



User Manual

EE260

**Heated Humidity and Temperature Probe
for Meteorological Applications**

YOUR PARTNER IN SENSOR TECHNOLOGY



ELEKTRONIK®
Ges.m.b.H.

E+E Elektronik Ges.m.b.H. does not accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

© Copyright E+E Elektronik Ges.m.b.H. All rights reserved.

EMC note USA (FCC):

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC note Canada (ICES-003):

CAN ICES-3 (A) / NMB-3 (A)

CONTENT

1	General	4
1.1	Explanation of Symbols	4
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	5
1.3	Environmental Aspects	5
2	Scope of Supply	5
3	Product Description	5
3.1	General	5
3.2	Dimensions	6
3.3	Electrical Connection	7
4	Installation	8
4.1	Radiation Shield	8
4.2	Wall Mount/Pole Mount	8
5	Setup and Adjustment	9
5.1	EE-PCS Product Configuration Software	9
5.2	Digital Interface RS485 with Modbus RTU Protocol	9
5.3	Modbus Register Map	11
5.4	Modbus Message Example	12
6	Maintenance and Service	13
6.1	Cleaning	13
6.2	Filter Replacement	13
6.3	Repairs	13
6.4	RH / T Adjustment and Calibration	13
6.4.1	Calibration and Adjustment at E+E Elektronik	14
6.4.2	Humidity Calibration and Adjustment by the User	14
6.4.3	Temperature Calibration and Adjustment by the User	15
6.5	Error Indication on the Analogue Output (NAMUR)	15
6.6	Spare Parts	15
7	Accessories	16
8	Technical Data	17

1 General

This user manual serves for ensuring 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. The user manual may not be used for the purposes of competition without the written consent of E+E Elektronik® and may not be forwarded to third parties. Copies may be made for internal purposes. All information, technical data and diagrams included in these instructions are based on the information available at the time of writing.



Please find this document and further product information on our website at www.epluse.com/EE260.

Disclaimer

The manufacturer or his authorized agent can be 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 damages incurred due to failure to comply with the applicable regulations, operating instructions or the specified operating conditions. Consequential damages are excluded from the liability.

1.1 Explanation of Symbols



This symbol indicates safety information.

It is essential that all safety information is strictly observed. Failure to comply with this information can lead to personal injuries or damage to property. E+E Elektronik® assumes no liability if this happens.



This symbol indicates instructions.

The instructions shall be observed in order to reach optimal performance of the device.

1.2 Safety Instructions

1.2.1 General Safety Instructions

- The device and mainly the filter cap shall not be exposed to unnecessary mechanical stress.
- When replacing the filter cap make sure not to touch the sensing elements.
- The device must be operated with the filter cap on at all times.
- Installation, electrical connection, maintenance and commissioning shall be performed by qualified personnel only.
- Use the EE260 only as intended and observe all technical specifications.
- Do not use EE260 in explosive atmosphere or for measurement of aggressive gases.
- Do not apply the nominal voltage to the RS485 data lines.
- This device is not appropriate for safety, emergency stop or other critical applications where device malfunction or failure could cause injury to human beings.

1.2.2 Intended Use

The EE260 is intended for the humidity (RH) and temperature (T) measurement in meteorology. It is compatible with rotation symmetric radiation shields (available as accessory HA010511). By means of a mounting clip (accessory HA010227) the EE260 can be pole/wall mounted, e.g. for deployment in weather huts / Stevenson screens.

The use of the EE260 in any other way than described in this manual bears a safety risk for people and the entire measurement installation and is therefore not allowed.

The manufacturer cannot be hold responsible for damages as a result of incorrect handling, installation, and maintenance of the equipment.

In order to avoid damage to the instrument or health hazards, the measuring equipment must never be manipulated with tools that are not specifically described in this manual.

The sensor may only be utilized in accordance with the conditions defined in the technical data. Otherwise, measurement inaccuracies will occur and equipment failures cannot be ruled out.

The steps recommended by the manufacturer for installation, inspections and maintenance work must be observed and carried out for the safety of the user and for the functionality of the equipment.

Unauthorized product modification leads to loss of all warranty claims. This may be accomplished only with an explicit permission of E+E Elektronik®!

