AcuTEMS™ DM Series

Duct Mount Temperature Sensor Installation Guide

CE

ACCUENERGY

Please read this manual carefully before installation, operation, and maintenance of the AcuTEMS DM Duct Mount 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 AcuTEMS DM 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 DM series temperature sensor is designed for ductwork mounting, featuring multiple probe lengths, various RTD, thermistor, and transmitter output options. The sensor sends the output to the HVAC control system, maintaining comfortable temperature level for building occupants and ensuring efficient equipment operation. The temperature probe is secured with a 4-screw mounting flange with set screw, allowing adjustable probe depth when needed. The AcuTEMS DM comes standard with an IP65 rated enclosure and gasketed cover providing superior moisture and dust protection, as well as four-quarter turn quick release screws for easy installation.

Dimensions

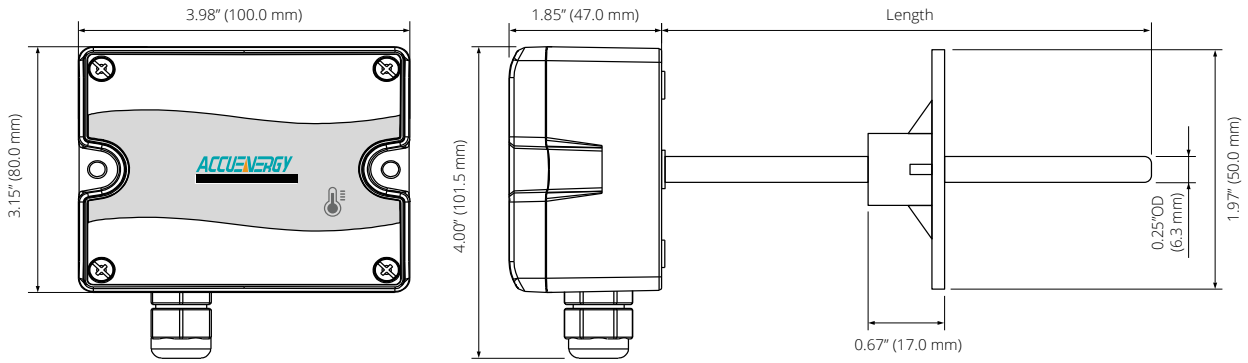

Figure 1 AcuTEMS DM Front and Side Views

Installation

Step 1: Choose the Optimal Mounting Location

The sensor probe should be mounted at the center of the duct where the least amount of stratification is present.

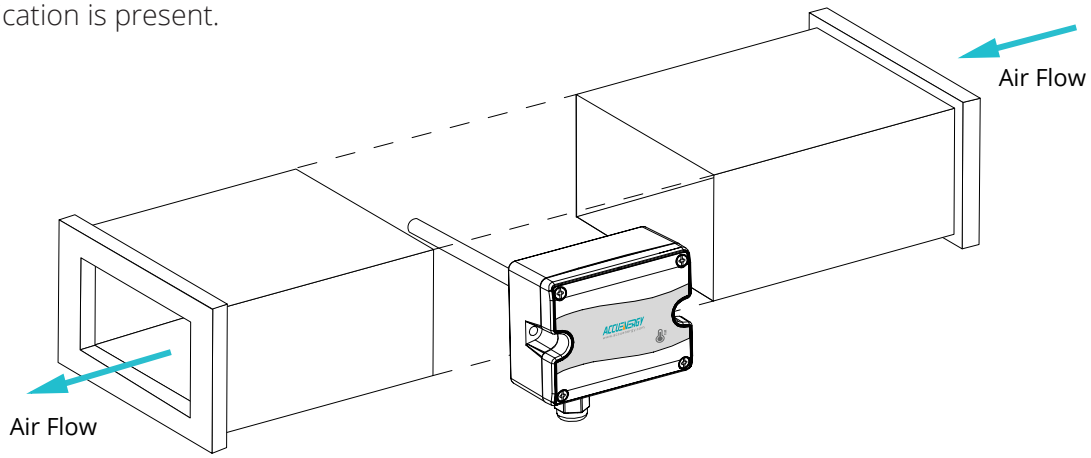

Figure 2 AcuTEMS DM Mounting Location

1. Choose the appropriate probe length for the sensor tip to be positioned at the center of the airflow.
2. Ensure the sensor is mounted away from any sources of air turbulence or obstructions, such as filters, heating/cooling coils, and dampers. Turbulent air can cause inaccurate, erratic temperature readings.
3. Duct probe should be placed 3 to 5 duct diameters away from any potential obstructions or 90° duct bends.
4. Mount the sensor on the side or top of the ductwork to prevent potential condensation from entering the sensor, which can cause damage.

