USER'S GUIDE

EE671 - Miniature Air Flow Transmitter

GENERAL

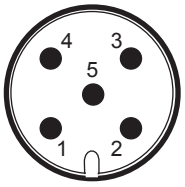
The EE671 air velocity transmitter operates on the hot-film anemometer principle and features an innovative, very robust E+E sensing element manufactured in thin-film technology combined with innovative transfer-molding.
The mounting flange allows for correct positioning and easy adjustment of the immersion depth.
EE671 is dedicated for accurate and reliable measurement in building automation and ventilation applications. For special applications do not hesitate to contact the manufacturer or their local distributor.

CAUTION

- Accurate measurement results are conditioned by the correct positioning of the probe in the air stream. Best accuracy is achieved in laminar flow
- Observe the minimum inlet and outlet path length, see page 4.
- Avoid mechanical stress on the probe and mainly onto the sensing head.
- Observe the humidity working range 5 … 95 % RH, non-condensing.
- Avoid installation in corrosive environment, as this may lead to sensor destruction.

WIRING

EE671 is ESD-sensitive device. It is neither short-circuit-proof, nor not surge-proof. The digital communication lines may not be connected to the supply lines.



view on sensor plug

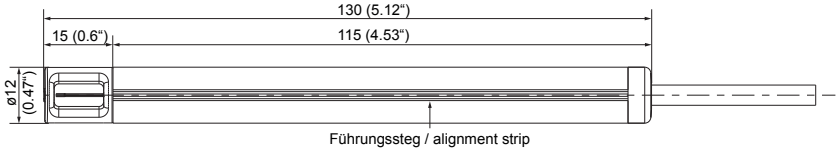
Plug version	Cable version	Analogue output	Modbus RTU output
1	grey	SDA (digital setup interface E2)	V+ = Supply voltage
2	brown	GND	RS485-B (=D-)
3	green	AV = Analogue output	RS485-A (=D+)
4	yellow	SCL (digital setup interface E2)	GND
5	white	V+ = Supply voltage	n.c.

Accessory HA0108xx - connecting cable

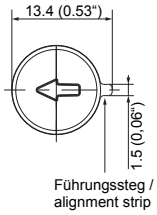
			Analogue output	Modbus RTU output
1		brown	SDA (digital setup interface E2)	V+ = Supply voltage
2		white	GND	RS485-B (=D-)
3		blue	AV = Analogue output	RS485-A (=D+)
4		black	SCL (digital setup interface E2)	GND
5		gray	V+ = Supply voltage	n.c.

DIMENSIONS mm (inch)

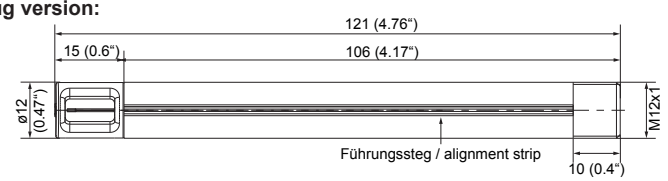
Cable version:



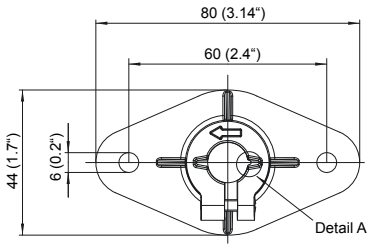
Front view sensor head:

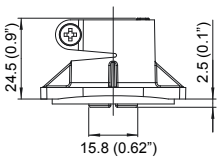


Plug version:

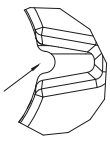


Flange:





