

# JUMO hydroTRANS S20

Humidity and temperature transmitter  
with optional CO<sub>2</sub> module, wall-mounted version



## Operating Manual



90704200T90Z001K000

V4.00/EN/00767180/2026-05-27

#### Further information and downloads



[qr-907042-en.jumo.info](https://qr-907042-en.jumo.info)

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# 1 About this documentation

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## 1.1 Purpose

This documentation is part of the device and includes all information to ensure that it is used safely and as intended across all phases of the product lifecycle.

If you do not follow the documentation and safety information, this may result in risk to life and damage to property due to improper use.

- Read and follow the documentation and the safety information and warnings.
- Store the document in its entirety, in an easily accessible location, and so that it can be read in full at all times.
- Contact the manufacturer if you have any questions about the device and documentation.

## 1.2 Target group

This documentation is intended to be used by personnel for plant mechanical systems for sanitary, heating and air-conditioning technology, electrical engineering or mechanical and plant engineering throughout all phases of the product life cycle.

## 1.3 Definition of terms

| Use in the documentation                       | Definition                                                                                                                                                   |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device, product                                | Humidity and temperature transmitter                                                                                                                         |
| CO <sub>2</sub> module, CO <sub>2</sub> sensor | Carbon dioxide (CO <sub>2</sub> ) as a measurand                                                                                                             |
| End device                                     | Smartphone, tablet, laptop, PC etc.                                                                                                                          |
| Measured value                                 | Process value                                                                                                                                                |
| Product lifecycle                              | Overall consideration of Product identification, acceptance of the goods, storage, mounting, connection, operation, troubleshooting, maintenance to disposal |

## 1.4 Trademark information

All trademarks and trade and company names used are the property of their rightful owners or authors.

## 1.5 Symbols



### NOTE!

This symbol is used in tables and indicates that further information is provided after the table.

---



### REFERENCE!

This symbol refers to **further information** in other sections, chapters, or other manuals.

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### 2.1 Intended use

The humidity and temperature transmitter monitors the ambient air quality.

The device is suitable for wall mounting in indoor areas and weather-proofed outdoor areas.

The documentation is part of the device. The device is only intended for use according to this documentation.

### 2.2 Qualification of personnel

The personnel deployed must meet the following requirements in all phases of the product lifecycle:

- Members of personnel have at least completed training in the field of plant mechanical systems for sanitary, heating, and air-conditioning technology or have completed a degree in electrical engineering or mechanical and plant engineering.
- Members of personnel are familiar with this documentation and the safety information and warnings it contains.

### 2.3 Transport and storage damage

The device can be damaged if it is insufficiently protected during transport and/or improperly stored.

- Transport the device protected from moisture and dirt in shockproof packaging.
- Protect all electrical and mechanical connections from damage.
- Observe the admissible storage temperature of the device.
- Store the device in a dry and dust-free environment.

### 2.4 Disturbances

#### 2.4.1 Climatic conditions

External factors affecting the electronic components, particularly the sensor element, can lead to measurement deviations. Appropriate measures reduce the influence of disturbances and ensure measurement accuracy:

- Protect the device from external heat sources.
- Protect the device from direct sunlight.
- Protect the device from strong drafts.

A measurement or process value is corrected using an offset.

⇒ "Measurand correction ", Page 31

#### 2.4.2 Volatile organic compounds (VOCs)

High concentrations in the ambient air and prolonged exposure of the sensor can lead to measurement deviations. Appropriate measures prevent damage to the sensor and ensure measurement accuracy:

- Adequate ventilation of the mounting site

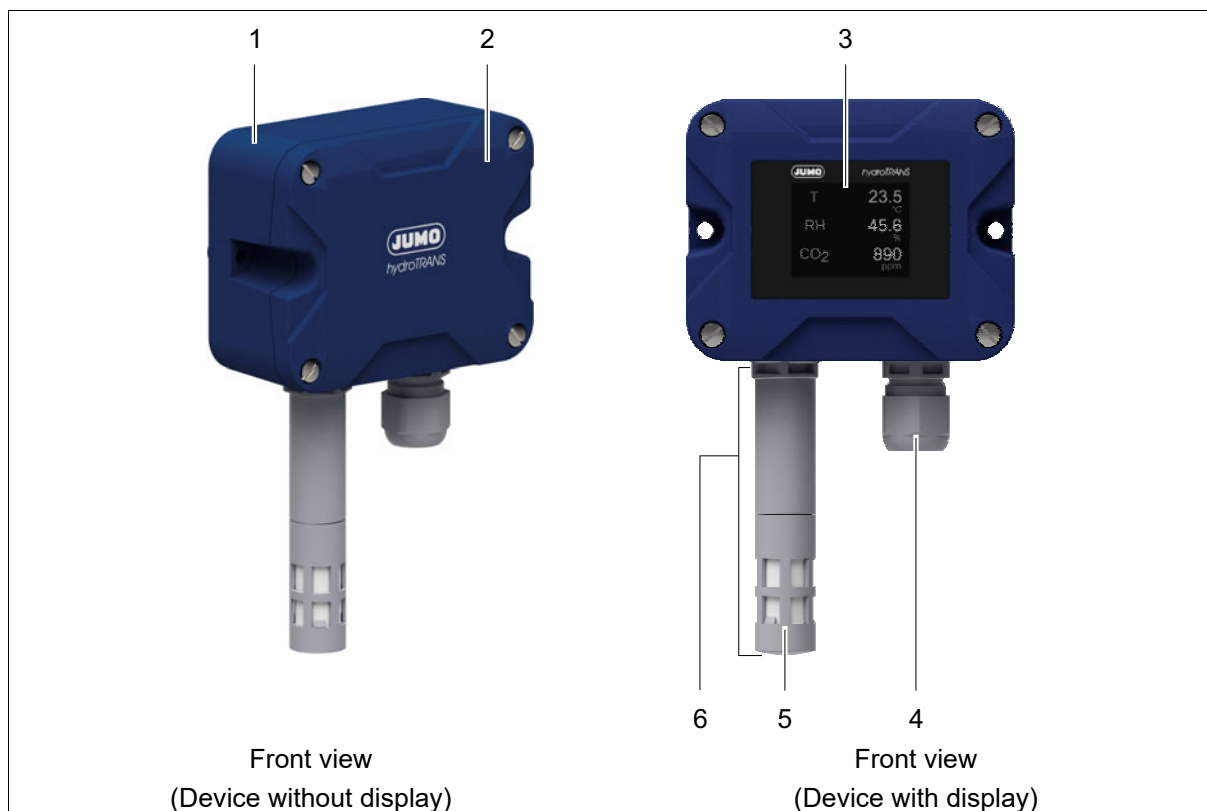
#### 2.4.3 Stabilisation time

After the initial start-up of the device, the sensor element adapts to the environmental conditions at the installation site. Measurement deviations may occur during this stabilisation time. Measurement accuracy is ensured by taking appropriate measures:

- Observe the stabilisation time of at least 60 h.

## 3 Description

### 3.1 Structure



- 1 Housing rear
- 2 Housing front
- 3 Display (TFT display)

- 4 Cable fitting
- 5 Filter cap
- 6 Probe

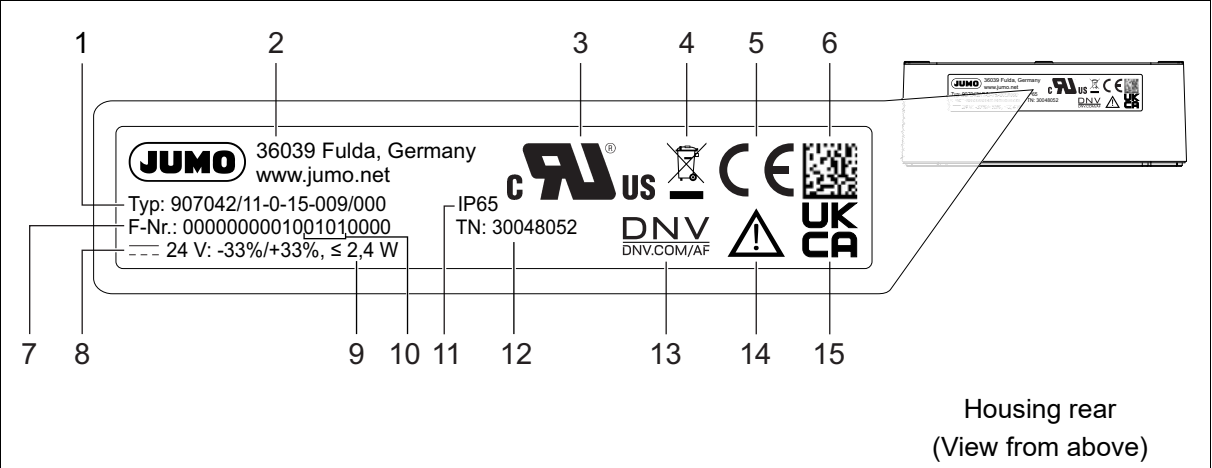
### 3.2 Functions

| Measurand                         | Function principle                   |
|-----------------------------------|--------------------------------------|
| Relative humidity                 | Capacitive measurement technology    |
| Temperature                       | Semiconductor measurement technology |
| Carbon dioxide (CO <sub>2</sub> ) | Photoacoustic measurement technology |

The process values of the measurands can be displayed on the optional display and issued to a higher-level system via the interfaces or analog outputs.

