Allen-Bradley

Duct Average-temperature Transmitter

Catalog Numbers 1414-ITX03ACDAA, 1414-ITX02ACDAA, 1414-CTQ03AIEAA, 1414-CTX03PCDAA

About the Duct Average-temperature Transmitter

The multi-point duct average-temperature transmitter incorporates numerous precision RTD sensors at equal distances. The transmitter is encapsulated in a soft copper probe for long lengths or a stainless steel probe for shorter lengths. All probes provide excellent heat transfer, fast response, and moisture-penetration resistance. The transmitter provides a high accuracy signal with excellent long term stability, low hysteresis, and fast response.

Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard and recognize the consequences.
	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, drive or motor, to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Mount the Duct Average-temperature Transmitter

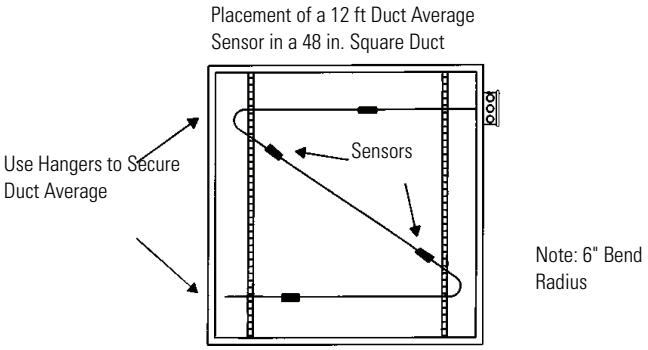
Follow these steps to mount the transmitter.

1. Install the duct average sensors onto hangers in the duct using supplied clamps.

   Located the sensors in a straight section of duct away from heating, cooling, or humidifier elements.

   The duct average sensor can be easily shaped to fit any duct size, but observe a minimum bend radius of six inches to prevent damage to wires or sensors. Duct average elements are not recommended for high humidity applications.

2. Mounted the duct average temperature transmitter enclosure to the outside of the duct, where the sensor tubing exits the duct, by using sheet metal screws (not supplied).



Wire and Connect the Duct Average-temperature Transmitter

Follow these steps to wire and connect the transmitter.

1. Connect the transmitter to the controller by using twisted 18...22 AWG wire.

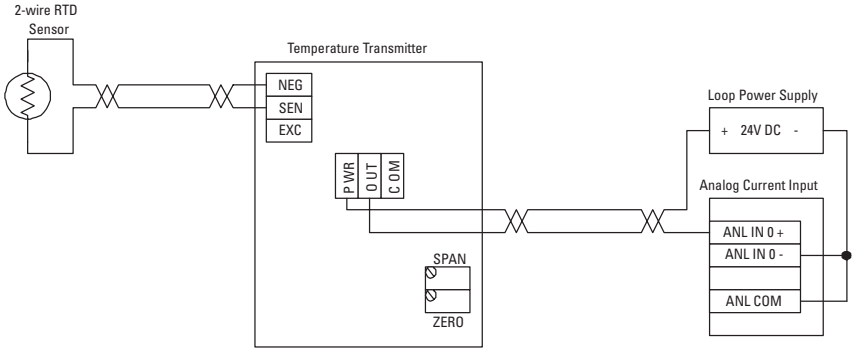
   The transmitter requires two wires for DC 4...20 mA loop-powered operation. The use of shielded cable is optional, but recommended for the highest noise immunity.

IMPORTANT Do not route signal wires in the same conduit with power cables as signal degradation may occur.

2. Select the controller Analog Input (AI) to match the transmitter output before power is applied.

   The AI type must be a current input with 250 or 500 ohm impedance. All transmitters have an operating range of 0...70 °C (32...158 °F). The transmitter board should not be mounted where temperatures exceed these values. See the connection diagram for more details.

Typical wiring to a controller is shown in the diagram. For 4...20 mA loop signal, only the PWR and OUT terminals are used.



Field Calibration

The unit can be calibrated in the field by using precision resistor values equal to the zero and span of the transmitter temperature range.

