JUMO hydroTRANS S30

Humidity and temperature transmitter with optional CO_2 module, duct version

Modbus

Operating Manual

JUMO

90704300T90Z001K000

V2.00/EN/00767190/2024-07-01

Further information and downloads

qr-907043-en.jumo.info

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1 About this documentation

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.

1.3 Definition of terms

Use in the documentation	Definition
Device, product	Humidity and temperature transmitter
CO_2 module, CO_2 sensor	Carbon dioxide (CO_2) 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.

2.1 Intended use

The humidity and temperature transmitter monitors outside air that enters into buildings and production processes.

The device is suitable for mounting in weather-proofed ventilation ducts.

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

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.

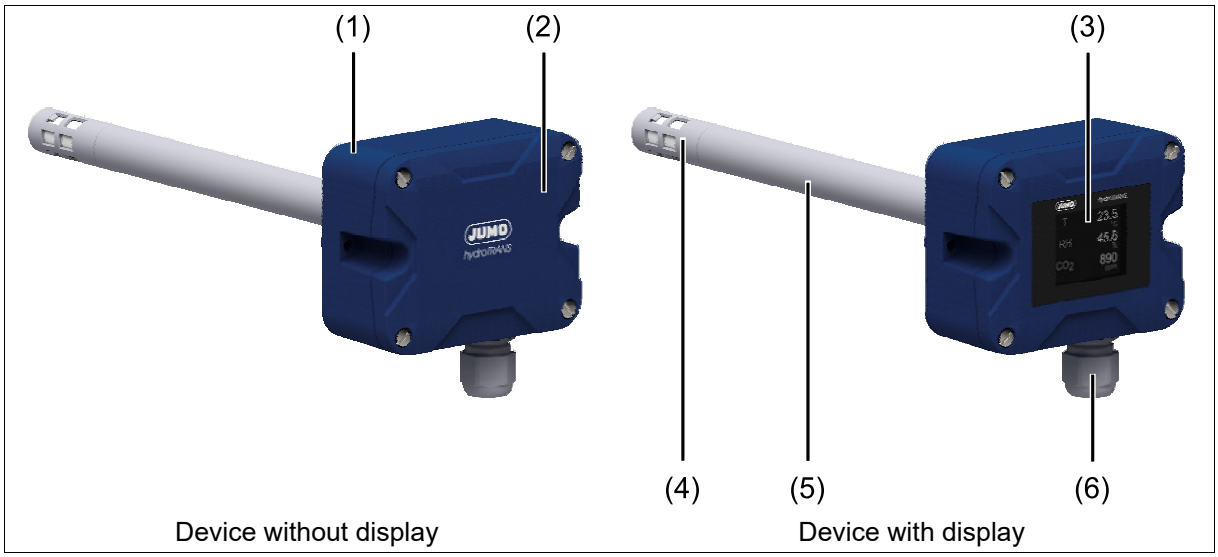
2.3 Transport and storage damage

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.

3 Description

3.1 Structure



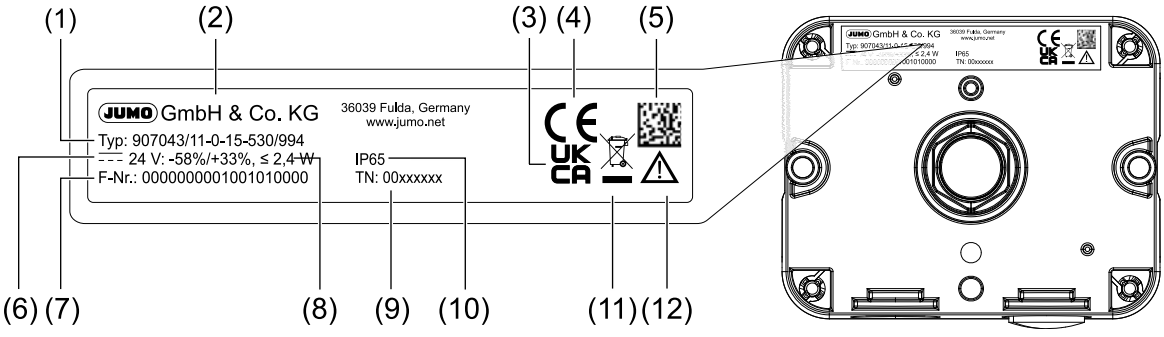
1	Housing rear	4	Filter cap
2	Housing front	5	Probe
3	Display (TFT display)	6	Cable fitting

3.2 Function

Measurand	**Function principle**
Relative humidity	Capacitive measurement technology
Temperature	Semiconductor measurement technology
Carbon dioxide (CO_2)	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



Housing rear
(Rear view)

1	Order code	7	Fabrication number
2	Manufacturer and address	8	Power consumption
3	UKCA identification marking	9	Part no.
4	CE identification marking	10	Protection type according to DIN EN 60529
5	Data Matrix code	11	Disposal
6	Voltage supply	12	Observe device documentation!

3.4 Scope of delivery

Device in the ordered version
Operating manual
Cable fitting
Thread sealing ring
Connecting flange
Rubber seal, self-adhesive
2 Fastening screws (socket button self-tapping screw 4.8 × 38)
4 socket button self-tapping screws 3.5 × 13

4 Technical data

4.1 Electrical safety

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

4.2 Electrical data

Device 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	
Conductor cross section	AWG 28 to AWG 14
Without ferrule	0.2 to 1.5 mm^2
With ferrule	0.25 to 1.5 mm^2
Stripping length	
Without ferrule	8 mm
With ferrule	10 mm
Temperature resistance	≥ 80 °C

Device 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	
Conductor cross section	AWG 28 to AWG 14
Without ferrule	0.2 to 1.5 mm^2
With ferrule	0.25 to 1.5 mm^2
Stripping length	
Without ferrule	8 mm
With ferrule	10 mm
Temperature resistance	≥ 80 °C

4.3 Inputs

4.3.1 Measurands

Relative humidity

Measuring range	0 to 100 % RH
With CO_2 module	0 to 95 % RH
Accuracy	
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_2 module	-10 to +60 °C
Accuracy	
Typical	±0.2 °C
Max.	±0.4 °C
Sampling rate	1 s

Carbon dioxide (CO_2)

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 Technical data

4.4 Outputs

Device with analog output

Current output	
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	
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[a] 8-1-odd 8-1-even 8-2-none
Data transfer rate	9600 baud 19200 baud 38400 baud[a] 57600 baud 115200 baud
Minimum response time	0 to 500 ms
Device address	1 to 254

[a] 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)

4.7 Environmental influences

Admissible ambient temperature	-40 to +80 °C
With CO_2 module	-10 to +60 °C
With display	-20 to +60 °C
Admissible storage temperature	-40 to +80 °C
With CO_2 module	-30 to +70 °C
With display	-30 to +60 °C
Protection type	DIN EN 60529 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_2 module), non-condensing
Electromagnetic compatibility (EMC)	DIN EN IEC 61326-2-3:2022
Interference emission	Class B[a]
Interference immunity	Industrial requirement
Oscillation[b]	DIN EN 60068-2-6
Amplitude	0.15 mm at 10 to 58.1 Hz
Acceleration	20 m/s^2 at 58.1 to 150 Hz
Shock[b]	DIN EN 60068-2-27
Peak acceleration	150 m/s^2
Shock duration	11 ms

[a] The product is suitable for industrial use as well as for households and small businesses.

