = 0-10V
1 = 0-20mA
2 = 4-20mA

Pressure Range
03 = 0…3 bar
06 = 0...6 bar
10 = 0...10bar
V1 = -1...(+3bar)

Options
A00 = Standard

Input 2 / Display w/ Buttons
0 = Standard NC + Display
2 = Analog IN 2 + Display
4 = Digital IN 2 + Display
6 = Frequency IN + Display*

Output 2
0 = NC
1 = Digital OUT
2 = Analog OUT2

* If Setpoint PMW-Frequency is selected, frequency input is not avaliable at IN 2

1.2 Operating Elements

1. Power supply, 8-pin male connector M12
2. LC display
3. Control panel
4. Programming interface (Ethernet IP)
5. Pressure supply
6. Pressure outlet
7. Exhaust
8. Ground connection M4 thread

1.3 Operating Modes

Shut-off:
If the setpoint falls below 0.5 %, the pilot valves are 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.

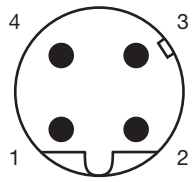
Autosafe:
If the coil current exceeds a certain value, dependent on the mechanics, for more than 20 seconds, the output current is limited to max. 70% to prevent the valve from overheating.

2. Electrical Connection

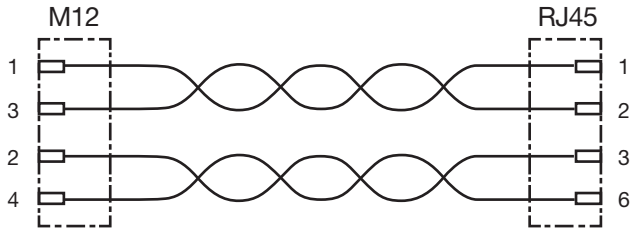
Ethernet IP Programming Interface

M12-Cable Plug,

4-pole, D-coded



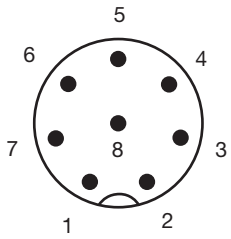
View on male connector
(the device is equipped
with a female connector)



*The use of a shielded cable is recommended.

M12 male connector,

8-pin, A coded



View on valve

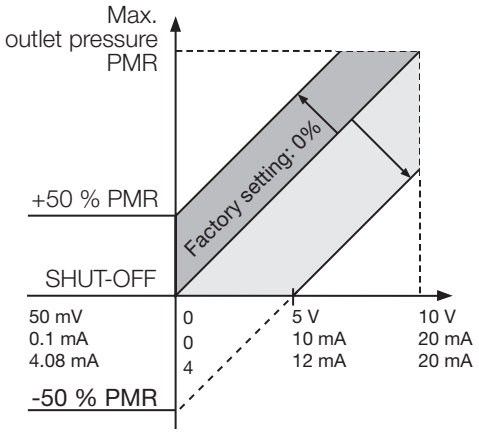
Pin	Description	8-wire cable (5 m, 10 m)
1	Digital Input	white
2	24 VDC voltage supply	brown
3	Setpoint ground SET-	green
4	Setpoint SET+ (PWM)	yellow
5	Analog input 2 / Digital input 2 / Frequency input	gray
6	Analog output	pink
7	Ground 24VDC	blue
8	Digital output / Analg output 2	red
Body	EMC screen	shield

1) The valve must only be supplied with 24V DC ±10% and a max. ripple of 10% (no supply via diode bridge). Overvoltage or a ripple rate exceeding these tolerances can damage the electronics.
2) The max. current at the digital output is 200 mA/4.8W (PNP output). The output is protected against short circuit and overload.
3) If a relay (inductive load) is connected to the pressure switch output, a freewheel diode or a varistor must be used.
4) A shielded cable must be used for protection against interference and EMC.
5) The valve body must be grounded with the earthing terminal PE (dia. M4)

3. Analog Setpoint - Outlet Pressure

Setpoint offset

The pressure setpoint zero can be changed via the DaS-HD software. Switch Module 1 to "Rescale" in the "Parameter/Setpoint" section. The zero range is max. -50 ... +100 %.



