E+E

your partner
in sensor
technology.

Datasheet EE650

Air Velocity Sensor for HVAC Applications

Modbus

BACnet

EE650

Air Velocity Sensor for HVAC Applications

The EE650 air velocity sensor is dedicated for accurate and reliable measurement in building automation and ventilation applications.

Innovative Design

The device employs an innovative air velocity sensing element, which operates on the thermal anemometer principle and is manufactured by E+E in state of the art thin-film technology. Due to its innovative design, the sensing element is very robust and highly insensitive to pollution, which leads to outstanding long-term performance.

User Configuration

For the EE650 with analogue output, the measuring range 0...10 / 15 / 20 m/s (0...2 000 / 3 000 / 4 000 ft/min), the output signal 4 - 20 mA or 0 - 10 V as well as the response time 1 or 4 seconds are selectable by jumpers.
The response time, the termination resistor and the bus address of the Modbus RTU and BACnet MS/TP versions can also be easily set on the electronics board.

Installation and Adjustment

The enclosure design and the mounting flange included in the scope of supply allow for fast and easy installation.
EE650 adjustment, output scale setting and interface parameter selection can be easily performed using the free EE-PCS product configuration software and an optional adapter cable.

EE650 for duct mounting

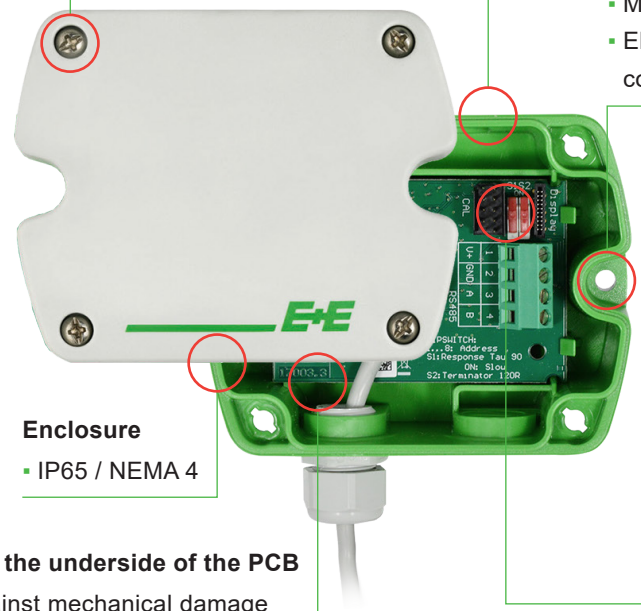
EE650 with remote probe

Features

Bayonet Screws
- Open/closed with a ¼ rotation

Appropriate for US mounting requirements
- Knock-out for ½" conduit fitting

External mounting holes
- Mounting with a closed cover
- Electronics protected against construction site pollution



Enclosure
- IP65 / NEMA 4

Configuration and Adjustment
- Measuring range
- Output signal
- Response time
- Bus address
- Termination resistor

Electronics on the underside of the PCB
- Protection against mechanical damage during installation

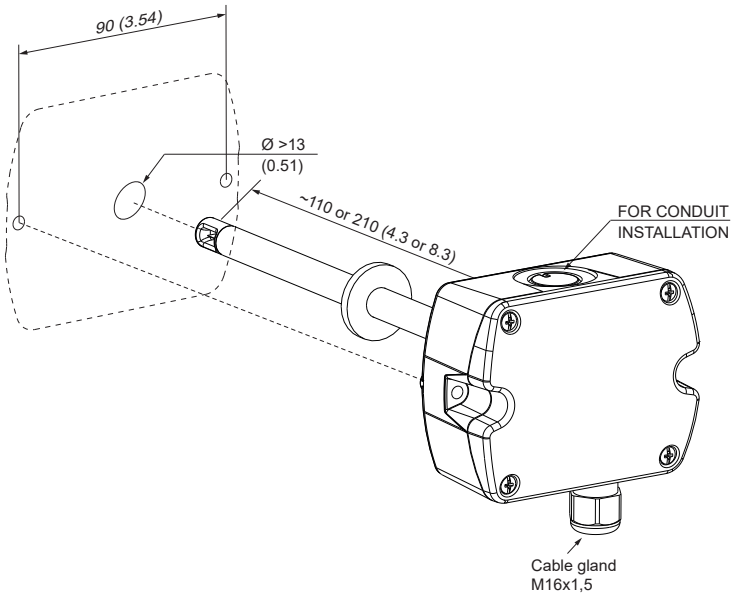
E+E air velocity sensing element
- Exceptional mechanical stability thanks to transfer-moulding technology
- High insensitivity to pollution
- Long-term stable
- Measurement down to 0.2 m/s (40 ft/min)

