Temperature

RTT15S Temperature Transmitter with Optional Optical Configurator

PSS 2A-1F5 B

Product Specification

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https://www.se.com

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Introduction

The Model RTT15S Temperature Transmitter is a microprocessor-based temperature transmitter that uses the HART® communication protocol. It receives input signals from thermocouple (TC), resistance temperature detector (RTD), ohm (Ω), or millivolt (MV) sources. It is available as a basic module, or in an explosion proof housing with optional display and optical buttons for local configuration.

Features

- Optional LCD display with selectable, programmable red or white backlight.
- Optional optical buttons for local configuration in seven languages.
- User-selectable HART versions 5 and 7.
- IP54, IP66, IP68, NEMA 4X, explosion proof housing selections in aluminum or stainless steel.
- Basic module can be mounted to surface or DIN rail.
- One unit configurable for TC , RTD, ohm, and mV.
- Supports 2-, 3-, and 4-wire RTDs.
- Allows average or difference measurement using 2-wire inputs.
- TC cold junction compensation.
- Galvanic isolation for both input and output.
- Automatic self-diagnostics and self-calibration.
- Wide selection of sensors and thermowells.
- Configurable failsafe mA value.
- Conforms to applicable European Union Directives (product marked with “CE” logo).
- EMC immunity per EU Directive 2014/30/EU.
- Compliant with NAMUR NE 21 criterion for burst.
- Meets many testing agency requirements for hazardous area installations.
- Standard 2-year warranty.

General Description

The RTT15S transmiitter is available in the following product configurations:

- Standalone DIN B module
- DIN B module in either weatherproof or explosion-proof connection head housing
- DIN B module in display housing and optional optical configuring display or non-configuring display
- As integrated assemblies with housing options above and attached sensors and/or thermowells

Input Types

The RTT15S transmitter can be used with a wide variety of temperature sensors, including 2-, 3-, and 4-wire RTDs, most popular thermocouples, and other resistance and millivolt input devices. The following is a general list of transmitter input types:

- Platinum RTDs, 2-, 3-, and 4-wire
- Nickel RTD, 3-wire
- Thermocouples
- Millivolt
- Ohm
- Average or difference measurement with two 2-wire RTDs, two TCs, or two mV inputs

Efficiency and Durability

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

Remote Communications

The transmitter uses the HART communication protocol for remote digital communication.

4 to 20 mA with HART 7 or HART 5 communications allows direct analog connection to common receivers while still providing full intelligent digital communications using a HART communicator or PC-based configurator.

HART 7 provides the familiar features of HART 5 as well as features introduced in HART 6 and 7, including long tag support, multivariable support and variable mapping, extended device status, individual sensor calibration, burst mode with event triggers, and trend reporting with time stamps.

HART Device Descriptors (DDs) are available from the Schneider Electric website for download. They are also part of the DD library available to handheld configurator users.

Rugged and Durable Sensors

Schneider Electric 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 helps ensure continuous contact between the sensor tip and well.

Galvanic Isolation

Galvanic isolation is provided for input and output.

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 nonvolatile EEPROM memory. Any necessary adjustments are made automatically without interrupting the output signal.

Out-of-Range and Fail State Current

Low out-of-range (downscale burnout) and high out-of-range (upscale burnout) 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 configurable between 3.5 and 23 mA for both shorted and open sensor conditions. Configuration selections are also provided for direct selection of NAMUR 43 low (3.5 mA) and NAMUR 43 high (23 mA), both independently selectable for either shorted or open sensor conditions. Shorted sensor detection is not applicable for thermocouples.

Optional Display and Optical Buttons

The transmitter is available with an optional, 96x64 pixel LCD display with a backlight that flashes if an error is detected. Both the normal backlight and the flashing error detected backlight can be configured as red or white, or turned off completely.

The display is available both with and without optical buttons that can be used for operating and programming the transmitter, even when the cover window is in place. The buttons can be operated either with or without gloves, and adapt to wear and smudges left on the surface.

The optical buttons are immune to interference from ambient light sources and other panel meters, such as other RTT15S transmitters mounted nearby.

Table 1 - Display Specifications

Display resolution	96 x 64 pixels
Number of digits	5
Response time, button to display	< 150 ms
Backlight	Selectable ON/OFF
Backlight color	Selectable white or red
Error detection indication	Selectable white or red (flashing)

Figure 1 - Monitoring View

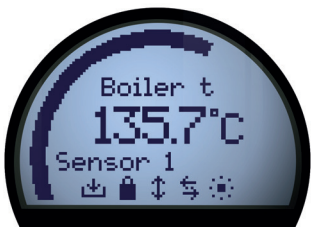


Figure 2 - Programming View

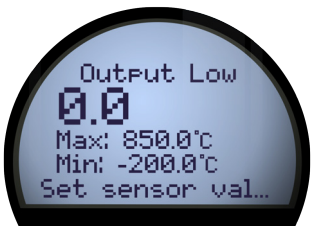
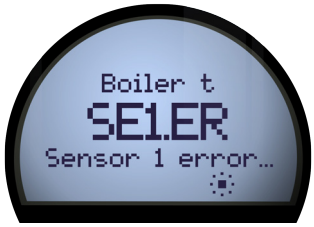


Figure 3 - Diagnostics View



Operating, Transportation, and Storage Specifcations

NOTICE

HAZARD OF REDUCED PERFORMANCE

- To help ensure proper operation, do not exceed the ambient temperature limits at the housing. 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.
- Reduced LCD performance below -20°C and above +70°C (-4°F and +158°F).

Failure to follow these instructions can result in reduced performance.

Influence	Operative Limits	Transportation and Storage Limits
Ambient Temperature[1]	-40 and +85°C (-40 and +185°F) for housing with silicone o-ring, or no housing	-40 and +85°C (-40 and +185°F)
	-20 and +85°C (4 and +185°F) for housing with FKM o-ring	
Relative Humidity	< 95%, non-condensing, no housing	< 95%, non-condensing, no housing
	0 and 100%, condensing, with housing	0 and 100%, condensing, with housing
Supply Voltage, DC	Ex ia, intrinsically safe: 10...30 V dc (no backlight) 12...30 V dc (with backlight)	Not Applicable
	Other certifications: 10...35 V dc (no backlight) 12...35 V dc (with backlight)	
Vibration (display housing only)	1.6 mm (0.06 in) 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

1. Calibration temperature range is 20 to 28°C (68 to 82°F).

Performance Specifications

All performance specifications apply to the transmitter only. Any issues associated with the thermocouple or RTD sensors, or any other millivolt or resistance sensors, are cumulative. For performance specifications on Schneider Electric RTDs and thermocouples, see the *Schneider Electric Temperature Products Catalog,* which can be downloaded from www.se.com.

Accuracy

Accuracy is the larger value of the General Values table or the Basic Values table.

Table 2 - General Values

All	Absolute Accuracy	Temperature Coefficient
All	≤ ±0.05% of span	≤ ±0.005% of span/°C

Table 3 - Basic Values

Input Type	Basic Accuracy	Temperature Coefficient
Pt50 – Pt1000	≤ ±0.1°C	≤ ±0.0005 °C/°C
Ni50 – Ni1000	≤ ±0.2°C	≤ ±0.0005 °C/°C
Resistance	≤ ±0.1 Ω	≤ ±5 mΩ/°C
Voltage	≤ ±10°µV	≤ ± 0.5 µV/°C
TC type E, J, K, L, N, T, U	≤ ±0.5°C	≤ ± 0.025 °C/°C
TC type B[1], R, S, W3, W5	≤ ±1°C	≤ ± 0.1 °C/°C
TC type B[2]	≤ ±3°C	≤ ± 0.3 °C/°C
TC type B[3]	≤ ±8°C	≤ ± 0.8 °C/°C
TC type B[4]	not specified	not specified

Table 4 - Thermocouple Accuracy Specification Ranges

TC B[1]	> 400°C
TC B[2]	> 160°C; < 400°C
TC B[3]	> 85°C; < 160°C
TC B[4]	< 85°C

Additional Performance Specifications

TC Cold Junction Compensation	< ±1.0°C
Maximum Offset on Input Signal	50% of selected maximum value
EMC Immunity Influence	< ±0.1% of span
NAMUR NE 21, A Burst Criterion	< ±1% of span