Step 2: Separate Front Cover

1. Locate the four quick release spring screws on each corner of the enclosure and rotate counterclockwise.
   NOTE: Use caution to avoid over-rotating the screws, which may cause damage to the enclosure. Refer to Figure 3 for details.

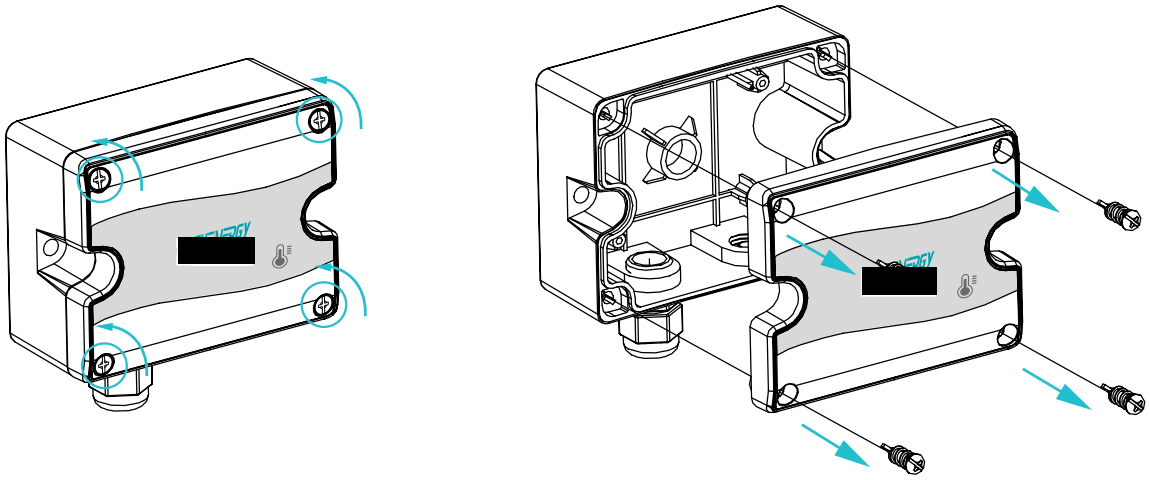

Figure 3 AcuTEMS DM Removing Cover

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

Step 3: Electrical Wiring

ALERT: The AcuTEMS DM 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 power supply with the AcuTEMS DM 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 DM temperature sensor is half-wave rectified.

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

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

NOTE: Accuenergy recommends 20 to 18 AWG (0.52-0.82mm²) twisted pair wires or shielded cable for signal connections. This applies to both power supply and analog output wiring.

Failure to follow the 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 AcuTEMS DM 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 4 for details.

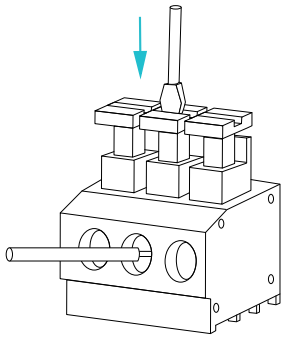

Figure 4 AcuTEMS DM Push Button Terminal Block

The temperature signal can be 0-10VDC, 4-20mA, or RTD/thermistor resistive output. The resistive outputs can be 2-wire or 3-wire depending on the application. Locate the wiring terminals and connect the AcuTEMS DM as shown in the following figures according to the sensor model selected.