3.3 Nameplate

Example:



- |   |                           |    |                                           |
|---|---------------------------|----|-------------------------------------------|
| 1 | Order code                | 9  | Power consumption                         |
| 2 | Manufacturer and address  | 10 | Date of manufacture (YYww)                |
| 3 | UL identification marking | 11 | Protection type according to DIN EN 60529 |
| 4 | Disposal                  | 12 | Part no.                                  |
| 5 | CE identification marking | 13 | DNV identification marking                |
| 6 | Data Matrix code          | 14 | Observe device documentation!             |
| 7 | Fabrication number        | 15 | UKCA identification marking               |
| 8 | Voltage supply (DC)       |    |                                           |

3.4 Approval marks and certificates



Certificates for approved device versions are available for download on the manufacturer's website.

3.5 Scope of delivery

|                                                                |
|----------------------------------------------------------------|
| Device in the ordered version                                  |
| Brief instructions                                             |
| Cable fitting                                                  |
| Thread sealing ring                                            |
| 2 Fastening screws (socket button self-tapping screw 4.8 × 38) |

## 4 Technical data

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### 4.1 Electrical safety

|              |                                                                                                                                              |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Requirements | DIN EN IEC 61010-1:2020<br>The device must be equipped with an electrical circuit that meets the requirements for "Limited-energy circuits". |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|

### 4.2 Electrical data

#### Device version with analog output

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| Voltage supply               | DC 24 V, -33 %/+33 %, SELV, PELV                 |
| Power consumption            | ≤ 2.4 W                                          |
| Overvoltage category         | II                                               |
| Pollution degree             | 2                                                |
| Protection rating            | DIN EN 61140, Class III (protective low voltage) |
| Electrical connection        |                                                  |
| Connection elements          | Spring-cage terminal                             |
| Connecting cable             |                                                  |
| Cable diameter               | 4.5 to 10 mm with M16 × 1.5 cable fitting        |
| Conductor cross section      |                                                  |
| Without ferrule              | 0.2 to 1.5 mm <sup>2</sup>                       |
| With ferrule                 | 0.25 to 1.5 mm <sup>2</sup>                      |
| Stripping length             |                                                  |
| Without ferrule              | 8 mm                                             |
| With ferrule                 | 10 mm                                            |
| Temperature resistance       | ≥ 80 °C                                          |
| For UL applications          |                                                  |
| Approved cables <sup>a</sup> | CYJV2/8, CYJV/7, PVVA2/8, PVVA/7                 |

<sup>a</sup> The cables must be suitable for the voltage, current and temperature used.

### Device version with RS485

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| Voltage supply               | DC 24 V, -58 %/+33 %, SELV, PELV                 |
| Power consumption            | ≤ 2.4 W                                          |
| Overvoltage category         | II                                               |
| Pollution degree             | 2                                                |
| Protection rating            | DIN EN 61140, class III (protective low voltage) |
| Electrical connection        |                                                  |
| Connection elements          | Spring-cage terminal                             |
| Connecting cable             |                                                  |
| Cable diameter               | 4.5 to 10 mm with M16 × 1.5 cable fitting        |
| Conductor cross section      |                                                  |
| Without ferrule              | 0.2 to 1.5 mm <sup>2</sup>                       |
| With ferrule                 | 0.25 to 1.5 mm <sup>2</sup>                      |
| Stripping length             |                                                  |
| Without ferrule              | 8 mm                                             |
| With ferrule                 | 10 mm                                            |
| Temperature resistance       | ≥ 80 °C                                          |
| For UL applications          |                                                  |
| Approved cables <sup>a</sup> | CYJV2/8, CYJV/7, PVVA2/8, PVVA/7                 |

<sup>a</sup> The cables must be suitable for the voltage, current and temperature used.

## 4.3 Inputs

### 4.3.1 Measurands

#### Relative humidity

|                                           |               |
|-------------------------------------------|---------------|
| Measuring range                           | 0 to 100 % RH |
| With CO <sub>2</sub> module               | 0 to 95 % RH  |
| Accuracy                                  |               |
| Stabilization time after initial start-up | ≥ 60 h        |
| Typical                                   | ±2.0 % RH     |
| Max.                                      | ±2.5 % RH     |
| Reference conditions                      |               |
| Humidity                                  | ≥ 30 % RH     |
| Sampling rate                             | 1 s           |

#### Temperature

|                             |               |
|-----------------------------|---------------|
| Measuring range             | -40 to +80 °C |
| With CO <sub>2</sub> module | -10 to +60 °C |
| Accuracy                    |               |
| Typical                     | ±0.2 °C       |
| Max.                        | ±0.4 °C       |
| Sampling rate               | 1 s           |

## 4 Technical data

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### Carbon dioxide (CO<sub>2</sub>)

|                      |                                       |
|----------------------|---------------------------------------|
| Measuring range      | 400 to 10000 ppm                      |
| Accuracy             | ±(50 ppm + 5 % of the measured value) |
| Reference conditions |                                       |
| Ambient temperature  | 25 °C                                 |
| Air pressure         | 1013 hPa                              |
| Humidity             | 50 % RH                               |
| Measuring range      | 400 to 1000 ppm                       |
| Sampling rate        | 30 s                                  |

### 4.4 Outputs

|                       |                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Current output        |                                                                                                                                |
| Function              | Output of measurands                                                                                                           |
| Measured values       | Relative humidity, temperature, optional: carbon dioxide (CO <sub>2</sub> )                                                    |
| Calculated values     | Dew point, frost point, wet-bulb temperature, absolute humidity, mixing ratio, partial water vapor pressure, specific enthalpy |
| Signal range          | 4 to 20 mA                                                                                                                     |
| Output signal limits  | 0 to 22 mA                                                                                                                     |
| Accuracy              | ≤ ±0.1 % in relation to the end of the signal range (20 mA)                                                                    |
| Temperature influence | ±50 ppm/K                                                                                                                      |
| Burden influence      | ≤ ±0.02 % per 100 Ω                                                                                                            |
| Burden                | ≤ 500 Ω                                                                                                                        |
| Voltage output        |                                                                                                                                |
| Function              | Output of measurands                                                                                                           |
| Measured values       | Relative humidity, temperature, optional: carbon dioxide (CO <sub>2</sub> )                                                    |
| Calculated values     | Dew point, frost point, wet-bulb temperature, absolute humidity, mixing ratio, partial water vapor pressure, specific enthalpy |
| Signal range          | 0 to 10 V                                                                                                                      |
| Output signal limits  | 0 to 11 V                                                                                                                      |
| Accuracy              | ≤ ±0.1 % in relation to the end of the signal range (10 V)                                                                     |
| Temperature influence | 50 ppm/K                                                                                                                       |
| Load influence        | ≤ ±15 mV                                                                                                                       |
| Load                  | ≥ 10 kΩ                                                                                                                        |

### 4.5 Interfaces

#### 4.5.1 RS485

|                       |                                                                                 |
|-----------------------|---------------------------------------------------------------------------------|
| Function              | Transfer of process data, configuration data, and device information            |
| Communication         | Via Modbus master                                                               |
| Galvanic isolation    | Functional                                                                      |
| Data transmission     | Serial                                                                          |
| Transmission protocol | Modbus RTU                                                                      |
| Data format           | 8-1-none <sup>a</sup><br>8-1-odd<br>8-1-even<br>8-2-none                        |
| Data transfer rate    | 9600 baud<br>19200 baud<br>38400 baud <sup>a</sup><br>57600 baud<br>115200 baud |
| Minimum response time | 0 to 500 ms                                                                     |
| Device address        | 1 to 254                                                                        |

<sup>a</sup> Default setting

#### 4.5.2 USB

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| Function              | Transfer of configuration data and device information |
| Communication         | Via end device and setup software                     |
| Transmission standard | USB 2.0                                               |
| Connector type        | Micro-B                                               |
| Power requirement     | ≤ 500 mA                                              |
| Cable length          | ≤ 5 m                                                 |

### 4.6 Display

|                        |                          |
|------------------------|--------------------------|
| Type                   | TFT display              |
| Size                   |                          |
| Display range          | 35.04 mm × 28.03 mm      |
| Screen size (diagonal) | 1.77"                    |
| Resolution             | 128 × 160 RGB            |
| Brightness             | 11 levels (configurable) |

## 4 Technical data

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### 4.7 Environmental influences

|                                     |                                                            |
|-------------------------------------|------------------------------------------------------------|
| Admissible ambient temperature      | -40 to +80 °C                                              |
| With CO <sub>2</sub> module         | -10 to +60 °C                                              |
| With display                        | -20 to +60 °C                                              |
| Admissible storage temperature      | -40 to +80 °C                                              |
| With CO <sub>2</sub> module         | -30 to +70 °C                                              |
| With display                        | -30 to +60 °C                                              |
| Protection type                     | DIN EN 60529                                               |
| Housing                             | IP65                                                       |
| Max. site altitude                  | 5,300 m above sea level                                    |
| Climatic conditions                 | DIN EN 60721-3-3                                           |
| Climate class                       | 3K24                                                       |
| Air temperature                     | -25 to +55 °C                                              |
| Relative humidity                   | ≤ 100 % (95 % with CO <sub>2</sub> module), non-condensing |
| Electromagnetic compatibility (EMC) | DIN EN IEC 61326-2-3:2022                                  |
| Interference emission               | Class B <sup>a</sup>                                       |
| Interference immunity               | Industrial requirement                                     |
| Oscillation <sup>b</sup>            | DIN EN 60068-2-6                                           |
| Amplitude                           | 0.15 mm at 10 to 58.1 Hz                                   |
| Acceleration                        | 20 m/s <sup>2</sup> at 58.1 to 150 Hz                      |
| Shock <sup>b</sup>                  | DIN EN 60068-2-27                                          |
| Peak acceleration                   | 150 m/s <sup>2</sup>                                       |
| Shock duration                      | 11 ms                                                      |