Test report
according to DIN EN 10204-2.2

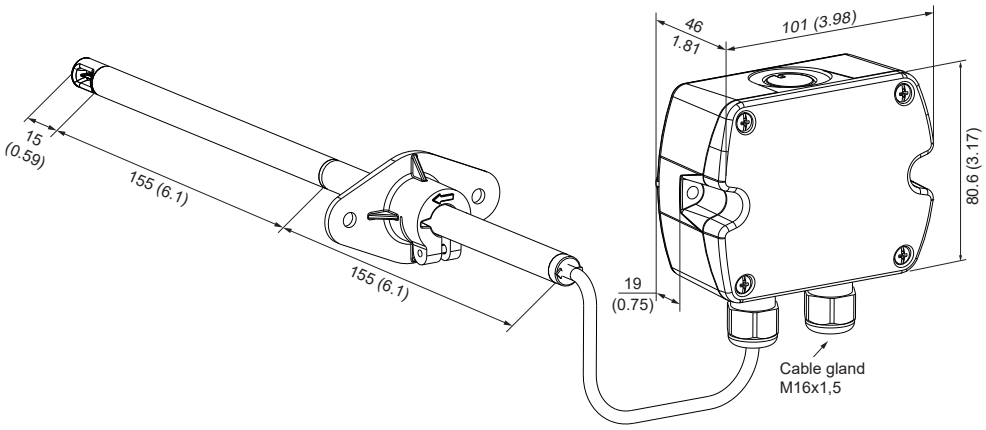
Dimensions

Values in mm (inch)

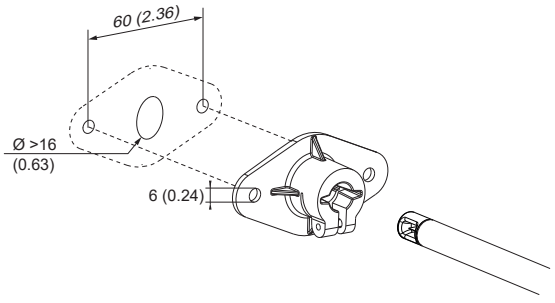
Duct mount



Remote probe



Mounting flange



Technical Data

Measurands

Air Velocity (v)

Measuring range	0...10 m/s (0...2000 ft/min) 0...15 m/s (0...3000 ft/min) 0...20 m/s (0...4000 ft/min) (factory setting)
Accuracy[1)] from 0.2 m/s, @ 20 °C (68 °F), 45 %RH and 1 013 hPa (14.7 psi)	± (0.2 m/s (40 ft/min) + 3 % of m. v.) mv = measured value
Response time t_{90}, typ. @constant temperature, selectable via jumpers, only for analogue output	4 s (factory setting) down to 1 s

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).

Outputs

Analogue

Air velocity v measuring range selectable via jumpers, only for analogue output	0 - 10 V 4 - 20 mA (3-wire, factory setting)	0 < I_L < 1 mA R_L ≤ 500 Ω	I_L = load current R_L = load resistance

Digital

Digital interface	RS485 (EE650 = 1 unit load)
Protocol **Factory settings** **Supported Baud rates** **Measured data types**	Modbus RTU 9 600 Baud, parity even, 1 stop bit, Modbus address 65 9 600, 19 200 and 38 400 FLOAT32 and INT16
Protocol **Factory settings** **Supported Baud rates**	BACnet MS/TP BACnet address 65 9 600, 19 200, 38 400, 57 600 and 76 800

Technical Data

General

Power supply class III USA & Canada: Class 2 supply necessary		24 V DC ±20 %	
Current consumption, max.		**AC supply**	**DC supply**
	Analogue output	170 mA	70 mA
	RS485	120 mA	50 mA
Electrical connection		Screw terminals max. 1.5 mm^2 (AWG 16)	
Cable gland		M16x1.5	
Humidity working range		5…95 %RH, non-condensing	
Temperature working range			
	Probe	-25...+50 °C (-13...+122 °F)	
	Electronics	-10...+50 °C (14...122 °F)	
	Storage	-30...+60 °C (-22...+140 °F)	
Enclosure material		Polycarbonate (PC), UL94V-0 approved	
Protection rating			
	Enclosure	IP65 / NEMA 4X	
	Remote probe	IP20	
Electromagnetic compatibility		EN 61326-1 FCC Part15 Class A	EN 61326-2-3 ICES-003 Class A Industrial environment
Conformity		CE UKCA	

Ordering Guide

	Feature	Description	Code	
			EE650-	
Hardware Configuration	Type	Duct mount	T2	
		Remote probe		T3
	Output	4 - 20 mA (changeable to 0 - 10 V via jumper)	A6	A6
		RS485	J3	J3
	Probe length	100 mm (3.94")	L100	
		200 mm (7.87")	L200	
		300 mm (11.81") (2 x 150 mm) (2 x 5.91")		L300
	Probe cable length	Not applicable	No code	
		1 m (3.3 ft)		K1
		2 m (6.6 ft)		K2
		5 m (16.4 ft)		K5
		10 m (32.8 ft)		K10
Dig. Interface	Protocol	Modbus RTU[1)]	P1	
		BACnet MS/TP[2)]	P3	
	Baud rate	9600	BD5	
		19200	BD6	
		38400	BD7	
		57600 (BACnet MS/TP only)	BD8	
		76800 (BACnet MS/TP only)	BD9	

1) Factory setting: parity even, 1 stop bit, Modbus Map see User Manual at
2) BACnet MS/TP Product Implementation Conformance Statement (PICS) available at

Order Examples

EE650-T2J3L200P1BD5

Feature	Code	Description
Type	T2	Duct mount
Output	J3	RS485
Probe length	L200	200 mm (7.87")
Protocol	P1	Modbus RTU
Baud rate	BD5	9600

EE650-T3A6L300K2

Feature	Code	Description
Type	T3	Remote probe
Output	A6	4 - 20 mA
Probe length	L300	300 mm (11.81") (2 x 150 mm) (2 x 5.91")
Probe cable length	K2	2 m (6.6 ft)