[b] The CO_2 module is sensitive to vibrations. In the event of vibrations, the measurement results could change on account of the design.

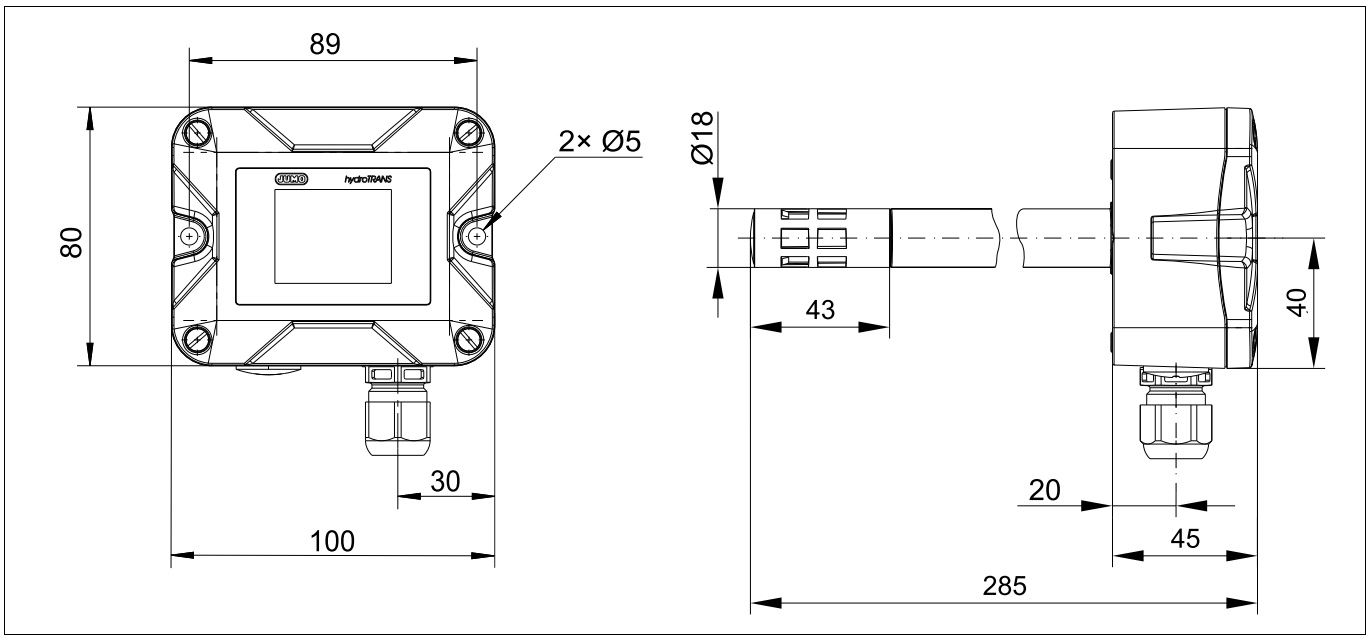
4 Technical data

4.8 Mechanical features

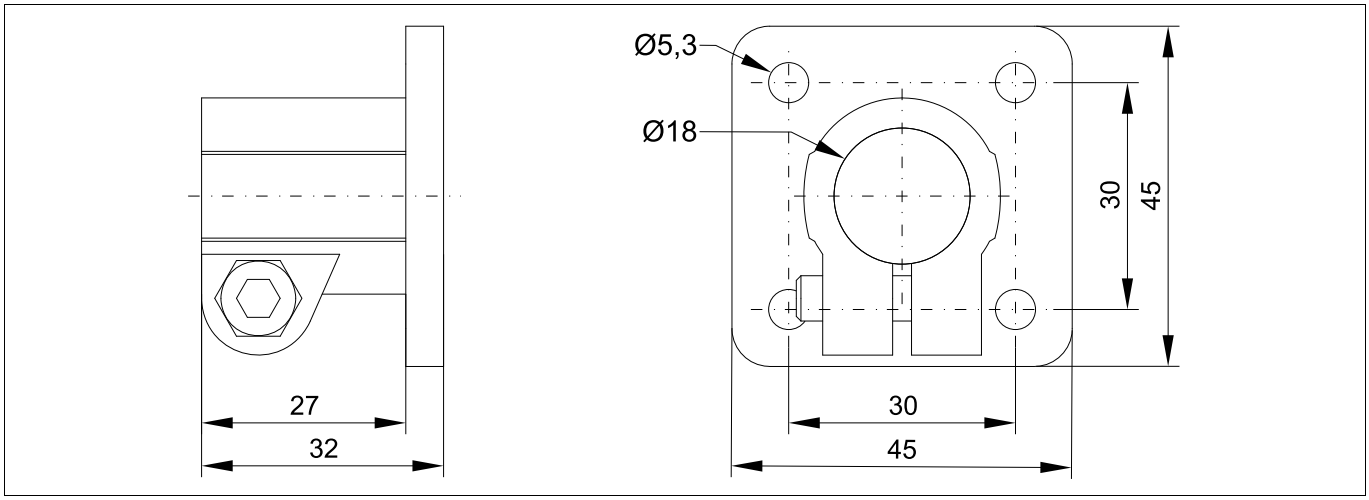
Materials	
Housing	PC
Display cover	PMMA
Weight	Approx. 260 g

