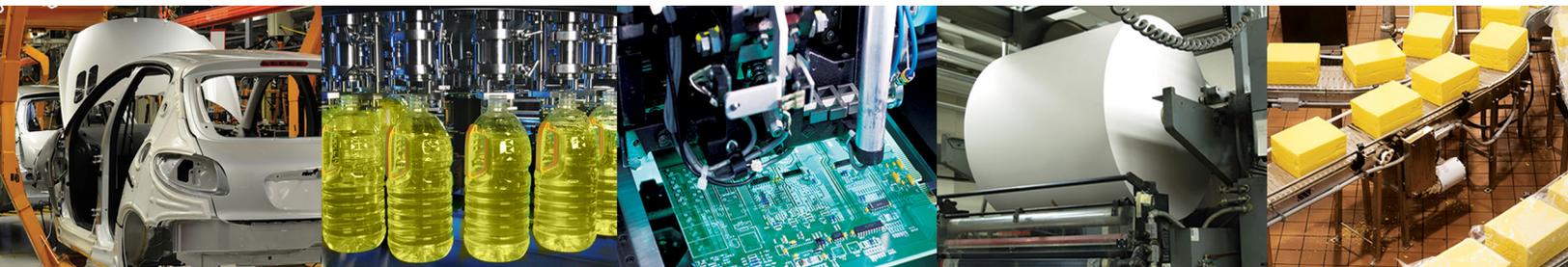


# Sentronic<sup>PLUS</sup> | 614 Series

Proportional Technology



**Sentronic<sup>PLUS</sup>**

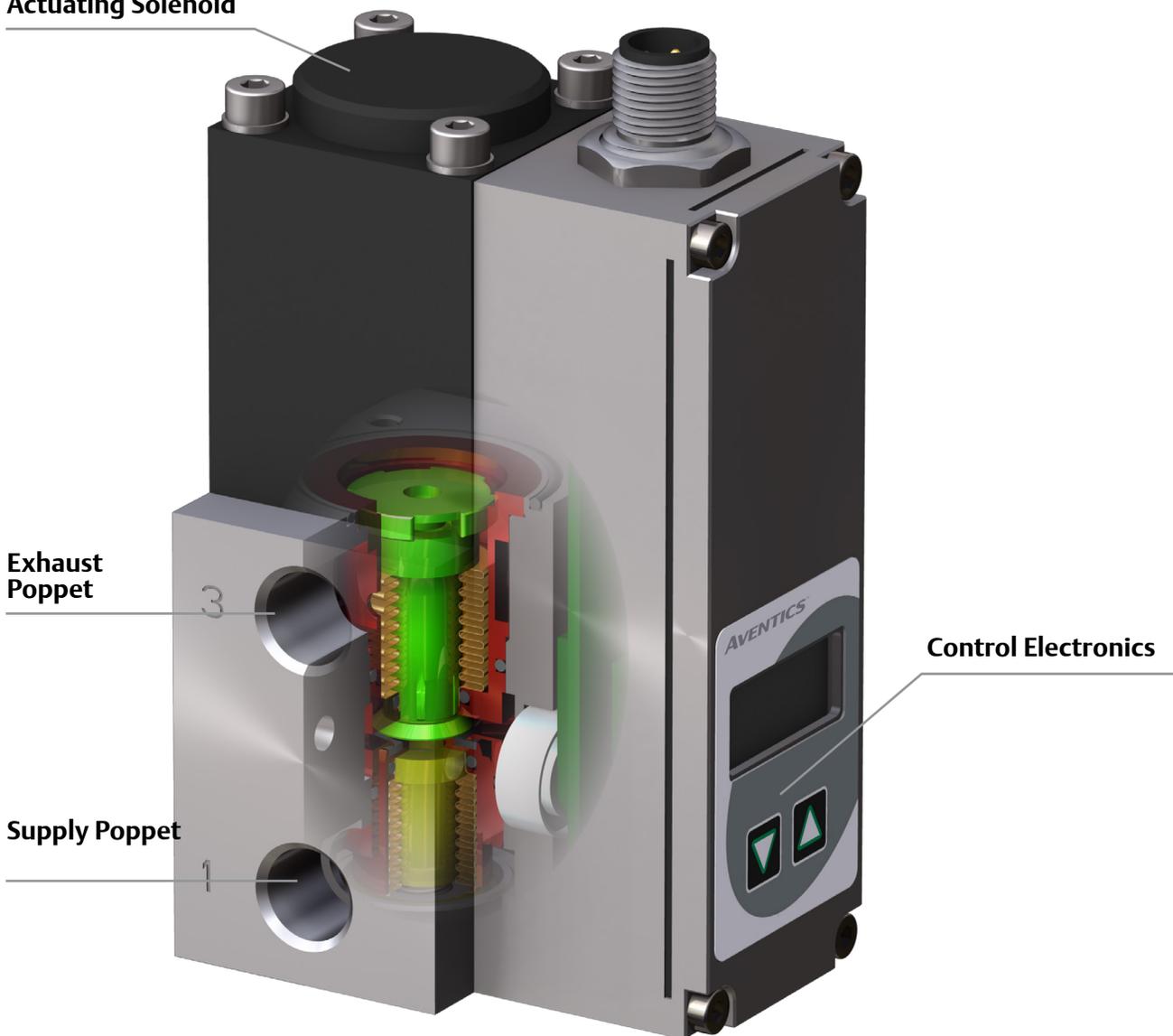
Sentronic<sup>PLUS</sup> is a digitally operated pressure regulator valve. This valve accurately adjusts pressure, flow, force, speed, and linear or angular positions. All orifices have the same diameter for short response times whether increasing or exhausting pressure. The valve components are designed to provide control at an extremely low hysteresis.