1.2.3 Mounting, Start-up and Operation

The EE260 humidity and temperature probe for meteorological applications 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 user must ensure that the device is set up and installed in a manner that does not have a negative effect on its safe use. The user is responsible for observing all applicable safety guidelines, local and international, with respect to safe installation and operation on the device. This user manual contains information and warnings that must be observed by the user in order to ensure safe operation.



- Mounting, start-up, operation and maintenance of the device may be performed by qualified staff only. Such staff must be authorized 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.
- All process and electrical connections shall be thoroughly checked by authorized staff before putting the device into operation.
- Do not install or start-up a device supposed to be faulty. Make sure that such devices are not accidentally used by marking them clearly as faulty.
- A faulty device may only be investigated and possibly repaired by qualified, trained and authorized staff. If the fault cannot be fixed, the device shall be removed from the process.
- Service operations other than described in this user manual may only be performed by the manufacturer.

1.3 Environmental Aspects



Products from E+E Elektronik® are developed and manufactured in compliance with all relevant environmental protection requirements. Please observe local regulations for the device disposal.



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

- EE260 – Heated Humidity and Temperature Probe for Meteorological Applications
- Inspection certificate according to DIN EN 10204-3.1
- Quick guide

3 Product Description

3.1 General

The EE260 probe is optimized for accurate and reliable relative humidity (RH) and temperature (T) measurement in meteorology and demanding outdoor applications.

Mounted in its upright position, the air first passes over EE260's Pt100 temperature sensing element, then over the heated probe shaft and over the heated humidity sensing element. This dual heating system prevents condensation or icing of the RH sensing element, on the probe head and on the filter cap. This leads to short response times and fast recovery as well as to precise RH measurement even under continuously high humidity and condensing conditions.

The proprietary E+E sensor coating, the encapsulated electronics and the UV resistant and T stable elastomere enclosure make the probe reliable, long-term stable and very well protected against environmental influences.

The EE260 measures RH and T and calculates the following humidity related parameters:

- Dew point temperature (Td)
- Frost point temperature (Tf)
- Wet bulb temperature (Tw)
- Water vapour partial pressure (e)
- Mixing ratio (r)
- Absolute humidity (dv)
- Specific enthalpy (h)

The RH and T measured values are available on two freely configurable and scalable voltage outputs as well as on the RS485 interface with Modbus RTU protocol. The values of the calculated parameters are available on RS485/Modbus RTU.

3.2 Dimensions

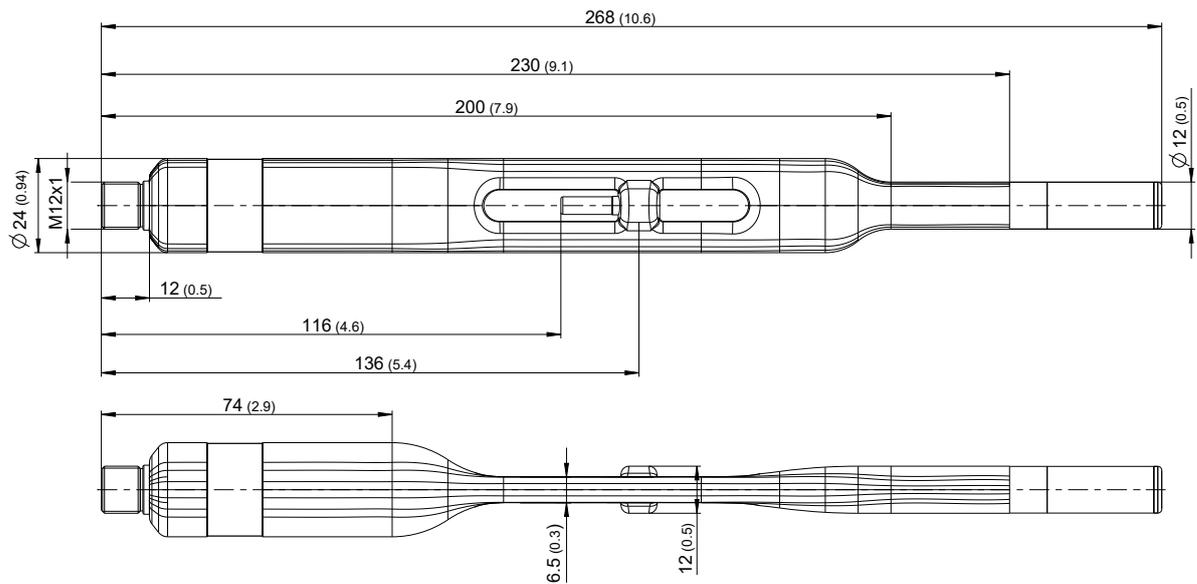


Fig. 1 Dimensions of EE260 in mm (inch)

