

# AcuTEMS™ OA Series

Outside Air Temperature Sensor  
Installation Guide



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**ACCUENERGY**

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Please read this manual carefully before installation, operation, and maintenance of the AcuTEMS OA Outside Air 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.

	<b>Electrical Shock Hazard:</b> 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.
	<b>Safety Warning:</b> Contains information about circumstances which, if not considered, may result in personal injury or death.
<b>NOTE</b>	An advance notice to provide additional information before an action is taken by the user.
<b>ALERT</b>	Indicating the operation may lead to device malfunction or potential data loss.

Installation and maintenance of the AcuTEMS OA 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 AcuTEMS OA series sensor measures the temperature of outside ambient air. The sensor's readings are used to optimize a building's HVAC system to maintain comfort and ensure efficient equipment operation. The AcuTEMS OA sensor can be mounted onto a vertical surface outdoors under an eave in a shaded location, and comes with an IP65 enclosure suitable for protection against outdoor elements. The sensor has multiple RTD, thermistor, and transmitter output options.

## Dimensions

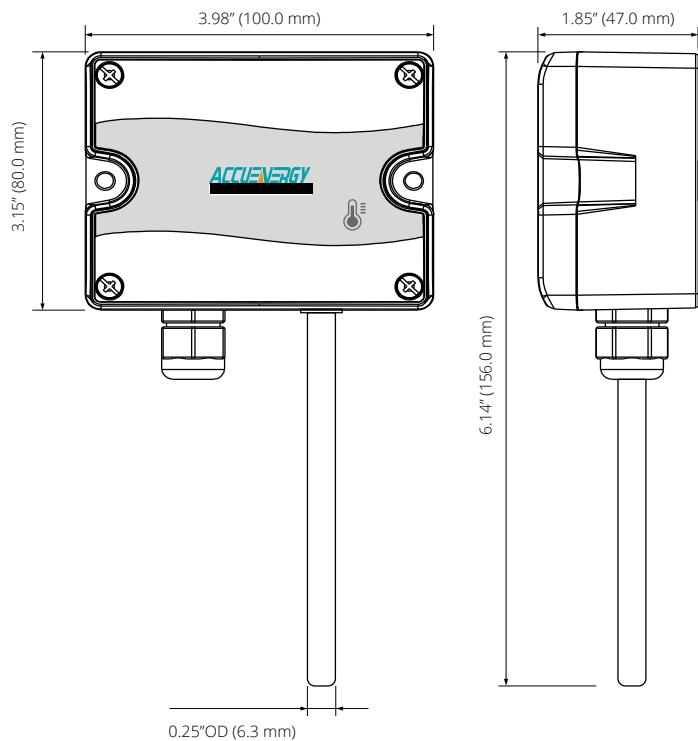


Figure 1 AcuTEMS OA Front and Side Views

# Installation

## Step 1: Choose the Optimal Mounting Location

The AcuTEMS OA sensor should be mounted in a shaded location, as direct sunlight will warm the sensor and affect the temperature reading.

1. The AcuTEMS OA sensor probe must be oriented down towards the ground to prevent moisture from entering the sensor.
2. If the mounting location is adjacent to a building located in the northern hemisphere, the AcuTEMS OA sensor should be mounted on the north side of the building to minimize direct sunlight exposure. If the building is located in the southern hemisphere, the temperature sensor should be mounted on the south side of the building.
3. Mount the sensor at least 3.5'(1m) above ground to prevent thermal radiation from skewing temperature readings and avoid water splash.
4. Mount the sensor at least 2'(0.6m) below the cover or eave to prevent thermal radiation.
5. Avoid locations near any equipment that produces heating or cooling, such as building vents, fan exhaust, or dampers, as this equipment can affect accurate temperature readings.

## Step 2: Separate Front Cover

1. To open the front cover of the AcuTEMS OA, turn the quick release spring screws counterclockwise, located on each corner of the enclosure.

**NOTE:** Exercise caution to not over-rotate the screws, which could damage the enclosure. Refer to Figure 2 for details.