Sentronic<sup>PLUS</sup> regulates pressure up to 725 psi (50 bar) and can be used in potentially explosive atmospheres according to ATEX Directive 94/9/EC.

With the Data Acquisition Software (DaS) and the RS232 interface, it is now possible to optimally adjust the valve's control parameters to a specific application. The scope function allows you to log and read out the system's response in real time.

The DaS capabilities streamline the development process and identify application-specific problems at an early stage. Saved control parameters can be loaded at any time and used as a reference for maintenance and error detection. Saved parameters can also be used for future production so that valves are factory-set to a specific application.

**Actuating Solenoid**



**Exhaust Poppet**  
3

**Supply Poppet**  
1

**Control Electronics**

All Sentronic valves are tested before leaving our manufacturing facilities. Each valve is provided with a test certificate showing all the test results.



**Advantages**

- Minimum hysteresis
- Quick response times
- Very high sensitivity
- Standard 50 µm filtration
- No constant air consumption
- Analog command signal
- Analog feedback output
- PC communication
- Digital Control
- Easy change of control parameters

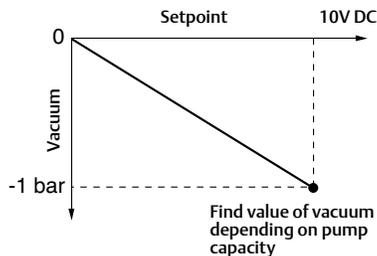
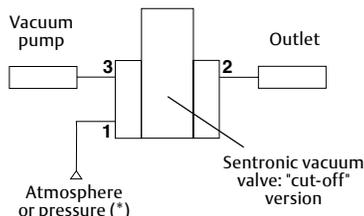
**Vacuum Control Options**

Sentronic valves can be used or applications where pressure and vacuum control is required. For instance, for testing the strength of piping, for testing car brake amplifiers, etc.

**3 versions are available:**

**V1 "Shut-off" version**

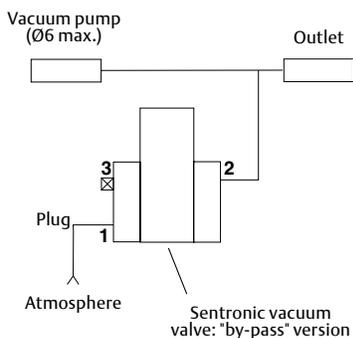
The valve is connected between the vacuum pump and the system to be regulated as shown in the diagram below. As long as the level of vacuum is not reached, the Sentronic<sup>PLUS</sup> valve allows free flow between the pump and the load system. When the setpoint is reached, the valve closes the circuit and no more air is consumed. In the event of leakage of the load system, the valve provides regulation by reconnecting the volume to the vacuum pump. When the setpoint is switched off, the valve breaks the vacuum by connecting the volume to atmosphere. When the 24 VDC is switched off, the valve connects the outlet to maximum vacuum.