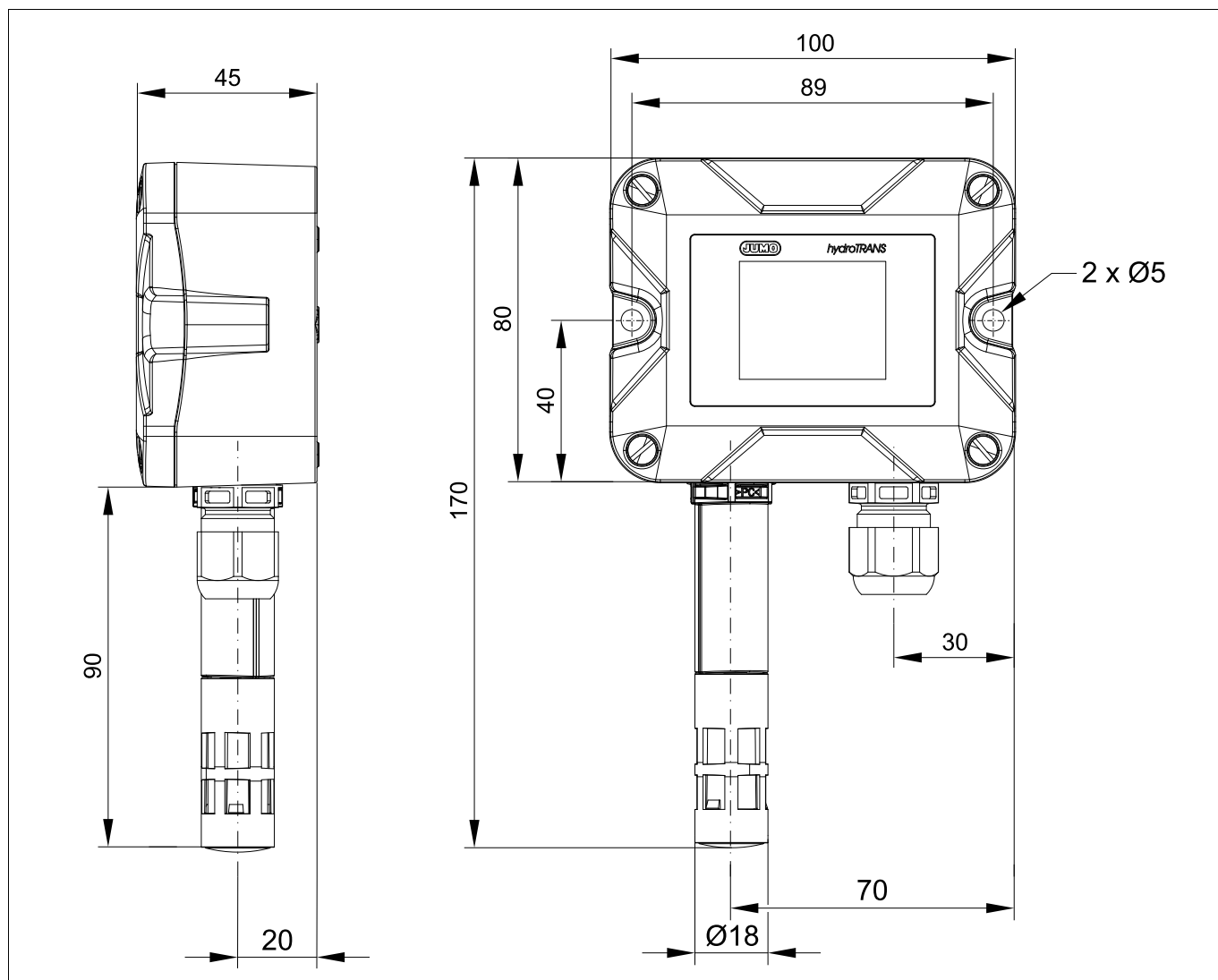
<sup>a</sup> The product is suitable for industrial use as well as for households and small businesses.

<sup>b</sup> The CO<sub>2</sub> module is sensitive to vibrations. In the event of vibrations, the measurement results could change on account of the design.

### 4.8 Mechanical features

|               |         |
|---------------|---------|
| Material      |         |
| Housing       | PC      |
| Display cover | PMMA    |
| Weight        | ~ 200 g |

### 4.9 Dimensions



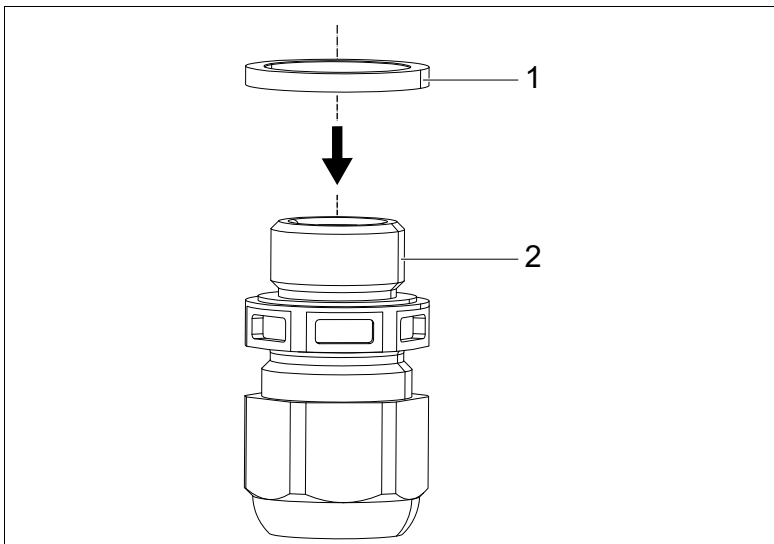
## 5 Mounting

### 5.1 Mount cable fitting

|          |                                                      |
|----------|------------------------------------------------------|
| Aids     | Torque wrench with open-ended insert, wrench size 20 |
| Material | Cable fitting                                        |
|          | Thread sealing ring                                  |

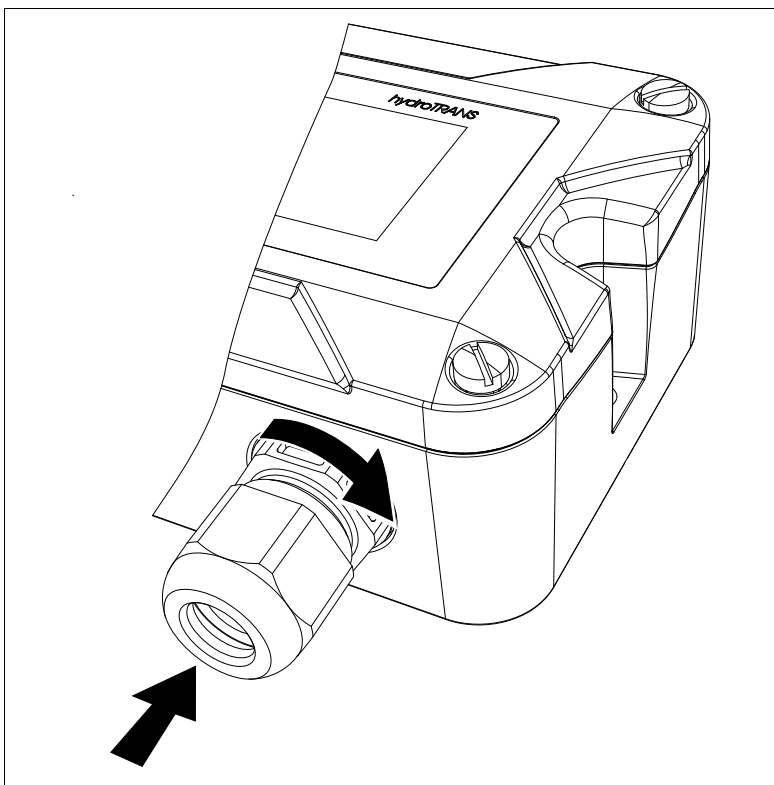
Procedure:

1. Place the thread sealing ring (1) on the socket (2) of the cable fitting.



2. Insert the cable fitting into the underside of the housing and tighten.

Tightening torque: 2 Nm



### 5.2 Mounting the device

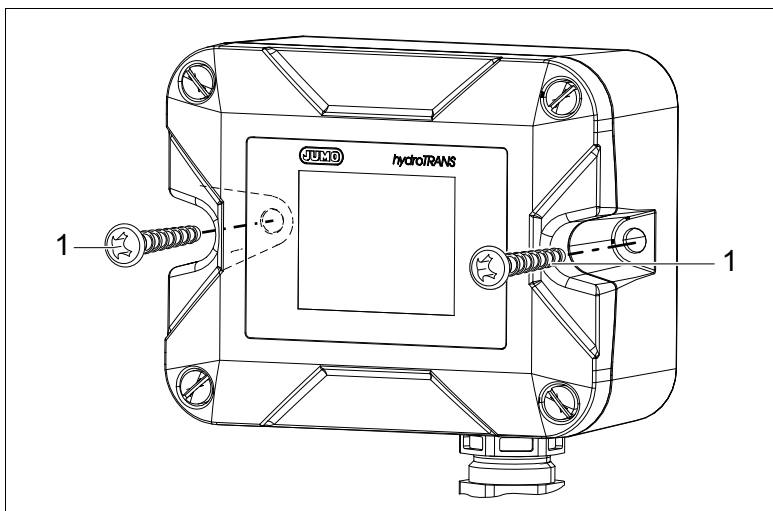
|          |                                                                |
|----------|----------------------------------------------------------------|
| Aids     | Cross-headed screwdriver                                       |
| Material | 2 Fastening screws (socket button self-tapping screw 4.8 × 38) |

Requirements:

- The mounting holes have been drilled.