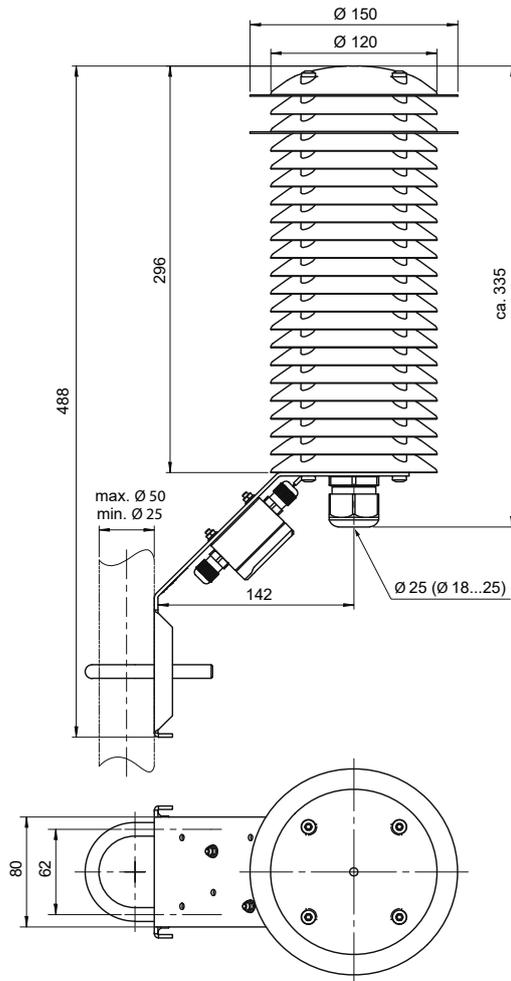


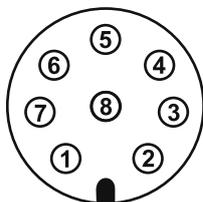
Fig. 2 Dimensions (in mm) of optional radiation shield (ordering code HA010511)

3.3 Electrical Connection



Important note:

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.



M12 device plug front view

Pin number	Function	Wire colors for accessories: - Connection cable HA010322/23/24/25
1	Analogue output 1	white
2	RS485 B (D-)	brown
3	GND analogue output	green
4	Analogue output 2	yellow
5	n.c.	grey
6	RS485 A (D+)	pink
7	Supply voltage	blue
8	GND	red

Tab. 1 EE260 pin assignment



To meet the EMC Directive 2004/108/EC a shielded connection cable must be used.

The connection cable mentioned above (accessory HA0103xx ,8 pole, M12x1 socket – free ends, PUR insulation), has a shielding included and is available in several lengths (refer to chapter 6.6).

4 Installation

4.1 Radiation Shield

With its rotation symmetric design, the EE260 is very well suited for mounting in a radiation shield, thus protecting the device against rain, snow, ice and solar radiation. The probe is fixed by means of a cable gland.

Best measurement performance is achieved in the optionally available radiation shield with artificial ventilation. Please refer to the HA010511 manual for more information.



Fig. 3 EE260 mounted within the optional radiation shield HA010511

4.2 Wall Mount/Pole Mount

The probe may be installed on a wall or a pole with the help of the mounting clip HA010227 (not included in the scope of supply, see data sheet "Accessories"). This also allows a placement in a Stevenson screen / weather hut.



Please note:

The probe shall be mounted vertically with the filter cap upside, a proper air circulation around the probe must be ensured (e.g. with HA010511). Please avoid any improper mechanical stress onto the probe.



Fig. 4 EE260 mounted with the optional clip HA010227

5 Setup and Adjustment

The EE260 is ready to use and does not require any configuration by the user. The factory setup of EE260 corresponds to the type number ordered. Please refer to the data sheet at www.epluse.com/ee260. The user can change the factory setup with the help the PCS10 Product Configuration Software, the Modbus configuration adapter (order code HA011018) and the EE260 configuration cable (order code HA011020).