1. Disconnect the sensor from the transmitter and connect the resistor that represents the zero value to the EXC and NEG terminals.

TIP If the unit uses a three-wire sensor, a jumper must be placed between EXC and SEN.

2. Adjust the ZERO pot until the desired output is achieved.
3. Connect the resistor that represents the span value to the EXC and NEG terminals.
4. Adjust the SPAN pot until the desired output is achieved.

   Repeat these steps until no further adjustment is required.

Specifications

Technical Specifications - Duct Average-temperature Transmitter

Attribute	1414-ITX03ACDAA, 1414-ITX02ACDAA, 1414-CTQ03AIEAA, 1414-CTX03PCDAA
Standard lengths	20 ft
Operating temperature range	0…70 °C (32…158 °F)
Probe type	Flexible copper tube
Wiring connections	Terminal blocks
Enclosures	Plastic ABS - UL94-V - NEMA 1 Aluminum - NEMA 3R
Sensor type	1 KΩ Platinum RTD Commercial and Hybrid: ±0.3% Class B Industrial: ±0.2% Class A
Cable	FT-6 plenum rated cable
Probe	304 Stainless steel straight tip, 6.35 mm (0.25 in.) OD Bendable soft copper tubing, 7.94 mm (0.3125 in.) OD
Output signal	4…20 mA current loop
Transmitter accuracy	±0.1% of span, including linearity
Power supply	15…35V DC
Consumption	Current: 22.5 mA Max. (with open sensor)
PCB operating temperature	0…70 °C (32…158 °F)
Wiring connection	Screw terminal block (14…22 AWG)

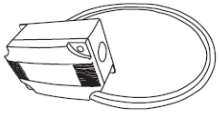
TIP Duct Temperature Averaging has four sensors on < 20 ft probe length and nine sensors on 24 ft probe length. A rigid, straight, stainless-steel probe is used on lengths shorter than 36 in.

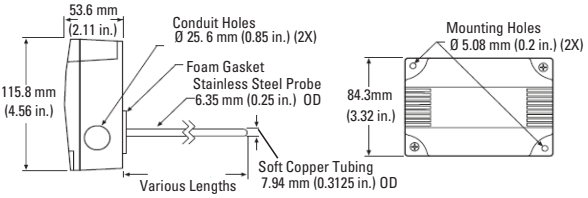
Available Duct Average-temperature Transmitter, 4…20 mA

Description	Commercial	Hybrid	Industrial with cc-pcb
	Plastic Enclosure	Aluminum Enclosure	
457 mm (18 in.) probe -6.7…48.9 °C (20…120 °F)		1414-CTQ03AIEAA	
457 mm (24 in.) probe -6.7…48.9 °C (20…120 °F)			
457 mm (36 in.) probe -6.7…48.9 °C (20…120 °F)			
609.6 cm (20 ft) tubing 0…50 °C (32…122 °F)	1414-CTX03PCDAA	1414-ITX03ACDAA	1414-ITX02ACDAA
609.6 cm (20 ft) tubing 0…100 °C (32…212 °F)			
731.52 cm (24 ft) tubing 0…100 °C (32…212 °F)			
731.52 cm (24 ft) tubing -50…50 °C (-58…122 °F)			
731.52 cm (24 ft.) tubing -50…100 °C (-58…212 °F)			

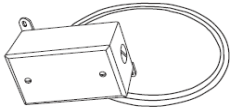
Dimensions

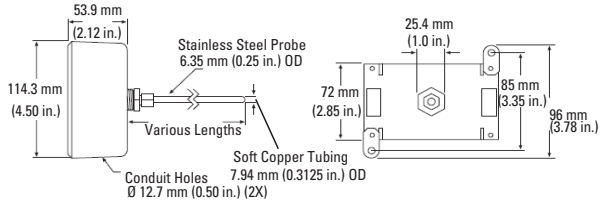
Plastic ABS Enclosure (NEMA 1)





Aluminum Enclosure (NEMA 3R)





Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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