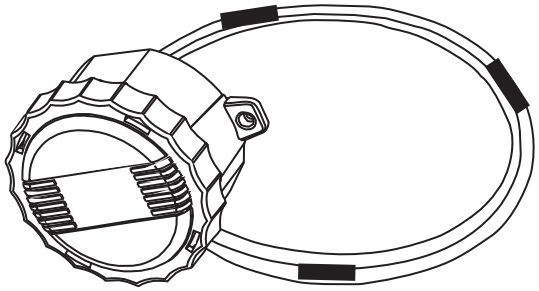
High Accuracy Duct Average Temperature Sensor HATSDFE

Installation Instructions



Introduction

The flexible, multi-point duct averaging utilizes multiple high accuracy sensors at equal distances across the assembly.The plenum rated FT-6 sensing cable is constructed to provide excellent heat transfer, fast response and resistance to moisture penetration. A round ABS enclosure with mounting tabs and a twist off cover is provided for ease of installation.

Before Installation

Read these instructions carefully before installing and commissioning the temperature sensor. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. **Take electrostatic discharge precautions during installation and do not exceed the device ratings.**

Mounting

The averaging sensor installs directly into any air duct with several lengths available for a wide range of duct widths/diameters. Select a suitable installation area in the middle of the duct wall. To achieve the best reading, do not place in an area where air stratification may be present. **Mount the sensor at least 1.5 m (5 ') in either direction from elbows, dampers, filters or other duct restrictions. Avoid areas where the sensor is exposed to vibrations or rapid temperature changes.**

Once a suitable spot is selected, drill a 9.5 - 12 mm (3/8" - 1/2") hole for the probe.

Unroll the sensing cable probe, being careful not to kink the wire and feed into the drilled hole until the enclosure is flush against the duct. The airflow direction is not important. Secure the enclosure to the duct with (2) #10 x 25 mm (1") self tapping screws (Not provided). Tighten screws until the enclosure is tight against the duct and that there is no movement of the enclosure as shown in Figure 1. A foam gasket on the back of the enclosure provides a tight seal against any air leaks.

Install two lengths of hanger strap, securing to the floor and ceiling of the duct. Attach the sensor in a "Z" or "S" pattern observing a minimum bend radius of two inches to prevent damage to wires or sensors and secure to the hanger strap using tube clamps or wire ties. Secure in several spots to minimize vibration as shown in Figure 2.

Remove cover by grasping firmly with hand and twisting approximately a quarter turn counter-clockwise. A landyard is attached between the cover and the box to allow the cover to hang during wiring and set up as shown in Figure 3.

A 21 mm (13/16") hole is provided for connection of either a 12.77mm (0.5") EMT connector or a cable gland style connector as shown in Figure 4. Insert the EMT or cable gland connector through the hole and securely fasten using a locknut. See Figure 5.

Make wire connections as per the "Wiring" illustrations on Page 2. Once wiring is complete, re-install cover and tighten by twisting clockwise.

Figure 1

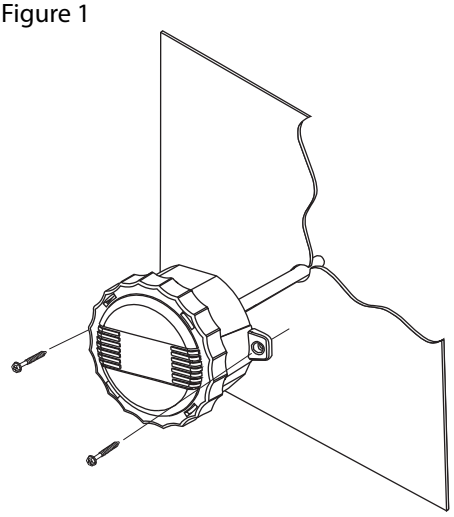


Figure 2

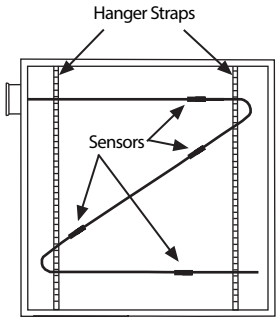


Figure 3

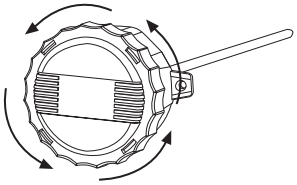


Figure 4

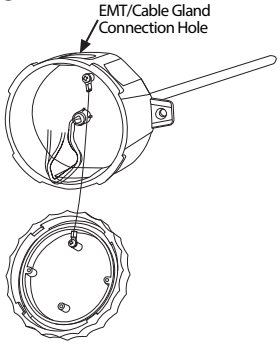
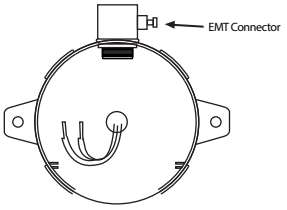


Figure 5



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Wiring

- Use 18-24 AWG shielded wiring for all connections. **Do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors.** Make all connections in accordance with national and local codes.
- Pull at least six inches of wire into the enclosure, then complete the wiring connection according to the wiring diagrams below.
- All thermistors and most RTD's are a 2 wire hook up and are not polarity sensitive. See Figure 5.
- For 3 wire RTD's wire device as shown in Figure 6.
- **All connections should be made using either butt-splices or soldering. The use of wire nuts is not recommended.**

