Datasheet EE660

Low Air Velocity Sensor

EE660

Low Air Velocity Sensor

The EE660 is optimized for highly accurate measurement of very low air velocity in laminar flow control and special ventilation applications, for instance in clean rooms.

Excellent Measurement Performance

The E+E thin film sensing element employed in EE660 operates on the hot film anemometer principle, which stands for excellent accuracy down to 0.15 m/s (30 ft/min), high insensitivity to pollution and low angular dependency.

Analogue and Digital Outputs

The air velocity measured data is available as current and voltage outputs or on the RS485 interface with Modbus RTU protocol, as well as on the optional display.

Easy Configuration and Adjustment

The EE660 is user configurable with jumpers on the electronics board or via software. An optional configuration stick and the free PCS10 Product Configuration Software facilitate the adjustment of EE660 and the display setup.

EE660 - T2 duct mount

EE660 - T3 with display and remote probe

Features

Display

- Large, easily readable
- With backlight
- 180° orientation

Bayonet screws

- Open / closed with a ¼ rotation

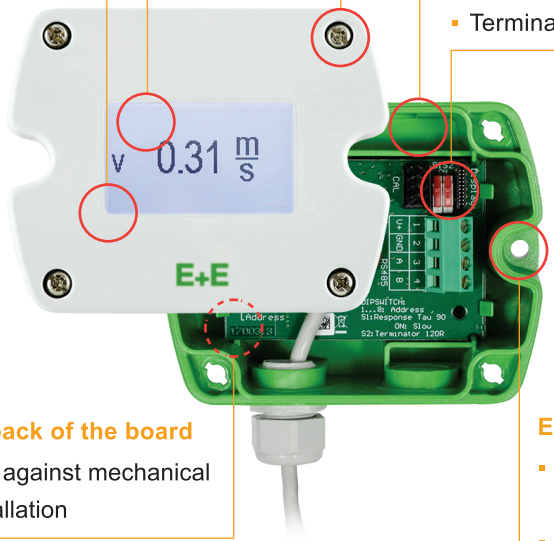
Knockout for ½" conduit fitting

Smooth cover surface

- No accumulation of dust in protruding edges

Adjustment configuration

- Measuring range
- Response time
- RS485 Setup
- Termination resistor

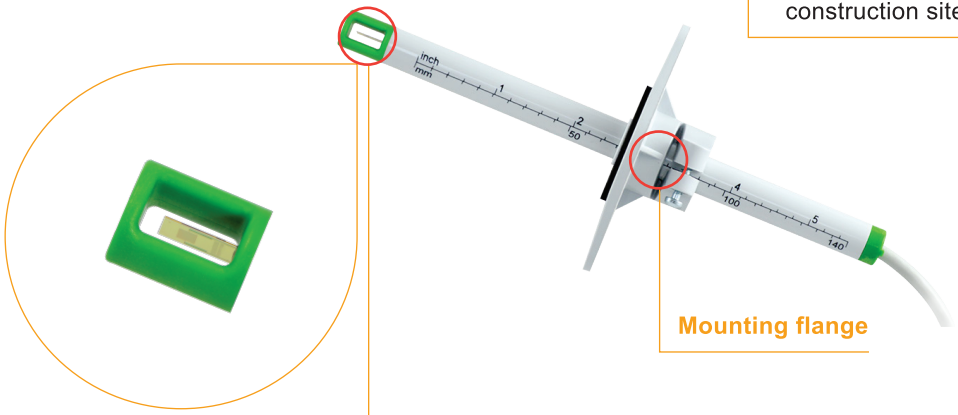


Electronics on the back of the board

- Optimum protection against mechanical damage during installation

External mounting holes

- Easy and fast mounting with closed cover
- Electronics protected against construction site pollution



Mounting flange

E+E flow sensor element

- Excellent accuracy
- Long-term stability
- Low sensitivity to pollution
- Low angular dependency

Test report

According to DIN EN 10204-2.2

Features

Accredited Traceable Calibration Certificate

Internationally recognised certificates for the calibration of measuring instruments from accredited laboratories document the traceability of the measurements to the International System of Units (SI). The E+E Elektronik calibration laboratory offers two levels of traceable calibrations.

- As a Designated Institute (DI) of the Republic of Austria, the E+E calibration laboratory maintains Austria's national measurement standards for humidity, dew point temperature, air velocity and CO_2. This authorises the E+E calibration laboratory to issue calibration certificates at the level of a National Metrological Institute (NMI).
- The E+E calibration laboratory is accredited by Akkreditierung Austria in accordance with DIN EN ISO/IEC 17025 with the identification number 0608. This allows the laboratory to issue ISO 17025 certificates for the measurands humidity, temperature, dew point temperature, air velocity, flow, pressure and CO_2.