Functional Specifications

Thermocouple Input Specifications

Table 5 - Thermocouple Range Limits and Span

TC	Range Limits	Minimum Span	Standard
B	0 and 1,820°C (32 and 3,308°F)	100°C (180°F)	IEC584
E	-100 and +1,000°C (-148 and +1,832°F)	50°C (90°F)	IEC584
J	-100 and +1,200°C (-148 and +2,192°F)	50°C (90°F)	IEC584
K	-180 and +1,372°C (-292 and +2,501.6°F)	50°C (90°F)	IEC584
L	-200 and +900°C (-328 and +1,652°F)	50°C (90°F)	DIN 43710
Lr	-200 and +800°C (-328 and +1,472°F)	50°C (90°F)	GOST 3044-84
N	-180 and +1,300°C (-292 and +2,372°F)	50°C (90°F)	IEC584
R	-50 and +1,760°C (-58 and +3,200°F)	100°C (180°F)	IEC584
S	-50 and +1,760°C (-58 and +3,200°F)	100°C (180°F)	IEC584
T	-200 and +400°C (-328 and +752°F)	50°C (90°F)	IEC584
U	-200 and +600°C (-328 and 1,112°F)	50°C (90°F)	DIN 43710
W3	0 and 2,300°C (32 and 4,172°F)	100°C (180°F)	ASTM E988-90
W5	0 and 2,300°C (32 and 4,172°F)	100°C (180°F)	ASTM E988-90

RTD Input Specifications

Cable resistance per wire (max): 5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)

Sensor current: Nom. 0.2 mA

Table 6 - RTD Range Limits and Span

RTD	Range Limits	Minimum Span	Standard
Pt100	-200 and +850°C (-328 and +1,562°F)	10°C (18°F)	IEC 60751
Ni100	-60 and +250°C (-76 and +482°F)	10°C (18°F)	DIN 43760
All	0 - 7000 Ω	25 Ω	≤ ±0.005% of span/°C

Ohms Resistance Input Specifications

Range Limits: 0 and 7,000 Ω

Minimum Span: 25 Ω

Millivolt Input Specifications

Range Limits: -800 and +800 mV

Minimum Span: -2.5 mV

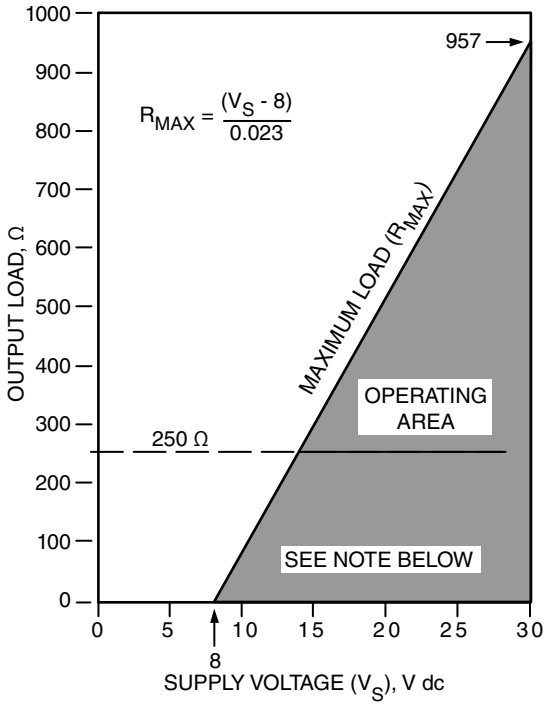
Input Resistance: 10 MΩ

Supply Voltage Requirements and External Loop Load Limitations

Nominal minimum supply voltage for HART 4 to 20 mA output with a superimposed digital signal is 8 V dc, for transmitters without a display. For transmitters that have the optional display, the minimum is 10 V dc if backlight is not used, or 12 V dc when backlight is in use.

The maximum supply voltage is 30 V dc for transmitters certified/approved as intrinsically safe; 35 V dc otherwise.

Figure 4 - HART 4 to 20 mA Output: Supply Voltage vs. Output Load



NOTE

The transmitter will function with an output load less than 250 Ω provided that a HART Communicator or PC-based Configurator is not connected to it. Use of a HART Communicator or PC-based Configurator requires 250 Ω minimum load.

Other Functional Specifications

Damping	1 to 6 s, configurable
Updating Time — Single Input	440 ms
Supply Voltage Effect	0.005% of span/volt change
Long-Term Stability (Drift)	0.1% of span/year
Thermocouple Cold Junction Compensation	TC cold junction compensated via internal measurement, user-entered constant, or external RTD (2-wire) provided by Pt100 or Ni100.
RTD Cable Resistance Compensation — Transmitter-to-Sensor	**4-Wire RTD:** Transmitter compensates for cable resistance changes due to ambient temperature changes. **3-Wire RTD:** Transmitter compensates for cable resistance changes due to temperature, as long as cables are exposed to the same ambient temperature. **2-Wire RTD:** Transmitter compensates for constant cable resistance. User may enter resistance value, or transmitter will measure it during setup.
Sensor Error Detection	Available for RTD, TC, and ohms inputs (open and shorted for RTD and ohms inputs, and open for TC inputs).
Input Resistance	10 MΩ

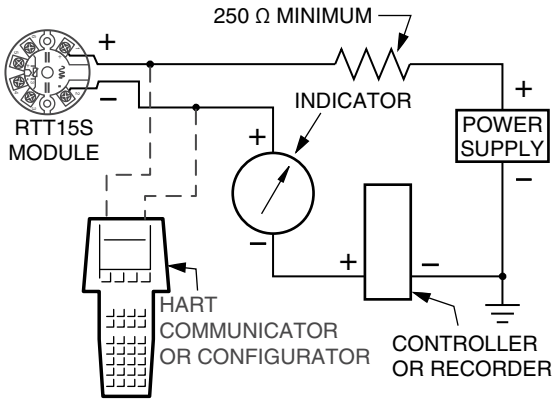
HART Communication Specifications

Parameter	Analog Mode	Multidrop Mode
Remote Configurator	HART Communicator or PC-based configurator	
Communication Rate	1,200 baud	
Communication Distance (rated)	3,050 m (10,000 ft)	1,525 m (5,000 ft)

4 to 20 mA Analog Mode

Analog output signal is updated 30 times per second. A minimum loop load of 250 ohms is required.

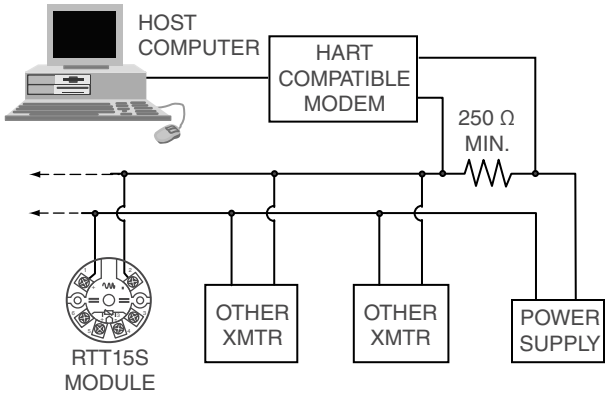
Figure 5 - HART 4 to 20 mA Output Bock Diagram (One Transmitter)



Multidrop Mode (Fixed Current)

This mode supports communication with up to 64 transmitters with HART 7, or up to 15 transmitters with HART 5 on a single pair of signal/power wires. The output signal is updated 4 times/second. A minimum loop load of 250 ohms is required.

Figure 6 - HART Multidrop Block Diagram (Up to 15 Transmitters with HART 5; up to 64 with HART 7)



Physical Specifications

Mounting

The basic transmitter module can be mounted to a DIN rail using the optional mounting clip and self-tapping screw. The basic module can also be mounted to a surface using user-supplied hardware.

The transmitter housing (without sensor) can be remote mounted to a surface or nominal DN 50 or 2 in pipe using the optional mounting bracket.

Electrical Connections

There are six terminals on the transmitter module for input and output connections. Four terminals are for RTD, TC, ohm, or mV sensor inputs, and two terminals (marked + and –) are for measurement output.

Housing Physical Data

Also refer to Dimensions-Nominal.

