

# Duct Temperature Transmitter

Catalog Numbers 1414-CTQ03AIDAA, 1414-CTQ03PDDAA, 1414-CTQ03PCDAA, 1414-CTQ03PBDAA, 1414-CTP03PDDAA, 1414-CTP03PCDAA, 1414-CTP03PBDAA, 1414-ITQ03ADDAA, 1414-ITQ03ACDAA, 1414-ITQ03ABDAA, 1414-ITP03ADDAA, 1414-ITP03ACDAA, 1414-ITP03ABDAA, 1414-ITQ02ADDAA, 1414-ITQ02ACDAA, 1414-ITQ02ABDAA, 1414-ITP02ADDAA, 1414-ITP02ACDAA, 1414-ITP02ABDAA

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## About the Duct Temperature Transmitter

This duct temperature transmitter is designed for single point monitoring. It is available with two probe lengths and enclosures to fit commercial and light-industrial applications. The duct temperature transmitter provides a 4...20 mA current signal proportional to the sensed temperature and is loop powered.

The temperature transmitter is designed to convert 1000 ohm RTD signal into an analog output with  $\pm 0.15$  °C Class A,  $\pm 0.30$  °C Class B, and 0.1% FSO accuracy for the board.



## 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.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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

	<b>WARNING:</b> 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.
	<b>ATTENTION:</b> 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.
	<b>SHOCK HAZARD:</b> Labels may be on or inside the equipment, for example, drive or motor, to alert people that dangerous voltage may be present.
	<b>BURN HAZARD:</b> Labels may be on or inside the equipment, for example, drive or motor, to alert people that surfaces may reach dangerous temperatures.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.

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## Install the Duct Temperature Transmitter

The duct type probes monitor a single point temperature within the duct. Follow these steps to install the duct temperature transmitter.

1. Drill a 6.35 mm (0.25 in.) hole in a straight section of duct away from heating, cooling, or humidifier elements.
2. Select a probe length that places the sensor well into the duct.  
Probes are tip sensitive, this helps to avoid errors due to laminar flow.
3. Install the probe through the hole.

## Wire and Connect the Duct Temperature Transmitter

Follow these steps to wire and connect the duct temperature transmitter.

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**IMPORTANT** Follow anti-static precautions to prevent damage to the device.

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1. Disconnect the power supply before making any connections to prevent electrical shock or equipment damage.
2. Connect the transmitter to the controller using 14...22 AWG wire.  
Use shielded cable for the highest noise immunity. The unit comes factory set for 4...20 mA loop powered operation with only the PWR and OUT required. The COM terminal is used for voltage output types or for AC power.

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

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3. Follow the example wiring diagram and make all connections in accordance with national and local electrical codes.
4. Ensure the controller Analog Input (AI) matches the transmitter output signal type before power is applied.  
The device is reverse voltage protected and will not operate if connected backwards. Follow specification ratings or inaccurate readings may result.

## Operation

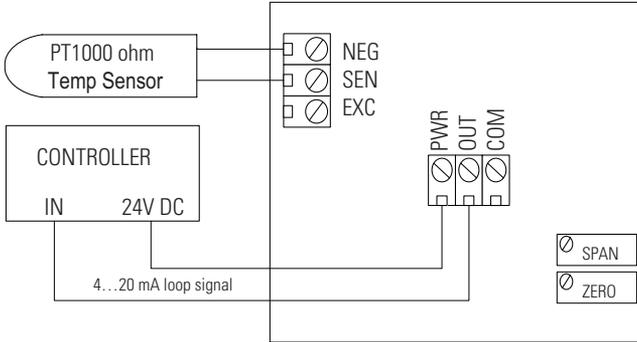
1. Allow the product to warm-up for 20 minutes before you attempt to verify accuracy of the transmitter.
2. Measure the signal by inserting a mA meter in series with the OUT terminal.  
The signal should read between 4...20 mA.

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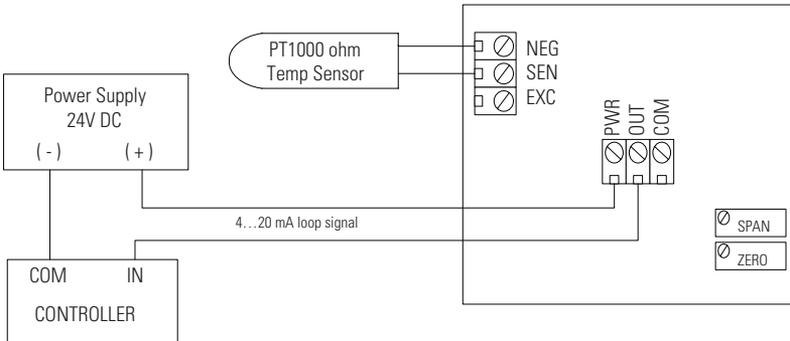
3. Calibrate the unit in the field by using precision resistance values equal to the zero and span of the temperature range.
4. Replace the attached probe with the resistor, then adjust the ZERO and SPAN pots accordingly to obtain the correct output signal.
5. Repeat the adjustments until both values are correct.

