FjordSense

RTHS
Humidity/Temperature Module

User Manual

CONTENT

1 General

This manual contains important instructions for the safe handling and optimal operation of the equipment. It should be read before first use and provided to all staff responsible for transport, installation, operation, maintenance, and repair. This document may not be used for competitive advantage or shared with third parties without written permission from Fjordsense. Internal copies are permitted. All content, including technical data and graphics, reflects the product specifications at the time of printing.

The liability of the manufacturer or its authorized agent is limited to instances of willful intent or gross negligence. Furthermore, such liability shall not exceed the total value of the order in question. The manufacturer assumes no responsibility for damages caused by non-compliance with all relevant regulations, operating instructions, or prescribed operating conditions. This exclusion also applies to all consequential damages.

1.1 Safety Instructions

1.1.1 General Safety Instructions

- The device, particularly the filter cap, must not be subjected to unnecessary mechanical stress.
- When replacing the filter cap, ensure that the sensing elements are not touched.
- The device must always be operated with the filter cap securely in place.
- Installation, electrical connection, maintenance, and commissioning shall be carried out exclusively by qualified personnel.
- Do not operate the RTHS in explosive atmospheres or for measuring aggressive gases.
- Use the RTHS only as intended and in strict compliance with all technical specifications.
- The sensor is an Electrostatic Discharge (ESD) sensitive component.
- Appropriate ESD protective measures must be observed when handling the sensing element.
- This device is not designed for safety-critical applications, including emergency shutdown systems or other scenarios where a malfunction could result in personal injury.

1.1.2 Intended Use

The RTHS humidity and temperature module is optimized for measuring relative humidity and temperature in climate chambers and similar OEM applications.

• Permitted Use: The device must be used only as specified in this manual and powered exclusively by a Separated Extra-Low Voltage (SELV) supply.
• Liability: The manufacturer assumes no liability for damages arising from incorrect handling, installation, or maintenance.
• Warranty: Any unauthorized modification to the product will result in the immediate voiding of all warranty claims.

The operational stress on the sensing elements under high-temperature conditions requires a reduced calibration interval.
To prevent instrument damage or potential safety risks, only tools explicitly approved in this manual may be used for any adjustment or maintenance of the measuring equipment.
The sensor must be operated strictly within the parameters defined in the technical specifications. Operation outside these conditions may cause measurement inaccuracies and potential equipment malfunctions.
For both user safety and equipment functionality, the manufacturer's specified procedures for installation, inspection, and maintenance must be strictly followed.
Any unauthorized product modification will void all warranty claims. Modifications require explicit prior written authorization from Fjordsense!

1.1.3 Mounting, Start-up and Operation

The RTHS humidity and temperature module is manufactured in compliance with state-of-the-art production standards. Each unit undergoes comprehensive testing and meets all safety requirements prior to leaving the factory. While the manufacturer has implemented all necessary measures to ensure operational safety, the user is responsible for proper installation and setup to maintain safe operating conditions. It is the user’s obligation to adhere to all applicable local and international safety regulations related to device installation and operation. This manual contains essential information and warnings that must be followed to ensure safe usage.

• Only qualified personnel authorized by the facility operator may perform mounting, startup, operation, or maintenance of the device.
• Qualified personnel must have fully read and understood this manual. Before operation, all process and electrical connections must be thoroughly inspected by authorized staff.
• Do not install or start up any device suspected to be faulty. Clearly mark defective units to prevent accidental use.
• Only trained and authorized personnel are permitted to diagnose or repair a faulty device. If the issue cannot be resolved, the device shall be removed from the process.
• Any service not explicitly described in this user manual may only be carried out by the manufacturer.

1.2 Environmental Aspects

Products from Fjordsense are designed and manufactured in accordance with applicable environmental protection standards. End users are responsible for complying with local regulations regarding equipment disposal.

At end of life, device components must be segregated according to local recycling requirements. Electronic components require proper disposal as electronic waste (e-waste) in compliance with regional environmental directives.

1.3 ESD Protection

The sensing elements and electronics board are Electrostatic Discharge (ESD) sensitive components. Proper ESD protection procedures must be observed during handling. Failure to implement these measures may cause permanent damage to the device through electrostatic discharge when contacting exposed sensitive areas.