Description	Model Selection	Material	Ingress Protection	Weight
No Housing (transmitter module only)	“N“ for Configuration Code STM01	n/a	IP54	50 g (1.8 oz)
Display Housing, 1/2 in NPT Conduit	“1“ for Configuration Code STM01; 53C for other Configuration Codes	Low-copper (< 0.05) aluminum	IP66, IP68, NEMA 4X	1.3 kg (2.9 lbs)
Display Housing, M20 Conduit	“2“ for Configuration Code STM01; 53M for other Configuration Codes	Low-copper (< 0.05) aluminum	IP66, IP68, NEMA 4X	1.3 kg (2.9 lbs)
Display Housing, 1/2 in NPT Conduit	“3“ for Configuration Code STM01; 54C for other Configuration Codes	316 ss	IP66, IP68, NEMA 4X	2.8 kg (6.2 lbs)
Display Housing, M20 Conduit	“4“ for Configuration Code STM01; 54M for other Configuration Codes	316 ss	IP66, IP68, NEMA 4X	2.8 kg (6.2 lbs)
GP Connection Head	“31“ for Configuration Codes SGP01, 2,3,4; SSP03	Aluminum Alloy A380 (3 to 4% copper)	IP66, NEMA 4	0.36 kg (0.8 lbs)
GP Connection Head	“91“ for Configuration Codes SGP01, 2,3,4; SSP03	316L ss	IP66, NEMA 4X	1.09 kg (2.4 lbs)
XP Connection Head	“59“ for Configuration Codes SXP01, 2, 3, 4, 5, 6, 7; SEL01, 2, 3, 4, 5, 6, 7	Aluminum Alloy A380 (3 to 4% copper)	IP66, NEMA 4	0.48 kg (1.05 lbs)
XP Connection Head	“60“ for Configuration Codes SXP01, 2, 3, 4, 5, 6, 7; SEL01, 2, 3, 4, 5, 6, 7	316L ss	IP66, NEMA 4X	1.41 kg (3.1 lbs)

Ohms Resistance Input Specifications

Range Limits: 0 and 7,000 Ω

Minimum Span: 25 Ω

Other Physical Specifications

Damping	1 to 6 s, configurable
Updating Time — Single Input	440 ms
Supply Voltage Effect	0.005% of span/volt change
Long-Term Stability (Drift)	0.1% of span/year
Thermocouple Cold Junction Compensation	TC cold junction compensated via internal measurement, user-entered constant, or external RTD (2-wire) provided by Pt100 or Ni100.
RTD Cable Resistance Compensation — Transmitter-to-Sensor	**4-Wire RTD:** Transmitter compensates for cable resistance changes due to ambient temperature changes. **3-Wire RTD:** Transmitter compensates for cable resistance changes due to temperature, as long as cables are exposed to the same ambient temperature. **2-Wire RTD:** Transmitter compensates for constant cable resistance. User may enter resistance value, or transmitter will measure it during setup.
Sensor Error Detection	Available for RTD, TC, and ohms inputs (open and shorted for RTD and ohms inputs, and open for TC inputs).
Input Resistance	10 MΩ

Electrical Certifications

The RTT15S Temperature Transmitter is designed to meet the electrical safety descriptions listed in the tables below when installed in accordance with agency installation instructions. Agency installation instructions are included with the purchased product, or can be downloaded at www.se.com by typing the certification type in the search box. For detailed information or status of testing laboratory approvals/certifications, contact Global Customer Support.

Table 7 - Transmitter Model without Housing

Agency Certification, Type of Protection, and Area Classification	Application Conditions	Configuration Code
ATEX intrinsic safe II 1 G Ex ia IIC T6...T4 Ga II 1 D Ex ia IIIC Da	T4: -40 ≤ Ta ≤ +85°C T6: -40 ≤ Ta ≤ +45°C	STM01
CSA/CSAus intrinsic safe Ex/AEx ia IIC Ga Class I, Division1, Groups ABCD;	T4: -40 ≤ Ta ≤ +85°C T6: -40 ≤ Ta ≤ +45°C	STM01
IECEx intrinsic safe Ex ia IIC T6...T4 Ga Ex ia IIIC Da	T4: -40 ≤ Ta ≤ +85°C T6: -40 ≤ Ta ≤ +45°C	STM01
NEPSI intrinsic safe Ex ia IIC T6...T4 Ga Ex ia IIIC Da	T4: -40 ≤ Ta ≤ +85°C T6: -40 ≤ Ta ≤ +45°C	STM01

Table 8 - Transmitter in Optical Housing, No Sensor Attached

Agency Certification, Type Protection, and Area Classification	Application Conditions	Configuration Code
ATEX intrinsic safe II 1 G Ex ia IIC T6...T4 GaI I 1 D Ex ia IIIC T100°C Da	**For Ex ia** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 45°C T60°C	STM01
ATEX Ex ic and Ex nA II 3 G Ex ic IIC T6...T4 Gc II 3 D Ex ic IIIC T100°C Dc II 3 G Ex nA IIC T6...T4 Gc	**For Ex nA** O-Ring Sealing: Silicone T4: -40 ≤ Ta ≤ 85°C T4 (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T4 (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T6 O-Ring Sealing: FKM T4: -20 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4: -20 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -20 ≤ Ta ≤ 60°C **For Ex ic** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T85°C	STM01
ATEX Ex db (flameproof) II 2 G Ex db IIC T6...T4 Gb II 2 D Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**For Ex db** T4, T5: -40 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4, T5: -40 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 70°C **For Ex tb** O-Ring Sealing: Silicone -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) -40 ≤ Ta ≤ 70°C T85°C O-Ring Sealing: FKM -20 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -20 ≤ Ta ≤ 80°C T100°C	STM01

Table 8 - Transmitter in Optical Housing, No Sensor Attached (Continued)

Agency Certification, Type Protection, and Area Classification	Application Conditions	Configuration Code
CSA/CSAus intrinsic safe Class I, Division1, Groups ABCD; Class II, Group EFG; Class III, Division 1. Class I, Zone 0, IIC Ex/AEx ia IIC Ga	**For Ex ia** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 45°C T60°C	STM01
CSA/CSAus explosion proof Class I, Division 1, Groups ABCD; Class II, Division 1, Groups EFG; Class III Ex db IIC, Class I, Zone 1	**For XP** T4,T5: -20/-40 ≤ Ta ≤ 85°C T100°C T6: -20/-40 ≤ Ta ≤ 70°C T85°C Silicone o-ring: 40°C ≤ Ta ≤ +85°C FKM o-ring: 20°C ≤ Ta ≤ +85°C	STM01
IECEx intrinsic safe Ex ia IIC T6...T4 Ga, Ex ia IIIC T100°C Da	**For Ex ia** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 0°C T100°C (RTT15S-T…3, RTT15S-T…4) T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 45°C T60°C	STM01
IECEx non sparking Ex nA IIC T6...T4 Gc Ex ic IIC T6...T4 Gc Ex ic IIIC T100°C Dc Zone 2, 22	**For Ex nA** O-Ring Sealing: Silicone T4: -40 ≤ Ta ≤ 85°C T4 (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T4 (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T6 O-Ring Sealing: FKM T4: -20 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4: -20 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -20 ≤ Ta ≤ 60°C **For Ex ic** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T85°C	STM01
IECEx Ex db (flameproof) Ex db IIC T6...T4 Gb Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**For Ex db** T4, T5: -40 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4, T5: -40 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 70°C **For Ex tb** O-Ring Sealing: Silicone -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) -40 ≤ Ta ≤ 70°C T85°C O-Ring Sealing: FKM -20 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -20 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) -20 ≤ Ta ≤ 70°C T85°C	STM01
INMETRO intrinsic safe[2] Ex ia IIC T6...T4 Ga Ex ia IIIC T100°C Da	**For Ex ia** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T5: -40 ≤ Ta ≤ 60°C T100°C T6: -40 ≤ Ta ≤ 45°C T100°C	STM01

2. Contact Global Customer Support for availability.

Table 8 - Transmitter in Optical Housing, No Sensor Attached (Continued)

Agency Certification, Type Protection, and Area Classification	Application Conditions	Configuration Code
INMETRO non sparking[3] Ex nA IIC T6...T4 Gc Ex ic IIC T6...T4 Gc Zone 2	**For Ex nA** O-Ring Sealing: Silicone T4: -40 ≤ Ta ≤ 85°C T4 (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T4 (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T6 O-Ring Sealing: FKM T4: -20 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4: -20 ≤ Ta 80°C (RTT15S-T…3, RTT15S-T…4) T6: -20 ≤ Ta ≤ 60°C **For Ex ic** T4: -40 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -40 Ta ≤ 60°C	STM01
INMETRO Ex db (flameproof)[3] Ex db IIC T6...T4 Gb Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**For Ex db** T4, T5: -40 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4, T5: -40 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 70°C **For Ex tb** O-Ring Sealing: Silicone -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) -40 ≤ Ta ≤ 70°C T100°C O-Ring Sealing: FKM -20 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) -20 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) -20 ≤ Ta ≤ 70°C T100°C	STM01
NEPSI intrinsic safe[3] Ex ia IIC T6...T4 Ga, Ex ia IIIC T100°C Da	**For Ex ia** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 45°C T60°C	STM01
NEPSI non sparking[3] Ex nA IIC T6...T4 Gc Ex ic IIC T6...T4 Gc Ex ic IIIC T100°C Dc Zone 2, 22	**For Ex nA** O-Ring Sealing: Silicone T4: -40 ≤ Ta ≤ 85°C T4 (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T4 (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T6 O-Ring Sealing: FKM T4: -20 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4: -20 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -20 ≤ Ta ≤ 60°C **For Ex ic** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T85°C	STM01
NEPSI Ex db (flameproof)[3] Ex db IIC T6...T4 Gb Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**For Ex db** T4, T5: -40 ≤ Ta ≤ 85°C (RTT15S-T…1, RTT15S-T…2) T4, T5: -40 ≤ Ta ≤ 80°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 70°C **For Ex ic** T4: -40 ≤ Ta ≤ 85°C T100°C (RTT15S-T…1, RTT15S-T…2) T4: -40 ≤ Ta ≤ 80°C T100°C (RTT15S-T…3, RTT15S-T…4) T6: -40 ≤ Ta ≤ 60°C T85°C	STM01