Besides the measurand selection of the analogue and digital outputs and their scaling, the digital interface settings may be changed. The RH and T measurement is offset and 2-point adjustable. It is possible to enable or disable the sensing element and the probe heating (separated from each other; factory setting for both: enabled) and the NAMUR error indication (factory setting: disabled). For the purpose of pressure compensation, the barometric air pressure at the operating site may be set.



Please note: The EE260 may not be connected to any additional power supply when using the Modbus configuration adapter HA011018.

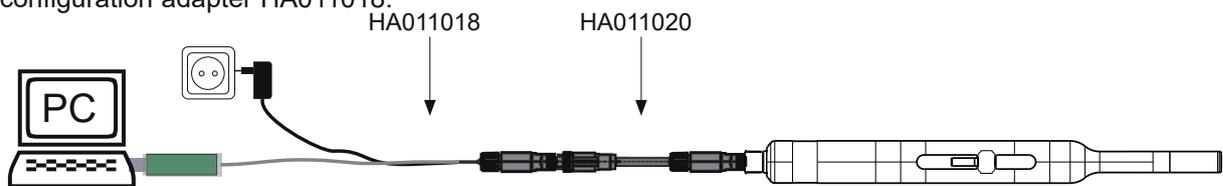


Fig. 5 Configuration

5.1 PCS10 Product Configuration Software

To use the software for performing adjustments and changes in settings, please proceed as follows:

1. Download the PCS10 Product Configuration Software from www.epluse.com/pcs10 and install it on the PC.
2. Connect the EE260 to the PC using the Modbus configuration adapter and the EE260 configuration cable.
3. Start the PCS10 software.
4. Follow the instructions on the PCS10 opening page for scanning the ports and identifying the connected device.
5. Click on the desired setup or adjustment mode from the main PCS10 menu on the left and follow the online instructions of the PCS10 which are displayed when clicking the "Tutorial" button.
6. Changes are uploaded to the probe by pressing the "Sync" button.

5.2 Digital Interface RS485 with Modbus RTU Protocol

Item	Factory settings	Selectable values (via PCS10)
Baud rate	9 600	9 600, 19 200, 38 400, 57 600, 76 800, 115 200
Data bits	8	8
Parity	Even	None, odd, even
Stop bits	1	1, 2
Modbus address	235	1...247

Tab. 2 Digital interface default settings

The recommended settings for multiple devices in a Modbus RTU network are 9600, 8, even, 1.

The EE260 represents 1 unit load on an RS485 network.

Device address, baud rate, parity and stop bits can be set via:

1. PCS10 Product Configuration Software, the Modbus configuration adapter HA011018 and the EE260 configuration cable HA011020.

The PCS10 can be downloaded free of charge from www.epluse.com/pcs10

2. Modbus protocol in the registers 1 (0x00) and 2 (0x01).

See Modbus Application Note AN0103 (available at www.epluse.com/ee260)

The serial number as ASCII code is located in read-only registers 1 - 8 (0x00 - 0x07, 16 bits per address).

The firmware version is located in register 9 (0x08) (bits 15...8 = major release; bits 7...0 = minor release). The sensor name is located in register 10 (0x09). The beforementioned registers can be read out with function code 0x03 or 0x04.



Please note: When reading the serial number or the sensor name, it is always necessary to read all 8 registers, even if the desired information requires less.



Please note: For obtaining the correct floating point values, both registers have to be read within the same reading cycle. The measured value can change between two Modbus requests, therefore, exponent and mantissa may get inconsistent.

Communication settings (INT16)		
Parameter	Register number ¹⁾ [Dec]	Register address ²⁾ [Hex]
Write register: function code 0x06		
Slave ID (Modbus address)	1	0x00
Modbus protocol settings ³⁾	2	0x01

Device information (INT16)		
Parameter	Register number ¹⁾ [Dec]	Register address ²⁾ [Hex]
Read register: function code 0x03 / 0x04		
Serial number (as ASCII)	1	0x00
Firmware version	9	0x08
Sensor Name	10	0x09

Air pressure (FLOAT32)		
Parameter	Register number ¹⁾ [Dec]	Register address ²⁾ [Hex]
Read and write register: function code 0x03 / 0x10		
Air pressure ⁴⁾	5001	0x1388

1) Register number starts from 1

2) Register address starts from 0

3) For Modbus protocol settings see Application Note Modbus AN0103 (available at www.epluse.com/ee260).