Procedure:

1. Mount the device using the fastening screws (1).



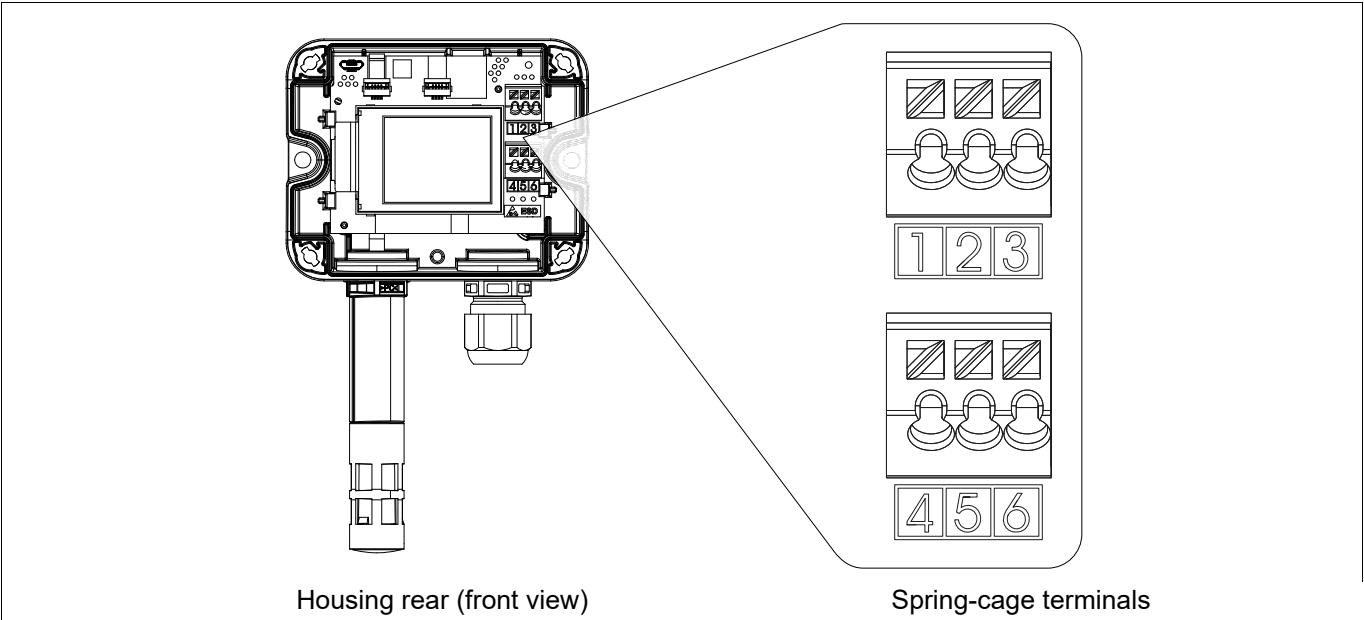
Electrical connection: ⇒ Page 18

# 6 Electrical connection

## 6.1 Preparing the electrical connection

- Requirements:
- The system has been de-energized and secured against being switched on again.
  - The connections for the voltage supply and signal processing have been correctly prepared.

## 6.2 Connection elements



### 6.2.1 Terminal assignment

#### Spring-cage terminals

| Designation   | Description                    | Assign-ment |
|---------------|--------------------------------|-------------|
| Analog output | Relative humidity <sup>a</sup> | 1           |
|               | Temperature <sup>a</sup>       | 2           |
|               | CO <sub>2</sub> <sup>a</sup>   | 3           |
|               | Analog output GND              | 4           |
|               | DC 24 V                        | 5           |
|               | GND                            | 6           |

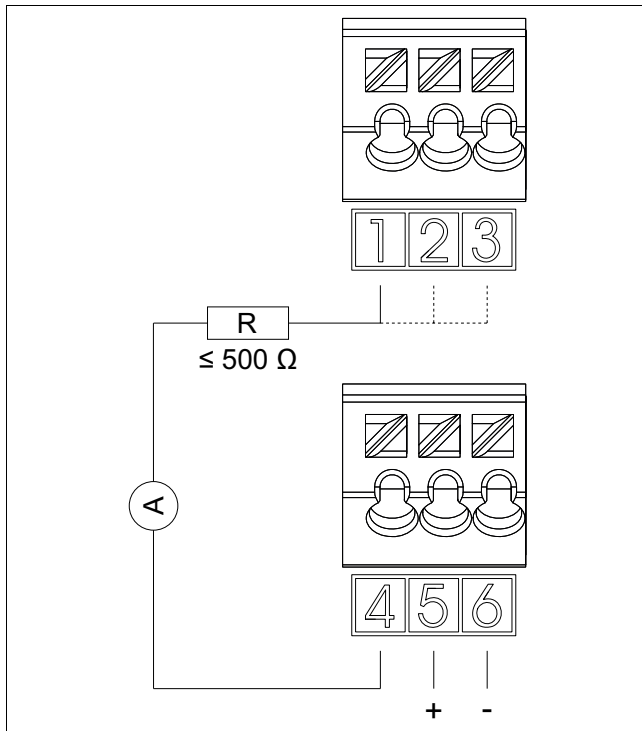
<sup>a</sup> Standard  
<sup>b</sup> Optional extra

| Designation | Description            | Assign-ment |
|-------------|------------------------|-------------|
| RS485       | RS485 A (D+)           | 1           |
|             | RS485 GND <sup>b</sup> | 2           |
|             | RS485 B (D-)           | 3           |
|             | -                      | 4           |
|             | DC 24 V                | 5           |
|             | GND                    | 6           |

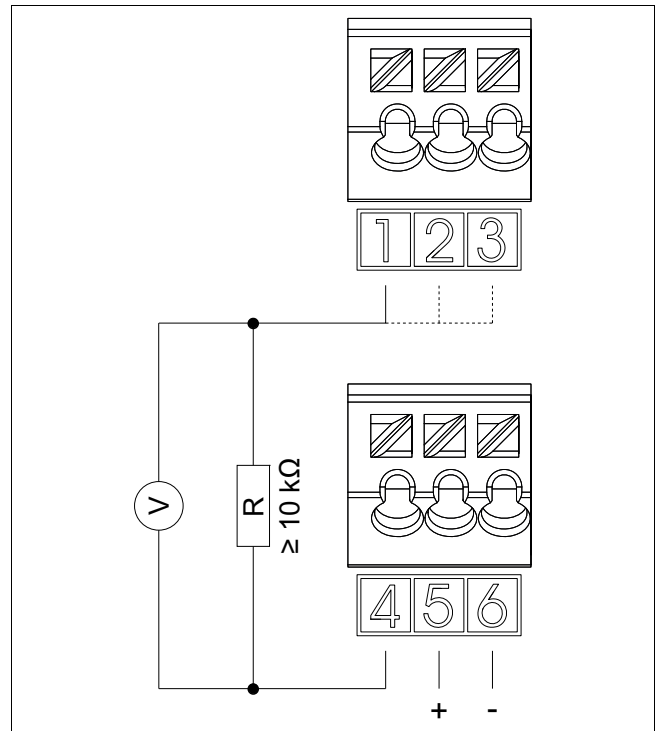
### 6.3 Connection diagram

#### Analog outputs

##### Current output



##### Voltage output



## 6 Electrical connection

### 6.4 Connecting the device

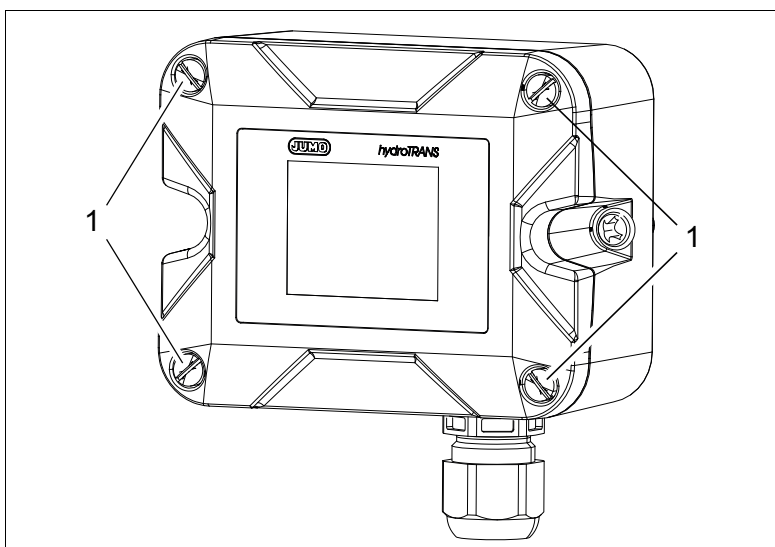
|          |                                                      |
|----------|------------------------------------------------------|
| Aids     | Slotted screwdriver                                  |
|          | Torque wrench with open-ended insert, wrench size 20 |
| Material | Connecting cable, ⇨ "Electrical data ", Page 10      |

Requirements:

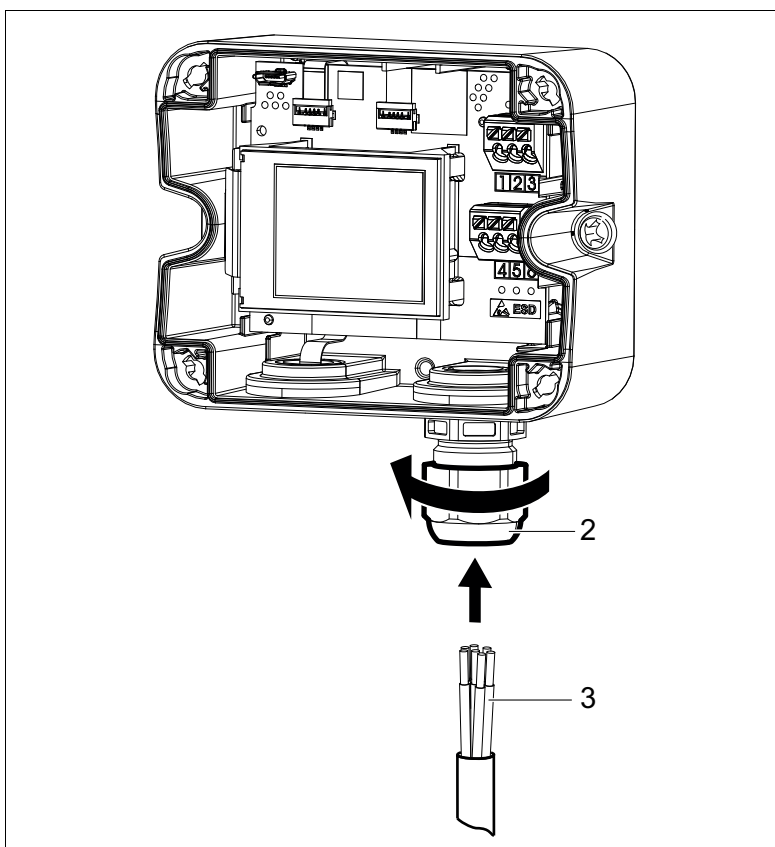
- The system has been de-energized and secured against being switched on again.
- The connections for the voltage supply and signal processing have been correctly prepared.

Procedure:

1. Loosen the quick-release screws (1).
2. Remove the housing front and place it down, taking care to protect it from pollutants.



3. Loosen the acorn nut (2).
4. Guide the connecting cable (3) through the cable fitting.

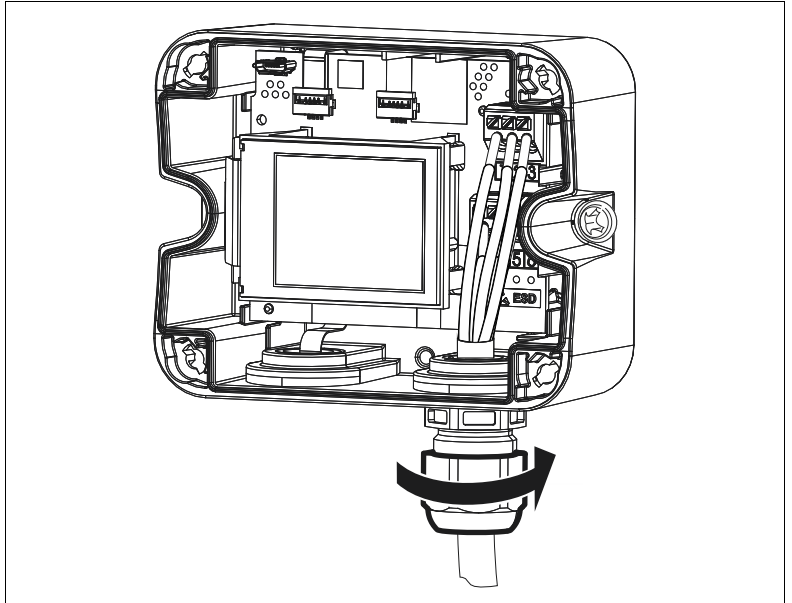


## 6 Electrical connection

5. Complete the electrical connection.

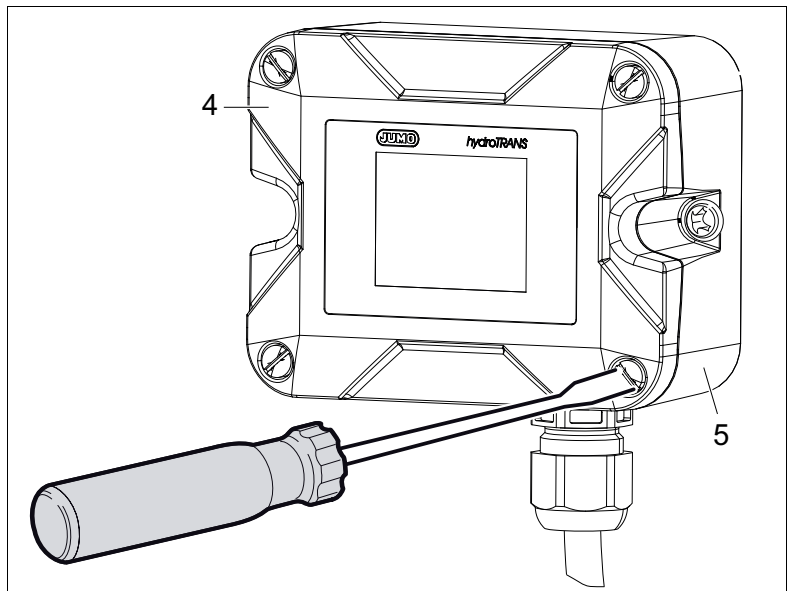
6. Tighten the acorn nut.

Tightening torque: 1.5 Nm



7. Place the housing front (4) on the housing rear (5). Lock the quick-release screws with a quarter turn.

*The housing is tightly sealed.*



8. Remove the protective film.

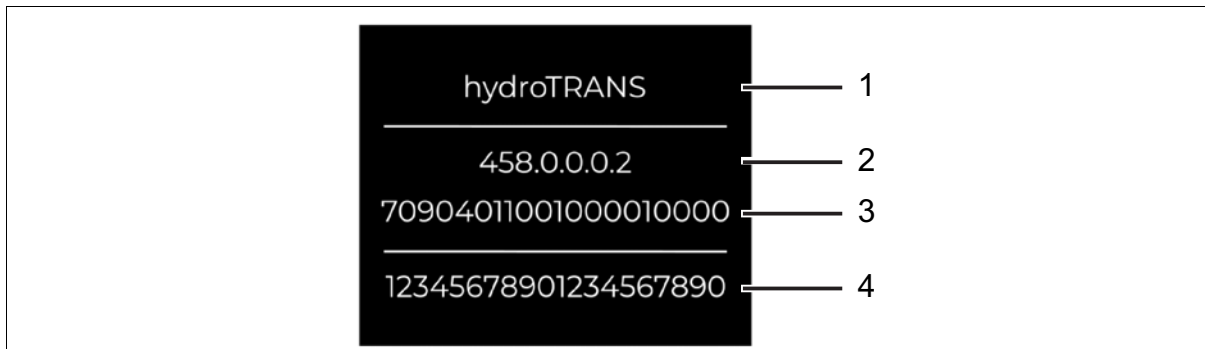
*The device is ready for operation as soon as the voltage supply is established.*

## 7 Operation

### 7.1 Display elements

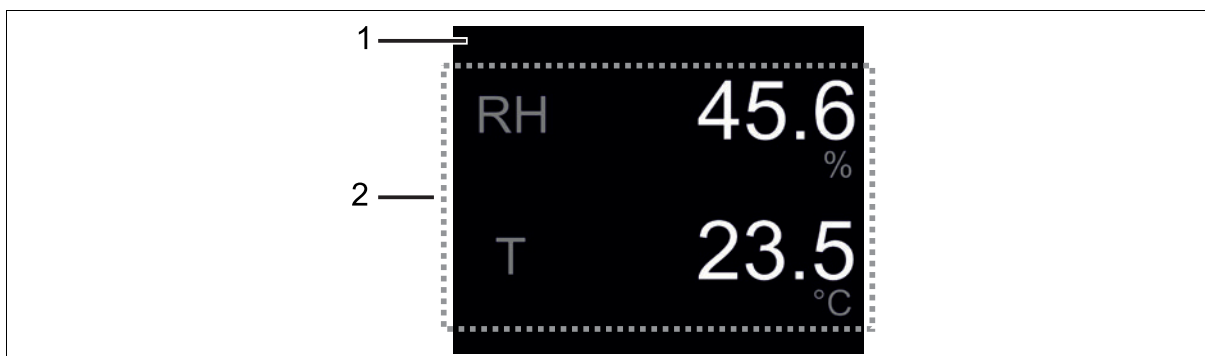
#### 7.1.1 Startup display

The startup display appears as soon as the voltage supply to the device is established. The startup display switches to the process value display after approximately five seconds.



| Pos. | Designation     | Description                        |
|------|-----------------|------------------------------------|
| 1    | Startup display | Shows the device name.             |
| 2    |                 | Shows the device software version. |
| 3    |                 | Shows the device hardware version. |
| 4    |                 | Shows the device TAG number.       |

#### 7.1.2 Process display



| Pos. | Designation           | Description                                                                                                                                                                           |
|------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Process display       | Shows the following values and messages: <ul style="list-style-type: none"><li>• Up to three process values</li><li>• Error messages</li></ul>                                        |
| 2    | Process value display | Shows the following values: <ul style="list-style-type: none"><li>• The formula symbol</li><li>• The process value (measured or calculated value)</li><li>• The system unit</li></ul> |

## 8 Setup program

The setup program is used to configure the devices. The free 30-day test version is available for download on the manufacturer's [product website](#).

The configuration data that is created can be saved in a file and transferred between the device and set-up program.

The data is transferred serially via the USB interface. The USB interface must have a 500-mA host.