3. Contact Global Customer Support for availability.

Table 9 - Transmitter in Connection Head as Termination in Sensor/Thermowell Assembly

Agency Certification, Type of Protection, and Area Classification	Application Conditions	Configura-tion Code
ATEX intrinsic safe II 1 G Ex ia IIC T6...T4 Ga II 1 D Ex ia IIIC T100°C Da	**For Ex ia** 59-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C 60-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C	SEL## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
ATEX Ex db (flameproof) II 2 G Ex db IIC T6...T4 Gb II 2 D Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**Without Union (no XU, RXU)** **For Ex db** With 59-RTT16S-E T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 70°C T6: -20 ≤ Ta ≤ 55°C With 60-RTT16S-E T4: -40 ≤ Ta ≤ 85°C T5: -40 ≤ Ta ≤ 70°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 59-RTT16S-E -20 ≤ Ta ≤ 85°C T100°C -20 ≤ Ta ≤ 70°C T85°C -20 ≤ Ta ≤ 55°C T65°C With 60-RTT16S-E -40 ≤ Ta ≤ 85°C T100°C -40 ≤ Ta ≤ 70°C T80°C -40 ≤ Ta ≤ 55°C T65°C **With Union (fitting XU, RXU)** **For Ex db** With 59-RTT16S-E T4, T5: -20 ? Ta ? 60°C T6: -20 ? Ta ? 55°C With 60-RTT16S-E T4, T5: -40 ≤ Ta ≤ 60°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 59-RTT16S-E -20 ≤ Ta ≤ 60°C T70°C -20 ≤ Ta ≤ 55°C T65°C With 60-RTT16S-E -40 ≤ Ta ≤ 60°C T70°C -40 ≤ Ta ≤ 55°C T65°	SXP## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
CSA/CSAus intrinsic safe Class I, Division1, Groups ABCD; Class II, Group EFG; Class III, Division 1. Class I, Zone 0, IIC Ex/AEx ia IIC Ga	59-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C 60-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 40°C T60°C	SEL## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07

Table 9 - Transmitter in Connection Head as Termination in Sensor/Thermowell Assembly (Continued)

Agency Certification, Type of Protection, and Area Classification	Application Conditions	Configuration Code
CSA/CSAus explosion proof SXP01, SXP02, SXP03, SXP04 Class I, Division 1, Groups ABCD; Class II, Division 1, Groups EFG; Class III SXP05, SXP06 Class I, Division 1, Groups BCD; Class II, Division 1, Groups EFG; Class III	59-RTT15S-C T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 80°C T6: -20 ≤ Ta ≤ 70°C 60-RTT15S-C T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 80°C T6: -20 ≤ Ta ≤ 70°C	SXP01 SXP02 SXP03 SXP04 SXP05 SXP06 SXP07
IECEx intrinsic safe Ex ia IIC T6...T4 Ga, Ex ia IIIC T100°C Da	59-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C 60-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 40°C T60°C	SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
IECEx Ex db (flameproof) Ex db IIC T6...T4 Gb Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**Without Union (no XU, RXU)** **For Ex db** With 59-RTT15S-E T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 70°C T6: -20 ≤ Ta ≤ 55°C Wtih 60-RTT15S-E T4: -40 ≤ Ta ≤ 85°C T5: -40 ≤ Ta ≤ 70°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 59-RTT15S-E -20 ≤ Ta ≤ 85°C T100°C -20 ≤ Ta ≤ 70°C T85°C -20 ≤ Ta ≤ 55°C T65°C With 60-RTT15S-E -40 ≤ Ta ≤ 85°C T100°C -40 ≤ Ta ≤ 70°C T80°C -40 ≤ Ta ≤ 55°C T65°C **With Union (fitting XU, RXU)** **For Ex db** With 59-RTT15S-E T4, T5: -20 ≤ Ta ≤ 60°C T6: -20 ≤ Ta ≤ 55°C With 60-RTT15S-E T4, T5: -40 ≤ Ta ≤ 60°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 59-RTT15S-E -20 ≤ Ta ≤ 60°C T70°C -20 ≤ Ta ≤ 55°C T65°C With 60-RTT15S-E -40 ≤ Ta ≤ 60°C T70°C -40 ≤ Ta ≤ 55°C T65°	SXP01 SXP02 SXP03 SXP04 SXP05 SXP06 SXP07

Table 10 - Transmitter in Optical Housing as Termination in Sensor/Thermowell Assembly

Agency Certification, Type of Protection, and Area Classification	Application Conditions	Configura-tion Code
ATEX intrinsic safe II 1 G Ex ia IIC T6...T4 Ga II 1 D Ex ia IIIC T100°C Da	**For Ex ia** With 53-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C With 54-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C	SEL## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
ATEX Ex db (flameproof) II 2 G Ex db IIC T6...T4 Gb II 2 D Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**Without Union (no XU, RXU)** **For Ex db** With 53-RTT15S-E T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 70°C T6: -20 ≤ Ta ≤ 55°C With 54-RTT15S-E T4: -40 ≤ Ta ≤ 85°C T5: -40 ≤ Ta ≤ 70°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 53-RTT15S-E -20 ≤ Ta ≤ 85°C T100°C -20 ≤ Ta ≤ 70°C T85°C -20 ≤ Ta ≤ 55°C T65°C With 54-RTT15S-E -40 ≤ Ta ≤ 85°C T100°C -40 ≤ Ta ≤ 70°C T80°C -40 ≤ Ta ≤ 55°C T65°C **With Union (fitting XU, RXU)** **For Ex db** With 53-RTT15S-E T4, T5: -20 ≤ Ta ≤ 60°C T6: -20 ≤ Ta ≤ 55°C With 54-RTT15S-E T4, T5: -40 ≤ Ta ≤ 60°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 53-RTT15S-E -20 ≤ Ta ≤ 60°C T70°C -20 ≤ Ta ≤ 55°C T65°C With 54-RTT15S-E -40 ≤ Ta ≤ 60°C T70°C -40 ≤ Ta ≤ 55°C T65°	SXP## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
CSA/CSAus intrinsic safe Class I, Division1, Groups ABCD; Class II, Group EFG; Class III, Division 1. Class I, Zone 0, IIC Ex/AEx ia IIC Ga	With 53-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C With 54-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 40°C T60°C	SEL## SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07

Table 10 - Transmitter in Optical Housing as Termination in Sensor/Thermowell Assembly (Continued)

Agency Certification, Type of Protection, and Area Classification	Application Conditions	Configuration Code
CSA/CSAus explosion proof[4] SXP01, SXP02, SXP03, SXP04 Class I, Division 1, Groups ABCD; Class II, Division 1, Groups EFG; Class III SXP05, SXP06 Class I, Division 1, Groups BCD; Class II, Division 1, Groups EFG; Class III	With 53-RTT15S-C T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 80°C T6: -20 ≤ Ta ≤ 70°C With 54-RTT15S-C T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 80°C T6: -20 ≤ Ta ≤ 70°C	SXP01 SXP02 SXP03 SXP04 SXP05 SXP06 SXP07
IECEx intrinsic safe Ex ia IIC T6...T4 Ga, Ex ia IIIC T100°C Da	With 53-RTT15S-F T4: -40 ≤ Ta ≤ 85°C T100°C T5: -40 ≤ Ta ≤ 60°C T70°C T6: -40 ≤ Ta ≤ 40°C T65°C With 54-RTT15S-F T4: -40 ≤ Ta ≤ 80°C T100°C T5: -40 ≤ Ta ≤ 60°C T75°C T6: -40 ≤ Ta ≤ 40°C T60°C	SEL01 SEL02 SEL03 SEL04 SEL05 SEL06 SEL07
IECEx Ex db (flameproof) Ex db IIC T6...T4 Gb Ex tb IIIC T100°C Db Zone 1, 2, 21, 22	**Without Union (no XU, RXU)** **For Ex db** With 53-RTT15S-E T4: -20 ≤ Ta ≤ 85°C T5: -20 ≤ Ta ≤ 70°C T6: -20 ≤ Ta ≤ 55°C With 54-RTT15S-E T4: -40 ≤ Ta ≤ 85°C T5: -40 ≤ Ta ≤ 70°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 53-RTT15S-E -20 ≤ Ta ≤ 85°C T100°C -20 ≤ Ta ≤ 70°C T85°C -20 ≤ Ta ≤ 55°C T65°C With 54-RTT15S-E -40 ≤ Ta ≤ 85°C T100°C -40≤ Ta ≤ 70°C T80°C -40≤ Ta ≤ 55°C T65°C **With Union (fitting XU, RXU)** **For Ex db** With 53-RTT15S-E T4, T5: -20 ≤ Ta ≤ 60°C T6: -20 ≤ Ta ≤ 55°C With 54-RTT15S-E T4, T5: -40 ≤ Ta ≤ 60°C T6: -40 ≤ Ta ≤ 55°C **For Ex tb** With 53-RTT15S-E -20 ≤ Ta ≤ 60°C T70°C -20 ≤ Ta ≤ 55°C T65°C With 54-RTT15S-E -40 ≤ Ta ≤ 60°C T70°C -40 ≤ Ta ≤ 55°C T65°	SXP01 SXP02 SXP03 SXP04 SXP05 SXP06 SXP07