**V2 "By-pass" version**

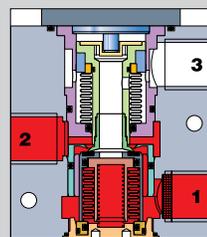
The vacuum pump operates continuously and the Sentronic<sup>PLUS</sup> is installed in a branch to regulate the level of the vacuum in the load system as a function of the setpoint by allowing a variable rate of air at atmospheric pressure to enter the system.

In this case, port 3 must be plugged.

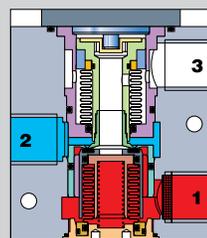


\* To accelerate vacuum control, it is possible to apply pressure (max. 2 bar) instead of atmospheric pressure to port 1 in the V1 Shut-off version or to port 3 in the V3 Shut-off version

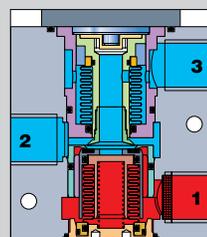
**Operating Principle**



**Increasing Pressure**  
The pressurization piston is operated and the flow from port 1 to port 2 is released.



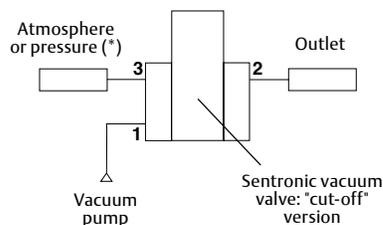
**Exhausting Pressure**  
The exhaust piston is lifted and the flow from port 3 to port 2 is released.



**Maintaining Pressure**  
The exhaust piston is in its central position: the flow between port 2 and port 1 or port 3 is blocked.

**V3 "Shut-off" version**

Version V3 has the same function as version V1, but connects the outlet to atmosphere on loss of power. There is no current to the proportional coil when zero vacuum is commanded.



How to Order

6 1 4 3 5 7 E 9 0 1 1 PB

Control Panel

- D = M12 with display - non-explosionproof
- E = M12 without display - explosionproof (ATEX)
- F = DIN connector, 7-pin, with display - non-explosionproof<sup>1</sup>
- G = DIN connector, 7-pin without display - non-explosionproof<sup>1</sup>

Version (ports), Body

- 0 = DN6 (G 1/4), ALU
- 1 = DN12 (G 1/2), ALU<sup>2</sup>
- 2 = DN20 (G 1), ALU<sup>2</sup>
- 4 = DN6 (NPT 1/4), ALU
- 5 = DN12 (NPT 1/2), ALU<sup>2</sup>
- 6 = DN20 (NPT 1), ALU<sup>2</sup>
- 7 = DN3 (G 1/8), Brass
- 8 = DN6 (G 1/4), Brass
- 9 = DN3 (NPT 1/8), Brass
- A = DN6 (NPT 1/4), Brass
- C = DN6 (G 1/4), Stainless Steel
- G = DN6 (NPT 1/4), Brass<sup>3</sup>
- H = DN6 (G 1/4), Brass<sup>3</sup>
- J = DNI (G 1/4), Brass
- K = DNI (NPT 1/4), Brass

Command Signal

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

Feedback

- 1 = Feedback output 0 – 10 Volt
- 2 = Feedback output 0 – 20 mA
- 3 = Feedback output 4 – 20 mA
- 4 = Feedback input 0 – 10 Volt<sup>4</sup>
- 5 = Feedback input 0 – 20 mA<sup>4</sup>
- 6 = Feedback input 4 – 20 mA<sup>4</sup>

Options

- A00 = Dual loop control
- 018 = Oxygen clean

Pressure Range

Output Pressure (psi)

