AcuHUM™ RM Series

Room Mount Relative Humidity and Temperature Sensor Installation Guide

68.0 %RH

CE

ACCUENERGY

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Please read this manual carefully before installation, operation, and maintenance of the AcuHUM RM room mount relative humidity and temperature sensor.

The information contained in this document is believed to be accurate at the time of publication, however, Accuenergy assumes no responsibility for any errors which may appear here and reserves the right to make changes without prior notice as part of continuing improvements. Please ask the local representative for the latest product specifications before ordering.

The following symbols in this manual appear throughout this documentation, in addition to electrical warning of danger or safety risk during the installation and operation of the sensors.

⚡	**Electrical Shock Hazard:** Contains information about procedures which must be followed to prevent the risk of electric shock and danger that can result in personal injury or death.
⚠	**Safety Warning:** Contains information about circumstances which, if not considered, may result in personal injury or death.
NOTE	An advance notice to provide additional information before an action is taken by the user.
ALERT	Indicating the operation may lead to device malfunction or potential data loss.

Installation and maintenance of the AcuHUM RM room mount relative humidity and temperature sensor shall only be performed by qualified, competent professionals who have received training and have experience with high voltage and current devices.

Accuenergy shall not be responsible or liable for any damage caused by improper sensor installation and/or operation.

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Introduction

Overview

The AcuHUM RM series relative humidity (RH) and temperature sensor utilizes digital polymer sensing technology to provide precise RH measurement, with reduced power consumption and improved long-term stability.

The RH sensor features an optional thermistor, RTD, or transmitter to provide a temperature and RH signal in one device. The sensor is designed to be wall-mounted indoors with a state-of-the-art enclosure design with four-way aspiration to minimize self-heating. The AcuHUM RM can provide either a 4-20mA or 0-10VDC relative humidity signal with several different temperature output options based on model selection. The AcuHUM RM can be ordered with an optional LCD that alternates the humidity and temperature readings in the room.

ALERT: When using 24VAC power supply with the AcuHUM RM, it is strongly recommended to power the unit with an independent, dedicated, UL-listed class 2 transformer.

ALERT: When using RTD or thermistor for temperature output, it is recommended to separate signal wiring and 24/120/230 VAC line voltages. Failure to do so will result in unstable reading.

ALERT: AcuHUM RM cannot be mounted in a pool room or used for any application where corrosive chemicals are present.

ALERT: The AcuHUM RM must be powered OFF during installation and wiring. Failure to do so may result in damage to the sensor.
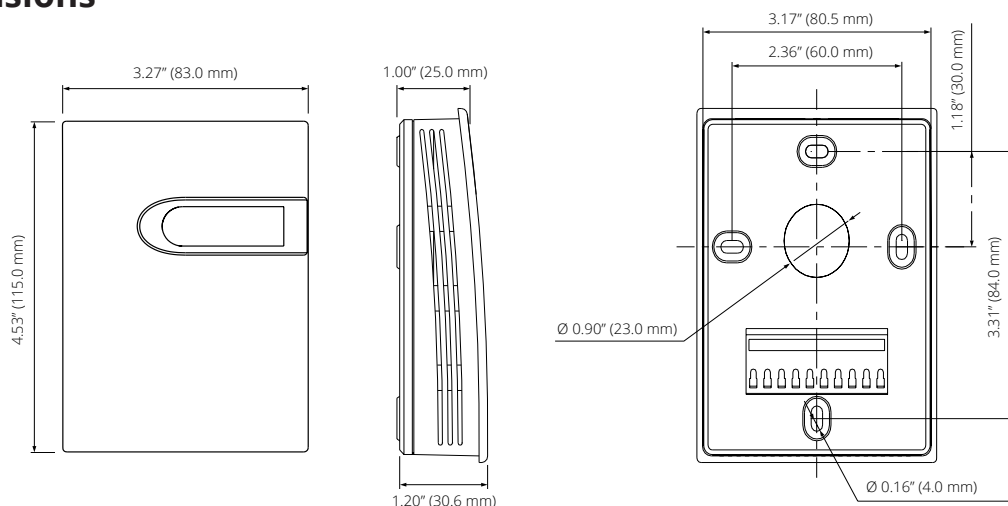
Dimensions