4) Ambient pressure in mbar, with 2 decimal digits (e.g. 1008.25), default value 1013.25 mbar

5.3 Modbus Register Map

The measured data is saved as a 32 bit floating point values (data type FLOAT32) and as 16 bit signed integer values (data type INT16).

FLOAT32:			
Parameter	Unit	Register number ¹⁾ [Dec]	Register address ²⁾ [Hex]
<i>Read register: function code 0x03 / 0x04</i>			
Temperature T	°C	1003	0x3EA
	°F	1005	0x3EC
	°K	1009	0x3F0
Relative humidity RH, Uw	% RH	1021	0x3FC
Water vapour partial pressure e	mbar	1101	0x44C
	psi	1103	0x44E
Dew point temperature Td	°C	1105	0x450
	°F	1107	0x452
	°K	1147	0x47A
Wet bulb temperature Tw	°C	1109	0x454
	°F	1111	0x456
	°K	1145	0x478
Absolute humidity dv	g/m ³	1113	0x458
	gr/ft ³	1115	0x45A
Mixing ratio r	g/kg	1121	0x460
	gr/lb	1123	0x462
Specific enthalpy h	kJ/kg	1125	0x464
	ft lbf/lb	1127	0x466
	BTU/lb	1129	0x468
Frost point temperature Tf	°C	1131	0x46A
	°F	1133	0x46C
	°K	1149	0x47C
Volume concentration Wv	ppm	1151	0x47E
	%	1155	0x482
	‰	1157	0x484
Saturation vapor pressure above water ew	mbar	1221	0x4C4
	psi	1223	0x4C6
Saturation vapor pressure above ice ei	mbar	1225	0x4C8
	psi	1227	0x4CA
Ice bulb temperature Ti	°C	1237	0x4D4
	°F	1239	0x4D6
	°K	1241	0x4D8
Specific humidity qv	g/kg	1247	0x4DE
	gr/lb	1249	0x4E0

1) Register number starts from 1

2) Register address starts from 0

INT16:				
Parameter	Unit	Scale ³⁾	Register number ¹⁾ [Dec]	Register address ²⁾ [Hex]
Read register: function code 0x03 / 0x04				
Temperature T	°C	100	4002	0xFA1
	°F	50	4003	0xFA2
	°K	50	4005	0xFA4
Relative humidity RH, Uw	% RH	100	4011	0xFAA
Water vapour partial pressure e	mbar	10	4051	0xFD2
	psi	1000	4052	0xFD3
Dew point temperature Td	°C	100	4053	0xFD4
	°F	100	4054	0xFD5
	°K	100	4074	0xFE9
Wet bulb temperature Tw	°C	100	4055	0xFD6
	°F	100	4056	0xFD7
	°K	100	4073	0xFE8
Absolute humidity dv	g/m ³	10	4057	0xFD8
	gr/ft ³	10	4058	0xFD9
Mixing ratio r	g/kg	10	4061	0xFDC
	gr/lb	10	4062	0xFDD
Specific enthalpy h	kJ/kg	1	4063	0xFDE
	ft lbf/lb	1	4064	0xFDF
	BTU/lb	1	4065	0xFE0
Frost point temperature Tf	°C	100	4066	0xFE1
	°F	100	4067	0xFE2
	°K	100	4075	0xFEA
Volume concentration Wv	ppm	0.1	4076	0xFEB
	%	1000	4078	0xFED
	‰	100	4079	0xFEE
Saturation vapor pressure above water ew	mbar	100	4111	0x100E
	psi	100	4112	0x100F
Saturation vapor pressure above ice ei	mbar	100	4113	0x1010
	psi	100	4114	0x1011
Ice bulb temperature Ti	°C	100	4119	0x1016
	°F	100	4120	0x1017
	°K	50	4121	0x1018
Specific humidity qv	g/kg	10	4124	0x101B
	gr/lb	10	4125	0x101C

1) Register number starts from 1

2) Register address starts from 0

3) Examples: For scale 100, the reading of 2550 means a value of 25.5. For scale 50, the reading of 2550 means a value of 51.