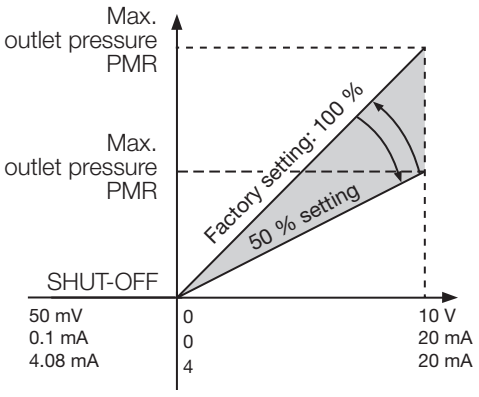
Offset Adjustment

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)** (see Technical Characteristics).

Setpoint span

The pressure span of the setpoint can be changed via the DaS-HD software. Switch Module 1 to "Rescale" in the "Parameter/Setpoint" section. The span is between +10 and +150 %.



Span Adjustment

4. Technical Characteristics

Construction

Pilot operated valve

Body:	Aluminium
Internal parts:	Stainless steel, brass, aluminium and POM
Seals:	Fluorelastomer (FPM)
Degree of protection:	IP65

Installation

Assembly position:	any; for optimum performance vertically with solenoid at the top.
Air:	free of condensate
Connections: tape	without hemp or Teflon sealing
Electrical connection:	Select a wire section that will give a a voltage drop of less than 2 volts at 2A.

4.1 Fluid Characteristics

Fluids:	Air or neutral gas, free of condensate, lubricated or not Class 5 to ISO 8573-1
Ports:	G1/4
Max. Inlet Pressure:	174 psi (12 bar)
Pressure Range:	see Section 1.1
Temperature / Fluid:	32°...122°F (0°...50°C)
Temperature / Ambient:	32°...122°F (0°...50°C)
Hysteresis:	<0,25% of span
Linearity:	<0,25% of span
Reliability:	<0,25% of span

4.2 Specification

Nominal Diameter DN	Stabilized Voltage *	Max. Power (W)	Max. Current (mA)	Insulation Class	Degree of Protection	Flow		Electrical Connection
						Cv Flow Factor (Kv Nm3/h)	at 6 bar (l/min-ANR)	
6	24 V DC +/-10%	5	240	F	IP65	1.30 (1.12)	1200	8-pin M12 connector, A coded (not supplied)

*Max. 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. 200 mA/4.8W, short-circuit protected
	HIGH (24 VDC) if feedback=setpoint LOW (open) if feedback≠setpoint

Installation and Operating Instructions

1. Before putting into operation carefully check all electrical connections and the supply voltage (24 VDC ±10 %). Overload can destroy the electronics. Recommended pre-fuse T2.0 A.

2. The electrical connection is made with a round connector M12x1. The connector must meet the requirements of DIN 60079-15.

   WARNING:
   Do not disconnect the connector while under voltage!
   When disconnected from power, use supplied protection cover to ensure IP protection.

3. Use shielded cables for the electrical connection of the valve. The shield, connector and control cabinet must be EMC compliant. The valve body must be electrically connected to ground (PE, machine ground). Do not run control cables parallel to high-voltage lines, servo-motor control cables etc.

4. Min. wire cross-section of supply voltage cable: 0.25 mm2.
   For longer cabling distances use larger cross-section cables as required.

5. Make sure that the valve is under pressure when a setpoint signal is applied to the valve (applying a setpoint signal with no pressure on the valve will cause it to overheat).

6. The valve is factory adjusted.

7. The product must be returned to the factory for repair.

WARNING NOTES
These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under SPECIFICATIONS. Please also see the corresponding product specification sheets.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult ASCO Numatics.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the operating manual if protection against a failure mode cannot be adequately ensured.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

5. Accessories

Description	Catalog Number
Supply cable 5 m; 8x0.50 mm^2 ; straight connector	TC0805MQX0000000
Supply cable 10 m; 8x0.50 mm^2 ; straight connector	TC0810MQX0000000
Supply cable 10 m; 8x0.50 mm^2 ; right-angle connector	TD0810MQX0000000
Programming cable 5 m; M12 Straight 4 Pin Male D-Coded to Male RJ45	QA0405MK0VA04000