4.9 Dimensions

Device



Connecting flange

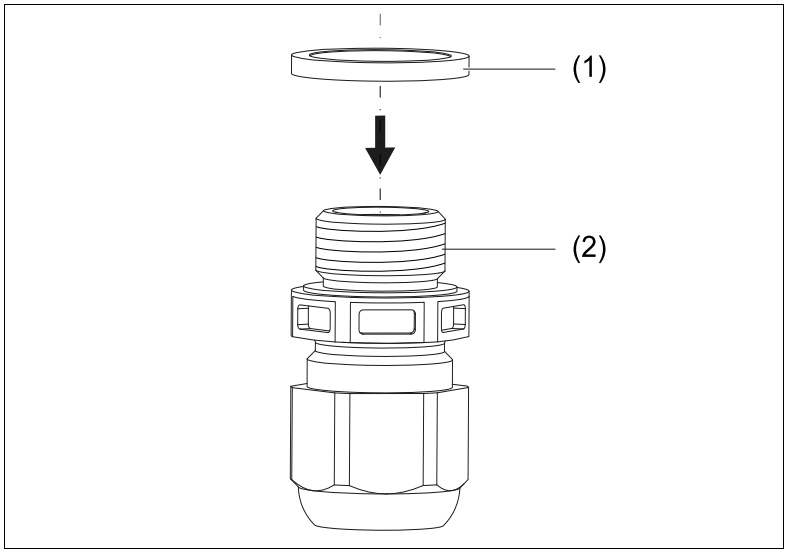


5.1 Mount cable fitting

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

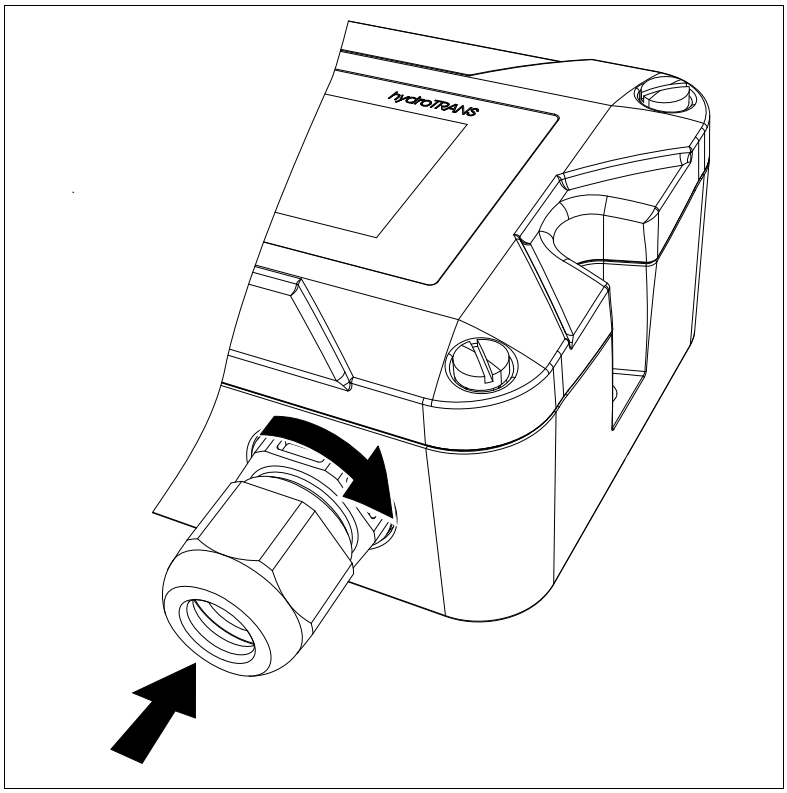
Procedure:

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 Mounting

5.2 Mount device without connecting flange

Aids	Cross-headed screwdriver
Material	Rubber seal, self-adhesive
	2 socket button self-tapping screws 4.8 × 38

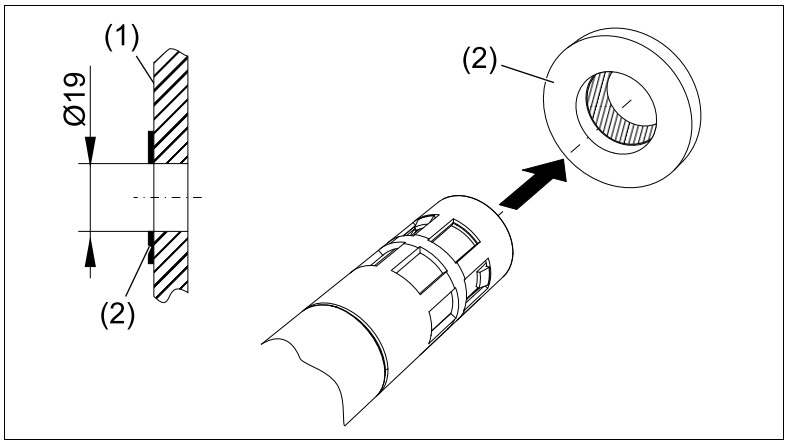
Requirements:

- The mounting hole is drilled into the duct wall.

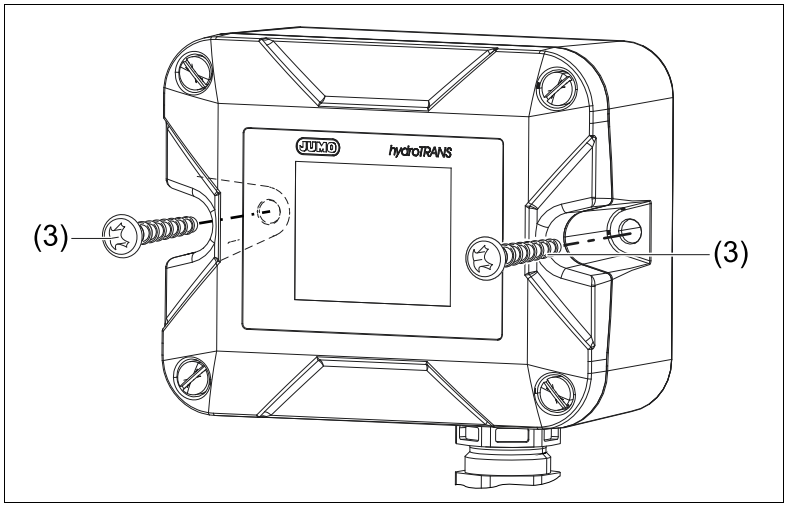
Procedure:

1. Glue the rubber seal (2) to the duct wall (1) centered in front of the mounting hole.

2. Insert the probe into the mounting hole.



3. Mount the device to the duct wall using the socket button self-tapping screws (3).



Electrical connection: ⇨ Seite 19

5.3 Mount device with connecting flange

Aids	Cross-headed screwdriver
	Hex key wrench size 5
Material	Connecting flange
	Rubber seal, self-adhesive
	4 socket button self-tapping screws 3.5 × 13