### Connection of the USB interface

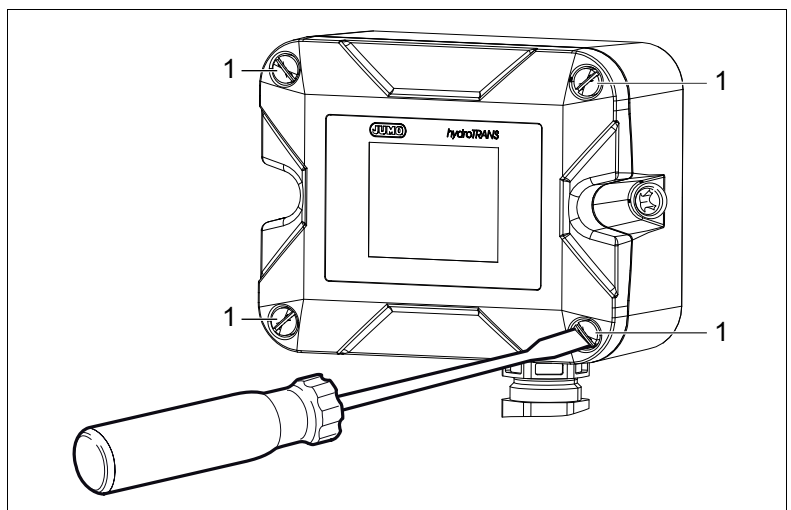
|          |                                        |
|----------|----------------------------------------|
| Aids     | Slotted screwdriver                    |
| Material | USB cable, connector type A to Micro-B |

Requirements:

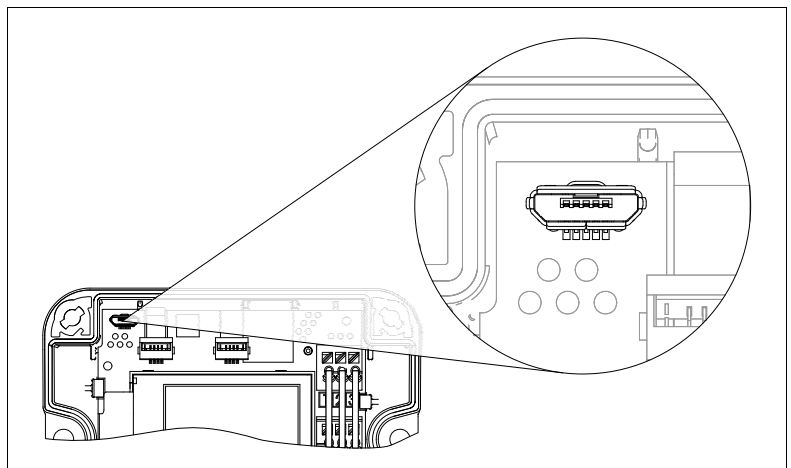
- The system has been de-energized and secured against being switched on again.

Procedure:

1. Loosen the quick-release screws (1).
2. Remove the housing front and place it down, taking care to protect it from pollutants.



3. Connect the USB cable to the USB port and connect it to the end device.
4. Start the setup program and configure the relevant settings.
5. Remove the USB cable once the data transfer is complete.



6. Place the housing front on the housing rear. Lock the quick-release screws with a quarter turn.  
*The housing is tightly sealed.*

## 9 Configuration

The default settings are shown in **bold** in the following tables.

### 9.1 File info

In the **File info** menu you can enter information about the configuration file.

### 9.2 Device version

The **Device version** menu provides an overview of the device hardware installed.

### 9.3 System data

| Parameter                                                                                       | Value                                      | Description                                                              |
|-------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------|
| Language                                                                                        | <b>German</b> , English, French, Spanish   | National language for the device texts of the process display.           |
| Temperature                                                                                     | <b>°C</b> , °F                             | System units of the process values shown in the process value display.   |
| Absolute humidity                                                                               | <b>g/m<sup>3</sup></b> , g/ft <sup>3</sup> |                                                                          |
| Mixing ratio                                                                                    | <b>g/kg</b> , gr/lb                        |                                                                          |
| Partial water vapor pressure                                                                    | <b>mbar</b> , psi                          |                                                                          |
| Specific enthalpy                                                                               | <b>kJ/kg</b> , BTU/lb                      |                                                                          |
| TAG number                                                                                      | –                                          | For categorization purposes, e.g. to identify the installation location. |
| Altitude<br> | <b>0 m</b>                                 | Refers to standard elevation zero (NHN).                                 |

#### Altitude

The parameter is used to calculate the ambient pressure based on the barometric formula and affects the calculation of the CO<sub>2</sub> concentration, mixing ratio, and specific enthalpy.

### 9.4 Display

#### Value 1st, 2nd, 3rd line > Analog selector

| Parameter         | Value                                                                                                                                                          | Description                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| No selection      | –                                                                                                                                                              | The process value is not shown.              |
| Measured values   | Relative humidity (RH), Temperature (T), Carbon dioxide (CO <sub>2</sub> )                                                                                     | Process values                               |
| Calculated values | Dew point (Td), Mixing ratio (x), Absolute humidity (a), Specific enthalpy (h), Wet-bulb temperature (Tw), Frost point (Tf), Partial water vapor pressure (Pw) | Process values                               |
| Brightness        | 0 to 10 ( <b>5</b> )                                                                                                                                           | Brightness of the process display backlight. |

### 9.5 Measurand correction

| Parameter         | Value                              | Description |
|-------------------|------------------------------------|-------------|
| Relative humidity | Offset                             | –           |
| Temperature       | Offset                             | –           |
| Carbon dioxide    | Offset, Automatic self-calibration | –           |

#### Relative humidity

| Parameter | Value                                    | Description                                                   |
|-----------|------------------------------------------|---------------------------------------------------------------|
| Offset    | Input range:<br>-15 to 15 % <b>(0.0)</b> | Process value correction, also affects the calculated values. |

#### Temperature

| Parameter | Value                                     | Description                                                   |
|-----------|-------------------------------------------|---------------------------------------------------------------|
| Offset    | Input range:<br>-15 to 15 °C <b>(0.0)</b> | Process value correction, also affects the calculated values. |

#### Carbon dioxide

| Parameter                                                                                                      | Value                                       | Description                                                   |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------|
| Offset                                                                                                         | Input range:<br>-500 to +500 ppm <b>(0)</b> | Process value correction, also affects the calculated values. |
|  Automatic self-calibration | <b>Active</b> , inactive                    | –                                                             |

##### Automatic self-calibration

Long-term accuracy is guaranteed if the CO<sub>2</sub> sensor is exposed to fresh air with an atmospheric CO<sub>2</sub> concentration of 400 ppm at least once a week.

If the application does not allow this:

- Set automatic self-calibration to inactive.
- Correct the offset manually.

## 9 Configuration

### 9.6 Analog outputs

Analog output 1/2/3 > Source > Analog selector

| Parameter         | Value                                                                                                                                                          | Description     |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| No selection      | –                                                                                                                                                              | Analog output 3 |
| Measured values   | <b>Relative humidity (RH)</b>                                                                                                                                  | Analog output 1 |
|                   | <b>Temperature (T)</b>                                                                                                                                         | Analog output 2 |
|                   | Carbon dioxide (CO <sub>2</sub> )                                                                                                                              | –               |
| Calculated values | Dew point (Td), Mixing ratio (x), Absolute humidity (a), Specific enthalpy (h), Wet-bulb temperature (Tw), Frost point (Tf), Partial water vapor pressure (Pw) | –               |

Analog output 1/2/3 > Source > Analog selector > Measured values > Relative humidity (RH)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | –           |
| Scale start       | Input range:<br>-99999 to 99999 % ( <b>0</b> )         | –           |
| Scale end         | Input range:<br>-99999 to 99999 % ( <b>100</b> )       | –           |
| Response at error | <b>Replacement value</b> , High, Low                   | –           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | –           |

Analog output 1/2/3 > Source > Analog selector > Measured values > Temperature (T)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | –           |
| Scale start       | Input range:<br>-99999 to 99999 °C ( <b>-40</b> )      | –           |
| Scale end         | Input range:<br>-99999 to 99999 °C ( <b>80</b> )       | –           |
| Response at error | <b>Replacement value</b> , High, Low                   | –           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | –           |

Analog output 1/2/3 > Source > Analog selector > Measured values > Carbon dioxide (CO<sub>2</sub>)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | –           |
| Scale start       | Input range:<br>-99999 to 99999 ppm ( <b>400</b> )     | –           |
| Scale end         | Input range:<br>-99999 to 99999 ppm ( <b>5000</b> )    | –           |
| Response at error | <b>Replacement value</b> , High, Low                   | –           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | –           |

## 9 Configuration

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Dew point (Td)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 °C ( <b>-40</b> )      | —           |
| Scale end         | Input range:<br>-99999 to 99999 °C ( <b>60</b> )       | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Mixing ratio (x)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 g/kg ( <b>0</b> )      | —           |
| Scale end         | Input range:<br>-99999 to 99999 g/kg ( <b>160</b> )    | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Absolute humidity (a)

| Parameter         | Value                                                           | Description |
|-------------------|-----------------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                                   | —           |
| Scale start       | Input range:<br>-99999 to 99999 g/m <sup>3</sup> ( <b>0</b> )   | —           |
| Scale end         | Input range:<br>-99999 to 99999 g/m <sup>3</sup> ( <b>150</b> ) | —           |
| Response at error | <b>Replacement value</b> , High, Low                            | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V          | —           |

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Specific enthalpy (h)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 kJ/kg ( <b>-40</b> )   | —           |
| Scale end         | Input range:<br>-99999 to 99999 kJ/kg ( <b>500</b> )   | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

