USER'S GUIDE

EE660 - Transmitter for Very Low Air Velocity

GENERAL

The EE660 transmitter is designed for accurate measurement of air velocity down to 0.15m/s (30 ft/min). It operates on the hot-film anemometer principle and features a high-end E+E sensing element manufactured in thin-film technology.
The construction of the sensing head leads to a very low angular dependence which facilitate the installation. The mounting flange allows for easy adjustment of the immersion depth.

The measuring range and the response time of EE660 can be selected with jumpers on the electronics board or with the free EE-PCS Product Configuration Software, see below "Settings".

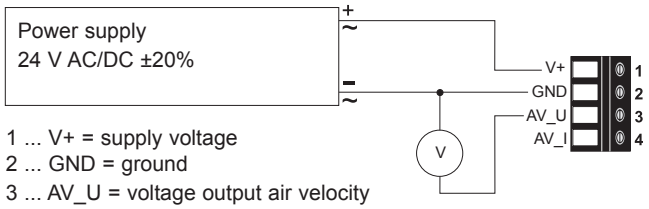
EE660 is dedicated for laminar flow control, HEPA filters monitoring, clean rooms and high-end HVAC. For special applications do not hesitate to contact the manufacturer or their local distributor.

CAUTION

- Accurate measurement results are conditioned by the correct positioning of the sensing 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 onto 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.

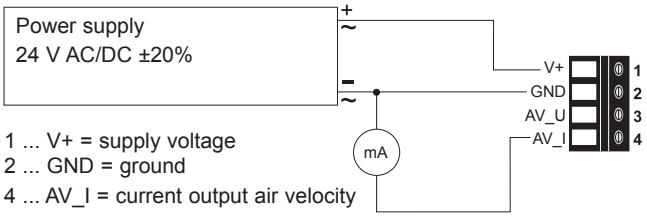
CONNECTING DIAGRAM

EE660 - Voltage output 0-10 V



1 ... V+ = supply voltage
2 ... GND = ground
3 ... AV_U = voltage output air velocity

EE660 - Current output 4-20 mA



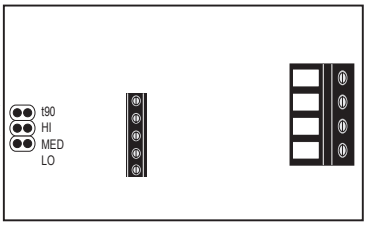
1 ... V+ = supply voltage
2 ... GND = ground
4 ... AV_I = current output air velocity

SETTINGS

Selection of the response time t90

jumper t90
SLOW ca. 4 sec.
(factory setting)

no jumper
FAST ca. 1 sec.



Selection of the working range

jumper HI
0...2 m/s
(factory setting)

jumper MED
0...1.5 m/s

no Jumper
0...1 m/s

For performing EE660 settings via EE-PCS Product Configuration Software (download from www.epluse.com/configurator) the working range jumper must be on HI.