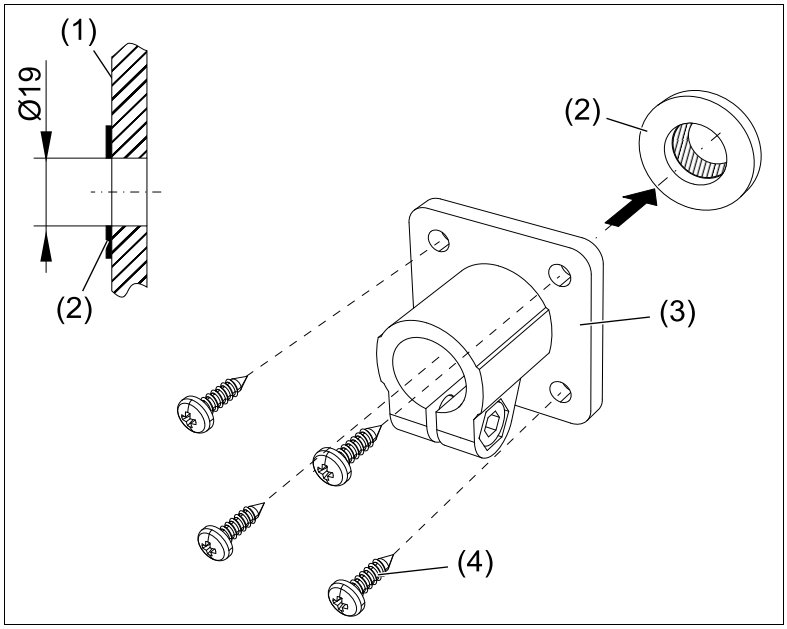
Requirements:

- The mounting hole is drilled into the duct wall.

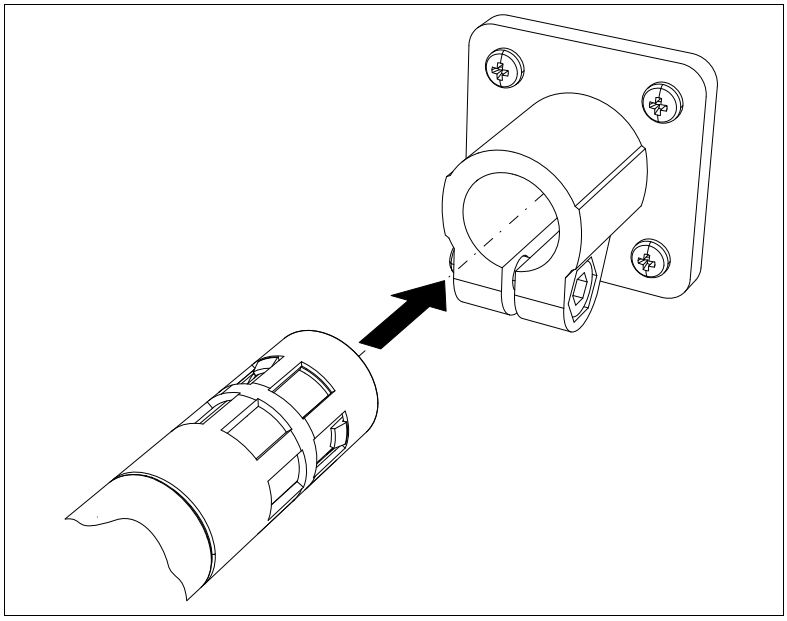
Procedure:

1. Glue the rubber seal (2) to the duct wall (1) centered in front of the mounting hole.

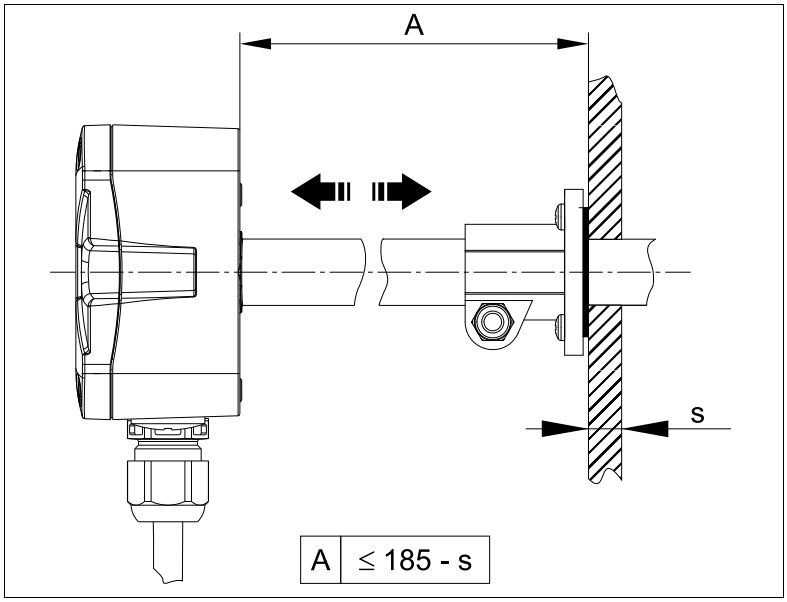
2. Attach the connecting flange (3) centered in front of the mounting hole using the socket button self-tapping screws (4).



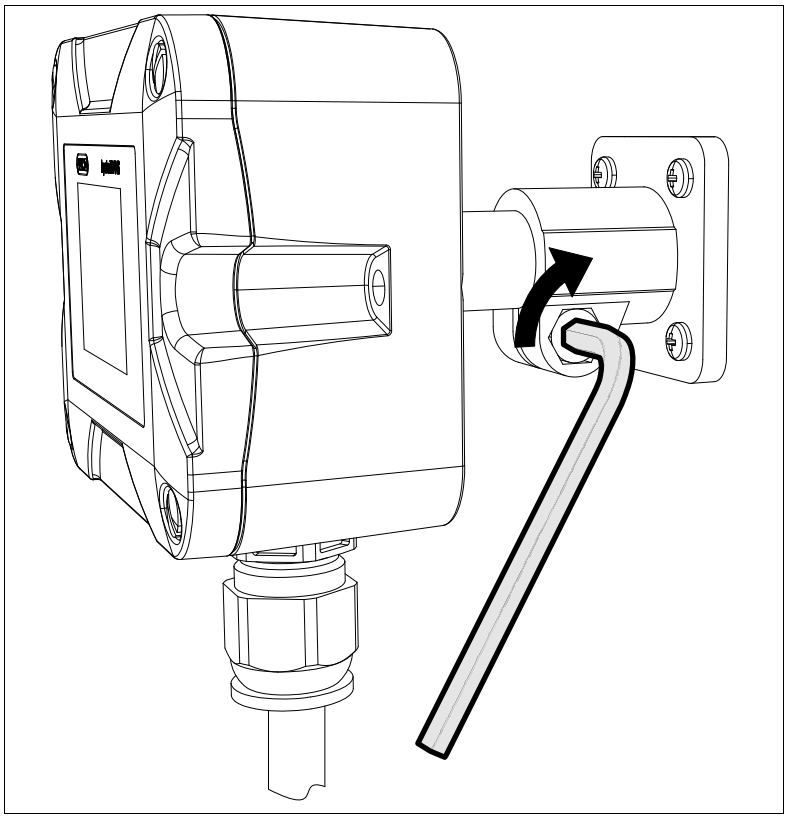
3. Insert the probe into the connecting flange.