## 9 Configuration

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### Analog output 1/2/3 > Source > Analog selector > Calculated values > Wet-bulb temperature (Tw)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 °C ( <b>0</b> )        | —           |
| Scale end         | Input range:<br>-99999 to 99999 °C ( <b>60</b> )       | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Frost point (Tf)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 °C ( <b>-40</b> )      | —           |
| Scale end         | Input range:<br>-99999 to 99999 °C ( <b>0</b> )        | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

### Analog output 1/2/3 > Source > Analog selector > Calculated values > Partial water vapor pressure (Pw)

| Parameter         | Value                                                  | Description |
|-------------------|--------------------------------------------------------|-------------|
| Signal type       | <b>4 to 20 mA</b> , 0 to 10 V                          | —           |
| Scale start       | Input range:<br>-99999 to 99999 mbar ( <b>0</b> )      | —           |
| Scale end         | Input range:<br>-99999 to 99999 mbar ( <b>200</b> )    | —           |
| Response at error | <b>Replacement value</b> , High, Low                   | —           |
| Replacement value | Input range:<br>3.4 to 22 mA ( <b>3.4</b> ), 0 to 11 V | —           |

### 9.7 Serial interface

| Parameter             | Value                                         | Description |
|-----------------------|-----------------------------------------------|-------------|
| Baud rate             | 9600, 19200, <b>38400</b> , 57600, 115200     | —           |
| Data format           | <b>8-1-none</b> , 8-1-odd, 8-1-even, 8-2-none | —           |
| Minimum response time | 0 to 500 ms ( <b>0</b> )                      | —           |

#### Modbus slave

| Parameter                    | Value                                      | Description                                                              |
|------------------------------|--------------------------------------------|--------------------------------------------------------------------------|
| Device address               | Input range: 1 to 254 ( <b>1</b> )         | —                                                                        |
| Temperature                  | °C, °F                                     | System units of the process values transferred via the Modbus interface. |
| Absolute humidity            | <b>g/m<sup>3</sup></b> , g/ft <sup>3</sup> |                                                                          |
| Mixing ratio                 | <b>g/kg</b> , gr/lb                        |                                                                          |
| Partial water vapor pressure | <b>mbar</b> , psi                          |                                                                          |
| Specific enthalpy            | <b>kJ/kg</b> , BTU/lb                      |                                                                          |

### 9.8 Online parameters

This function requires an active connection between the setup program and device.

| Parameter             | Description                                                          |
|-----------------------|----------------------------------------------------------------------|
| Hardware/software     | Version of the device hardware and software                          |
| Measurands            | Test of sensor functions                                             |
| Display               | Test of color reproduction                                           |
| Calibration constants | Calibration constants of analog outputs                              |
| Analog outputs        | Test of analog outputs<br>Measure the signal at the relevant output. |

# 10 Modbus address tables

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## Transmission

All data types are transmitted in big-endian format according to Modbus standard.

## Access types

RO = Read-Only (read-only access)  
RW = Read/Write (read and write access)  
WO = Write-Only (write-only access)

## Limited write cycles

The numbers of write cycles of memory modules (e.g. EEPROM, flash memory) are limited.

- Do not send write operations to save or commit actions on a non-cyclical basis.

## 10.1 Version and fabrication number

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                    | Coding |
|--------------------|--------|-----------|----------------------------|--------|-------------------------|--------|
| Dec.               | Hex    |           |                            |        |                         |        |
| 21                 | 0x0015 | String    | 19                         | RO     | Software version number | –      |
| 54                 | 0x0036 | String    | 11                         | RO     | Hardware version number | –      |
| 94                 | 0x005E | String    | 10                         | RO     | Fabrication number      | –      |

## 10.2 Configuration

### 10.2.1 System data

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                       | Coding                                 |
|--------------------|--------|-----------|----------------------------|--------|----------------------------|----------------------------------------|
| Dec.               | Hex    |           |                            |        |                            |                                        |
| 1000               | 0x03E8 | Selection | 1                          | RW     | Language                   | German<br>English<br>French<br>Spanish |
| 1001               | 0x03E9 | Selection | 1                          | RW     | Temperature                | °C<br>°F                               |
| 1002               | 0x03EA | Selection | 1                          | RW     | Absolute humidity          | g/m³<br>g/ft³                          |
| 1003               | 0x03EB | Selection | 1                          | RW     | Mixing ration              | g/kg<br>g/lbs                          |
| 1004               | 0x03EC | Selection | 1                          | RW     | Pressure                   | mbar<br>psi<br>bar                     |
| 1005               | 003ED  | Selection | 1                          | RW     | Enthalpy                   | kJ/kg<br>BTU/lbs                       |
| 1006               | 0x03EE | String    | 10                         | RW     | Measuring point identifier | –                                      |
| 1016               | 0x03F8 | Integer   | 2                          | RW     | Altitude                   | 0 to 3.000 m                           |

# 10 Modbus address tables

## 10.2.2 Display

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data           | Coding  |
|--------------------|--------|-----------|----------------------------|--------|----------------|---------|
| Dec.               | Hex    |           |                            |        |                |         |
| 1100               | 0x044C | Selector  | 6                          | RW     | Value 1st line | –       |
| 1106               | 0x0452 | Selector  | 6                          | RW     | Value 2nd line | –       |
| 1112               | 0x0458 | Selector  | 6                          | RW     | Value 3rd line | –       |
| 1118               | 0x045E | Integer   | 2                          | RW     | Brightness     | 0 to 10 |

## 10.2.3 Measurand correction

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                       | Coding                       |
|--------------------|--------|-----------|----------------------------|--------|----------------------------|------------------------------|
| Dec.               | Hex    |           |                            |        |                            |                              |
| 1200               | 0x04B0 | Float     | 2                          | RW     | Offset Temperature         | -15 to 15 °C<br>-27 to 27 °F |
| 1202               | 0x04B2 | Float     | 2                          | RW     | Offset Relative humidity   | -15 to 15 %                  |
| 1204               | 0x04B4 | Float     | 2                          | RW     | Offset Carbon dioxide      | -500 to 500 ppm              |
| 1206               | 0x04B6 | Selection | 1                          | RW     | Automatic self-calibration | Off<br>On                    |

## 10.2.4 Serial interface

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data              | Coding                                |
|--------------------|--------|-----------|----------------------------|--------|-------------------|---------------------------------------|
| Dec.               | Hex    |           |                            |        |                   |                                       |
| 1500               | 0x05DC | Selection | 1                          | RW     | Baud rate         | 9k6<br>19k2<br>38k4<br>57k6<br>115k2  |
| 1501               | 0x05DD | Selection | 1                          | RW     | Data format       | 8N1<br>8O1<br>8E1<br>8N2              |
| 1502               | 0x05DE | Integer   | 2                          | RW     | Device address    | 1 to 254                              |
| 1504               | 0x05E0 | Selection | 1                          | RW     | Temperature       | °C<br>°F                              |
| 1505               | 0x05E1 | Selection | 1                          | RW     | Absolute humidity | g/m <sup>3</sup><br>g/ft <sup>3</sup> |
| 1506               | 0x05E2 | Selection | 1                          | RW     | Mixing ration     | g/kg<br>gr/lbs                        |
| 1507               | 0x05E3 | Selection | 1                          | RW     | Pressure          | mbar<br>psi<br>bar                    |
| 1508               | 0x05E4 | Selection | 1                          | RW     | Enthalpy          | kJ/kg<br>BTU/lbs                      |

# 10 Modbus address tables

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                  | Coding   |
|--------------------|--------|-----------|----------------------------|--------|-----------------------|----------|
| Dec.               | Hex    |           |                            |        |                       |          |
| 1509               | 0x05E5 | Integer   | 2                          | RW     | Minimum response time | 0 to 500 |

## 10.2.5 Analog inputs

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data           | Coding |
|--------------------|--------|-----------|----------------------------|--------|----------------|--------|
| Dec.               | Hex    |           |                            |        |                |        |
| 6000               | 0x1770 | Float     | 2                          | RO     | Humidity       | –      |
| 6002               | 0x1772 | Float     | 2                          | RO     | Temperature    | –      |
| 6004               | 0x1774 | Float     | 2                          | RO     | Carbon dioxide | –      |

## 10.2.6 Calculated values

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                         | Coding |
|--------------------|--------|-----------|----------------------------|--------|------------------------------|--------|
| Dec.               | Hex    |           |                            |        |                              |        |
| 6006               | 0x1776 | Float     | 2                          | RO     | Dew point                    | –      |
| 6008               | 0x1778 | Float     | 2                          | RO     | Mixing ration                | –      |
| 6010               | 0x177A | Float     | 2                          | RO     | Absolute humidity            | –      |
| 6012               | 0x177C | Float     | 2                          | RO     | Specific enthalpy            | –      |
| 6014               | 0x177E | Float     | 2                          | RO     | Wet-bulb temperature         | –      |
| 6016               | 0x1780 | Float     | 2                          | RO     | Frost point                  | –      |
| 6018               | 0x1782 | Float     | 2                          | RO     | Partial water vapor pressure | –      |