Visit www.eplusecal.com for detailed information on calibration and to enquire a certificate of accredited traceable calibration for the EE660 from the Designated Institute.

ISO 9001 Calibration Certificate

An ISO 9001 calibration certificate documents the comparative measurement of a device against high quality reference equipment (factory level standard). The comparison is performed in accordance with internal procedures that comply with ISO 9001 and provides information on the specimen's measuring accuracy. The reference equipment is traceable to national standards, however, the calibration process is not accredited. Therefore, an ISO 9001 calibration is neither traceable nor internationally comparable.

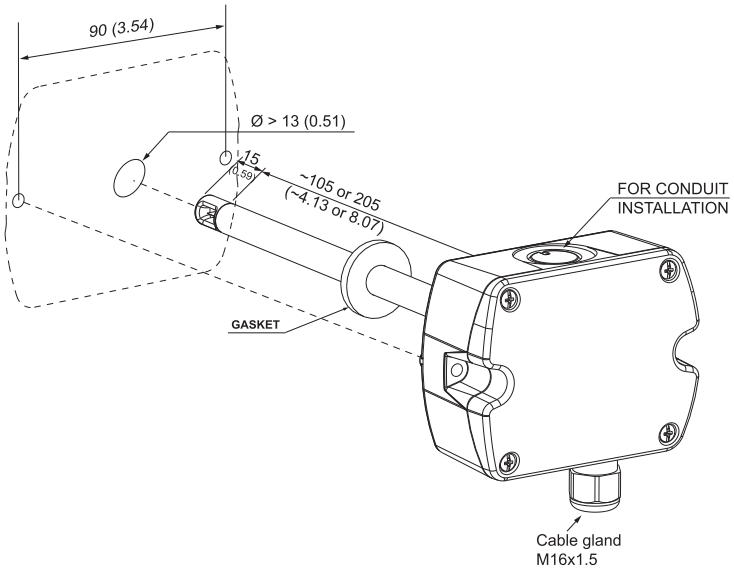
Visit www.epluse.com/iso9001cal for detailed information on calibration and to enquire an ISO 9001 calibration certificate.

Dimensions

Values in mm (inch)

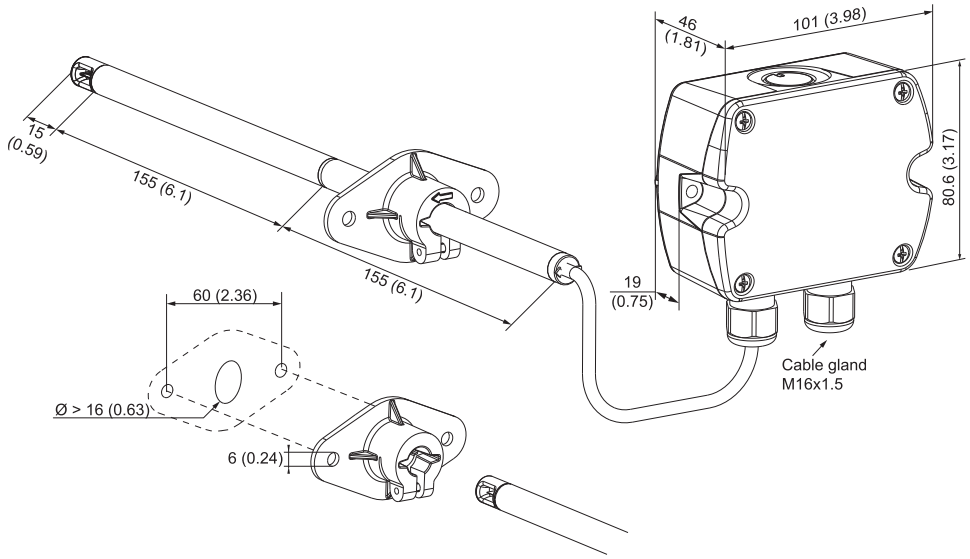
Type

T2: Duct mount



Type

T3: Remote probe



Technical Data

Measurands

Air Velocity (v)

Measuring range Selectable by jumper, only for analogue output	0...1 m/s (0...200 ft/min) 0...1.5 m/s (0...300 ft/min) 0...2 m/s (0...400 ft/min)
Accuracy[1)] in air @ 20 °C (68 °F), 45 %RH and 1013 hPa (14.7 psi) **0.15...1 m/s (30...200 ft/min)** **0.15...1.5 m/s (30...300 ft/min)** **0.15...2 m/s (30...400 ft/min)**	mv = measured value ±(0.04 m/s + 2 % of mv) / ±(7.9 ft/min + 2 % of mv) ±(0.05 m/s + 2 % of mv) / ±(9.8 ft/min + 2 % of mv) ±(0.06 m/s + 2 % of mv) / ±(11.8 ft/min + 2 % of mv)
Response time t_{90}, typ. @ constant temperature	4 s or 1 s (Selectable by jumper (analogue) and slide switch (digital))

1) The accuracy statement includes the uncertainty of the factory calibration with an coverage 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).