5.4 Modbus Message Example

Example of Modbus RTU command for reading the temperature (float value) T = 24.625015 °C from the register 0x3EA

- Device EE260; slave ID 235 [0xEB]
Reference document, chapter 6.3: www.modbus.org/docs/Modbus_Application_Protocol_V1_1b3.pdf
- See Application Note Modbus AN0103 (available on www.epluse.com/ee260)

	Modbus ID address	Function code	Starting address Hi	Starting address Lo	No. of register Hi	No. of register Lo	CRC		
Request [Hex]:	EB	03	03	EA	00	02	F3	71	
	Modbus ID address	Function code	Byte count	Register 1 value Hi	Register 1 value Lo	Register 2 value Hi	Register 2 value Lo	CRC	
Response Hex]:	EB	03	04	00	08	41	C5	C0	3C

Decoding of floating point values:

Floating point values are stored according IEEE754 standard. The byte pairs 1, 2 and 3, 4 are inverted as follows:

MMMMMMMM	MMMMMMMM	SEEEEEEE	EMMMMMMM
Byte 3	Byte 4	Byte 1	Byte 2

Example:

Response [Hex]				Value in decimal
Byte 1 (Register 2 - Hi)	Byte 2 (Register 2 - Lo)	Byte 3 (Register 1 - Hi)	Byte 4 (Register 1 - Lo)	
44	C5	00	08	24.625015

6 Maintenance and Service

EE260 does not require any special maintenance, nevertheless for high accurate measurements especially over wide RH and T ranges it is recommended to calibrate the probe every 12 months. If needed, the enclosure may be cleaned and the device may be re-adjusted as described below.

6.1 Cleaning

Use a damp soft cloth to remove deposits of dust or dirt from the exterior of the probe. Do not use any solvents or abrasive cleaning agents and no isopropanol (isopropyl alcohol).

In case of dusty, oily and polluted environment:

- Use a damp soft cloth to remove deposits of dust or dirt from the exterior of the probe. Do not use any solvents or abrasive cleaning agents.
- The filter cap shall be replaced once in a while with an E+E original one (see below).
- If needed, the sensing element of the humidity probe can be cleaned by the user (see the E+E cleaning instructions)

6.2 Filter Replacement

In a dusty or polluted environment it might be necessary to replace the filter cap or the filter membrane, respectively, once in a while. In most of the cases, a clogged filter shows visible contamination or dirt. Longer response time of the humidity measurement also indicates a clogged filter cap. In such cases, replace the filter cap or the filter membrane by a new, original one, see chapter „6.6 Spare Parts“.



Procedure

- Turn the filter cap counter-clockwise for removing it.
- Install the new filter cap finger tight by turning it clockwise.



While replacing the filter cap take very good care to not touch or rub the sensing element.

6.3 Repairs

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

6.4 RH / T Adjustment and Calibration

In meteorological applications there might arise the need for periodical humidity and temperature calibration or adjustment.

Definitions

- **Calibration** documents the accuracy of a measurement device. The device under test (specimen) is compared with the reference and the deviations are documented in a calibration certificate. During the calibration, the specimen is not changed or improved in any way.
- **Adjustment** improves the measurement accuracy of a device. The specimen is compared with the reference and brought in line with it. An adjustment can be followed by a calibration which documents the accuracy of the adjusted specimen.

6.4.1 Calibration and Adjustment at E+E Elektronik

Calibration and/or adjustment can be performed in the E+E Elektronik calibration laboratory. For information on the E+E capabilities in ISO or accredited calibration please see www.eplusecal.com.

6.4.2 Humidity Calibration and Adjustment by the User

Depending on the level of accuracy required, the humidity reference can be:

- Handheld device (e.g. Omniport 30), please see www.epluse.com/Omniport30.
- Humidity standards (e.g. Humidity Calibration Kit), please see www.epluse.com/EE260.



Please note: It is of very high importance that for the RH calibration the RH and T sensing elements are at the same temperature.

Please contact your sales representative for assistance.



Please note: When the calibration/adjustment procedure with the help of PCS10 starts, both heating modes of the EE260 are disabled automatically if they have **on** status. At the end of the procedure the heating comes back to **on** automatically.