TECHNICAL DATA

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Measuring values

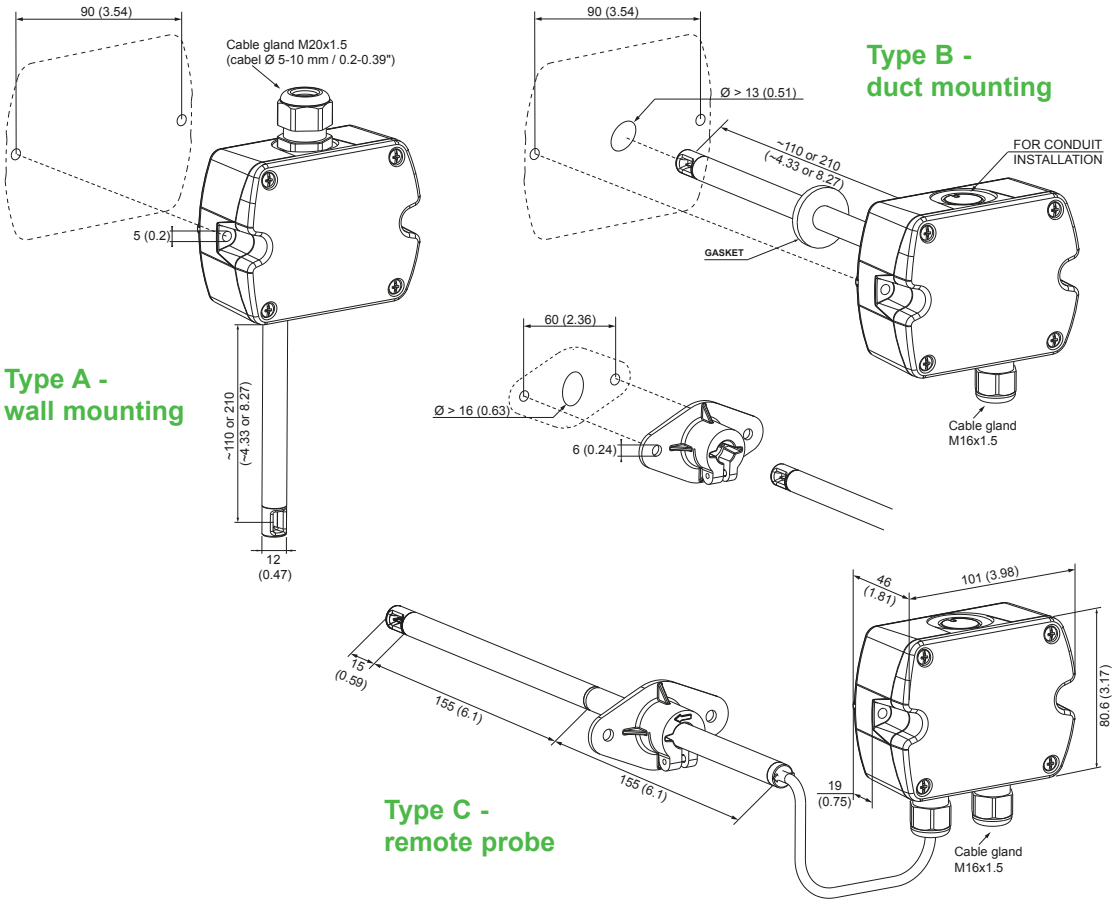
Working range [1]	0...1 m/s	(0...200ft/min)	
	0...1.5 m/s	(0...300ft/min)	
	0...2 m/s	(0...400ft/min)	
Output	0 - 10 V	-1 mA < I_L < 1 mA	
0...1 m/s / 0...1.5 m/s / 0...2 m/s	4 - 20 mA	R_L < 450 Ω (linear, 3-wires)	
Accuracy at 20 °C (68 °F),	0.15...1 m/s	(30...200 ft/min)	± (0.04 m/s (7.9 ft/min) + 2 % of mv)
45 % RH, 1013 hPa	0.15...1.5 m/s	(30...300 ft/min)	± (0.05 m/s (9.8 ft/min) + 2 % of mv)
	0.15...2 m/s	(30...400 ft/min)	± (0.06 m/s (11.8 ft/min) + 2 % of mv)
Response time τ_{90} [1) 2)]	typ. 4 sec or typ. 1 sec (at constant temperature)		

General

Power supply	24V AC/DC ± 20%		
Current consumption			
for AC supply	max. 180 mA rms (with Display),	74 mA rms (without Display)	
for DC supply	max. 85 mA (with Display),	41 mA (without Display)	
Angular dependence	< 3% of the measured value at | Δα | < 10°		
Electrical connection	screw terminals max. 1.5 mm² (AWG 16)		
Cable gland	M16x1.5		
Electromagnetic compatibility	EN61326-1 Industrial Environment	EN61326-2-3	ICES-003 ClassB FCC Part 15
Housing material	Polycarbonate, UL94V-0 (with Display UL94HB) approved		
Protection class	Enclosure IP65 / NEMA4, remote probe IP20		
Temperature range	working temperature probe	-25 ... +50 °C (-13...122°F)	
	working temperature electronic	-10 ... +50 °C (14...122°F)	
	storage temperature	-30 ... +60 °C (-22...140°F)	
Working range humidity	5...95 % RH (non-condensing)		