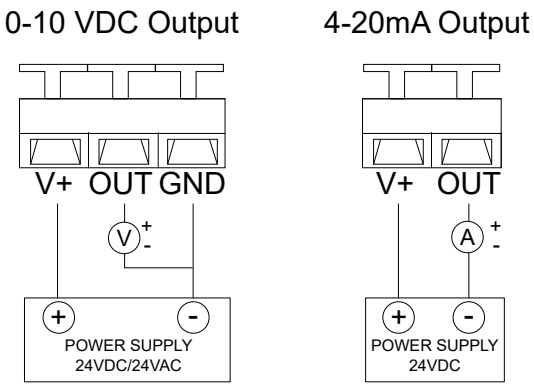

Figure 5 AcuTEMS DM Wiring Terminals for Temperature Transmitter

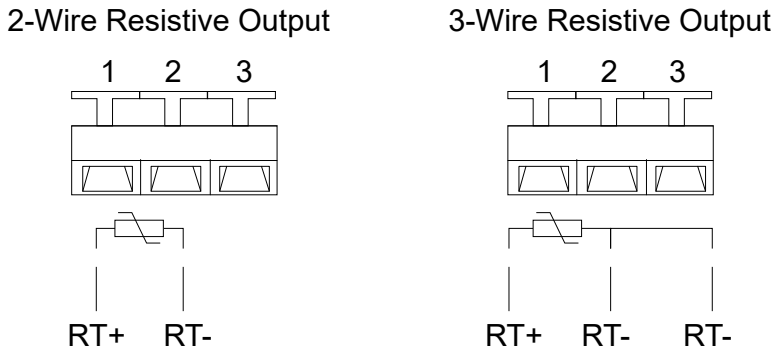

Figure 6 AcuTEMS DM Wiring Terminals for Resistive Output

Step 4: Mount Duct Sensor

Accuenergy recommends using the provided installation flange which enables adjustable probe insertion. Install the flange on the side or top of the duct. Once mounting location is determined:

1. Drill a 9/32" (7mm) diameter opening in the duct for sensor probe insertion.
2. Align the central opening of the mounting flange with the prepared opening for the sensor probe.
3. Fasten the mounting flange with the four provided screws and then insert the sensor probe into the duct.
4. Adjust the AcuTEMS DM probe to the required depth, and use the remaining screws to tighten the flange clamp to secure the probe. Refer to Figure 7 for details.

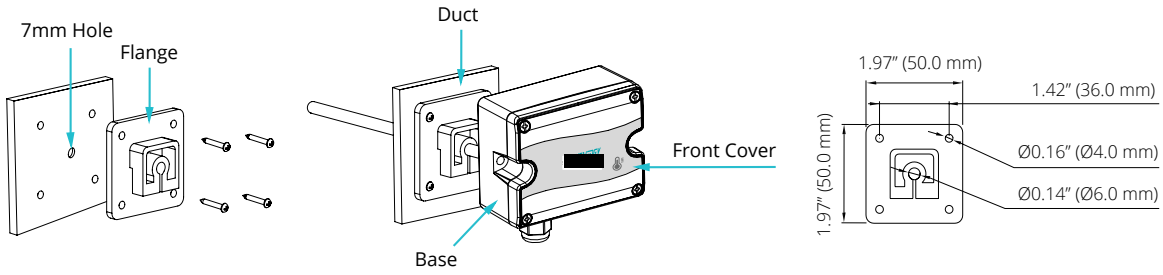

Figure 7 Duct Mount with Flange

NOTE: Over-tightening screws may cause damage to mounting flange so use caution when fastening.

1. Review the wiring installation, and make sure all terminals are connected properly.
2. To finish the installation, fasten the front cover back onto the enclosure by turning the spring screws clockwise.

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	0~50°C (32~122°F) or 0-100°C (32-212°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	4-Screw Duct Mount Flange with Adjustable Probe and Set Screw
Wiring Connection	Push Button Terminal Blocks (2 Wire or 3 Wire)
Weight	330g (0.73lbs)
Certifications/Warranty	
Enclosure Material	Fire Retardant Polycarbonate (UL94V-0)
Protection	IP65
Agency Approvals	CE
Warranty	5 Years

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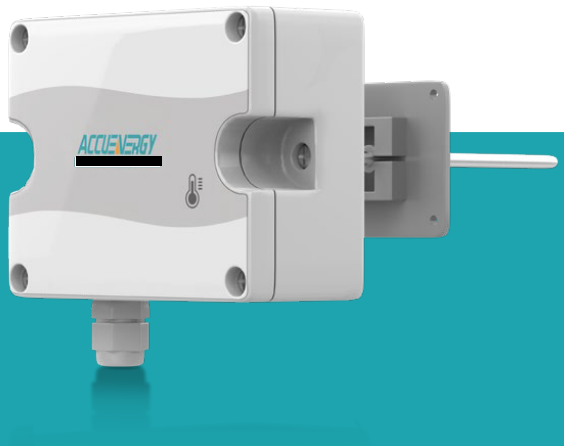
& 45001 Certified



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Specs Subject To Change Without Notice.