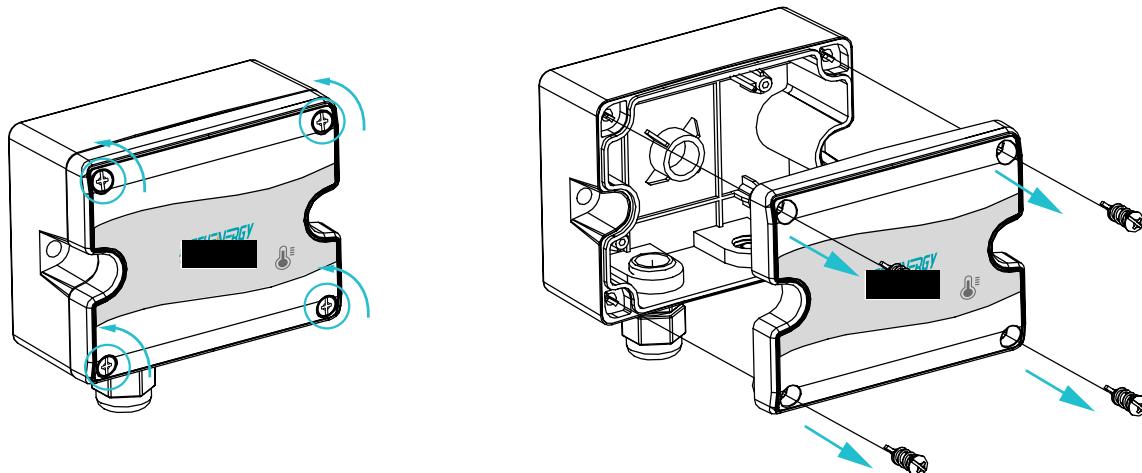


Figure 2 AcuTEMS OA Removing Front Cover

2. Carefully remove the front cover to reveal the electrical terminals. Connect the wiring according to the instructions specified in Step 3.

## Step 3: Electrical Wiring

**ALERT:** The AcuTEMS OA sensor with a 0-10VDC output can be powered with both 24VAC and 24VDC power supply. The 4-20mA output option is compatible with 2-wire DC loop power only.

**ALERT:** When using 24VAC to power the AcuTEMS OA transmitter, it is strongly recommended to power the unit with an independent, dedicated, UL Listed Class 2 transformer. The 24VAC power supply is only used for a 0-10VDC output signal.

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

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

**ALERT:** Do not mix half and full-wave rectified devices when powering with AC voltage. The AcuTEMS OA temperature sensor is half-wave rectified.

**NOTE:** Watertight PG9 cord grip installed (5/8" knockout hole when PG9 removed).

**NOTE:** Accuenergy recommends 20 to 18 AWG (0.52-0.82mm<sup>2</sup>) twisted pair wires or shielded cable for signal connections. This applies for both power supply and analog output wiring.

Failure to follow these instructions may damage the product and void the warranty.

Once the front cover is removed, feed the power supply and signal wiring through the PG9 cable gland. The AcuPRE OA sensor features push-button terminal blocks, which utilize a spring clamp mechanism to secure wires.

1. To connect the wire, push in the button to open the corresponding spring.
2. Insert the wire into the terminal, and then release the button, allowing the spring to clamp the wire.
3. To remove the wire, push in the button to open the spring, allowing the wire to be pulled out. Refer to Figure 3 for details.

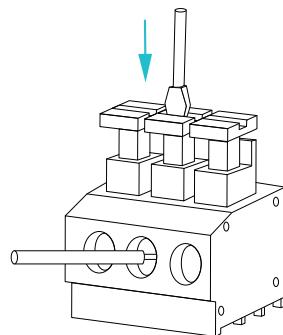


Figure 3 AcuTEMS OA Push Button Terminal Block

The AcuTEMS OA temperature signal can be 0-10VDC, 4-20mA, or RTD/thermistor resistive output. Locate the wiring terminals for the respective model and connect the AcuTEMS OA as shown in the following figures.