4. Does not include stainless steel housing options.

Ordering Instructions and Order Codes

The RTT15S can be ordered in the following configurations:

- Transmitter only, with or without housing or display.
- Transmitter in housing, connected to a sensor, with or without display, and with or without an attached thermowell

The following table indicates which configuration codes include sensors, thermowells, and transmitters. RTT15S can be ordered as part of any Configuration Code where “Yes” is indicated for transmitters. Order codes for all configuration codes can be found in the *Schneider Electric Temperature Products Catalog*.

Table 11 - Temperature Product Configuration Codes

Code	Description	Sensors	Thermo-wells	Transmit-ters
SGP01	General Purpose Fixed Element RTD Assemblies	Yes	No	Yes
SGP02	General Purpose Fixed Element Thermocouple Assemblies	Yes	No	Yes
SGP03	General Purpose Spring-Loaded RTDs with or without Thermowells	Yes	Yes	Yes
SGP04	General Purpose Spring-Loaded Thermocouples with or without Thermowells	Yes	Yes	Yes
SGP05	Spring-Loaded Replacement Element RTDs	Yes	No	No
SGP06	Spring-Loaded Replacement Element Thermocouples	Yes	No	No
SSP03	GP Heat Tracing RTD/Thermocouple Assemblies	Yes	No	Yes
SXP01	Explosionproof and Flameproof Fixed Element RTD Assemblies	Yes	No	Yes
SXP02	Explosionproof and Flameproof Fixed Element Thermocouple Assemblies	Yes	No	Yes
SXP03	Explosionproof and Flameproof Spring-Loaded RTDs with Thermowells	Yes	Yes	Yes
SXP04	Explosionproof and Flameproof Spring-Loaded Thermocouples with Thermowells	Yes	Yes	Yes
SXP05	Explosionproof and Flameproof Spring-Loaded RTD Assemblies	Yes	No	Yes
SXP06	Explosionproof and Flameproof Spring-Loaded Thermocouple Assemblies	Yes	No	Yes
SXP07	Explosionproof and Flameproof Heat Trading RTD/Thermocouple Assemblies	Yes	No	Yes
STW01	Threaded, Socket Weld, Weld-in Thermowells	No	Yes	No
STW02	Flange Thermowells	No	Yes	No
STM01	Temperature Transmitters	No	No	Yes
SEL01	Intrinsically Safe Fixed Element RTD Assemblies	Yes	No	Yes
SEL02	Intrinsically Safe Fixed Element Thermocouple Assemblies	Yes	No	Yes
SEL03	Intrinsically Safe Spring-Loaded RTDs with Thermowells	Yes	Yes	Yes
SEL04	Intrinsically Safe Spring-Loaded Thermocouples with Thermowells	Yes	Yes	Yes
SEL05	Intrinsically Safe Spring-Loaded RTD Assemblies	Yes	No	Yes
SEL06	Intrinsically Safe Spring-Loaded Thermocouple Assemblies	Yes	No	Yes
SEL07	Intrinsically Safe Heat Trading RTD/Thermocouple Assemblies	Yes	No	Yes

Transmitter

Configuration Code STM01
RTT15S Temperature Transmitter

ORDER CODES

Example Order Number:

1	2	3	4	5	6	7	8	9	10
RTT15S	- T	- 1	- SA	- 1	- J	- ZZ	- U	- S(0-100) F	- L1

CODE	DESCRIPTION
RTT15S	Temperature Transmitter with optional Optical Configurator

1 Output

CODE	DESCRIPTION
T	4 to 20 mA with HART Digital Communications

2 Input\Output Configuration

CODE	DESCRIPTION
1	Single Sensor Input
2[1]	Dual Sensor Input -PV is Sensor 1
3[1]	Dual Sensor Input - PV is Average of Sensor 1 and Sensor 2
4[1]	Dual Sensor Input - PV is Difference between Sensor 1 and Sensor 2
[1] Input Measurement Type must be the same for both sensors. Both inputs of a duplex 3- or 4-wire RTD sensor cannot be connected to the RTT15S at the same time. Only Input 1 can be configured for 3- or 4-wire RTD.	

3 Housing and Sensor Mount

CODE	DESCRIPTION
BB	Basic Module for DIN Rail or Surface Mounting or Replacement
SA	Housing without Sensor

4 Housing Type

CODE	DESCRIPTION
N	No Housing; Select with Housing and Sensor Mounting Code BB
1	Aluminum, 1/2" Female NPT Conduit
2	Aluminum, M20 Female Conduit
3[1]	316 SS, 1/2" Female NPT Conduit
4[1]	316 SS, M20 Female Conduit
[1] Must select L1 or L2 with this housing option	

5 Input Measurement Type

CODE	DESCRIPTION	CODE	DESCRIPTION
00	Unconfigured	U	Thermocouple, Type U
B	Thermocouple, Type B	3	Thermocouple, Type W3
E	Thermocouple, Type E	5	Thermocouple, Type W5
J	Thermocouple, Type J	2	2-wire RTD, 100 ohm plat IEC 751
K	Thermocouple, Type K	Q	3-wire RTD, 100 ohm plat IEC 751
T	Thermocouple, Type T	4	4-wire RTD, 100 ohm plat IEC 751
L	Thermocouple, Type L	F	3-wire RTD, 100 ohm nickel DIN 43760
N	Thermocouple, Type N	P	Ohms input
R	Thermocouple, Type R	M	Millivolt input
S	Thermocouple, Type S		

6 Hazardous Area Certifications

CODE	DESCRIPTION
ZZ	No Certification (Non-Hazardous Area)
CA	CSA IS, I/1/ABCD & Ex ia Zones (CSA & CSAus)
CN	CSA NI I/2/ABCD
CD	CSA Explosion proof, & Ex d Zones(CSA & CSAus)
AA	ATEX Intrinsic Safe Ex ia & Ex ic
AN	ATEX Non Sparking Ex nA
AD	ATEX Ex d (Flameproof)
EA	IECEx Intrinsic Safe Ex ia & Ex ic
EN	IECEx Non Sparking Ex nA
ED	IECEx Ex d (Flameproof)

7 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout ≥ 23 mA
D	Downscale Burnout ≤ 3.5 mA

8 Range

CODE	DESCRIPTION
S	(Lower limit - Upper limit)

9 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

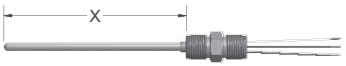
10 Optional Selections

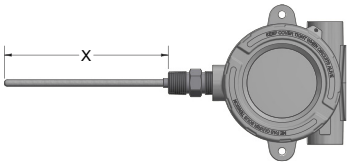
CODE	DESCRIPTION
L1	Integral Display/Optical Configurator
L2	Integral Display only
P1	Aluminum, 1/2" NPT Conduit Plug
P2	316SS, 1/2" NPT Conduit Plug
P3	Aluminum, M20 NPT Conduit Plug
P4	316SS, M20 Conduit Plug
A4	Silicone O-Rings, -40 ºC Temp Rated
M1	Mounting Set Painted Steel
M2	Mounting Set 316SS
D1	Din Rail Mounting Clip for Basic Module

Sensors with Connection Heads

Configuration Code SGP01
Fixed-Element RTD Assemblies with General-Purpose Connection Heads

Fixed-Sheath RTD Assemblies with General-Purpose Connection Heads are provided with head mounting fittings that are welded or brazed to the sheath for direct immersion into a process. To order an assembly with an optional 4 to 20 mA transmitter, select the assembly below and the transmitter from the back of this section. The RTD assemblies are supplied with a 316 stainless steel sheath in several diameters. They are available in various tolerances and temperature ranges as noted below.





