+Datasheet EE680

Air Velocity and Temperature Sensor for Laminar Flow

EE680

Air Velocity and Temperature Sensor for Laminar Flow

The EE680 is dedicated for precise measurement of the air velocity (Av) and the temperature (T) in laminar flow. The GMP-compliant design is ideal for cleanrooms and safety cabinets in pharmaceutical, life sciences and microelectronics industries.

Outstanding Measurement Performance

The EE680 operates on the hot film anemometer principle. It employs an E+E thin-film sensing element which stands for excellent accuracy down to 0.1 m/s (20 ft/min), long term stability and low angular dependency. The multipoint air velocity factory adjustment leads to best performance over the entire working range. The E+E proprietary coating protects the sensing element against H_2O_2 and corrosive cleaning agents.

Versatility

The EE680 is available as straight and angled version with various probe lengths. The design is optimized for easy cleaning, while the mounting concept and the M12 stainless steel connector facilitate the installation and replacement. A led ring integrated in the stainless steel enclosure indicates the laminar flow conditions and the sensor status.

Analogue Outputs or RS485 Interface, User Selectable

The Av and T measured data is available as current or voltage analogue outputs or on the RS485 interface with Modbus RTU protocol.
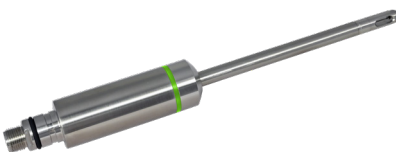
User Configurable and Adjustable

The setup and adjustment of the EE680 can be easily performed with an optional adapter and the free PCS10 Product Configuration Software.

EE680-T29 angled probe with flange

EE680-T15 straight probe with flange

EE680-T15 straight probe without flange

EE680 mounting flange

Features

EE680 Sensor

- Highly accurate over the entire working range
- Precise measurement of even smallest air flow
- Combined Av and T measurement
- Voltage, current or digital RS485 output, selectable
- User configurable and adjustable

Probe and Sensing Element

- E+E sensor coating for best resistance against H_2O_2
- Stainless steel probe and sensing head

Visualization

- Optical indication of the laminar flow and sensor condition
- LED ring status directly visible on the sensor
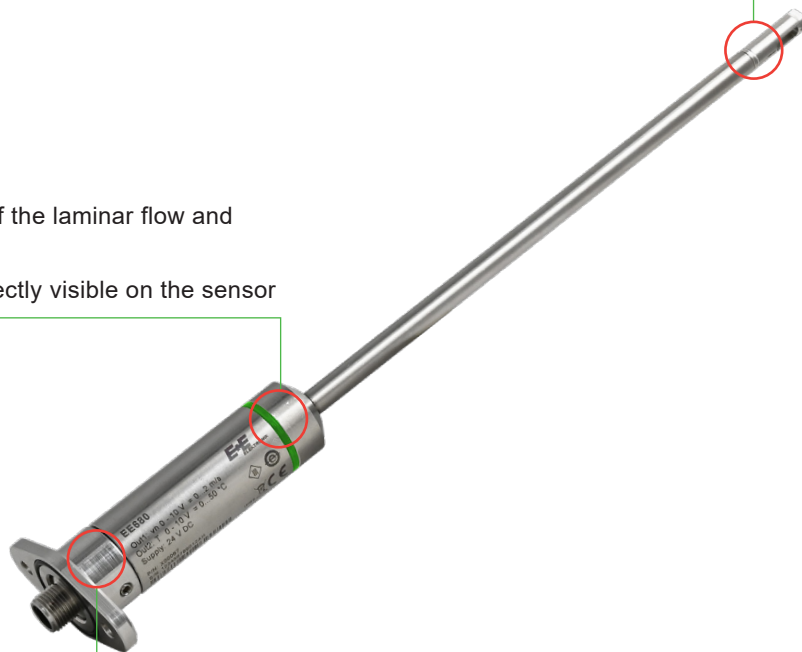
Application Specific Design

- GMP compliant design for easy cleaning
- Straight or angled probe with various lengths
- Stainless steel mounting flange
- M12 stainless steel connector

Inspection certificate

according to DIN EN 10204-3.1 with six Av points

Features

E+E Sensor coating

The E+E proprietary sensor coating is a protective layer applied to the active surface of the sensing element. The coating substantially extends the life-time and the measurement performance of the E+E sensor in applications with frequent H_2O_2 sterilization processes. Additionally, it improves the sensor's long term stability.