Figure 1 AcuHUM RM Front, Side, and Rear View

Installation

Step 1: Choose the Optimal Mounting Location

The AcuHUM RM sensor should be mounted vertically on an interior wall, typically 1.2-1.8m (4-6ft) above the floor. The exact height requirements will be dictated by local code and regulations.
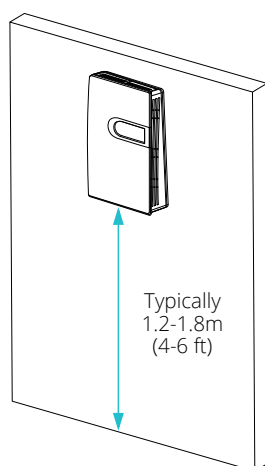
Typically
1.2-1.8m
(4-6 ft)

Figure 1 AcuHUM RM Typical Mounting Location

NOTE: The sensor should be installed on the interior building walls. Do not install on external walls as outside temperatures may cause relative humidity/temperature fluctuations.

1. Mount the sensor in an area where air circulation is mixed and not blocked. Ensure there are no obstructions near the mounting location, such as curtains, furniture, doors, or other objects.

2. AcuHUM RM should be mounted away from any heat sources such as hot water pipes, direct sunlight, space heaters, and electric equipment that generates heat.

3. AcuHUM RM should be mounted away from any cold sources such as dehumidifiers and fans.

4. AcuHUM RM should be mounted away from supply heating/cooling registers, air vents, windows, and poorly insulated walls. Infiltration of cold air will affect the RH and temperature readings.

Step 2: Separate Front Cover

To connect the electrical wiring, the terminal needs to be accessed by opening the front cover.

1. Locate the locking hook positioned at the top of the enclosure.

2. Insert a small flathead screwdriver, slightly press down on the locking hook.

3. Gently pull open the front cover as illustrated in the following figure.
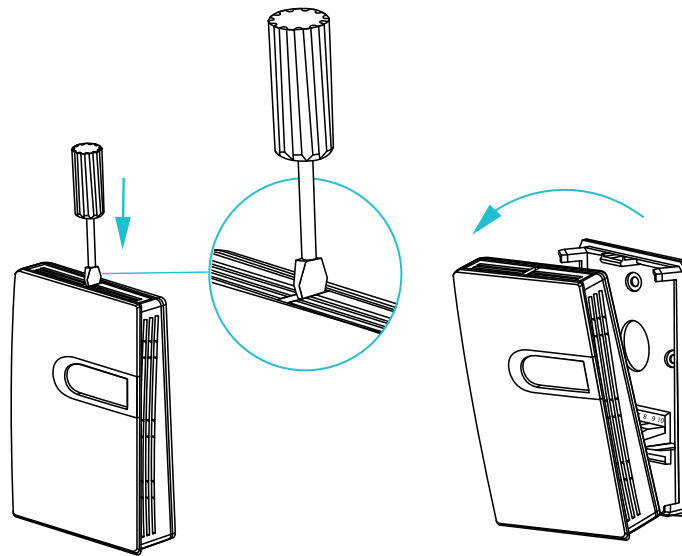
Figure 2 AcuHUM RM Removing Front Cover

The electrical terminals will be revealed. Connect the wiring according to the instructions in the next step.

Step 3: Electrical Wiring

ALERT: When using 24VAC power source with the AcuHUM RM, it is strongly recommended to power the unit with an independent, dedicated, UL-listed class 2 transformer.

ALERT: If sharing a 24VAC transformer with other equipment such as controllers, or transmitters, an improper polarity will cause damage to the sensor.

ALERT: Do not mix half and full-wave rectified devices when powering with AC power supply. The AcuHUM RM is half-wave rectified.

ALERT: Do not run the temperature sensor wiring in any conduit with line voltage (24/120/230 VAC) if using RTD or Thermistor for temperature monitoring. AC voltage will cause an unstable temperature reading.

ALERT: If using shielded cable, ground the shield only at the controller's end. Grounding both ends can cause a ground loop.

NOTE: Accuenergy recommends 16 to 24 AWG twisted pair wires or shielded cable for signal connections. This applies to both power supply and analog output wiring.