4. Align the probe. In doing so, bear in mind the insertion depth A depending on the wall thickness s.

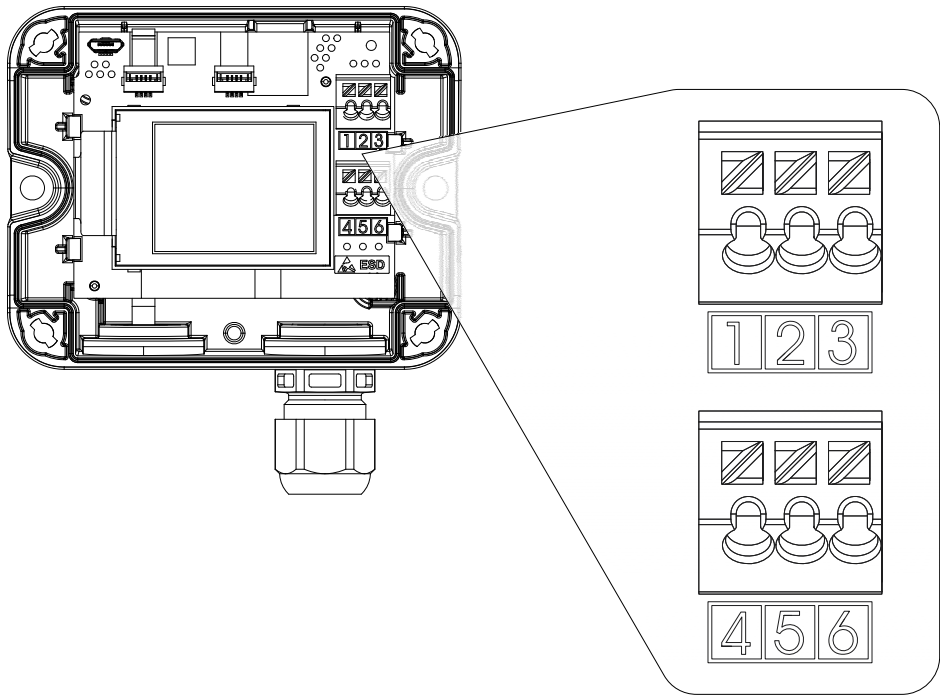


5. Fix the position of the probe using the clamping screw.



Electrical connection: ⇨ Page 19

6.1 Connection elements



Housing rear (front view)

Spring-cage terminals

6.1.1 Terminal assignment

Spring-cage terminals

Designation	Description	Assignment
Analog output	Relative humidity[a]	1
	Temperature[a]	2
	CO_2 [a]	3
	Analog output GND	4
	DC 24 V	5
	GND	6

Designation	Description	Assignment
RS485	RS485 A (D+)	1
	RS485 GND[b]	2
	RS485 B (D-)	3
	-	4
	DC 24 V	5
	GND	6