Detail A: Recess for alignment strip



TECHNICAL DATA

Flow measurement

Measurement range[1]	0...5 m/s (0...1000 ft/min) 0...10 m/s (0...2000 ft/min) 0...15 m/s (0...3000 ft/min) 0...20 m/s (0...4000 ft/min)
Output signal	
analogue[1]	0 - 1 V (max. 1 mA) 0 - 5 V (max. 1 mA) 0 - 10 V[2] (max. 1 mA)
RS485	Modbus RTU
Accuracy[3] at 20 °C (68 °F) / 45 % rh and 1013 hPa (14.7 psi)	0.5...5 m/s (100...1000 ft/min): ±(0.2 m/s / 40 ft/min + 3 % of measured value) 1... 10 m/s (200...2000 ft/min): ±(0.3 m/s / 60 ft/min + 4 % of measured value) 1... 15 m/s (200...3000 ft/min): ±(0.35 m/s / 70 ft/min + 5 % of measured value) 1... 20 m/s (200...4000 ft/min): ±(0.4 m/s / 80 ft/min + 6 % of measured value)
Response time τ_{90}	typ. 4 s

General

Supply voltage (Class III)	10...29 V DC SELV
Current demand	max. 50 mA at 20 m/s (4000 ft/min)
Temperature range	operation: -20...60 °C (-4...140 °F) storage: -30...60 °C (-22...140 °F)
Operating range humidity	5...95 % RH (non-condensing)
Connection	
Cable version	0.5 m (1.6 ft) / 2 m (6.6 ft) cable, PVC, temperature-flexible, 5x0.25 mm² (AWG 23) with ferrules
Plug version	M12 connector system, 5-pin
Electromagnetic compatibility[4]	EN61326-1 ICES-003 ClassB EN61326-2-3 FCC Part 15
Material / protection class	polycarbonate / IP50 (probe head); IP54 (housing)

1) See ordering information
2) Only at supply voltage V+ ≥ 15 V
3) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-fold standard deviation). The tolerance was calculated in accordance with EA-4/02 following the GUM (Guide to the Expression of Uncertainty in Measurement).
4) The EE671 is not short-circuit-proof and not surge-proof (ESD-sensitive device).

SCOPE OF SUPPLY

- EE671 transmitter according to ordering guide
- Protection cap
- Mounting flange
- User manual

MODBUS RTU

The EE671 air flow transmitter can be operated in a Modbus RTU network with max. 32 devices. For Modbus protocol settings see Application Note Modbus AN0103 (www.epluse.com/EE671).

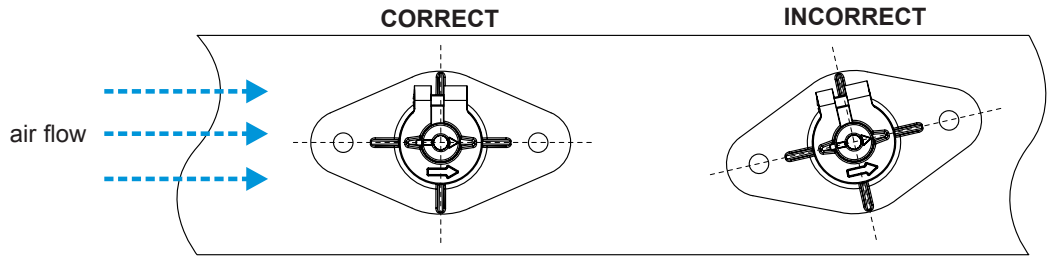
MODBUS MAP:

Register [DEC]	Protocol address [HEX]	Measured value	Unit	Type
Read registers (function code 0x03 / 0x04)				
30001	0x00	Serial number		ASCII
30009	0x08	Software version		Binary
30010	0x09	Transmitter name		ASCII
30026	0x19	Temperature	°C	32-bit float
30028	0x1B	Temperature	°F	32-bit float
30030	0x1D	Temperature	K	32-bit float
30032	0x1F	Air velocity	m/s	32-bit float
30034	0x21	Air velocity	ft/min	32-bit float
30046	0x2D	Temperature	°C x 100	16-bit integer
30047	0x2E	Temperature	°F x 100	16-bit integer
30048	0x2F	Temperature	K x 100	16-bit integer
30049	0x30	Air velocity	m/s x 100	16-bit integer
30050	0x31	Air velocity	ft/min x 100	16-bit integer
Write registers (function code 0x06)				
60001	0x00	Network address		
60002	0x01	Communication parameter		