E+E Modular Sensor Platform

The EE680 is compatible with the Sigma 05 host device of the E+E Modular Sensor Platform. Together they become a versatile, plug-and-play Av / T modular sensor with analogue outputs and optional display. Besides EE680, Sigma 05 accommodates also other E+E intelligent sensing probes. See www.epluse.com/sigma05 for further details.
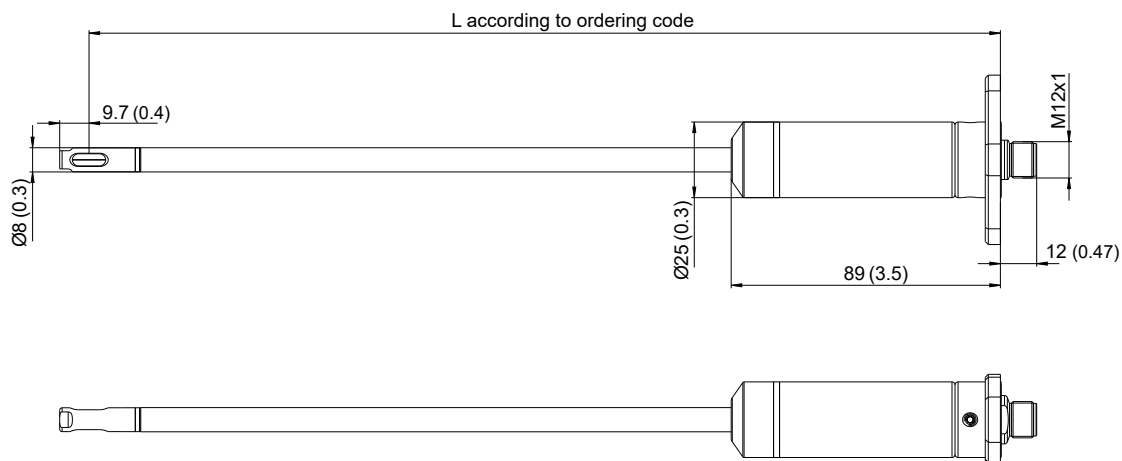

Sigma 05 with EE680

Dimensions

Values in mm (inch)

Type T15

Straight probe

L according to ordering code

9.7 (0.4)

M12x1

Ø8 (0.3)

Ø25 (0.3)

12 (0.47)

89 (3.5)

Mounting flange

Ø5.5 (0.22)

15 (0.6)

5 (0.2)

Ø18...20 (0.71...0.79)
drilling diameter

30 (1.2)

40 (1.6)

56 (2.2)

Type T29

90° angled probe

12 (0.47)

M12x1

89 (3.5)

Ø25 (0.3)

300 (11.8)

Ø8 (0.3)

9.7 (0.4)

300 (11.8)
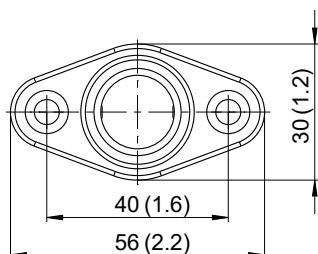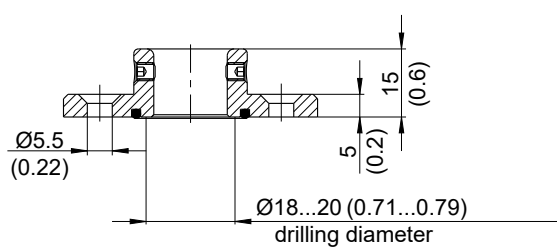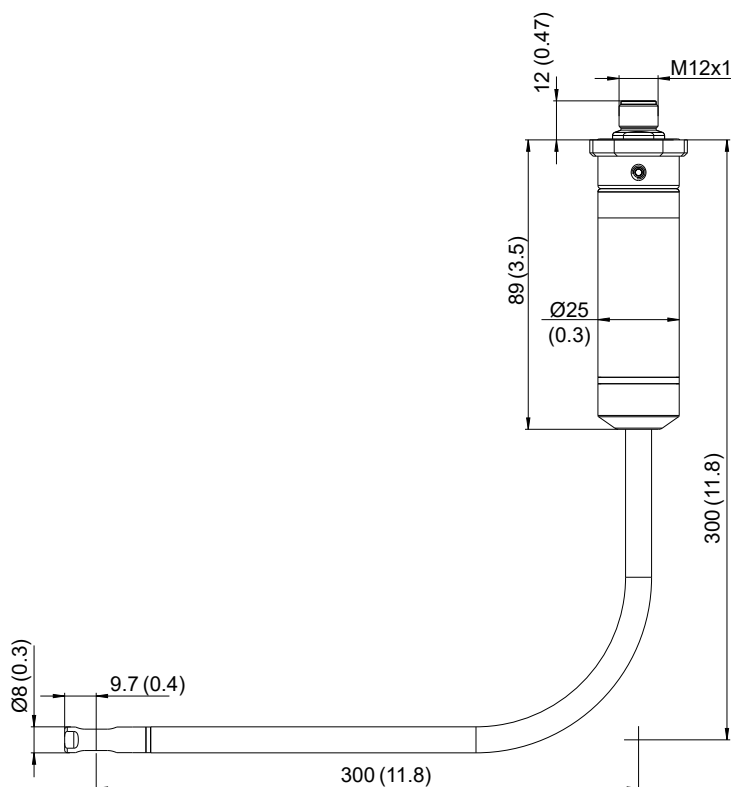
Technical Data