Figure 5 2 Wire Termination

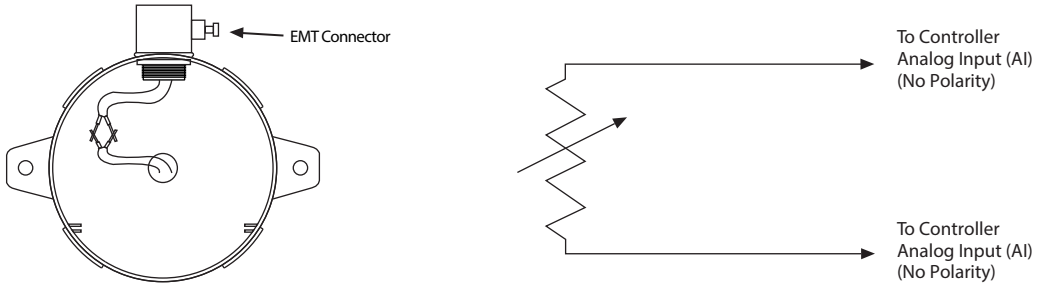
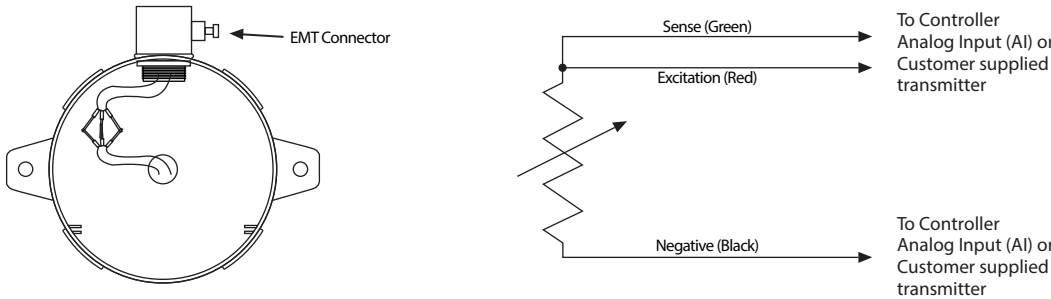


Figure 6 3 Wire Termination



NOTE: To connect a three-wire sensor as a two-wire, tie the EXCitation and SENse lines together

Specification:

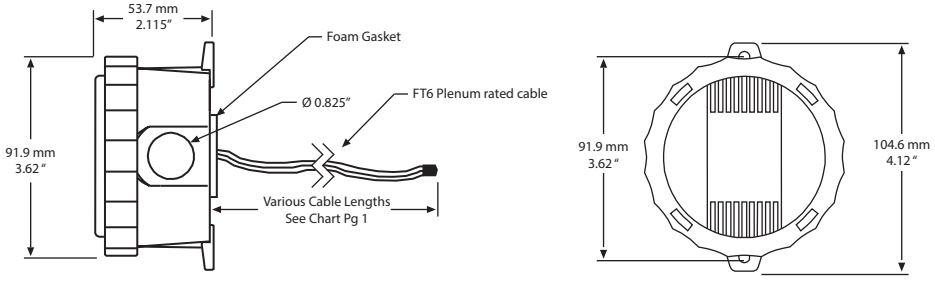
Sensor Type:..... Various thermistors or RTD
Accuracy..... **RTD Class A:** ±0.15˚C @ 0˚C
RTD 1/3 DIN: ±0.1˚C @ 0˚C
RTD 1/10 DIN: ±0.03˚C @ 0˚C
NTC Thermistor Type 39 : ±0.05˚C, 0-70˚C
NTC Thermistor Type 55: ±0.03˚C, 0-70˚C
NTC Thermistor Type 40/46 : ±0.1˚C, 0-70˚C
Probe Sensing Range .....-20 to 60˚C (-4 to 140˚F)
Wire/Probe ..... FT6 Plenum rated cable
Probe Length .....1800, 3600 6100, or 7300 mm
(6', 12', 20' or 24')
Quantity of sensing points .....4 elements - 1800, 3600 and 6300 mm
(6', 12' and 20')
9 elements - 7100 mm (24')
Enclosure:.....ABS - UL94-V0 - IP65 (NEMA4X)
Termination:.....2 or 3 wire pigtail.

Typical Wire Resistance Values

When using low resistance sensors, long wire runs can add significant error to the readings. Use the following chart to determine errors due to wire resistance or consider using a transmitter for better accuracy. Locate the type of wire being used. Multiply the total length of the wire (distance from the controller to the sensor and back) by the number found in the chart below for total resistance.

GAUGE WIRE TYPE	18 AWG	22 AWG	24 AWG
STRANDED (OHMS/FOOT)	5.85 mΩ	14.75 mΩ	23.29 mΩ
SOLID (OHMS/FOOT)	6.4 mΩ	15.85 mΩ	25.72 mΩ

Dimensions:



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