ORDER CODES

	1-0	1-1	1-2		2-0		3		4-0	4-1		4-2	
Example Order Number:	**RBF185L**	**48**	**3**	**-**	**006(1/2)**	**-**	**00**	**-**	**8HN**	**53CA**	**-**	**RTT15S**	Select Type and Range from back of section

1-0 100 Ω Platinum RTD Elements α = 0.003 85 °C^{-1}

CODE		TOLERANCE[1]	TEMP. RANGE
SINGLE	*DUPLEX*		
R1T185L	R1T285L	Grade B	(-200 to 200) °C
R5T185L	R5T285L	(1/5) Class B	(-30 to 150) °C
RBF185L	RBF285L	Class B	(-50 to 200) °C
RAF185L	RAF285L	Class A	(-30 to 200) °C
R1T185H	R1T285H	Grade B	(-200 to 600) °C
RAT185H	RAT285H	Class A	(-100 to 450) °C

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
28[1]	1/8
38	3/16
48	1/4
68	3/8

[1] Not available in duplex

1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4[1]	4-wire element

[1] Not available in duplex

2-0 "X" Dimensions

Insert three digit "X" length in inches.

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

3-0 No Fitting

CODE	00

3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
05A	316 SS	1/8	1/8, 3/16, 1/4
05B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
15A	Brass	1/8	1/8, 3/16, 1/4
15B	Brass	1/4	3/16, 1/4, 3/8
15C	Brass	1/2	1/4, 3/8
14	Brass/ Steel	Flange	1/8, 3/16, 1/4, 3/8

3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

3-3 Fixed Bushings[1]

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A _ _[2]	1/8	1/8, 3/16, 1/4
8B _ _[2]	1/4	1/8, 3/16, 1/4, 3/8
8C _ _[2]	1/2	1/8, 3/16, 1/4, 3/8
8D _ _[2]	3/4	1/8, 3/16, 1/4, 3/8

[1] Requires Table 4, Option 9HP Selection
[2] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

4-0 Head Mounting Fittings

CODE	DESCRIPTION
6HN	1/2" x 1/2" NPT steel hex nipple 1" "E" length
8HN	1/2" x 1/2" NPT stainless steel hex nipple 1" "E" length
9HP	1/2" NPT stainless steel bushing (no process threads)
8RNDC	3/4" x 1/2" NPT stainless steel hex nipple

4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum Screw Cover Head
91	Stainless Steel Screw Cover Head
53CB	Aluminum 1/2" NPT Transmitter Housing
53MB	Aluminum M20 Transmitter Housing
54CB	Stainless 1/2" NPT Transmitter Housing
54MB	Stainless M20 Transmitter Housing

Series 53 and 54 transmitter housings are supplied with an FKM O-ring (-20 to 85) ºC as standard. For optional Silicone O-ring (-40 to 85) ºC replace option B with option A (Ex 53CA)

4-2 Options

RTT15S	(4 to 20) mA HART® Transmitter DIN B
I	Stainless Steel Tag

See transmitter ordering information in back of section.

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Sensors with Connection Heads

Temperature Transmitters for Sensors with Connection Heads

Example Order Number:

1		2		3		4		5		6		7	8
RTT15S	-	O	-	A	-	Q	-	A	-	U	-	S(0-100)	C

1 Transmitter

CODE	DESCRIPTION
RTT15S	Optical Temperature Transmitter OTTPlus

2 Display Option

CODE	DESCRIPTION
O	Optical Configuring Display
D	Optical Non-Configuring Display
T	Solid Cover

3 Area Certifications

CODE	DESCRIPTION
A	General Purpose

4 Input Measurement Type

CODE	DESCRIPTION
00	Unconfigured
E	Thermocouple, Type E
J	Thermocouple, Type J
K	Thermocouple, Type K
T	Thermocouple, Type T
2	2-wire RTD, 100 ohm platinum IEC 751
Q[1]	3-wire RTD, 100 ohm platinum IEC 751
4[1]	4wire RTD, 100 ohm platinum IEC 751
[1] Not available in Duplex	

5 Input/Output Type

CODE	DESCRIPTION
A	Configured for Single Sensor (Input Ch1; Ch2 Inactive
B	Configured for Dual Sensor Input - PV is Sensor 1 (Secondary Value Ch2)
C	Configured for Dual Input - PV is difference between Sensor 1 and Sensor 2
D	Configured for Dual Input - PV is average of Sensor 1 and Sensor 2

6 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout ≥ 23 mA
D	Downscale Burnout ≤ 3.5 mA

7 Range

CODE	DESCRIPTION
S	(Lower limit - Upper limit)

8 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

Nominal Dimensions

For dimensional information specific to your sales order, contact your sales representative to order a Certified Dimensional Print (CDP).

All dimensions in diagrams are shown in millimeters over inches ($\frac{mm}{in}$).