[a] Standard

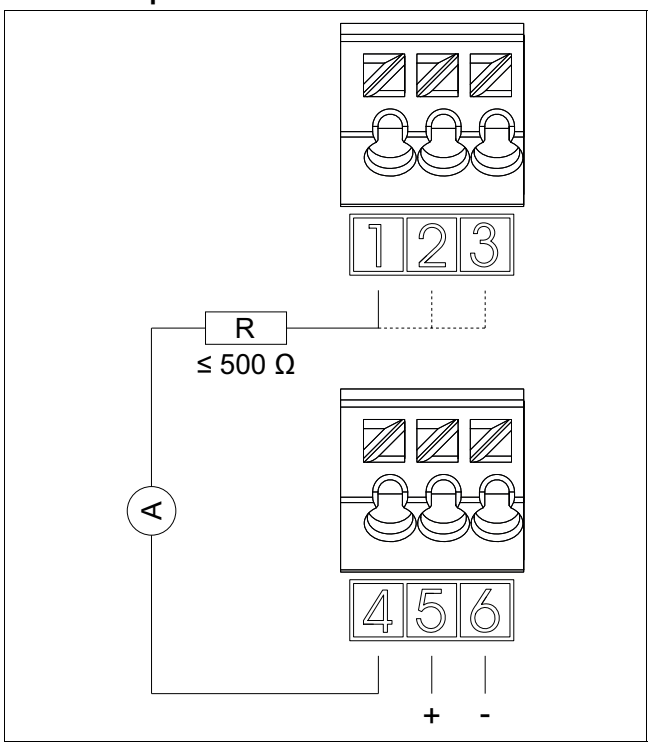
[b] Optional extra

6 Electrical connection

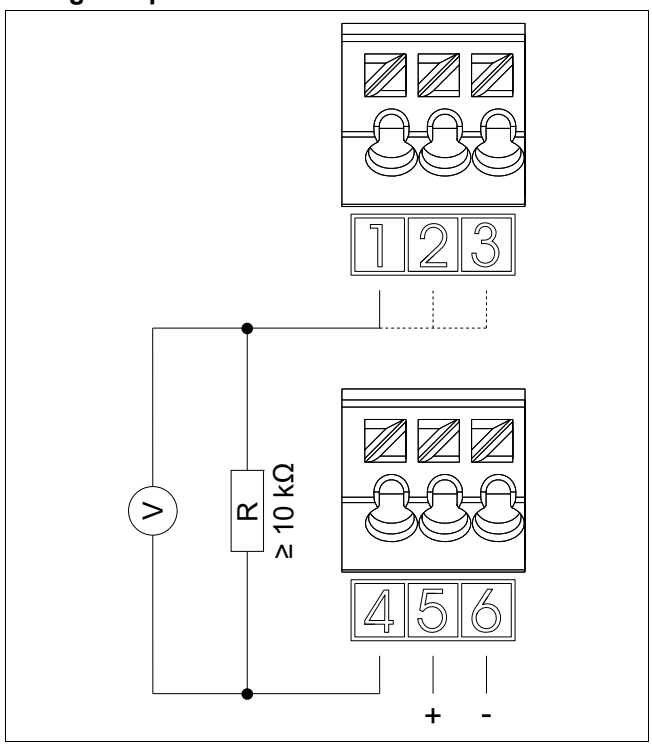
6.2 Connection diagram

Analog outputs

Current output



Voltage output



6.3 Connecting the device

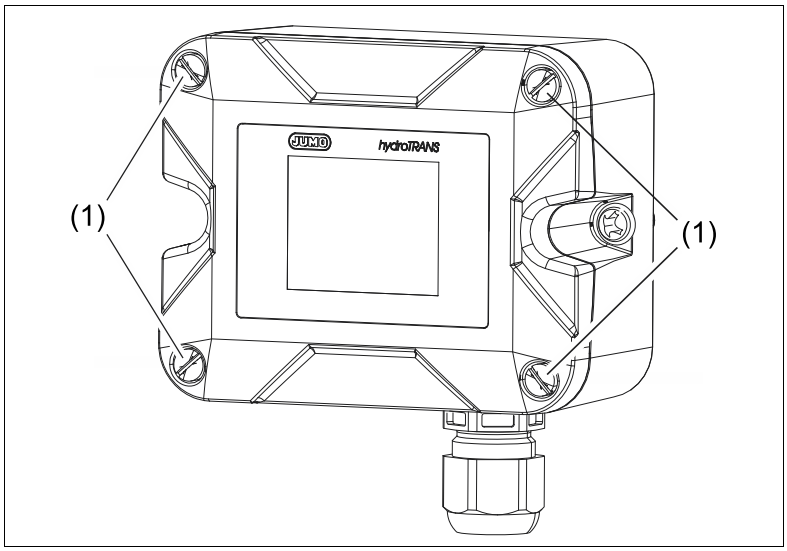
Aids	Slotted screwdriver
	Torque wrench with open-ended insert, wrench size 20
Material	Connecting cable, ⇨ "Electrical data ", Page 10

Requirements:

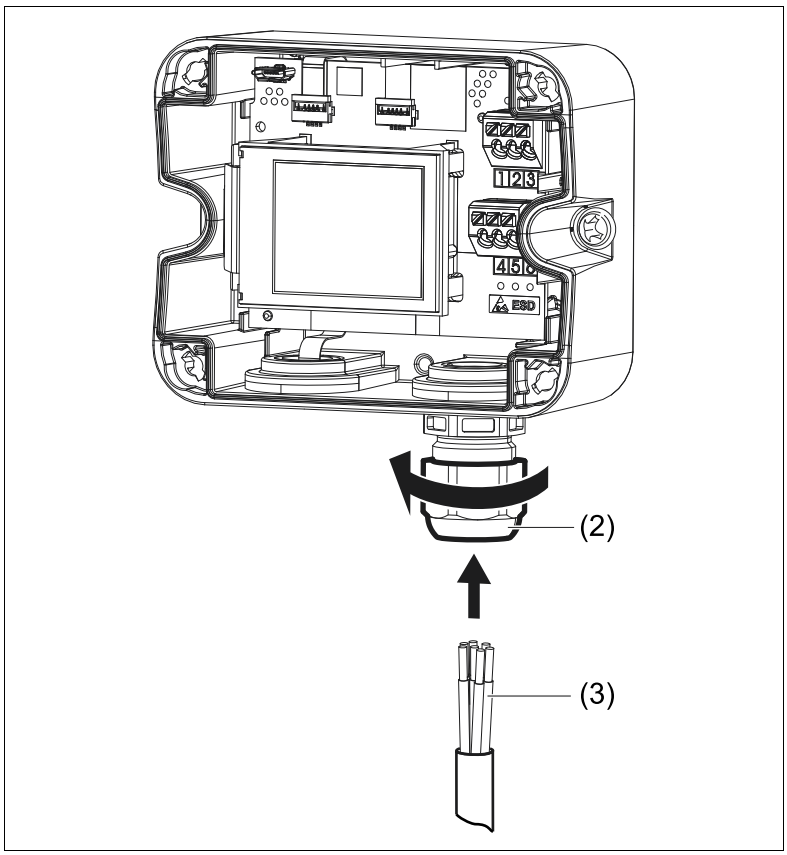
- The system has been de-energized and secured against being switched on again.
- The connections for the voltage supply and signal processing have been correctly prepared.

Procedure:

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

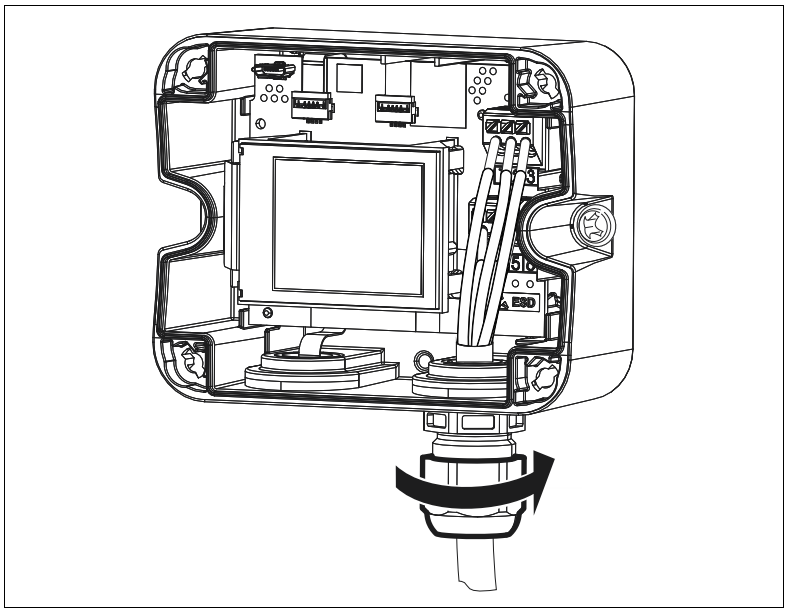


3. Loosen the acorn nut (2).
4. Guide the connecting cable (3) through the cable fitting.

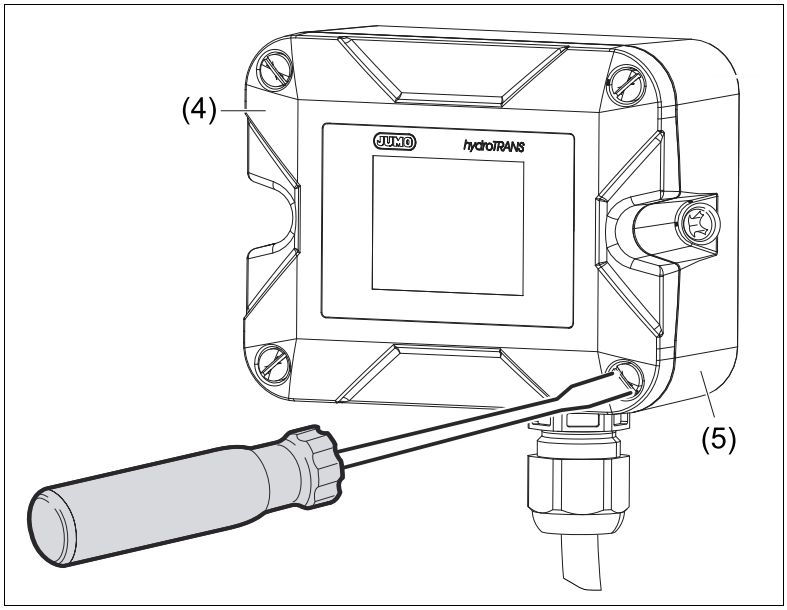


5. Complete the electrical connection.

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.