40	= 0 – 0.1 bar (1.5)	2 (29)
50	= 0 – 0.5 bar (7.3)	2 (29)
60	= 0 – 1 bar (14.5)	2 (29)
02	= 0 – 2 bar (29)	3 (44)
03	= 0 – 3 bar (44)	8 (116)
PA	= 0 – 3.4 bar (50)	8 (116)
05	= 0 – 5 bar (73)	8 (116)
06	= 0 – 6 bar (87)	12 (174)
PB	= 0 – 6.9 bar (100)	12 (174)
10	= 0 – 10 bar (145)	12 (174)
PC	= 0 – 10.3 bar (150)	12 (174)
12	= 0 – 12 bar (174)	14 (203)
PD	= 0 – 12.8 bar <sup>5</sup> (200)	18 (261)
16	= 0 – 16 bar <sup>5</sup> (232)	18 (261)
PE	= 0 – 17.2 bar <sup>5</sup> (250)	22 (316)
20	= 0 – 20 bar <sup>5</sup> (290)	22 (316)
PF	= 0 – 20.7 bar <sup>5</sup> (350)	22 (316)
3H	= 0 – 30 bar <sup>6</sup> (435)	40 (580)
5H	= 0 – 50 bar <sup>6</sup> (725)	60 (870)

Max. Inlet Pressure (psi)

Vacuum (relative)

- V1 = 0 to -1 bar  
Shut-off valve, connects to vacuum on loss of power
- V2 = 0 to -1 bar  
Bypass valve
- V3 = 0 to -1 bar  
Shut-off valve, connects to atmosphere on loss of power

Absolute Pressure Ranges Available on Request

Digital Output

- 1 = Pressure switch output PNP ± 5%

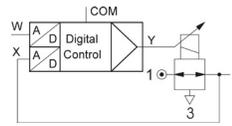
<sup>1</sup> 7-pin DIN connector allows crossover from 833-354 or 601 Series legacy analog Sentronic version; ships with field installable connector.

<sup>2</sup> Up to max. 12 bar <sup>3</sup> Only for pressure ranges from 30 to 50 bar <sup>4</sup> Feedback input is needed for dual loop units

<sup>5</sup> Only for DN1, DN3 & DN6 <sup>6</sup> Only for DN6 body type G or H. Other versions available on request.

## Sentronic<sup>PLUS</sup> Electronic Pressure Regulator

Sentronic<sup>PLUS</sup> is a 3-way proportional valve with digital control. Its construction allows the valve to be used in potentially explosive atmospheres according to ATEX Directive 94/9/EC. The valve also has pressure ranges from 1.5 psi to 725 psi. The Data Acquisition Software (DaS) that comes with Sentronic<sup>PLUS</sup> can be used to adjust the valve's control parameters to a specific application. Command signal, feedback signal and control parameters can be viewed in real time and adjusted as required for an application. Settings can be saved and loaded at any time for reference or diagnostics. Sentronic<sup>PLUS</sup> can be configured for dual loop control of process variables such as flow, force, speed, RPM, and temperature.



Fluids	Ambient Temperature	Body	Internal Parts	Seals
Air or neutral gas, filtered at 50 μm, condensate-free, lubricated or unlubricated	0 °C to 60 °C (32 °F to 140 °F)	Aluminum	Stainless steel and brass	NBR (nitrile) and FPM (fluoroelastomer)

General Valve Information	
Fluid Temperature	0 °C to 60 °C (32 °F to 140 °F)
Command Signal- analog	0 – 10 V (impedance 100 KΩ), 0 - 20 mA/4 - 20 mA (impedance 250 Ω)
Ports	1/8, 1/4, 3/8 (NPT or GTap)
Construction	Direct-operated Poppet Valve
Hysteresis	1% of span
Linearity/ pressure measurement	± 0.5% of span
Repeatability	± 0.5% of span
Explosion Safety	
Safety code	⊕ II 3D Ex tc III C T 135 °C Dc X, ⊕ II 3G EX ec II C T4 Gc X, 0 ≤ Ta ≤ 50 °C