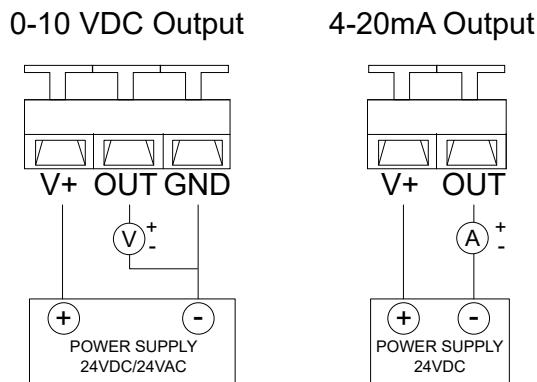


Figure 4 AcuTEMS OA Wiring Terminals for Temperature Transmitter

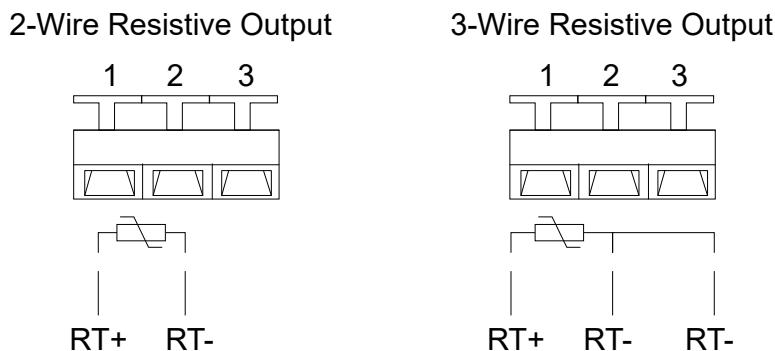


Figure 5 AcuTEMS OA Wiring Terminals for Resistive Output

## Step 4: Mount the Temperature Sensor

The AcuTEMS OA is designed to be mounted onto any vertical surface.

1. Drill two screw holes according to the locations shown in the Figure 6 below. Ensure the sensor is levelled and the sensor probe is pointed downward and perpendicular to the ground.

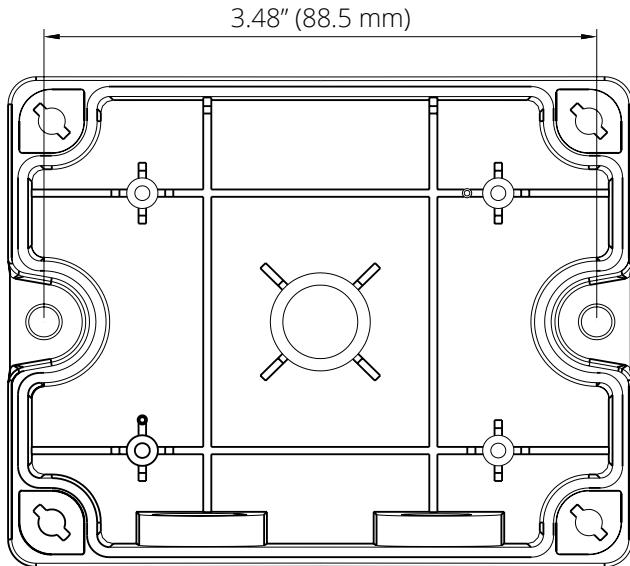


Figure 6 AcuTEMS OA Mounting Hole Location for Surface Mount

2. Align the sensor enclosure over the drilled holes and secure the sensor by inserting and fastening two screws.

**NOTE:** Proceed with caution as over-tightening the screws may cause damage to the enclosure.

3. Review the wiring installation, and make sure all terminals are connected properly.
4. To finish the installation, position the front cover directly over the backplate and fasten the spring screws clockwise to secure the cover.

## Technical Specifications

Electrical	
Transmitter Voltage Power	19.2~28.8 VAC or VDC
Transmitter Current Power	19.2~28.8 VDC (RL=500Ω); 8.5~35 VDC (RL=0Ω)
Transmitter Output	4~20mA (2 Wires) or 0~10VDC (3 Wires)
Output Load	≤500Ω (Current), ≥2KΩ (Voltage)
Temperature Performance	
Temperature Sensor Type	RTD or Thermistor, See Ordering Information
Transmitter Accuracy (If Applicable)	<±0.3°C @ 0~70°C (<±0.54°F @ 32~158°F)
Thermistor Accuracy (If Applicable)	10K Ω, Type III - ±0.3°C @ 25°C (0.54°F @ 77°F) 10K Ω, Type II - ±0.2°C @ 25°C (0.36°F @ 77°F) 20K Ω - ±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) 1KΩ Nickel - ±0.5°C @ 25°C (0.9°F @ 77°F)
Temperature Transmitter Measurement Range	-40~60°C (-40~140°F)
Response Time	<10s
Environmental	
Operating Temperature Range	-40~70°C (-40~158°F) @ 0~95%RH (Non-Condensing)
Storage Temperature	-30~80°C (-22~176°F)
Mechanical	
Mounting	Screw Surface Mount
Wiring Connection	Push Button Terminal Blocks (2 or 3 wire)
Weight	240g (0.53lbs)
Certifications/Warranty	
Enclosure Material	Fire Retardant Polycarbonate (UL94V-0)
Protection	IP65
Agency Approvals	CE
Warranty	5 Years

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