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User Manual EE040

Humidity and Temperature Sensor



Content

1	General Information.....	3
1.1	Explanation of Warning Notices and Symbols.....	3
1.2	Safety Instructions	4
1.2.1	General Safety Instructions	4
1.2.2	Intended Use.....	4
1.2.3	Mounting, Start-up and Operation.....	4
1.3	Environmental Aspects.....	5
2	Scope of Supply	5
3	Product Description	6
3.1	General	6
3.2	Dimensions	6
3.3	Electrical Connection	7
4	Maintenance and Service	7
4.1	Cleaning	7
4.2	Repairs	7
5	Accessories	7
6	Technical Data	8
7	Conformity	9
7.1	Declarations of Conformity.....	9
7.2	Electromagnetic Compatibility.....	9
7.3	FCC Part 15 Compliance Statement	9
7.4	ICES-003 Compliance Statement.....	9

1 General Information

This user manual is intended to ensure proper handling and optimal functioning of the device. The user manual shall be read before commissioning the equipment and it shall be provided to all staff involved in transport, installation, operation, maintenance and repair. E+E Elektronik Ges.m.b.H. accepts no liability for any warranty or liability claims arising from this publication or improper handling of the product(s) described.

All information, technical data and diagrams included in this document are based on the information available at the time of writing. The document may contain technical inaccuracies and typographical errors. The contents will be revised on a regular basis and changes will be implemented in subsequent versions. The product(s) described and the contents of this document may be changed or improved at any time without prior notice.

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PLEASE NOTE

Find this document and further product information on our website at www.epluse.com/ee040.

1.1 Explanation of Warning Notices and Symbols

Safety precautions

Precautionary statements warn of hazards in handling the device and provide information on their prevention. The safety instruction labeling is classified by hazard severity and is divided into the following groups:

DANGER

Danger indicates hazards for persons. If the safety instruction marked in this way is not followed, the hazard will very likely result in severe injury or death.

WARNING

Warning indicates hazards for persons. If the safety instruction marked in this way is not followed, there is a risk of injury or death.

CAUTION

Caution indicates hazards for persons. If the safety instruction marked in this way is not followed, minor or moderate injuries may occur.

NOTICE

Notice signals danger to objects or data. If the notice is not observed, damage to property or data may occur.

Informative notes

Informative notes provide important information that is characterised by its relevance.

INFO

The information symbol indicates tips on handling the device or provides additional information on it. This information is useful to achieve optimum performance of the device.

The title field may deviate from "INFO" depending on the context. For instance, it may also read "PLEASE NOTE".

1.2 Safety Instructions

1.2.1 General Safety Instructions

NOTICE

Improper handling of the device may result in its damage.

- The EE040 enclosure, the sensing probe and particularly the front end (filter side), must not be exposed to unnecessary mechanical stress.
- Do not attempt to open the EE040 enclosure.
- Use the EE040 only as intended and observe all technical specifications.

1.2.2 Intended Use

The EE040 is an relative humidity (RH) and temperature (T) sensor in OEM applications.

WARNING

Non-compliance with the product documentation may cause safety risks for people and the entire measurement installation.

The manufacturer is not liable for any damage caused by improper handling, installation and maintenance of the device.

- Do not use EE040 in explosive atmosphere or for measurement in aggressive gases.
- This device is not appropriate for safety, emergency stop or other critical applications where device malfunction or failure could cause injury to human beings.
- The device may not be manipulated with tools other than specifically described in this manual.

NOTICE

Failure to follow the instructions in this user manual may lead to measurement inaccuracy and device failures.

- The EE040 may only be operated under the conditions described in this user manual and within the specification included in chapter 9 Technical Data.
- Any unauthorised product modification will invalidate all warranty claims. Modifications may only be carried out with the express authorisation of E+E Elektronik Ges.m.b.H.!
- To ensure accurate measurements, it is important to avoid temperature gradients along the device. This is particularly relevant if the device is installed in a partition wall between areas with different temperatures. In this case, ensure that the back-end (connector side) of the device is thermally insulated when facing out of the wall.

1.2.3 Mounting, Start-up and Operation

The EE040 has been produced under state of the art manufacturing conditions, has been thoroughly tested and has left the factory after fulfilling all safety criteria. The manufacturer has taken all precautions to ensure safe operation of the device. The device shall be set up and installed in a way that does not impair its safe use. All applicable local and international safety guidelines for safe installation and operation of the device have to be observed. This user manual contains information and warnings that must be observed in order to ensure safe operation.

PLEASE NOTE

The manufacturer or his authorised agent can only be held liable in case of willful or gross negligence. In any case, the scope of liability is limited to the corresponding amount of the order issued to the manufacturer. The manufacturer assumes no liability for damage caused by non-compliance with the applicable regulations, operating instructions or the specified operating conditions. Any consequential damage is excluded from liability.

⚠ WARNING

Non-compliance with the product documentation may result in accidents, personal injury or property damage.