Outputs

Analogue

Air velocity (v)	0 - 10 V 4 - 20 mA (linear, 3-wire)	$-1 < I_L < 1$ mA $R_L < 450\ \Omega$	I_L = load current R_L = load resistance
Scaling area	0...1 m/s / 0...1.5 m/s / 0...2 m/s (selectable by jumper, only for analogue output)		

Digital

Digital interface	RS485 (EE660 = 1 unit load)
Protocol **Factory settings** **Supported Baud rates** **Measured data types**	Modbus RTU 9600 Baud, parity even, 1 stop bit, Modbus address 65 9600, 19200 and 38400 FLOAT32 and INT16

Technical Data

General

Power supply class III USA & Canada: Class 2 supply necessary		24 V AC / DC ±20 %			
Current consumption, max.		**AC supply - no display**	**DC supply - no display**	**AC supply - with display**	**DC supply - with display**
	Analogue output	74 mA $_{rms}$	41 mA	180 mA $_{rms}$	85 mA
	Digital output	120 mA $_{rms}$	50 mA		
Dependency	**of inflow angle (α)** **of inflow direction**	<3% for α <10° <3%			
Electrical connection		Screw terminals max. 1.5 mm^2 (AWG 16)			
Cable gland		M16x1.5			
Humidity working range		5…95 %RH, non-condensing			
Temperature range	**Probe** **Electronics** **Storage**	-25 °C...+50 °C (-13 °F...+122 °F) -10 °C...+50 °C (-14 °F...+122 °F) -30 °C...+60 °C (-22 °F...+140 °F)			
Enclosure	**Material** **Protection rating** **Compliance**	PC (Polycarbonate) IP65 / NEMA 4X UL94 V-0 approved / with display: UL94 HB approved			
Protection rating	**Remote probe**	IP20			
Electromagnetic compatibility		EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B	Industrial environment	
Conformity		CE UKCA			
Configuration and adjustment		PCS10 Product Configuration Software (free download) and USB-C configuration stick.			

Ordering Guide

	Feature	Description	Code	
			EE660-	
Hardware Configuration	Type	Duct mount	T2	
		Remote probe		T3
	Output	0 - 10 V and 4 - 20 mA	A7	
		RS485	J3	
	Probe length	100 mm (3.94")	L100	
		200 mm (7.87")	L200	
		300 mm (11.81")		L300
	Probe cable length	1 m (3.3 ft)		K1
		2 m (6.6 ft)		K2
		5 m (16.4 ft)		K5
		10 m (32.8 ft)		K10
	Display	Without display	No code	
		Display with backlight (only for analogue ouput A7)	D2	
	Display unit	m/s	No code	
		ft/min	DA21	
Digital Interface	Protocol	Modbus RTU[1)]	P1	
	Baud rate	9600	BD5	
		19200	BD6	
		38400	BD7	
	Accredited Traceable Calibration Certificate in accordance with DIN EN ISO/IEC 17025		see www.eplusecal.com	
	ISO 9001 Calibration Certificate		see www.epluse.com/iso9001cal	

1) Further information in the Modbus Map, see User Guide at www.epluse.com/ee660.

Order Examples

EE660-T3J3L300K1P1BD5

Feature	Code	Description
Type	T3	Remote probe
Output	J3	RS485
Probe length	L300	300 mm (11.81")
Probe cable length	K1	1 m (3.3 ft)
Display	No code	Without display
Protocol	P1	Modbus RTU
Baud rate	BD5	9600

EE660-T2A7L200

Feature	Code	Description
Type	T2	Duct mount
Output	A7	0 - 10 V and 4 - 20 mA
Probe length	L200	200 mm (7.87")

Accessories

For further information please refer to the Accessories datasheet.

Description	Code
USB-C configuration stick	HA011070
PCS10 Product Configuration Software (free download: www.epluse.com/pcs10)	PCS10
Power supply adapter 24 V DC	V03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