MOUNTING

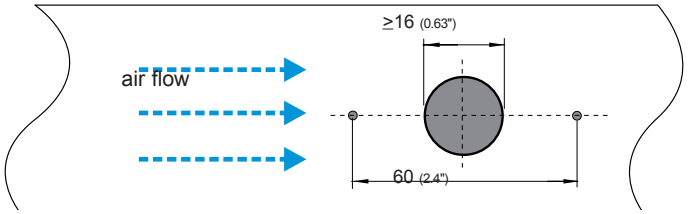
Whenever possible use the mounting flange for installing the EE671. The flange allows for correct positioning in the flow and for easy adjustment of the immersion depth.

The arrows engraved on the sensing head of EE671 and on the mounting flange indicate the direction of the air stream during factory adjustment.
Observe the direction of the arrow when installing the mounting flange.
Once the mounting flange is correctly aligned to the air flow direction, the alignment strip along the probe assures that the EE671 is also correctly aligned.

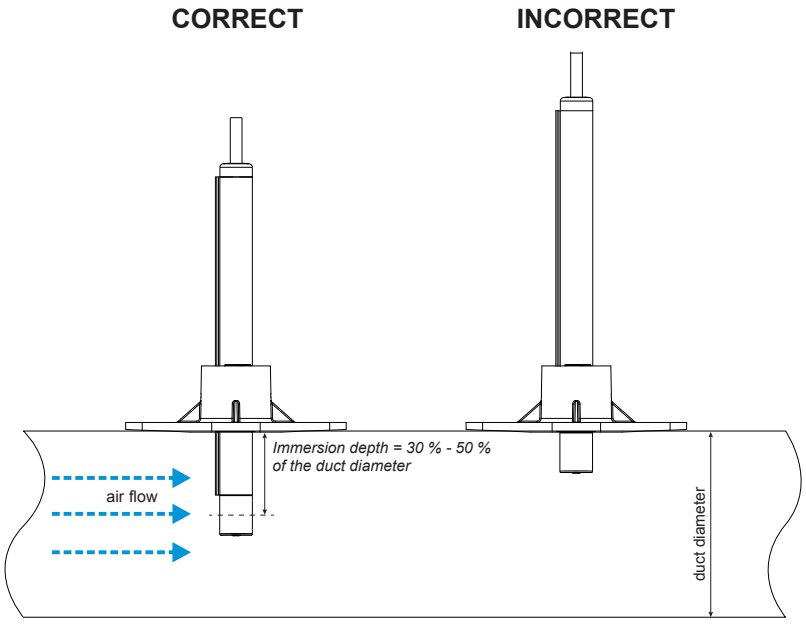


MOUNTING INTO A DUCT

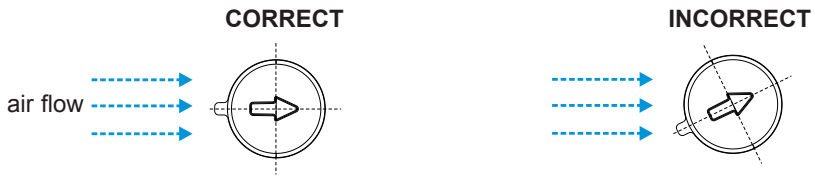
drilling in the wall of the duct:



The mounting flange allows also for precise setting of the EE671 immersion depth. The entire sensing head must be in the air flow to be measured.



When installing the EE671 probe without the mounting flange, make sure that the arrow on the sensing head matches exactly the flow direction.