## 10.2.7 Error messages Modbus

| Modbus PDU address |        | Data type | Number of Modbus registers | Access | Data                    | Coding |
|--------------------|--------|-----------|----------------------------|--------|-------------------------|--------|
| Dec.               | Hex    |           |                            |        |                         |        |
| 6400               | 0x1900 | Boolean   | 1                          | RO     | General error           | –      |
| 6401               | 0x1901 | Boolean   | 1                          | RO     | Configuration faulty    | –      |
| 6402               | 0x1902 | Boolean   | 1                          | RO     | Calibration faulty      | –      |
| 6403               | 0x1903 | Boolean   | 1                          | RO     | Device not calibrated   | –      |
| 6404               | 0x1904 | Boolean   | 1                          | RO     | Humidity sensor faulty  | –      |
| 6405               | 0x1905 | Boolean   | 1                          | RO     | CO2 sensor faulty       | –      |
| 6450               | 0x1932 | Boolean   | 1                          | RO     | Device restart required | –      |

### Error messages for invalid values

For measured values in the floating-point format, the error is displayed in the value itself, i.e. it contains the error code instead of the measured value.

| Error message        | Possible cause            |
|----------------------|---------------------------|
| $1.0 \times 10^{37}$ | Measuring range underflow |
| $2.0 \times 10^{37}$ | Measuring range overflow  |
| $3.0 \times 10^{37}$ | Value invalid             |

## 11.1 Process value error

With error messages in line with the NAMUR classification NE 107, process value errors are supplemented by symbols and a two-line message (alternating with the process display).

| Error message | Possible cause                                       | Remedy                                              |
|---------------|------------------------------------------------------|-----------------------------------------------------|
| <<<<<         | The measuring range was undershot.                   | Operate the device within the device specification. |
| >>>>>         | The measuring range was exceeded.                    |                                                     |
| -----         | No valid input value<br>Incorrect mathematical value |                                                     |

## 11.2 Error messages in line with NAMUR

Error messages in line with NAMUR classification NE 107 are displayed by symbols and a two-line message (alternating with the process display).

| Symbol                                                                            | Designation   |
|-----------------------------------------------------------------------------------|---------------|
|  | Error/failure |

| Error message                | Possible cause                                          | Remedy                                               |
|------------------------------|---------------------------------------------------------|------------------------------------------------------|
| Configuration faulty         | The checksum of the configuration data is faulty (CRC). | Transfer the configuration data to the device again. |
| Calibration data faulty      | The checksum of the calibration data is faulty (CRC).   | Contact the manufacturer.                            |
| Device not calibrated        | The calibration flag has not been set.                  |                                                      |
|                              | There is no calibration data.                           |                                                      |
| Humidity/temperature invalid | The humidity and temperature sensor is faulty.          |                                                      |
|                              | The communication to the sensor is impaired.            |                                                      |
| CO <sub>2</sub> invalid      | The CO <sub>2</sub> sensor is faulty.                   |                                                      |
|                              | The communication to the sensor is impaired.            |                                                      |

# 12 Maintenance and cleaning

## 12.1 Replacing filter cap

|          |                                                  |
|----------|--------------------------------------------------|
| Material | Plastic membrane filter or plastic sinter filter |
|----------|--------------------------------------------------|

Requirements:

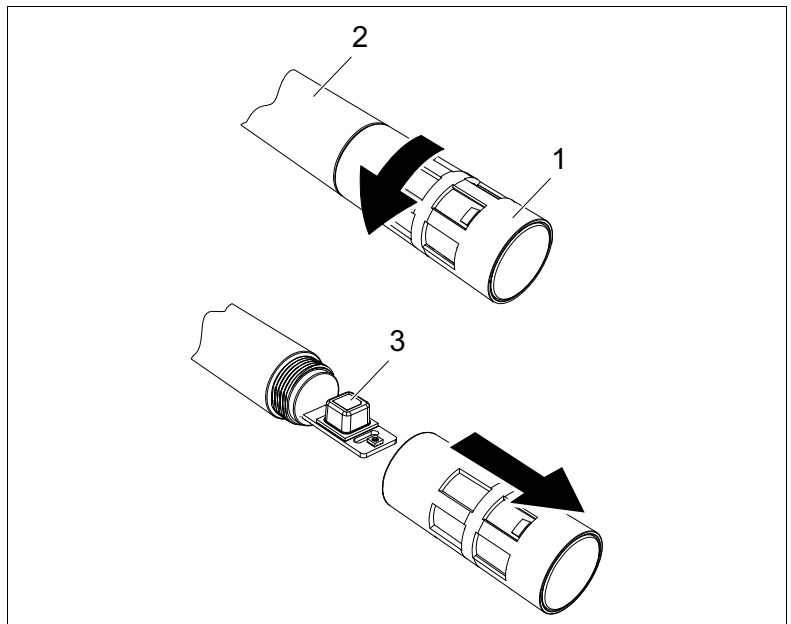
- The system has been de-energized and secured against being switched on again.
- A clean and dry storage location has been prepared.

Procedure:

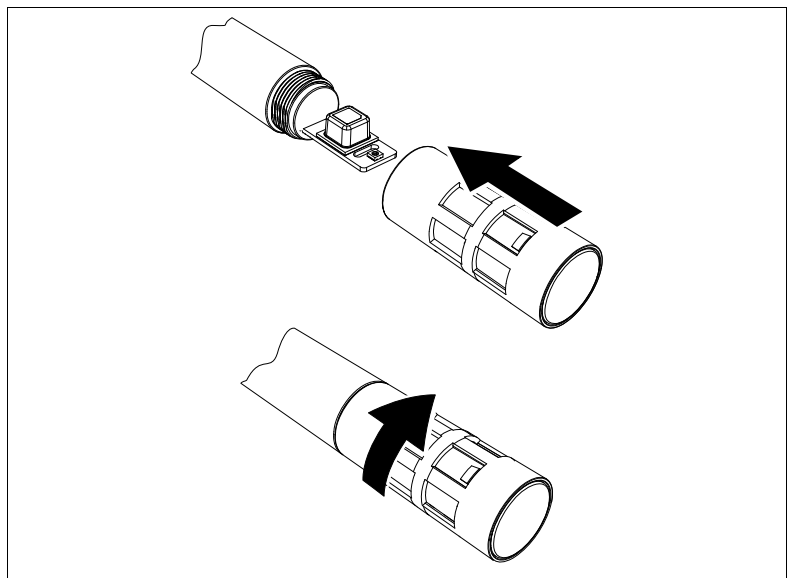
1. **CAUTION! Exposed sensor board (3). Destruction of the device electronics possible**

- Do not touch the sensor board.

Manually loosen the filter cap (1) and remove from the housing (2).



2. Guide the new filter cap over the sensor board and manually screw onto the housing.



## 12.2 Cleaning

Clean the device with a cloth dampened with water.

## 13.1 Dismounting

|      |             |
|------|-------------|
| Aids | Screwdriver |
|------|-------------|

Requirements:

- The system has been de-energized and secured against being switched on again.

Procedure:

1. Loosen the quick-release screws on the housing front.
2. Remove the housing front and place it down, taking care to protect it from pollutants.
3. Disconnect the electrical connection.
4. Loosen the fastening screws on the housing rear.
5. Remove the housing rear.

## 13.2 Returns

Procedure:

1. The [supplementary sheet for product returns](#) must first be completed correctly and signed. Then enclose it with the shipping documents and attach it to the packaging, ideally on the outside.
2. Use the original packaging or a suitably secure container for sending the device.

## 13.3 Disposal



- Do not dispose of the device or replaced parts in the trash after use.
- Delete programs and data stored on the device.
- Remove batteries, if any, if this can be done without damaging the device.
- Dispose of the device and the packaging material in a responsible and environmentally friendly manner.
- Observe the country-specific laws and regulations for waste treatment and disposal.

In accordance with Directive 2012/19/EU on Waste from Electrical and Electronic Equipment, manufacturers are obliged to offer the option of returning waste equipment. Request the return from the manufacturer.

## 14 Accessories

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### Without UL approval

| Designation                         | Part no. |
|-------------------------------------|----------|
| USB cable, A to Micro-B             | 00616250 |
| Plastic sinter filter (Ø = 18 mm)   | 00754581 |
| Plastic membrane filter (Ø = 18 mm) | 30048149 |
| JUMO hydroTRANS setup program       | 00775170 |

## 15 Open-source software

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The device software and/or device components were developed using open-source software.

Insofar as the respectively applicable license terms justify a claim on the provision of source code or other information, JUMO GmbH & Co. KG will provide the source code and the license texts on a conventional data carrier at the cost incurred for the provision of the data carrier.

This offer is valid for three years after the software is made available. This offer is valid beyond that time to the extent specified in the license terms.

For questions related to open-source software, please contact:

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**Email** [licensecompliance@jumo.net](mailto:licensecompliance@jumo.net)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |           |           |           |                 |               |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                   | 产品中有害物质的名称及含量<br>China EEP Hazardous Substances Information |           |           |           |                 |               |                 |
| 产品组别<br>Product group: 907042                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |           |           |           |                 |               |                 |
| 部件名称<br>JUMO hydro Trans S20                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 外壳<br>Housing<br>(Gehäuse)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | ○         | ○         | ○         | ○               | ○             | ○               |
| 螺栓<br>Screw<br>(Schraube)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             | ○         | ×         | ○         | ○               | ○             | ○               |
| 印刷电路组件<br>printed circuit assemblies<br>(Leiterplattenbestandteile)                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | ○         | ×         | ○         | ○               | ○             | ○               |
| <p>本表格依据SJ/T 11364的规定编制。</p> <p>This table is prepared in accordance with the provisions SJ/T 11364.</p> <p>○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。</p> <p>Indicate the hazardous substances in all homogeneous materials for the part are below the limit of the GB/T 26572.</p> <p>×</p> <p>×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。</p> <p>Indicate the hazardous substances in at least one homogeneous material of the part exceed the limit of the GB/T 26572.</p> |                                                             |           |           |           |                 |               |                 |





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