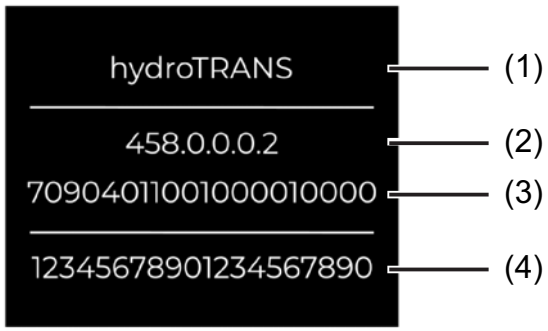
8. Remove the protective film.

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

7.1 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: • Up to three process values • Error messages, ⇨page 34
2	Process value display	Shows the following values: • The formula symbol • The process value (measured or calculated value) • The system unit

8 Setup program

The setup program is used to configure the devices and can be downloaded free of charge from the product website of the manufacturer.

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

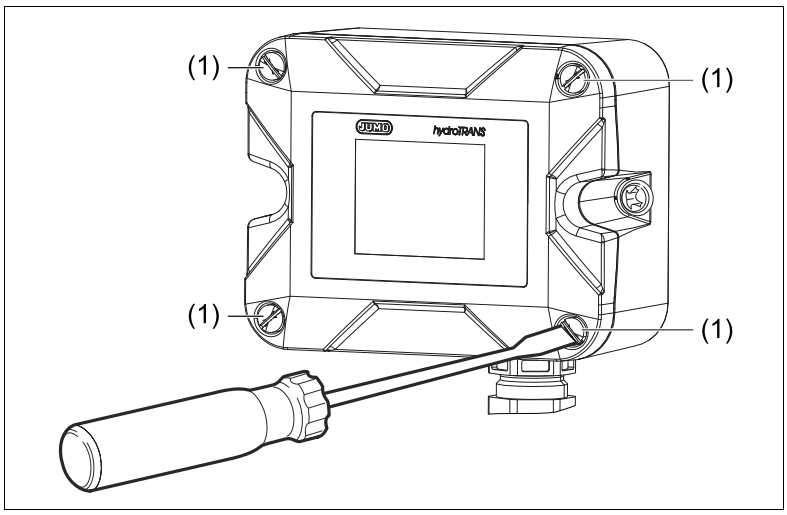
Aids	Slotted screwdriver
Material	USB cable, connector type A to Micro-B

Requirements:

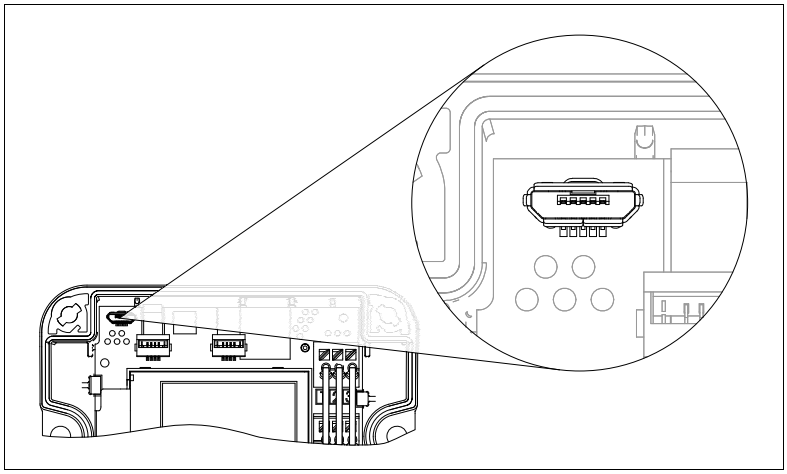
- The system has been de-energized and secured against being switched on again.

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.

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	**German**, English, French, Spanish	National language for the device texts of the process display.
Temperature	**°C**, °F	System units of the process values shown in the process value display.
Absolute humidity	**g/m³**, g/ft³	
Mixing ratio	**g/kg**, gr/lb	
Partial water vapor pressure	**mbar**, psi	
Specific enthalpy	**kJ/kg**, BTU/lb	
TAG number	–	For categorization purposes, e.g. to identify the installation location.
Altitude 📖	**0** m	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_2 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 (CO2)	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 (**5**)	Brightness of the process display backlight.

9 Configuration

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: -15 to 15 % (**0.0**)	Process value correction, also affects the calculated values.

Temperature

Parameter	Value	Description
Offset	Input range: -15 to 15 °C (**0.0**)	Process value correction, also affects the calculated values.

Carbon dioxide

Parameter	Value	Description
Offset	Input range: -500 to +500 ppm (**0**)	Process value correction, also affects the calculated values.
Automatic self-calibration 📖	**Active**, inactive	–

Automatic self-calibration

Long-term accuracy is guaranteed if the CO_2 sensor is exposed to fresh air with an atmospheric CO_2 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.