- Mounting, installation, commissioning, start-up, operation and maintenance of the device may only be carried out by qualified staff. Such staff must be authorised by the operator of the facility to carry out the mentioned activities.
- The qualified staff must have read and understood this user manual and must follow the instructions contained within. The manufacturer accepts no responsibility for non-compliance with instructions, recommendations and warnings.
- All process and electrical connections must be thoroughly checked by authorised staff before commissioning the device.
- Do not install or start-up a device suspected to be faulty. Mark it clearly as faulty and remove it from the process.
- Service operations other than described in this user manual may only be performed by the manufacturer. A faulty device may only be investigated and possibly repaired by qualified, trained and authorised staff. If the fault cannot be fixed, the device shall be removed from the process.

1.3 Environmental Aspects

i PLEASE NOTE

Products from E+E Elektronik Ges.m.b.H. are developed and manufactured in compliance with relevant environmental protection requirements. Please observe local regulations for the disposal of the device.



For disposal, the individual components of the device must be separated according to local recycling regulations. The electronics shall be disposed of correctly as electronics waste.

2 Scope of Supply

- EE040, with mounting flange included.

3 Product Description

3.1 General

The EE040 is designed for cost-effective measurement of relative humidity (RH) and temperature (T) in OEM (Original Equipment Manufacturer) applications.

The sensor's proprietary E+E coating protects from dirt, dust and corrosion.

Measurements can be performed in air, non-explosive atmosphere and non-aggressive gases.

The humidity range of the sensor is 0...100 %RH, non-condensing and the temperature range of the sensor is -40...+85 °C (-40...+185 °F). The measurement data is provided at two analogue voltage outputs.

Product Variants

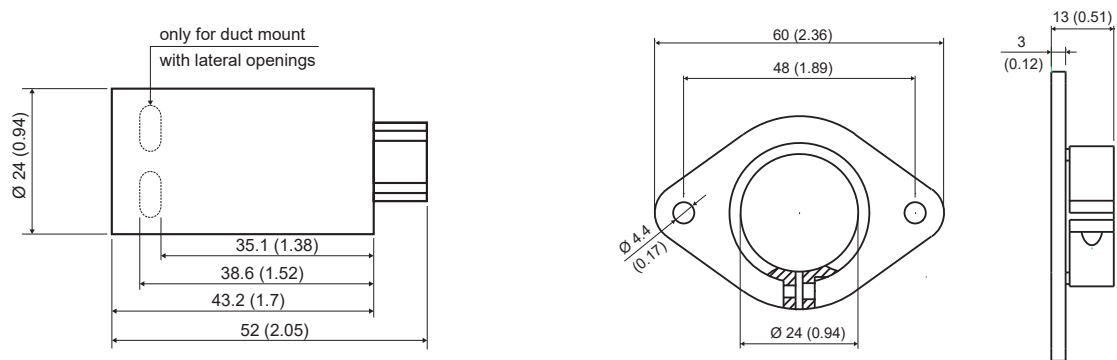
Two different EE040 types provide different options for measurement tasks:

Probe Type	Description
T2	Duct mount
T18	Duct mount with lateral openings

Tab. 1 Probe types

3.2 Dimensions

Values in mm (inch)



3.3 Electrical Connection

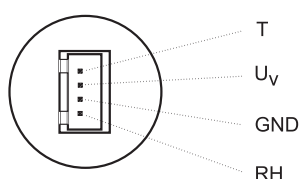
⚠ WARNING

Incorrect installation, wiring or power supply may cause overheating and can therefore lead to personal injuries or damage to property. For correct cabling of the device, always observe the presented wiring diagram for the product version used.

The manufacturer cannot be held responsible for personal injuries or damage to property as a result of incorrect handling, installation, wiring, power supply and maintenance of the device.

The EE040 is compatible with Molex 6471 (4pins) and female crimp contacts 4809 555L. A connection cable is available as an option (see the table below).

Connection diagram



Optional connection cable

Length	Order code
2 m (6.6 ft)	HA010305
5 m (16.4 ft)	HA010306

Fig. 1 EE040 connection

4 Maintenance and Service

4.1 Cleaning

A clogged filter causes a long response time. A periodic check of the filter is recommended, especially in the case of installation in a polluted environment.

If cleaning of the filter is necessary, pug off the device and clean the filter with a soft brush.

NOTICE

Never clean the filter with pressurised water.

4.2 Repairs

i PLEASE NOTE

Repairs may only be carried out by the manufacturer. The attempt of unauthorised repair excludes any warranty claims.

5 Accessories

For further information please refer to the [Accessories](#) datasheet.

Description	Code
Connection Cable	
2 m (6.6 ft)	HA010305
5 m (16.4 ft)	HA010306

6 Technical Data

Measurands

Relative Humidity (RH)

Measuring range	0...100 %RH, non-condensing	
Accuracy¹⁾ @ 20 °C (68 °F)	30...70 %RH 0...95 %RH	±3 %RH ±5 %RH
Response time t₆₃	Duct mount Duct mount with lateral openings	<45 s <30 s

1) Traceable to international standards, administrated by NIST, PTB, BEV,...
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).

