Product Data Sheet
00813-0300-4728, Rev AA
December 2021

Rosemount™ 644 Rail Mount Temperature Transmitter

with RK Option and HART® 7 Protocol

ROSEMOUNT™

EMERSON™

Features and benefits

Fulfill your needs within one model family with a customizable transmitter design

- Rail mount form factor
- 4–20 mA/HART® Revision 7
- IEC 61508 certified by an accredited third-party agency for use in safety instrumented systems up to SIL 3
- Single or dual sensor inputs for RTD, T/C, mV, and ohm
- Diagnostic suite
- Transmitter-sensor matching with Callendar-Van Dusen constants

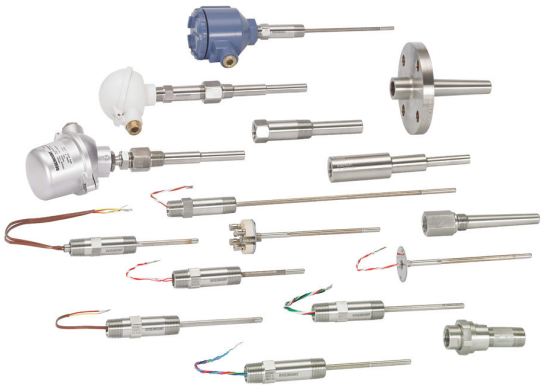
Standard transmitter design provides flexible and reliable performance in process environments

- Offers improved measurement accuracy and reliability over direct-wiring a sensor to the digital control system for a lower overall installation cost
- One-year stability rating reduces maintenance costs
- Open/short sensor diagnostics assist with detecting issues in the sensor loop
- Compensation for ambient temperatures enhances transmitter performance

Contents

Explore the benefits of a complete point solution from Rosemount Temperature Measurement

- An “Assemble To Sensor” option enables Emerson to provide a complete point temperature solution, delivering an installation-ready transmitter, and sensor assembly.
- Emerson offers a selection of RTDs, thermocouples, and thermowells that bring superior durability and Rosemount reliability to temperature sensing, complementing the Rosemount Transmitter portfolio.



Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account
- Improve mean time to repair and maintain efficiency
- Ensure confidence that you have located the correct device
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information

HART device revision

Table 1: Change Summary: Rosemount 644 Rail Mount HART Device Revision

Release date	NAMUR software revision	NAMUR hardware revision	HART software revision(1)	Manual document number
May 2021	01.05.10	01.05.10	7	00809-0500-4728

(1) *NAMUR software revision is located on the hardware tag of the device. HART software revision can be read using a HART communication tool.*

Ordering information

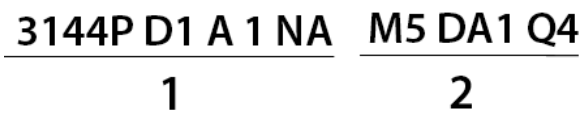
Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our website to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in the following figure.

Figure 1: Model Code Example



1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

Required model components

Model

Code	Description	
644	Temperature transmitter	

Transmitter type

Code	Description	
R	Rail mount - single sensor input	
T	Rail mount - dual sensor input	

Output

Code	Description	
A	4-20 mA with digital signal based on HART® protocol	

Product certifications

Code	Description	
NA	No approval	

Code	Description	
I5	USA Intrinsically Safe; Non-incendive	
I6	Canada Intrinsically Safe	
I1	ATEX Intrinsically Safe	
N1	ATEX Type n	
I7	IECEx Intrinsically Safe	
N7	IECEx Type n	
I3	China Intrinsically Safe	

Rail mount HART® transmitter version

Code	Description	
RK(1)	HART 7 rail mount transmitter	

(1) *This document pertains to devices with this option.*

Additional options

Plantweb™ standard diagnostic functionality

Code	Description	
DC(1)	Diagnostics: Hot backup and sensor drift alert	

(1) *Only available with T (dual sensor), not R (single sensor).*

Software configuration

Code	Description	
C1	Custom configuration of date, descriptor, and message (requires CDS with order)	

Alarm level configuration

Code	Description	
A1	NAMUR alarm and saturation levels, high alarm	
CN	NAMUR alarm and saturation levels, low alarm	

Sensor trim

Code	Description	
C2	Transmitter sensor matching - trim to specific Rosemount RTD calibration schedule (CVD constants)	