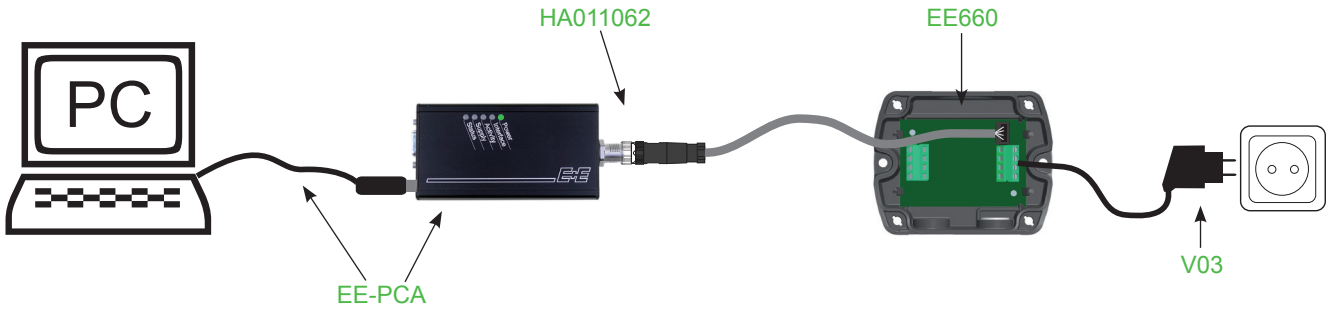
1) Selectable by jumper
2) Response time τ_{90} is measured from the beginning of a step change of air velocity to the moment of reaching 90% of the step.

DIMENSIONS MM (INCH)



CONFIGURATION AND ADJUSTMENT

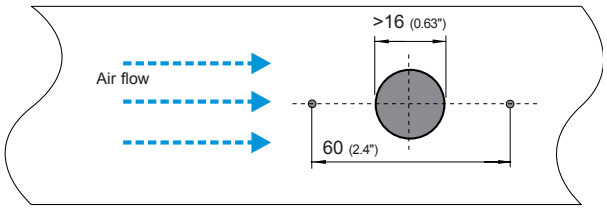
The EE660 as ordered is ready for use immediately and requires no configuration by the user. If required, the optional E+E Product Configuration Adapter (EE-PCA) and the E+E Product Configuration Software (EE-PCS) can be used for changing the factory setup as well as for adjusting of the air velocity measurement. Additionally, it allows for setting the display backlighting and orientation.



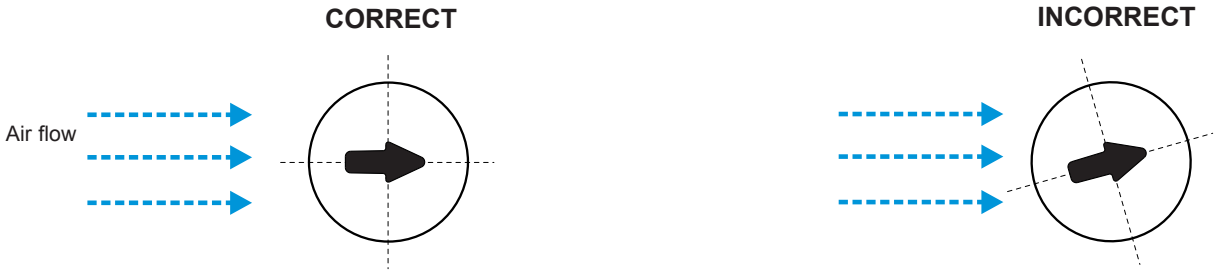
For product data sheets EE-PCS and EE-PCA please see www.epluse.com.
The E+E Product Configuration Software (EE-PCS) is free and can be downloaded from www.epluse.com/configurator