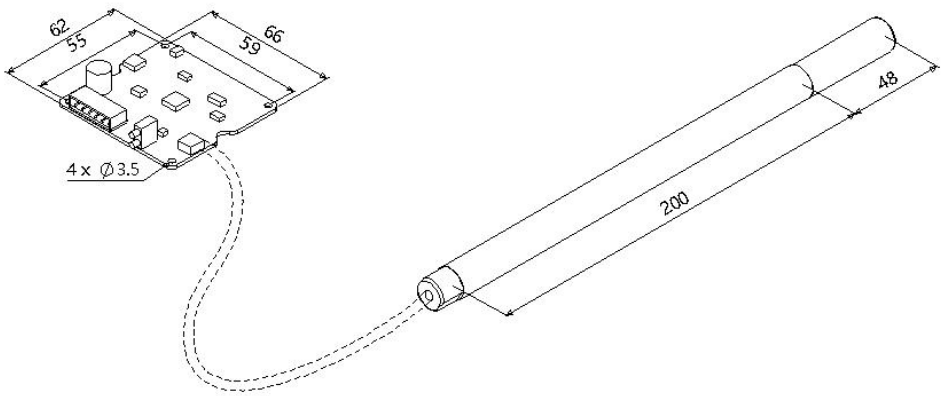
2 Product Description

2.1 General

The measured RH data is available on an analogue current output (4 ~ 20 mA / 3or4-wire).

The RTHS sensing probe and its electronic unit are factory-calibrated as an integrated assembly and must not be separated from each other. The probe cable shall not be cut, shortened, or extended.

2.2 Dimensions



2.3 Installation

2.3.1 Electronics Board

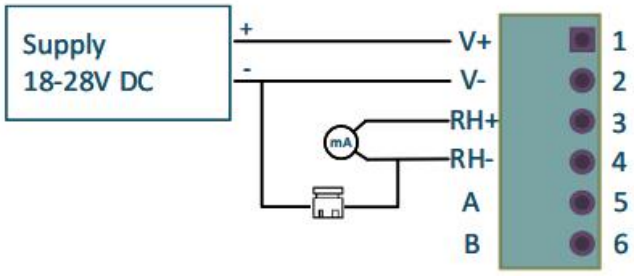
Circuit boards must be handled exclusively by their edges. Contact with electronic components or conductive traces must be avoided.

2.3.2 Sensing Probe

Direct contact with the sensing head must be avoided. The probe must remain equipped with its filter cap during all operations.
A clogged filter cap will adversely affect measurement response time.

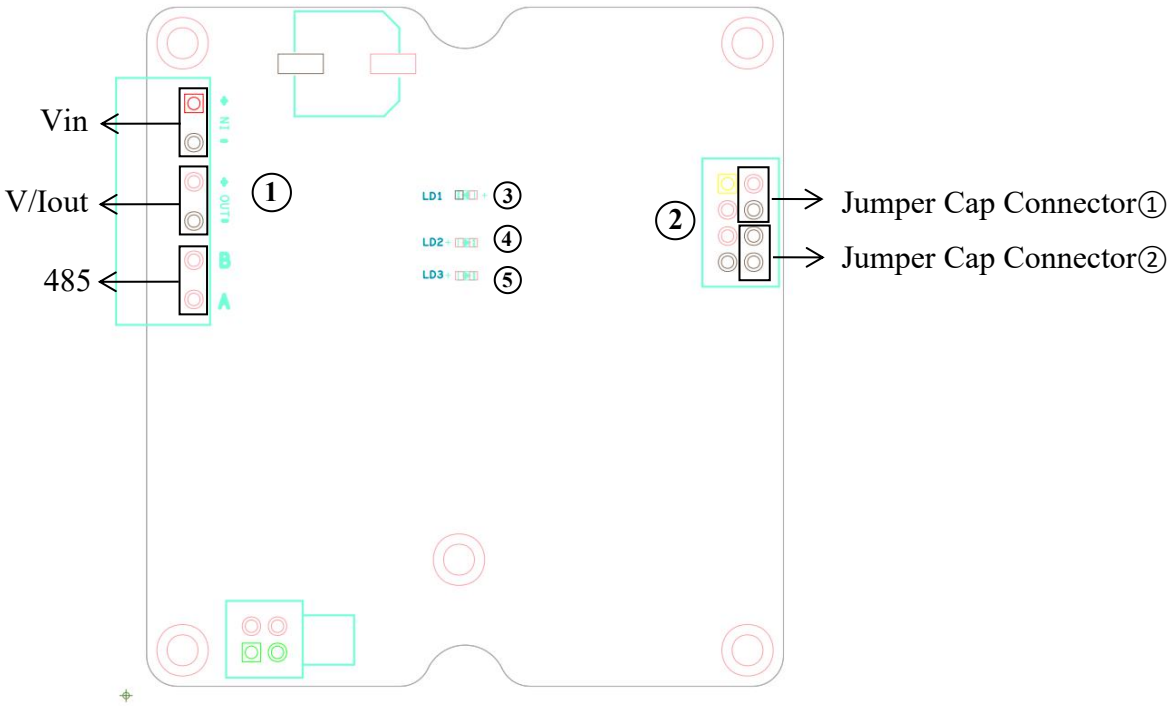
To ensure accurate measurements, it is critical to prevent temperature gradients along the sensing probe. Where feasible, the entire probe should be immersed in the measurement environment. If the probe must be mounted through a partition wall, thermal isolation of the probe's rear section must be implemented.