NOTE: If using 4-20mA output for RH/temperature signal, the sensor must be powered with an 18.5~35VDC (RL=500Ω) power supply. Ensure that the analog input common reference of the BAS controller, PLC, and Automation Panel is connected to the DC power supply common reference to complete the circuit. The sensor will not work if the common references are not connected. Refer to Figure 4 below.

NOTE: If using 4-20mA output for temperature signal only, the relative humidity circuit MUST still be connected, otherwise the transmitter will not work.

Not following these instructions may damage the product and void the warranty.

The AcuHUM RM relative humidity output signal is available in 0-10VDC or 4-20mA output ratings, depending on model selection. The temperature output can be 0-10VDC, 4-20mA, RTD, or thermistor resistive output. Locate the electrical terminals for the respective and connect the AcuHUM RM as shown in the following figures.
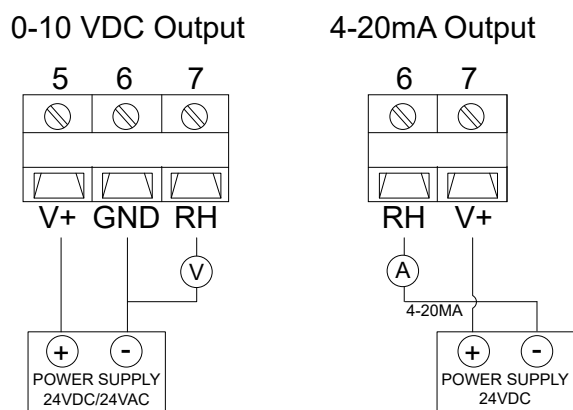
AcuHUM RM model with respective relative humidity output:

Figure 3 AcuHUM RM Wiring Diagram, RH Only

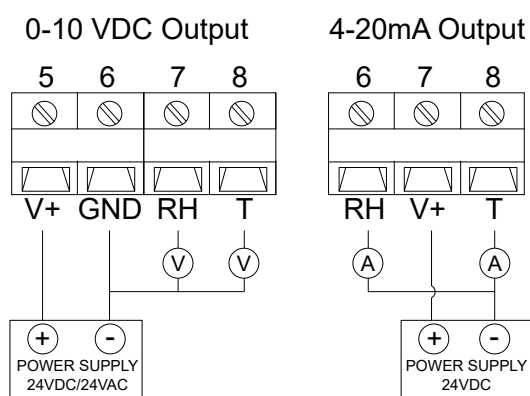AcuHUM RM models with both relative humidity and analog temperature output:

Figure 4 AcuHUM RM Wiring Diagram, RH and Analog Temperature Output

AcuHUM RM models with relative humidity and resistive thermistor/RTD temperature output:
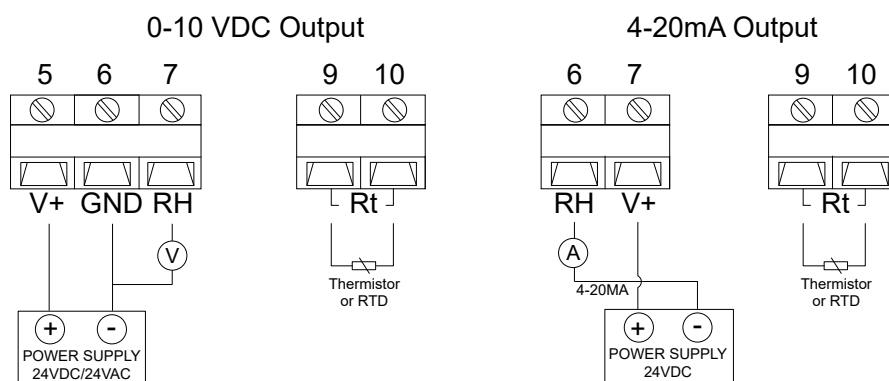

Figure 5 AcuHUM RM Wiring Diagram, RH and Resistive Temperature Output

Step 4: Mount RH Sensor

1. Feed the cable through the open passage located in the center of the backplate, then mount the sensor to the wall by attaching the backplate to either a standard 2" x 4" junction box, or install directly to the interior wall by securing the provided screws through the four fastening holes.