Please observe these important notes on changing the sensing element data:

- The sensing element data generally only has informational character.
- For all applications, an alleged drift of the device can be corrected using the offset correction or the one/two point adjustment offered by the PCS10.
- For very special requirements, the drift can be corrected acting upon the characteristic of the sensing elements, i.e. upon the sensor data such as nominal capacity or humidity coefficient. This requires deep knowledge about the sensing elements and the design of the measuring device.
- **Important!** Contact the E+E sales representative before any attempt of acting upon the sensing element data!
- **Caution!** Upon changing the sensing element data, the original data is lost. There is no way to automatically return to the original sensor data. Please make sure to note and save the original sensing element data before making any change!

6.4.3 Temperature Calibration and Adjustment by the User

For a reproducible T calibration or adjustment, it is recommended to measure the Pt100 of the EE260 in a liquid bath. This reduces the T inhomogeneity surrounding the probe to a minimum. It must be ensured to use an inert, nonconductive liquid which does not chemically contaminate the sensor element (e.g. GALDEN HT200).



Please note: When the calibration/adjustment procedure with the help of PCS10 starts, both heating modes of the EE260 are disabled automatically if they have **on** status. At the end of the procedure the heating comes back to **on** automatically.

The temperature reference (T-Ref) shall be located at the same level as the Pt100 of the EE260.

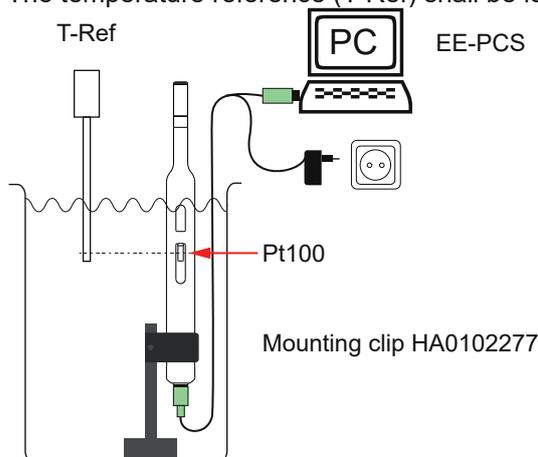


Fig. 6 Temperature calibration/adjustment in a liquid bath

6.5 Error Indication on the Analogue Output (NAMUR)

The EE260 features an error indication on its analogue outputs according to the NAMUR NE 043

recommendations (Standardization of the Signal Level for the Failure Information of Digital Transmitters, Edition 2003-02-03, see www.namur.net/en/recommendations-and-worksheets/current-nena.html). The feature is enabled by factory default and can be disabled with the PCS10 Product Configuration Software, see above.

Output signal	NAMUR signal level
0-1 V	1.1 V
0-2.5 V	2.75 V
0-5 V	5.5 V
0-10 V	11 V

6.6 Spare Parts

Description

- Filter PTFE membrane on stainless steel body
- PTFE membrane for filter

Order code

HA010114
HA010114ME

7 Accessories

Please also refer to the “Accessories“ data sheet.

Description

- Radiation shield, artificially ventilated
- Modbus configuration adapter¹⁾
- EE260 configuration cable¹⁾
- PCS10 Product Configuration Software (Download: www.epluse.com/PCS10)
- M12x1 cable connector, 8 pole socket
- Connection cable, 8 pole, M12x1 socket - free ends
 - 1.5 m (4.9 ft)
 - 3 m (9.8 ft)
 - 5 m (16.4 ft)
 - 10 m (32.8 ft)
- Wall mounting clip Ø25 mm
- Protection cap M12 female connector
- Protection cap M12 male connector