Figure 7 - Transmitter with Display Housing — Front View

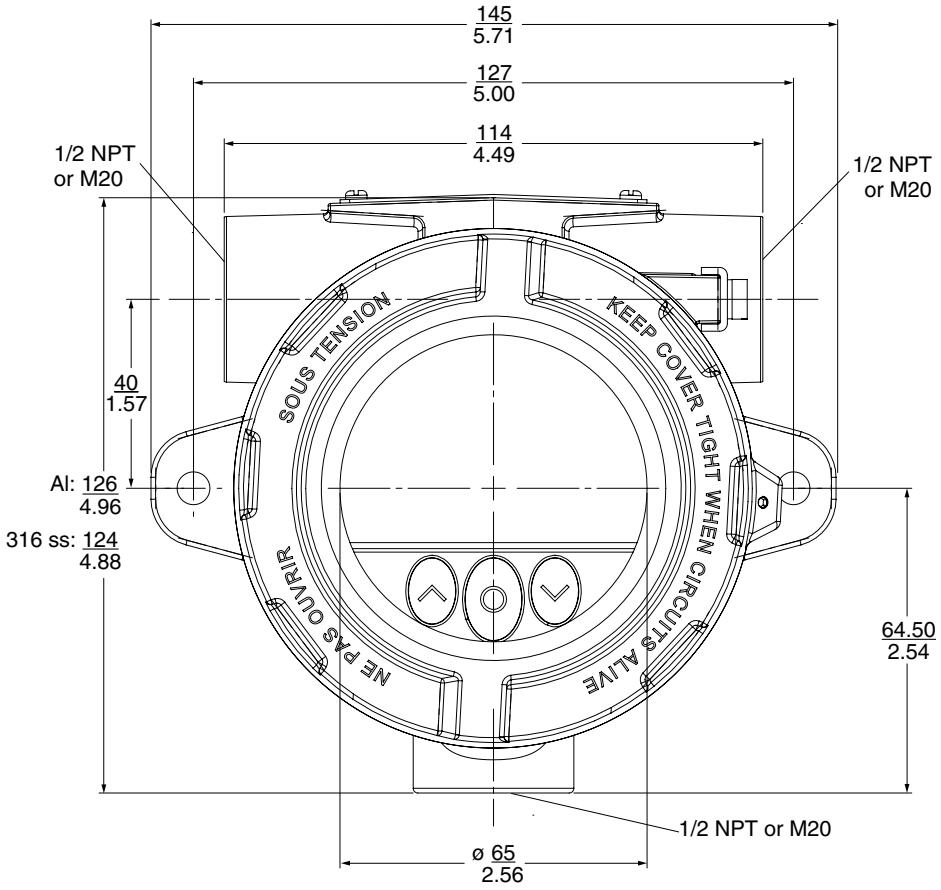


Figure 8 - Transmitter with Display Housing — Side View

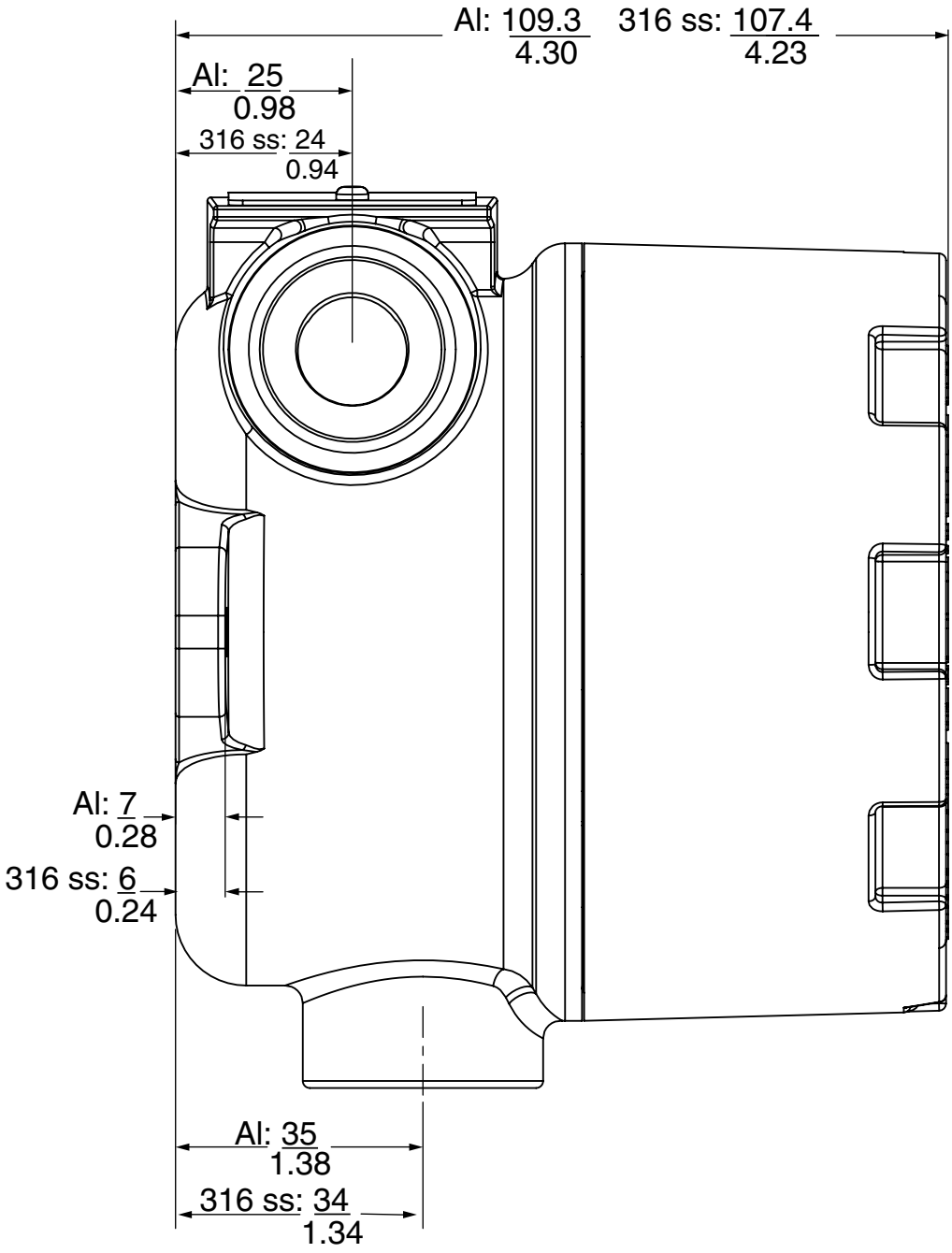


Figure 9 - Transmitter with Display Housing — Wall Mount — Top View

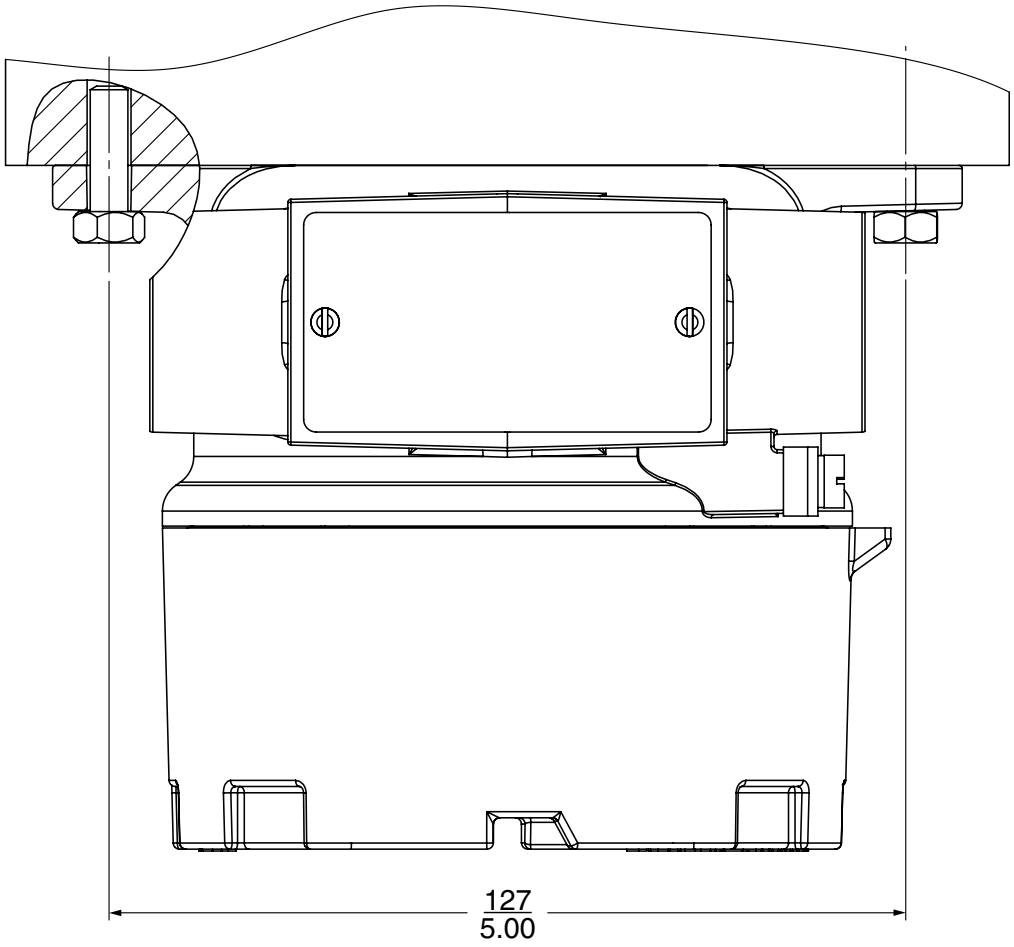


Figure 10 - Transmitter with Display Housing — Pipe Mount — Side View

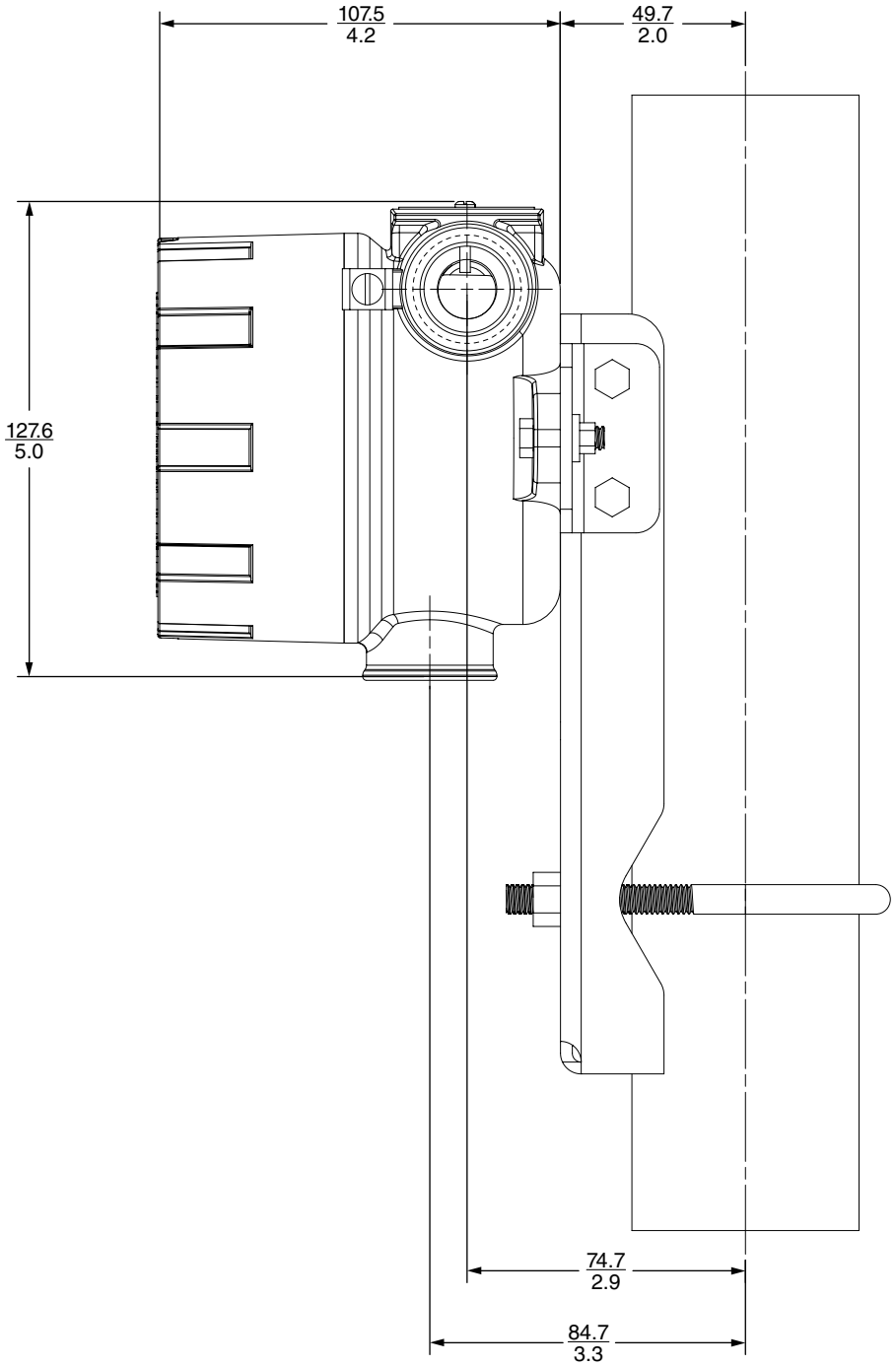


Figure 11 - Basic Transmitter — No Housing