2.4 Electrical Connection



The manufacturer shall not be held liable for any personal injury or property damage resulting from improper handling, installation, wiring, power supply, or maintenance of the device.

2.5 Setup and Configuration



1. Terminal for supply and output signal
2. Terminal for controlling Jumper Cap Connector

2.1 Jumper Cap Connector①
-Install the jumper cap-for voltage output
-Remove the jumper cap-for current output:

2.2 Jumper Cap Connector②
-Install the jumper cap-VOUT- to VIN- connected (Common GND)
-Remove the jumper cap-VOUT- to VIN- disconnected (Separate GND)

3. Power Indicator
4. Status LED (green):
-flashing = supply voltage applied / microprocessor is active
5. Status LED (red):
-flashing = Sensor fault

2.6 Register Definition

Function Code 0x03		
Register address		
0x20	Temp	Output Temperature * 1000
0x21		
0x22	RH	Output Humidity * 1000
0x23		
0x26	error	error

3 Maintenance and Service

RTHS does not require any special maintenance, nevertheless for high accurate measurements especially over wide RH and T ranges it is recommended to calibrate/adjust the sensor every 12 months.

3.1 Filter Replacement

Application conditions may occasionally require replacement of the filter cap. Typically, a blocked filter exhibits visible soiling or debris. Extended response durations during humidity readings can also signal filter obstruction.

Replacement Procedure

■ Rotate the filter cap counterclockwise to detach it.

■Secure the new filter cap by turning it clockwise until hand-tight.

■ During installation, avoid any contact with or abrasion of the sensing surface.

3.2 Repairs

All repair work must be performed exclusively by the manufacturer. Unauthorized repair attempts will void all warranty coverage.

3.3 Self Diagnosis and Error Messages

FeedbackModule	Meaning
Green LED off, Red LED steady on	Chip Malfunction
Green LED off, Red LED slow flash	Temperature Sensor Malfunction
Green LED off, Red LED fast flash	Temperature Sensor Disconnection
Green LED steady on, Red LED slow flash	Humidity Sensor Malfunction
Green LED steady on, Red LED fast flash	Humidity Sensor Disconnection

4 Technical Data

Measurands

Relative Humidity

Measuring range		0...100％RH	
Accuracy (including hysteresis , non-linearity and repeatability)			
hysteresis	-15...40 ℃ (5...104 ℉) ≤90%RH	±(1.3+0.003*mv)%RH	mv= messured value
	＞90%RH	±2.3%RH	
non-linearity	-25...70℃ (-13...158 ℉)	±(1.4+0.01*mv)%RH	
Repeatability	-50...180 ℃ (-40...356 ℉)	±(1.5+0.015*mv)%RH	
Response time at 20℃(68℉)		15s	

Temperature

Measuring range		-50...180 ℃ (-58...356 ℉)	

Output

Analogue		RH:4-20mA(3/4wire)	

General

Power supply class III		18-28V DC	
Current consumption, typ.		24 V DC ＜40mA	
Working range			
	Electronics		-40...60 ℃ (-40...140°F), 0...90 %RH non-condensing
	Probe		-50...180 ℃ (-58...356 °F)/ short time up to 200 °C (392°F) possible, 0...100 %RH
Storage conditions			-40...60℃ (-40...140 ° F）, 0...90 %RH non-condensing