

Foxboro® Optical Temperature Transmitter RTT15S



OTTPPLUS

The Model RTT15S is a microprocessor-based temperature transmitter that uses the HART communication protocol. It receives input signals from thermocouples, RTDs, ohm, or millivolt sources. It is available as a basic module, or in an explosion-proof housing with optional display and optical buttons for local configuration.

The RTT15S provides a wide range of packaging, sensor types, and other options making this transmitter suitable for most temperature applications. The microprocessor-based electronics minimize ambient temperature effects and result in high accuracy, repeatability, and linearization of the sensor signal. Ease of mounting and installation makes these transmitters an extremely attractive offering.

RTT15S at a Glance

- Optical configuration buttons can be operated through the glass cover of the explosion-proof housing
- Transmitter can be configured in hazardous locations without shutting down the process
- Configurable backlighting in white and red colors
- Display can be configured to flash or change colors upon diagnostic error detection

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RTT15S Temperature Transmitter - Features

User-friendly interface

- Optional LCD display with selectable, programmable red or white backlight
- 5 lines of text or symbols
- Configurable bar graph
- Intuitive menu structure with scrolling help text

Optional optical buttons for local configuration with scrolling help text in 7 languages

- English
- German
- Swedish
- Spanish
- Danish
- French
- Italian

User-selectable HART versions 5 and 7

- HART 7 default

Efficient and Durable

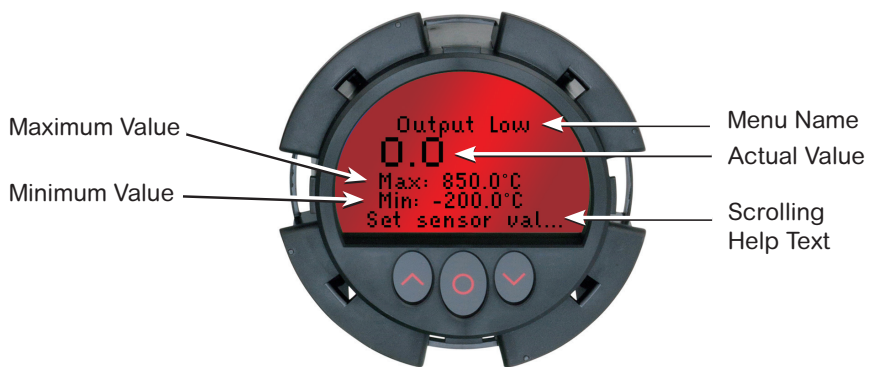
Industrial-grade integrated circuits and sealed electronics combine to make this microprocessor-based transmitter an efficient and durable device.

Rugged and Reliable Sensors

Foxboro sensors are of high quality and rugged construction and provide maximum accuracy and longevity. Sensors designed for use with wells include a spring-loading mechanism that ensures continuous contact between the sensor tip and well.

Automatic Self Calibration

This transmitter has an advanced automatic self-calibration routine. Several times per minute, the transmitter checks the zero and full-scale output against highly accurate and stable internal voltage signals that are referenced back to the factory calibration stored in non-volatile EEPROM memory. Any necessary adjustments are made automatically without interrupting the output signal.



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RTT15S Temperature Transmitter - Features continued

Out of Range and Failure Current

Low and high out-of-range output values are user configurable between 3.5 and 23 mA. A configuration selection for NAMUR 43 (3.8 and 20.5 mA) is also provided.

The transmitter can also be configured for sensor error detection. Output values are independently

shorted and open sensor conditions. Configuration selections are also provided for direct selection of NAMUR 43 low (3.5 mA) and NAMUR 43 (23 mA), both independently selectable for either shorted or open sensor conditions. Shorted sensor detection not applicable for thermocouples.

Operating, Transportation, and Storage Conditions (A)

| Influence | Operative Limits | Transportation and Storage Limits |
|-----------------------------|--|--|
| Ambient Temperature (b) (c) | -40°C and +85°C (-40°F and +185°F) for housing with silicone o-ring, or no housing -40°C and +85°C (-40°F and +185°F) for housing with FKM o-ring | -40°C and +85°C (-40°F and +185°F) |
| Relative Humidity | < 95%, non-condensing with no housing 0 and 100%, condensing with housing | < 95%, non-condensing with no housing 0 and 100%, condensing with housing |
| Supply Voltage | No housing: 8 to 30 V dc With housing, certified as intrinsically safe: 10 to 30 V dc (12 to 30 V dc with optional display) With housing, certified as other: 10 to 35 V dc (12 to 35 V dc with optional display) | not applicable |
| Vibration | 1.6 mm from 2 to 25 Hz 4 g from 25 to 100 Hz (IEC 60068-2-6:2007) | 1070 mm (42 in) drop in shipping container |

- a. To ensure proper operation, the ambient temperature limits at the housing should not be exceeded. This is particularly relevant when sensors/wells are direct-connected to the housing and very high process temperatures are being measured. The transfer of heat from the process to the housing can be minimized by use of thermowell extensions, or in extreme cases, by using a remote housing installation.
- b. Reduced LCD performance below -20°C and above +70°C (-4°F and above +158°F).
- c. Calibration temperature range is 20°C to 28°C (68°F to 82°F).

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Accuracy

Accuracy is the Largest Value from Table 1 or Table 2



Table 1. General Values

| Input Type | Absolute Accuracy | Temperature Coefficient |
|------------|---------------------------|--|
| All | $\leq \pm 0.05\%$ of span | $\leq \pm 0.005\%$ of span/ $^{\circ}\text{C}$ |

Table 2. Basic Values

| Input Type | Basic Accuracy | Temperature Coefficient |
|--|--------------------------------|---|
| Pt100 | $\leq \pm 0.1^{\circ}\text{C}$ | $\leq \pm 0.005^{\circ}\text{C}/^{\circ}\text{C}$ |
| Ni100 | $\leq \pm 0.2^{\circ}\text{C}$ | $\leq \pm 0.005^{\circ}\text{C}/^{\circ}\text{C}$ |
| Resistance | $\leq \pm 0.1 \Omega$ | $\leq \pm 5 \text{ m}\Omega/^{\circ}\text{C}$ |
| Volt | $\leq \pm 10 \mu\text{V}$ | $\leq \pm 0.5 \mu\text{V}/^{\circ}\text{C}$ |
| TC type E, J, K, L, N, T, U | $\leq \pm 0.5^{\circ}\text{C}$ | $\leq \pm 0.025^{\circ}\text{C}/^{\circ}\text{C}$ |
| TC type B ¹ R, S, W3, W5 | $\leq \pm 1^{\circ}\text{C}$ | $\leq \pm 0.1^{\circ}\text{C}/^{\circ}\text{C}$ |
| TC type B ² | $\leq \pm 3^{\circ}\text{C}$ | $\leq \pm 0.3^{\circ}\text{C}/^{\circ}\text{C}$ |
| TC type B ³ | $\leq \pm 8^{\circ}\text{C}$ | $\leq \pm 0.8^{\circ}\text{C}/^{\circ}\text{C}$ |
| TC type B ⁴ | not specified | not specified |