Electrical Characteristics						
Nominal Diameter DN (mm)	Voltage *	Max. Power (W)	Max. Current (mA)	Insulation Class	Degree of Protection	Electrical Connection
1	24 VDC = ± 10%	12	500	F	IP65	5-pin M12 connector or 7-pin DIN connector
3	24 VDC = ± 10%	12	500	F	IP65	5-pin M12 connector or 7-pin DIN connector
6	24 VDC = ± 10%	24 <sup>1</sup>	1000 <sup>1</sup>	F	IP65	5-pin M12 connector or 7-pin DIN connector
12	24 VDC = ± 10%	34	1400	F	IP65	5-pin M12 connector or 7-pin DIN connector
20	24 VDC = ± 10%	44	1800	F	IP65	5-pin M12 connector or 7-pin DIN connector

\* Max. ripple: 10%

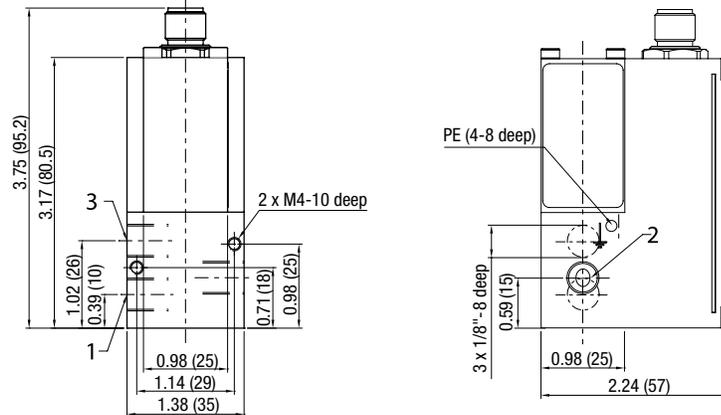
<sup>1</sup> For DN6, brass version G or H/1.8A, 44W

Specifications				
Ø Ports	Ø Orifice DN (mm)	Flow		
		C <sub>v</sub> Flow Factor (K <sub>v</sub> Nm <sup>3</sup> /h)	at 6 Bar (l/min - ANR)	
1/8 NPT or GTap	1	0.032 (0.028)	30	
1/8 NPT or GTap	3	0.21 (0.18)	210	
1/4 NPT or GTap	6	0.70 (0.60)	700	
1/2 NPT or GTap	12	1.39 (1.20)	1400	
1 NPT or GTap	20	5.57 (4.80)	5600	

Dimensions: inches (mm)

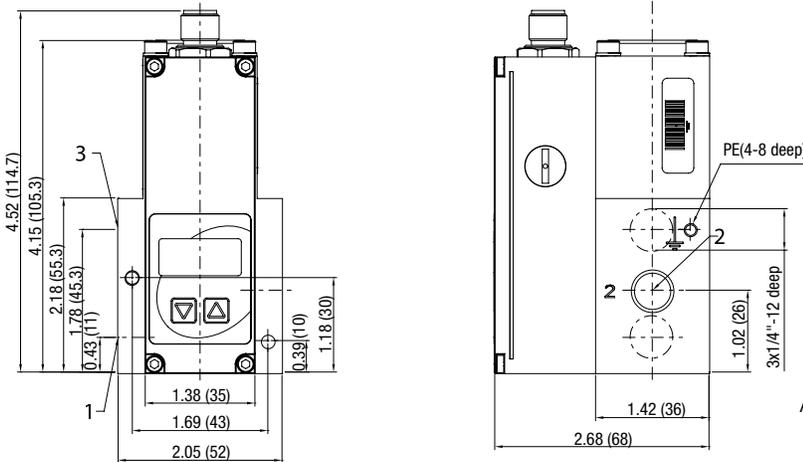
1/8 NPT or GTap (DN1 and DN3)

Weight: 0.55kg (1.21lbs)