Measurands

Air Velocity (v)

Standard conditions factory setting	pn = 1 013.25 mbar (14.7 psi); Tn = 23 °C (73 °F), freely configurable via PCS10
Measuring range	0...2 m/s (0...400 ft/min)
Accuracy[1] in air @ 23 °C (73 °F) and 1 013 hPa (14.7 psi)	0.1...2 m/s (20...400 ft/min): ± (0.5 % of mv +0.05 m/s) mv = measured value
Dependency **of inflow angle (α)** **of inflow direction**	<3 % for α < ±10° <3 %
Response time t_{90}, typ.	<1.5...40 s (Factory setting: 1.5 s, configurable via PCS10)

1) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).
   The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Temperature (T)

Measuring range	-20...+70 °C (-4...+158 °F)
Accuracy, typ. in air @ 23 °C (73 °F), at air flows ≥ 0.45 m/s	±0.5 °C (±0.9 °F)

Outputs

Digital

Digital interface	RS485 (EE872 = 1/10 unit load)
Protocol **Factory settings** **Supported Baud rates** **Measured data types**	Modbus RTU 9 600 Baud, parity even, 1 stop bit, Modbus address 68 9 600, 19 200, 38 400, 57 600, 76 800 and 115 200 FLOAT32 and INT16

General

Power supply class III ◇‖‖◇ USA & Canada: Class 2 supply necessary	24 V DC ±20 %
Current consumption, typ.	<30 mA
Electrical connection	M12x1, 5 poles, stainless steel 1.4404
Pressure working range	700...1 300 hPa (10.2...18.9 psi)
Storage conditions	-20...+70 °C 0...95 %RH, non-condensing
Enclosurematerial	Stainless steel 1.4404
Protection rating	IP65
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3 Industrial environment FCC Part15 Class A ICES-003 Class A
Conformity	CE UKCA
Configuration and adjustment	PCS10 Product Configuration Software ([free download](#)) and configuration adapter

Ordering Guide

Feature	Description	Code			
		EE680-			
Type	Straight probe	**T15**		**T15**	
	90° angled probe		**T29**		**T29**
Measuring range	0...2 m/s (0...400 ft/min)	**No code**			
Probe length	200 mm (7.87")	**L200**		**L200**	
	300 mm (11.81")	**L300**	**L300**	**L300**	**L300**
Mounting	With flange	**TG5**			
Output signal[1]	4 - 20 mA	**GA6**			
	0 - 20 mA	**GA5**			
	0 - 10 V	**GA3**			
	0 - 5 V	**GA2**			
	Digital interface RS485		**No code**		
Output 1 measurand	Standardized air velocity[2] vn [m/s]	**No code**			
	Standardized air velocity[2] vn [ft/min]	**MA23**			
	Temperature T [°C]	**MA1**			
	Temperature T [°F]	**MA2**			
Output 1 scaling low	0	**No code**			
	Value	**SAL**_Value_			
Output 1 scaling high	2	**No code**			
	Value	**SAH**_Value_			
Output 2 measurand	Temperature T [°C]	**No code**			
	Temperature T [°F]	**MB2**			
	Standardized air velocity vn [m/s]	**MB22**			
	Standardized air velocity vn [ft/min]	**MB23**			
Output 2 scaling low	0	**No code**			
	Value	**SBL**_Value_			
Output 2 scaling high	50	**No code**			
	Value	**SBH**_Value_			
Protocol	Modbus RTU[3]			**P1**	

(Left side labels: Hardware Config. / Software-Setup (Analogue-) Outputs)

1) Applies to both outputs.
2) Standardized air velocity vn at standard conditions (factory setup): Tn = 23 °C (73 °F), pn = 1 013.25 hPa (14.7 psi), settable via PCS10.
3) Factory settings: baud rate 9600, parity even, stop bits 1.
   Modbus map and communication settings: See User Manual and Modbus Application Note at www.epluse.com/ee680.