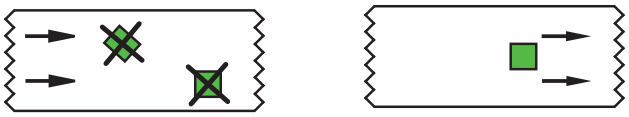


MOUNTING GUIDELINES FOR AIR VELOCITY MEASURING DEVICES

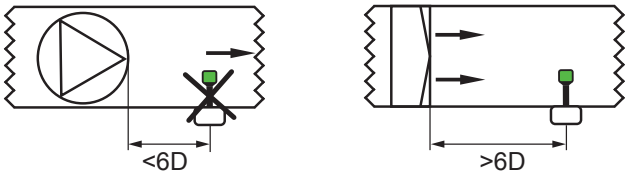
For accurate measurement results it is of paramount importance to place the sensing probe at a location with low turbulence, such as after filters, rectifiers, heaters or coolers. Turbulence appears after obstructions like fans, bends, junctions or section changes in the duct (diffusers / confusers), so the probe shall be placed far enough from these. The minimum length of the settling zone (straight duct section without obstructions whatsoever) between the probe and the source of turbulence depends on the diameter of the duct. An “equivalent diameter” Dgl can be defined for a rectangular duct with dimensions a · b:

$$D_{gl} = \frac{2 \cdot a \cdot b}{a + b}$$

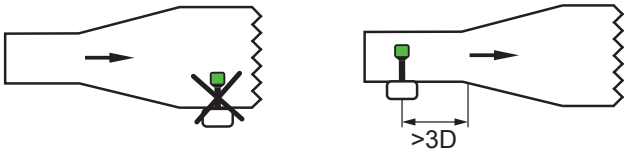
The following pictures supply guidelines for correct installation of air velocity transducers with respect to location and to minimum recommended settling zones.



Install the sensor in the middle of the duct.

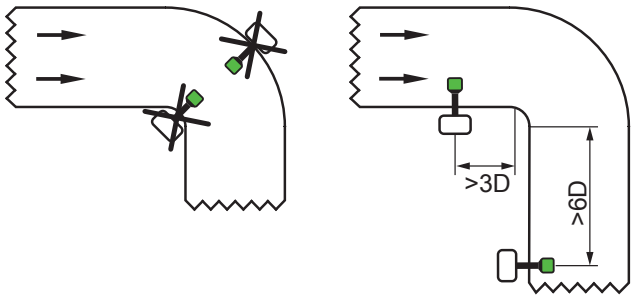


The preferred position of the sensor is after a filter.



Place the sensor in front of the diffusers at a position with high air velocity.

Place the sensor at a position with laminar (non turbulent) flow. Turbulence appears after fans as well as after bends, junctions, air heater, air cooler, filters, flaps or diameter changes in the duct.



MAINTENANCE OF THE E+E AIR VELOCITY TRANSMITTERS

Due to the absence of moving parts, the E+E air velocity transmitters are not subject to wear. The construction (shape, dimensions and materials) of the hot film air velocity sensor is per se highly insensitive to dust and dirt. No maintenance is required under normal environmental conditions. For operation in polluted environment it is advisable to periodically clean the sensing head by washing it in isopropyl alcohol, preferably in an ultrasound cleaner. Alternatively shake it gently few minutes in a pot with isopropyl alcohol and let it dry free. Do not touch or rub the sensor and do not use any mechanical tools for cleaning.

USA
FCC notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the installation manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which thereceiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CANADIAN
ICES-003 Issue 5:
CAN ICES-3 B / NMB-3 B

INFORMATION +43 7235 605 0 / info@epluse.com

E+E Elektronik Ges.m.b.H.
Langwiesen 7 • A-4209 Engerwitzdorf
Tel: +43 7235 605-0 • Fax: +43 7235 605-8
info@epluse.com • www.epluse.com
LG Linz Fn 165761 t • UID-Nr. ATU44043101
Place of Jurisdiction: A-4020 Linz • DVR0962759