### Wiring Diagram

Sinking 4...20 mA signal w/excitation from controller



4...20 mA signal w/external 24V DC power supply



## 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 Temperature Transmitter

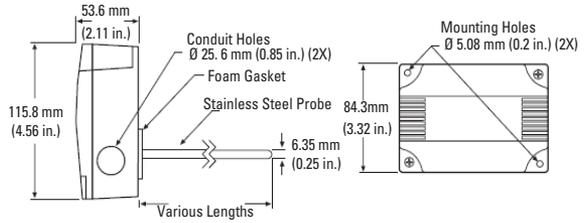
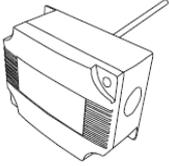
Attribute	1414-CTQx, 1414-CTPx, 1414-ITQx, 1414-ITPx
Operating temperature range	-20...105 °C (-4...221 °F)
PCB operating temperature range	0...70 °C (32...158 °F)
Sensor types	PT1000 Ω Platinum RTD Commercial and Hybrid: ±0.3% Class B Industrial: ±0.2% Class A
Enclosures	Plastic ABS - UL94-V - NEMA 1 Aluminum - NEMA 3R
Cable type	PVC insulated, parallel bonded
Probe	304 stainless steel with spin welded tip
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)
Wiring connections	Screw terminal block (14...22 AWG)

**Available Duct Transmitters, 4...20 mA**

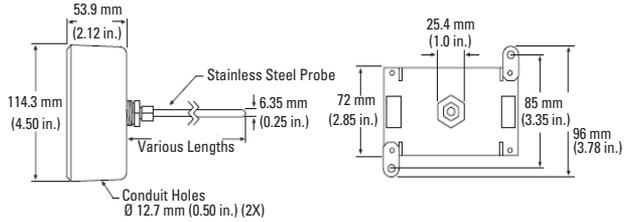
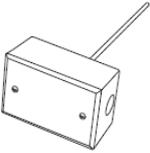
Description	Commercial	Hybrid	Industrial with cc-pcb
	Plastic Enclosure	Aluminum Enclosure	
457 mm (18 in.) probe 0...100 °C (32...212 °F)	1414-CTQ03PDDAA		1414-ITQ02ADDAA
457 mm (18 in.) probe 0...50 °C (32...122 °F)	1414-CTQ03PCDAA		1414-ITQ02ACDAA
457 mm (18 in.) probe 0...35 °C (32...95 °F)	1414-CTQ03PBDAA		1414-ITQ02ABDAA
457 mm (18 in.) probe -50...50 °C (-58...122 °F)			1414-ITQ02WADAA
457 mm (18 in.) probe -50...100 °C (-58...212 °F)			1414-ITQ02WJDAA
457 mm (18 in.) probe -50...121 °C (-58...250 °F)			1414-ITQ02WMDAA
305 mm (18 in.) probe -6.7...48.9 °C (20...120 °F)		1414-CTQ03AIDAA	1414-ITQ02AIDAA
305 mm (12 in.) probe 0...100 °C (32...212 °F)	1414-CTP03PDDAA		1414-ITP02ADDAA
305 mm (12 in.) probe 0...50 °C (32...122 °F)	1414-CTP03PCDAA		1414-ITP02ACDAA
305 mm (12 in.) probe 0...35 °C (32...95 °F)	1414-CTP03PBDAA		1414-ITP02ABDAA
305 mm (12 in.) probe -50...50 °C (-58...122 °F)			1414-ITP02WADAA
305 mm (12 in.) probe -6.7...48.9 °C (20...120 °F)		1414-CTP03AIDAA	1414-ITP02AIDAA

## Dimensions

Plastic ABS Enclosure (NEMA 1)



Aluminum Enclosure (NEMA 3R)



# 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 <a href="#">Worldwide Locator</a> at <a href="http://www.rockwellautomation.com/support/americas/phone_en.html">http://www.rockwellautomation.com/support/americas/phone_en.html</a> , 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.

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication [BA-DUJ002](#), available at <http://www.rockwellautomation.com/literature/>.

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