Order code

HA010511
HA011018
HA011020
PCS10
HA010704

HA010322
HA010323
HA010324
HA010325
HA010227
HA010781
HA010782

¹⁾ Both accessories are necessary for configuration

8 Technical Data

Measurands

Relative humidity

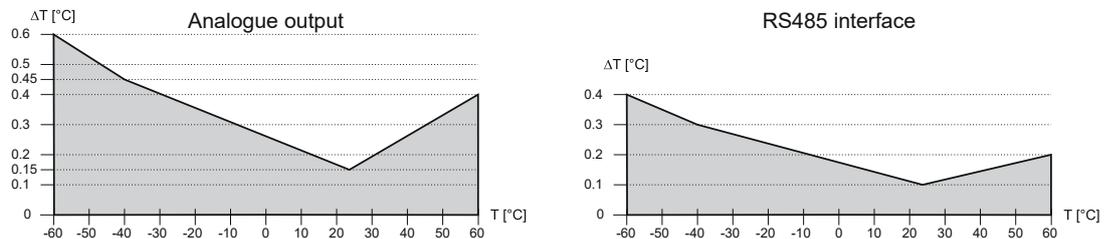
Measuring range	0...100 %RH	
Sensing element	E+E HMC01, heated	
Response time t_{90} at 20 °C (68 °F)	< 15 s	
Accuracy ¹⁾ (incl. hysteresis, non-linearity and repeatability)		
-15...40 °C (5...104 °F)	for RH ≤ 90 %	± (1.3 + 0.3 % *mv) %RH
-15...40 °C (5...104 °F)	for RH > 90 %	± 2.0 % RH
-25...60 °C (-13...140 °F)		± (1.4 + 1 % *mv) %RH
-40...-25 °C (-40...-13 °F)		± (1.5 + 1.5 % *mv) %RH

mv = measured value

Temperature

Measuring range	-60...60 °C (-76...140 °F)
Temperature sensor	Pt100 1/3 DIN B
Response time, typ. ²⁾	$t_{63} \leq 20$ s

Accuracy



Outputs³⁾

Analogue	0 - 1 V / 0 - 2.5 V / 0 - 5 V / 0 - 10 V
Freely selectable and scalable	$0 < I_L < 1$ mA
Digital interface	RS485 (EE260 = 1 unit load)
Protocol	Modbus RTU
Default settings ⁴⁾	Baud rate 9600, parity even, 1 stop bit, Modbus address 235
Supported baud rates	9600, 19200, 38400, 57600, 76800 and 115200
Data types for measured values	FLOAT32 and INT16 registers

General

Supply voltage	7 - 30 V DC
Power consumption, typ.	300 mW (25 mA @ 12 V DC, heating included)
Electrical connection	M12x1, 8 poles, stainless steel 1.4404
Filter	PTFE membrane, stainless steel body
Protection rating	IP67
Enclosure material	Thermoplastic elastomer, UV resistant and T stable
Electromagnetic compatibility ⁵⁾	EN 61326-1 EN 61326-2-3 FCC Part15 ClassA ICES-003 ClassA
Operating and storage conditions	-60...60 °C (-76...140 °F) 0...100 % RH (operation) 0...95 % RH non-condensing (storage)



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).
 2) At air speed > 15 m/s
 3) The EE260 simultaneously features two analogue voltage outputs and the RS485 interface.
 4) Find more details about communication setting in the Modbus Application Note at www.epluse.com/ee260
 5) Compliance with EN61000-4-3 and EN 61000-4-6: Electromagnetic interferences may cause additional deviations <2 % RH.



HEADQUARTERS

E+E Elektronik Ges.m.b.H.

Langwiesen 7
4209 Engerwitzdorf
Austria
Tel.: +43 7235 605-0
E-mail: info@epluse.com
Web: www.epluse.com

SUBSIDIARIES

E+E Elektronik China

18F, Kaidi Financial Building,
No.1088 XiangYin Road
200433 Shanghai
Tel.: +86 21 6117 6129
E-mail: info@epluse.cn

E+E Elektronik France

47 Avenue de l'Europe
92310 Sèvres
Tel.: +33 4 74 72 35 82
E-mail: info@epluse.fr

E+E Elektronik Germany

Obere Zeil 2
61440 Oberursel
Tel.: +49 6171 69411-0
E-mail: info@epluse.de

E+E Elektronik Italy

Via Alghero 17/19
20128 Milano (MI)
Tel.: +39 02 2707 86 36
E-mail: info@epluse.it

E+E Elektronik Korea

Suite 2001, Heungdeok IT
Valley Towerdong, 13,
Heungdeok 1-ro, Giheung-gu
16954 Yongin-si, Gyeonggi-do
Tel.: +82 31 732 6050
E-mail: info@epluse.co.kr

E+E Elektronik USA

333 East State Parkway
Schaumburg, IL 60173
Tel.: +1 847 490 0520
E-mail: office@epluse.com

YOUR PARTNER IN SENSOR TECHNOLOGY



ELEKTRONIK®
Ges.m.b.H.