Order Example

EE680-T15L300TG5GA6

Feature	Code	Description
Type	T15	Straight probe
Measuring range	No Code	0...2 m/s (0...400 ft/min)
Probe length	L300	300 mm (11.81")
Mounting	TG5	With flange
Output signal	GA6	4 - 20 mA
Output 1 measurand	No code	Standardized air velocity vn [m/s]
Output 1 scaling low	No code	0
Output 1 scaling high	No code	2
Output 2 measurand	No code	Temperature T [°C]
Output 2 scaling low	No code	0
Output 2 scaling high	No code	50
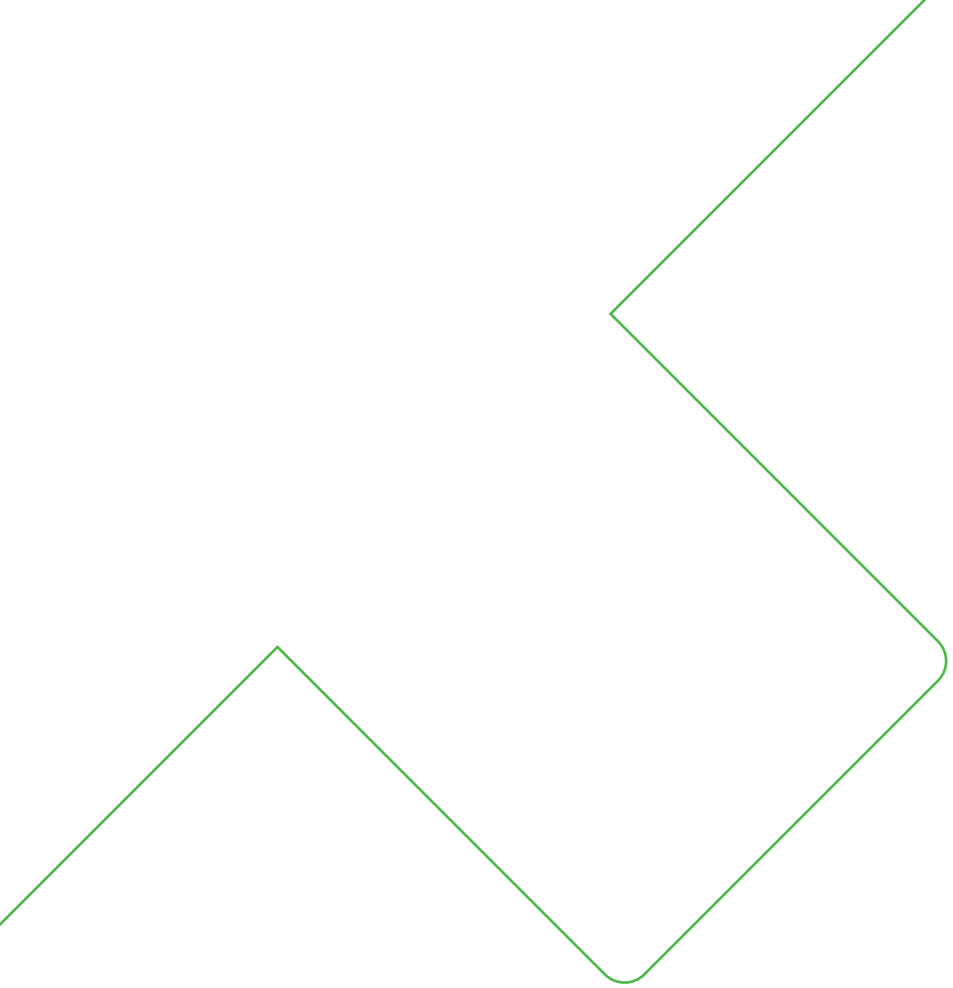
EE680-T29L300TG5P1

Feature	Code	Description
Type	T29	90° angled probe
Measuring range	No code	0...2 m/s (0...400 ft/min)
Probe length	L300	300 mm (11.81")
Mounting	TG5	With flange
Output signal	No code	Digital interface RS485
Protocol	P1	Modbus RTU

Accessories

For further information see datasheet Accessories.

Accessories	Code
Modbus configuration adapter	**HA011018**
E+E Product Configuration Software (Free Download: www.epluse.com/pcs10)	**PCS10**
Protection cap M12 socket	**HA010781**
Protection cap M12 plug	**HA010782**

Connection cable M12 - flying leads
           1.5 m (4.9 ft)
           5 m (16.4 ft)
           10 m (32.8 ft)
	
	HA010819
	HA010820
	HA010821

M12 Y adapter, M12 plug - 2 x M12 sockets, 5-polig	**HA030204**
M12 cable connector, 5 pole, for self assembly	**HA010708**
Mounting set EE680	**HA011601**
M12 sealing plug, stainless steel	**HA011602**

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