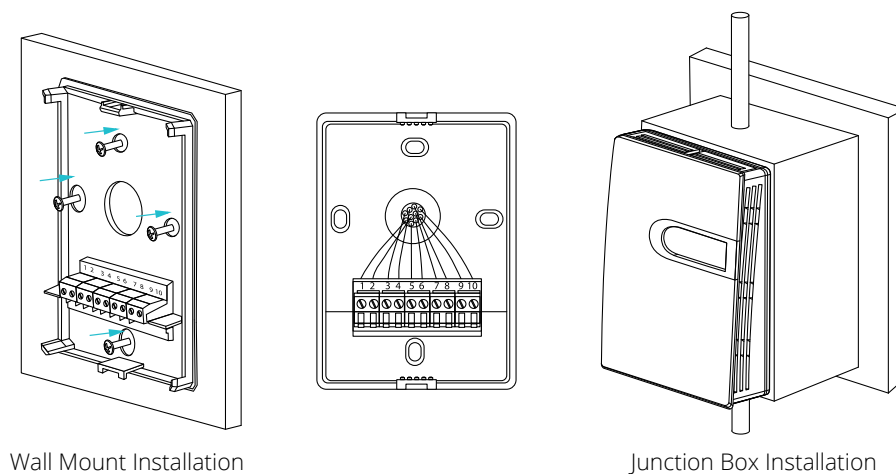Wall Mount Installation　　　　　　　　　Junction Box Installation

Figure 6 AcuHUM RM Mounting Backplate and Wire Access

2. Review the wiring installation, and make sure all terminals are connected properly.
3. To finish the installation, position the front cover directly over the backplate and apply gentle pressure until it clicks back into place.

Technical Specifications

Relative Humidity Measurement	
Electrical	
Voltage Power	16~28VAC / 16~35VDC
Current Power	18.5~35VDC (RL=500Ω); 8.5~35VDC (RL=0Ω)
Output	4~20mA (2 Wires) or 0~10VDC (3 Wires)
Performance	
Sensor Type	Digital Polymer
Accuracy	±2% (25°C, 20~80%RH)
Measurement RH Range	0~100%
Operating RH Range	5~95%RH (Non-Condensing)
Hysteresis	<±1%RH
Response Time	<10s (25°C, in Slow Air)
Drift	<±0.5%RH/Year
Temperature Measurement	
Electrical	
Transmitter Voltage Power	16~28VAC / 16~35VDC
Transmitter Current Power	18.5~35VDC (RL=500Ω); 8.5~35VDC (RL=0Ω)
Transmitter Output	4~20mA (2 Wires) or 0~10VDC (3 Wires)
Output Load	≤500Ω (Current), ≥2KΩ (Voltage)
Performance	
Sensor Type	RTD or Thermistor, See Ordering Information
Transmitter Accuracy (If Applicable)	<±0.3°C @ 5~60°C (<±0.54°F @ 41~140°F)
Thermistor Accuracy (If Applicable)	10KΩ, Type III - 0.3°C @ 25°C (0.54°F @ 77°F) 10KΩ, Type II - 0.2°C @ 25°C (0.36°F @ 77°F) 20KΩ - 0.2°C @ 25°C (0.36°F @ 77°F)
RTD Accuracy (If Applicable)	1K Ω Platinum - 0.2°C @ 25°C (0.36°F @ 77°F) 100 Ω Platinum - 0.2°C @ 25°C (0.36°F @ 77°F) 1K Ni Ω Nickel - 0.5°C @ 25°C (0.9°F @ 77°F)
Temperature Transmitter Measurement Range	0~50°C (32~122°F)
Response Time	<10s

Environmental

Operating Temperature Range	-20~70°C (-4~158°F)
Storage Temperature	-20~80°C (-4~176°F)

Mechanical

Mounting	Single Gang Junction Box or Surface Mount
Wiring Connection	Screw Terminal Blocks
Weight	110g (0.24lbs)
Display (Optional)	4-Digit LCD with Unit Indication
Display Resolution	0.1°C (0.1°F), 0.1%RH

Certification/Warranty

Enclosure Material	Fire Retardant Polycarbonate (UL94V-0)
Protection	IP30
Agency Approvals	CE
Warranty	5 Years

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ISO 9001, 14001
& 45001 Certified

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Specs Subject To Change Without Notice.