MOUNTING

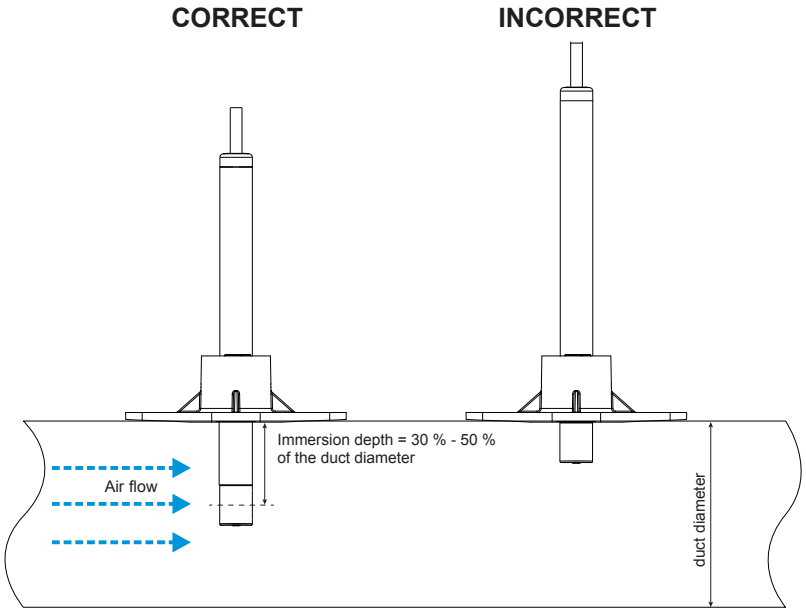
DRILLING IN THE WALL OF THE DUCT FOR INSTALLING THE MOUNTING FLANGE



The arrow engraved on the sensing head of EE660 indicates the direction of the air stream during factory adjustment. When installing the EE660 probe, make sure that the arrow matches exactly the flow direction.



The mounting flange allows for precise setting of the EE660 immersion depth in a duct. The entire sensing head must be in the air flow to be measured.

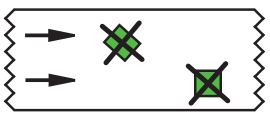


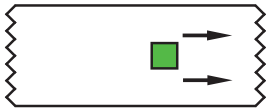
MOUNTING GUIDELINES FOR AIR VELOCITY MEASURING DEVICES

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:

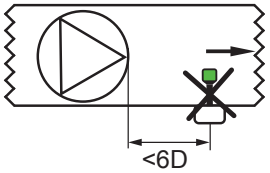
$$D_{gl} = \frac{2 \cdot a \cdot b}{a + b}$$

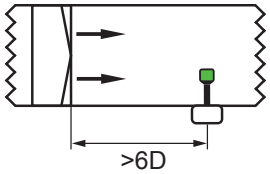
The following pictures supply guidelines for correct installation of air velocity transducers with respect to location and to minimum recommended settling zones.



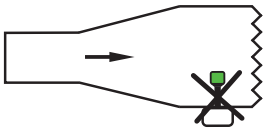


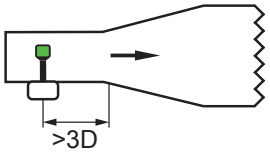
Install the sensor in the middle of the duct.



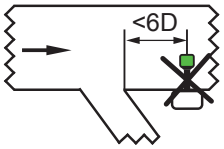


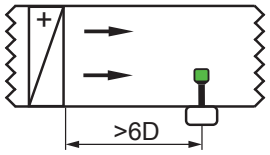
The preferred position of the sensor is after a filter.



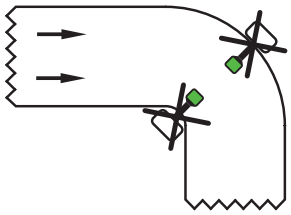


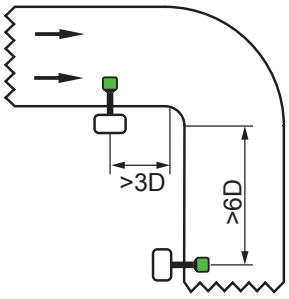
Place the sensor in front of the diffusers at a position with high air velocity.





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.

SCOPE OF SUPPLY

- EE660 Transmitter according ordering guide
- Cable gland
- Mounting flange (for Type B & C only)
- Mounting kit
- Protection cap
- Operation manual
- Two self-adhesive labels for configuration changes (see user guide at www.epluse.com/relabeling)
- Test report according to DIN EN10204 - 2.2

ACCESSORIES

• Product configuration adapter	see data sheet EE-PCA
• Product configuration software	EE-PCS (free download: www.epluse.com/EE660)
• Power supply adapter	V03 (see data sheet Accessories)

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

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