Temperature (T)

Measuring range	-40...+85 °C (-40...+185 °F)	
Accuracy¹⁾ @ 20 °C (68 °F)	±0.3 °C (±0.54 °F)	

1) Traceable to international standards, administrated by NIST, PTB, BEV,...
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

RH: 0...100 % T: -40...+85 °C (-40...+185 °F)	0 - 2.5 V
Output load	≥5 kΩ

General

Power supply class III  USA & Canada: Class 2 supply necessary	5 V DC ±10 %		
Current consumption , typ. Without load With 5 kΩ load	2 mA <3.5 mA		
Start-up time , typ.	4 s		
Electrical connection	Appropriate for Molex 6471 (4 pins) and female crimp contacts 4809 555L		
Storage conditions	-40...+60 °C (-40...+140 °F) 0...95 %RH, non-condensing		
Enclosure material	PPO (Polyphenyleneoxide), GF20, UL94HB approved		
Protection rating Connector side Front side (duct mount) Front side (duct mount with lateral openings)	IP30 IP50 IP20		
Electromagnetic compatibility ¹⁾	EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B	Industrial environment
Conformity	 		

1) EE040 is not protected against surge.

7 Conformity

7.1 Declarations of Conformity

E+E Elektronik Ges.m.b.H. hereby declares that the product complies with the respective regulations listed below:



European directives and standards.

and



UK statutory instruments and designated standards.

Please refer to the product page at www.epluse.com/ee040 for the Declarations of Conformity.

7.2 Electromagnetic Compatibility

EMC for industrial environment.

The sensor is a group 1 device and corresponds to class B.

7.3 FCC Part 15 Compliance Statement

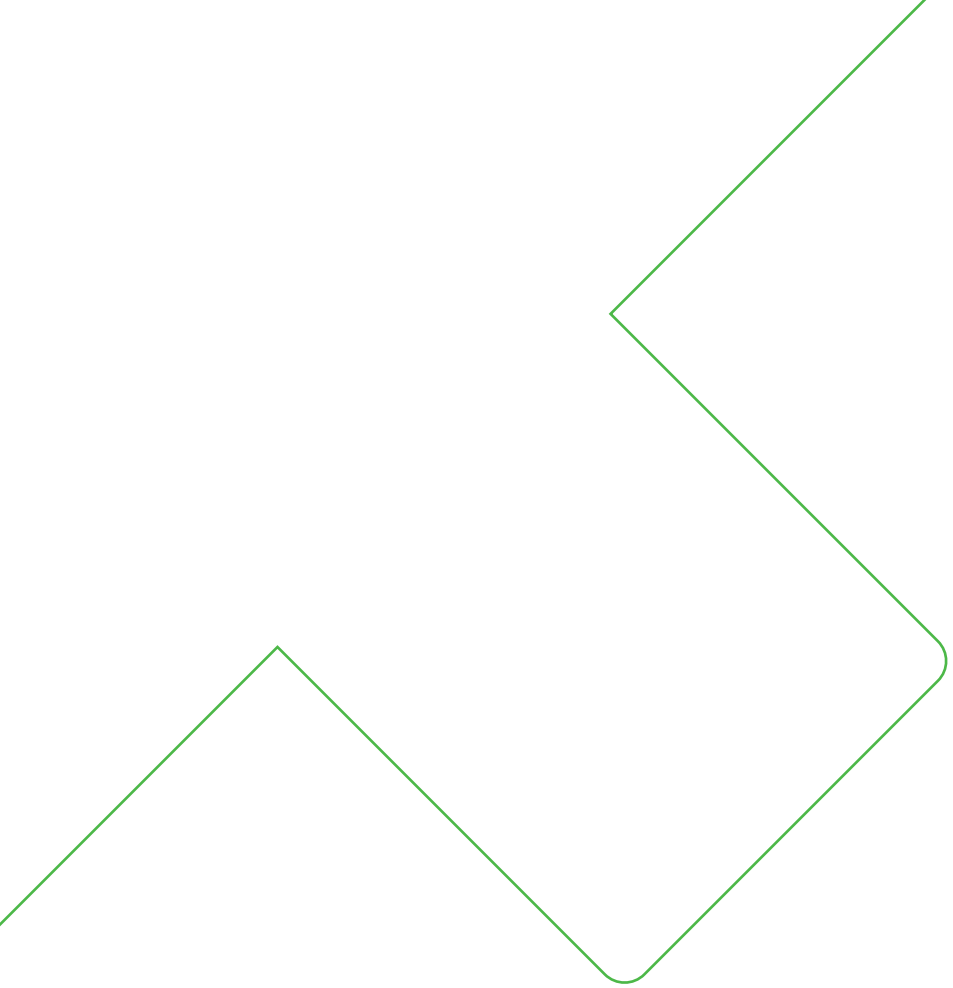
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate 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 the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

7.4 ICES-003 Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.



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