9.6 Analog outputs

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

Parameter	Value	Description
No selection	–	Analog output 3
Measured values	**Relative humidity (RH)**	Analog output 1
	Temperature (T)	Analog output 2
	Carbon dioxide (CO2)	–
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	**4 to 20 mA**, 0 to 10 V	–
Scale start	Input range: -99999 to 99999 % (**0**)	–
Scale end	Input range: -99999 to 99999 % (**100**)	–
Response at error	**Replacement value**, High, Low	–
Replacement value	Input range: **3.4** to 22 mA, 0 to 11 V	

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

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

Analog output 1/2/3 > Source > Analog selector > Measured values > Carbon dioxide (CO_2)

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

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

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

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

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

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

Parameter	Value	Description
Signal type	**4 to 20 mA**, 0 to 10 V	–
Scale start	Input range: -99999 to 99999 g/m^3 (**0**)	–
Scale end	Input range: -99999 to 99999 g/m^3 (**150**)	–
Response at error	**Replacement value**, High, Low	–
Replacement value	Input range: **3.4** to 22 mA, 0 to 11 V	–

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

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

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

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

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

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

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

Parameter	Value	Description
Signal type	**4 to 20 mA**, 0 to 10 V	–
Scale start	Input range: -99999 to 99999 mbar (**0**)	–
Scale end	Input range: -99999 to 99999 mbar (**200**)	–
Response at error	**Replacement value**, High, Low	–
Replacement value	Input range: **3.4** to 22 mA, 0 to 11 V	–

9 Configuration

9.7 Serial interface

Parameter	Value	Description
Baud rate	9600, 19200, **38400**, 57600, 115200	–
Data format	**8-1-none**, 8-1-odd, 8-1-even, 8-2-none	–
Minimum response time	0 to 500 ms (**0**)	–

Modbus slave

Parameter	Value	Description
Device address	Input range: 1 to 254 (**1**)	–
Temperature	**°C**, °F	System units of the process values transferred via the Modbus interface.
Absolute humidity	**g/m^3**, g/ft^3	
Mixing ratio	**g/kg**, gr/lb	
Partial water vapor pressure	**mbar**, psi	
Specific enthalpy	**kJ/kg**, 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 Measure the signal at the relevant output.

10.1 Version and fabrication number

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

[a] r: Read access

10.2 Configuration

10.2.1 System data

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

[a] r/w: Read/write access

10.2.2 Display

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

[a] r/w: Read/write access

10 Modbus address tables

10.2.3 Measurand correction

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

[a] r/w: Read/write access

10.2.4 Serial interface

Modbus PDU address		Data type	Number of Modbus registers	Access[a]	Data	Coding
Dec.	Hex					
1500	0x05DC	Selection	1	r/w	Baud rate	9k6 19k2 38k4 57k6 115k2
1501	0x05DD	Selection	1	r/w	Data format	8N1 8O1 8E1 8N2
1502	0x05DE	Integer	2	r/w	Device address	1 to 254
1504	0x05E0	Selection	1	r/w	Temperature	°C °F
1505	0x05E1	Selection	1	r/w	Absolute humidity	g/m³ g/ft³
1506	0x05E2	Selection	1	r/w	Mixing ration	g/kg gr/lbs
1507	0x05E3	Selection	1	r/w	Pressure	mbar psi bar
1508	0x05E4	Selection	1	r/w	Enthalpy	kJ/kg BTU/lbs
1509	0x05E5	Integer	2	r/w	Minimum response time	0 to 500

[a] r/w: Read/write access

10.2.5 Analog inputs

Modbus PDU address		Data type	Number of Modbus registers	Access[a]	Data	Coding
Dec.	Hex					
6000	0x1770	Float	2	r	Humidity	–
6002	0x1772	Float	2	r	Temperature	–
6004	0x1774	Float	2	r	Carbon dioxide	–

[a] r: Read access

10.2.6 Calculated values

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

[a] r: Read access

10.2.7 Error messages Modbus

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

[a] r/w: Read access

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 Troubleshooting

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	
	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_2 invalid	The CO_2 sensor is faulty.	
	The communication to the sensor is impaired.	

12.1 Replacing filter cap

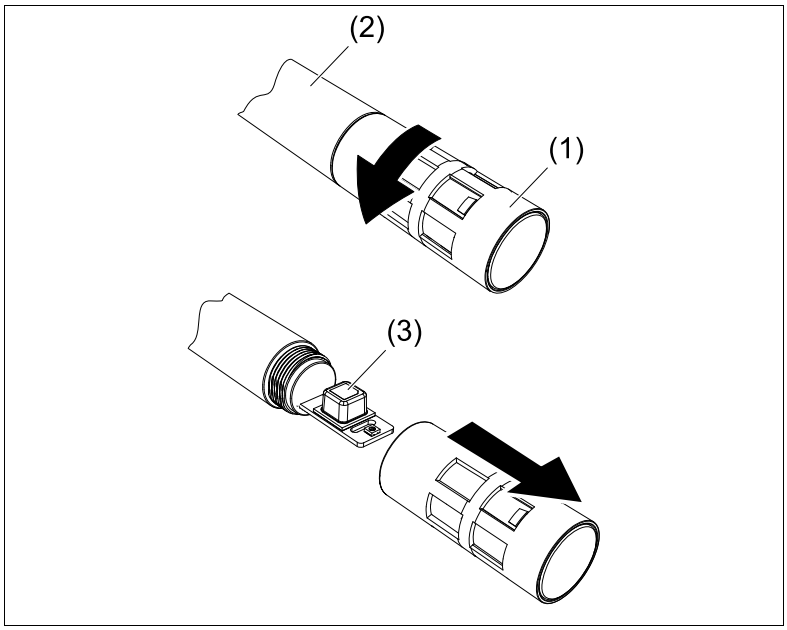
Requirements:

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

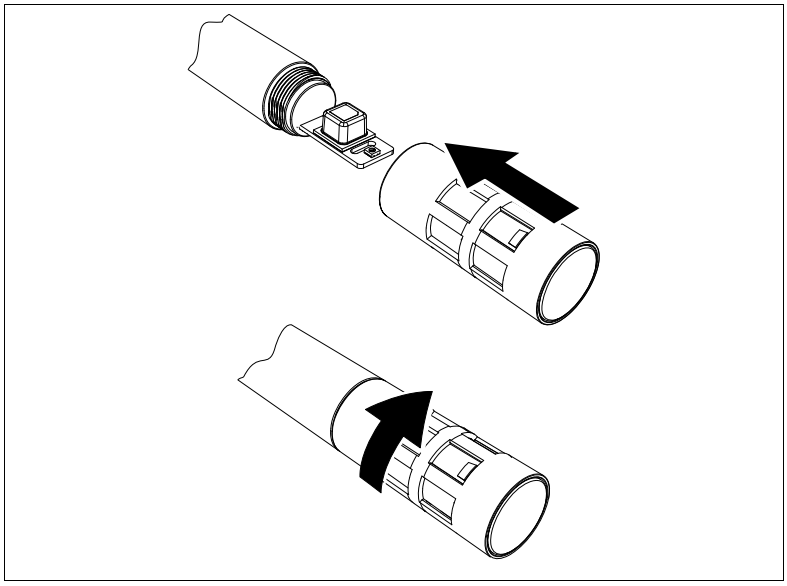
Procedure:

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 Shutdown

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 or the connecting flange.
5. Remove the housing rear or the flange.

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 Spare parts and accessories

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

15 Open-source software

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.

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