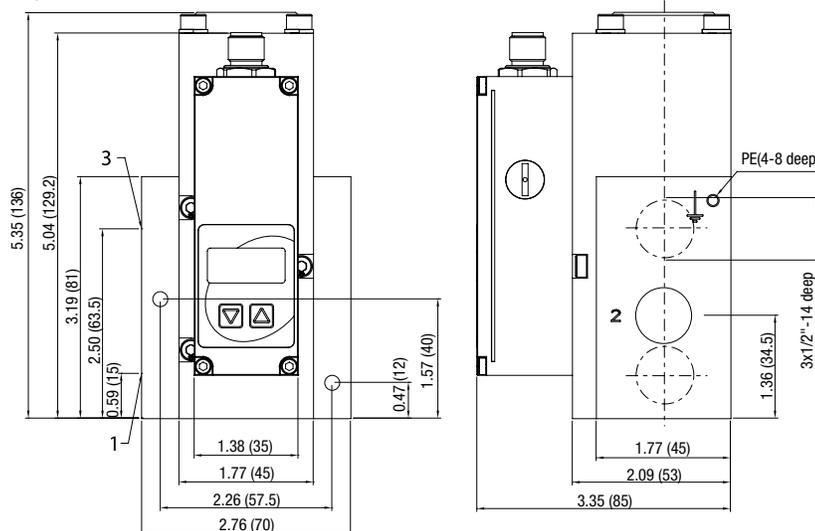
1/4 NPT or GTap

Weight: 0.85kg (1.87lbs)



1/2 NPT or GTap

Weight: 1.65kg (3.64lbs)



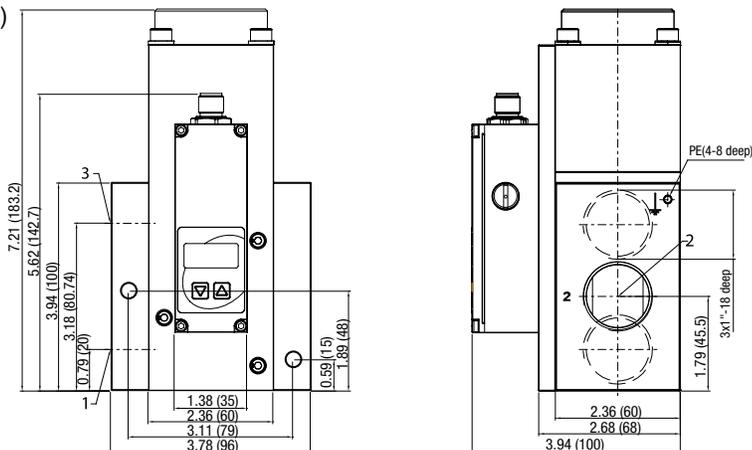
A) Thread M5 - depth 10 (on opposite side); tapped through-hole for M4 screw.

A) Thread M5 - depth 10 (on opposite side); tapped through-hole for M4 screw.

Dimensions: inches (mm)

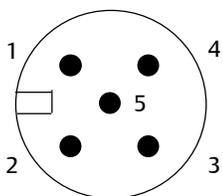
1 NPT or GTap

Weight: 3.40kg (7.50lbs)



A) Thread M8 - depth 15 (on opposite side); tapped through-hole for M6 screw.

Connector Pin Out



Pin	Description
1	+24 VDC Supply
2	Command Signal
3	+0 VDC Common (Supply)
	+0 VDC Common (Command Signal)*
4	Analog output (Feedback)
5	Digital output (Pressure switch)
Body	EMV screen

\* A 6-wire cable with separate common for the command signal is used for cable lengths over 2m to minimize the voltage drop for the command signal.

Accessories



5 Pin 12mm FEMALE Straight Field Attachable Connectors		Model Number
PG 9 Cable Gland		TC05F20000000000
5 Pin 12mm FEMALE 90 DEGREE Field Attachable Connectors		Model Number
PG 9 Cable Gland		TD05F200000000000
Micro Female 5 Pole Straight 6 Wire 24 AWG, Shielded		
3 Meter		TC0503MMS000671Y
5 Meter		TC0505MMS000671Y
Micro Female 5 Pole 90 Degree 6 Wire 24 AWG Euro Color Code, Shielded		
3 Meter*		TD0503MMS000671Y*
5 Meter*		TD0505MMS000671Y*
PC Software & Cable Connectors		Model Number
DaS Light: Data Acquisition Software for Sentronic <sup>D</sup> - basic parameters - free download at Emerson.com/AVENTICS; full version upon request		Website download
DaS Expert: Data Acquisition Software for Sentronic <sup>D</sup> - full parameters		Consult Factory
Parameter adapter USB, 1m cable (this connector or 88100732 required for DaS software usage)		N50930300100000
RS 232 cable converter; 2m cable with 9-pin Sub-D		88100732

\* Do not use with the 1\* Sentronic<sup>PLUS</sup>