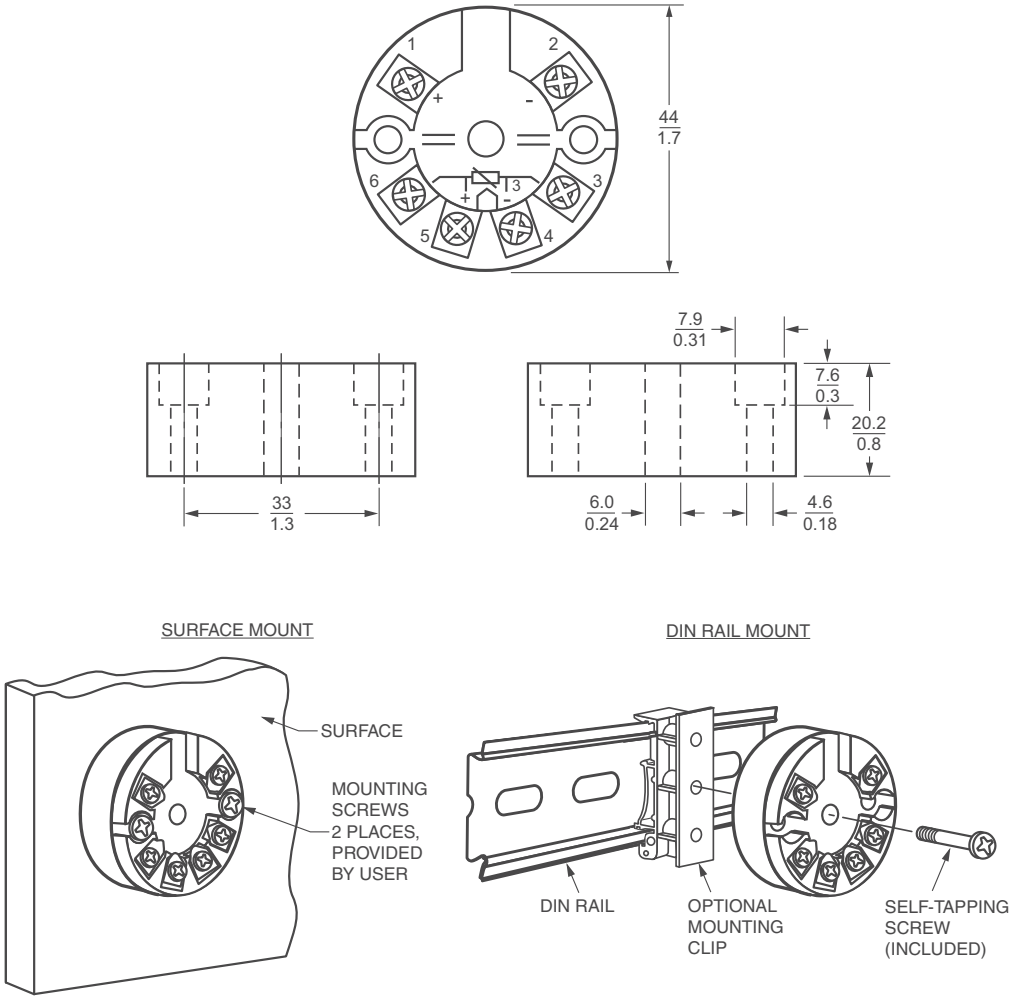


Figure 12 - Connection Head Housing — 31 and 91 Series

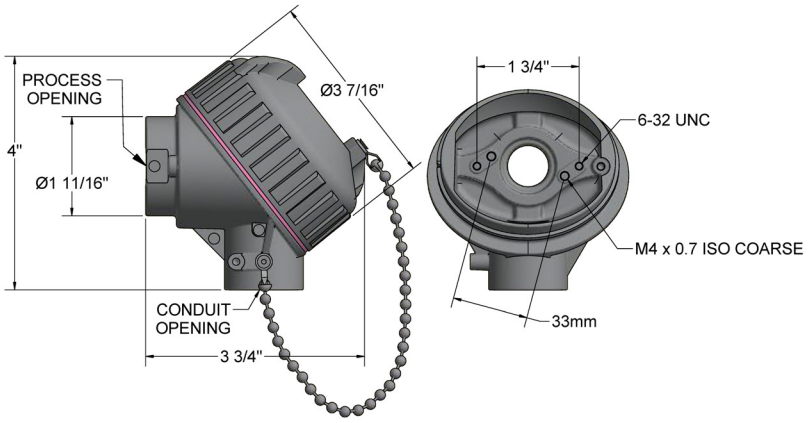


Figure 13 - Connection Head Housing — 93 Series

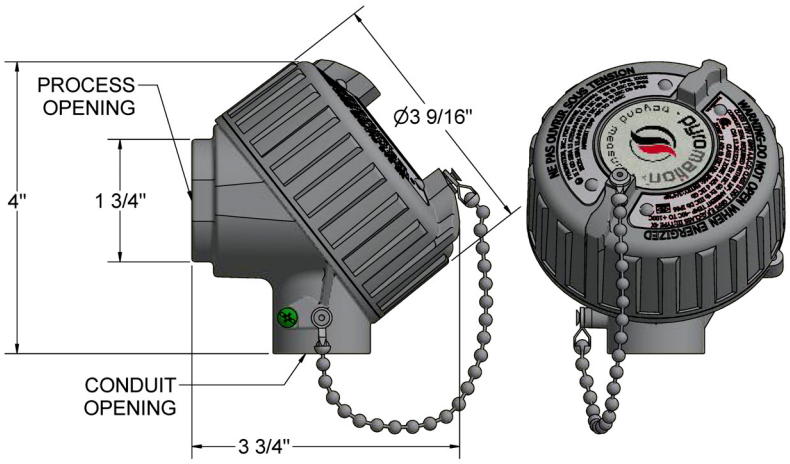
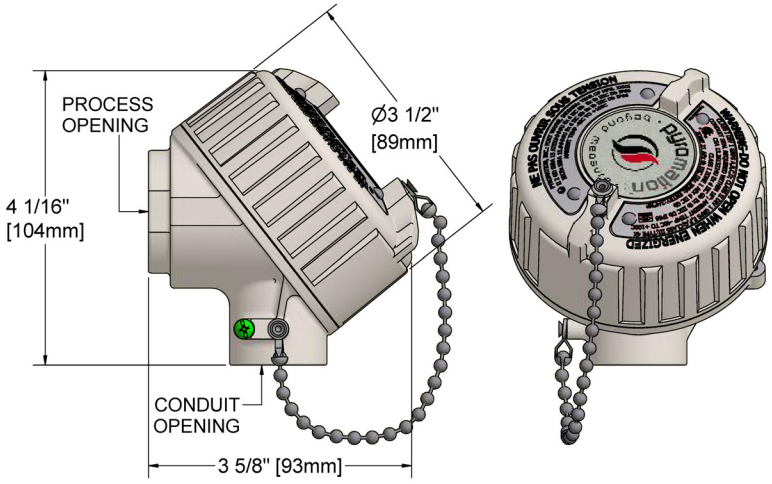


Figure 14 - Connection Head Housing — 94 Series



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As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

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