5-point calibration

Code	Description	
C4	5-point calibration (use option code Q4 to generate a calibration certificate)	

Calibration certificate

Code	Description	
Q4	Calibration certificate (3-point calibration)	

Quality certification for safety

Code	Description	
QT	Safety certified to IEC 61508 with certificate of FMEDA data	

Enhanced performance

Code	Description	
P8(1)	Enhanced transmitter accuracy	

(1) *Only available with Pt 100 RTD sensors. See Table 3 for Enhanced Accuracy specifications.*

Line filter

Code	Description	
F5	50 Hz line voltage filter	
F6	60 Hz line voltage filter	

Extended product warranty

Code	Description	
WR3	3-year limited warranty	
WR5	5-year limited warranty	

Specifications

Environmental conditions

Ambient operating temperature range	Standard: -50 to +85 °C SIL: -40 to +80 °C
Storage temperature	-50 to +85 °C
Calibration temperature	23…25 °C
Humidity	< 99% RH (non-cond.)
Protection degree	IP20

Mechanical specifications

Dimensions (H x W x D)	109 x 23.5 x 104 mm
Weight, single input / dual input	150 g/160 g
Maximum wire size	0.13…2.08 mm^2/AWG 26…14 stranded wire
Screw terminal torque	0.5 Nm
Vibration: IEC 60068-2-6	■ 2…25 Hz: ±1.6 mm ■ 25…100 Hz: ±4 g

Common specifications

Supply voltage, DC	■ Rosemount 644R Ordinary Location: 7.5(1)…48(2)VDC ■ Rosemount 644R Hazardous Approval: 7.5(1)…30(2)VDC
Additional minimum supply voltage when using test terminals	0.8 V
Maximum internal power dissipation	≤ 850 mW per channel
Minimum load resistance at > 37 V supply	(Supply voltage – 37)/23 mA
Isolation voltage, test/operation	■ Rosemount 644R Ordinary Location: 2.5 kVAC/55 VAC ■ Rosemount 644R Hazardous Approval: 2.5 kVAC/42 VAC
Polarity protection	All inputs and outputs
Write protection	Jumper or software
Warm-up time	< 5 minutes
Start-up time	< 2.75 seconds
Programming	HART® protocol
Signal/noise ratio	> 60 dB
Long-term stability, better than	■ ±0.05% of span/year ■ ±0.18% of span/5 years

Response time	70 ms
Programmable damping	0...60 s
Signal dynamics, input	24 bit
Signal dynamics, output	18 bit
Effect of supply voltage variation	< 0.005% of span/VDC

(1) *The minimum supply voltage must be as measured at the terminals of the Rosemount 644R (i.e. all external drops must be considered).*
(2) *Make sure to protect the device from overvoltages by using a suitable power supply or by installing overvoltage protecting devices.*

Input accuracies

Table 2: Rosemount 644R Transmitter Accuracy

Sensor options	Sensor reference	α	Input ranges		Minimum span(1)		Digital accuracy(2)		D/A accuracy(3)
2-, 3-, 4-wire RTDs			**°C**	**°F**	**°C**	**°F**	**°C**	**°F**	**% of span**
Pt 10	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.80	± 1.44	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 20	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.40	± 0.72	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 50	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.30	± 0.54	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 100	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.15	± 0.27	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 200	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.15	± 0.27	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			± 0.27	± 0.49	± 0.03%

Table 2: Rosemount 644R Transmitter Accuracy *(continued)*

	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 500	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.19	± 0.34	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 1000	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.19	± 0.34	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 2000	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.40	± 0.72	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Pt 10000	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.40	± 0.72	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					
Ni 10	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 1.60	± 2.88	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 20	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.80	± 1.44	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 50	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.32	± 0.58	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					

Table 2: Rosemount 644R Transmitter Accuracy *(continued)*

Ni 100	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 120	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 200	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 500	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 1000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 2000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.16	± 0.29	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					
Ni 10000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	10	18	± 0.32	± 0.58	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.006170	-60 to 180	-76 to 356					

Table 2: Rosemount 644R Transmitter Accuracy *(continued)*

Cu 5	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 1.6	± 2.88	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 10	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 1.40	± 2.52	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 20	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 1.40	± 2.52	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 50	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 1.34	± 2.41	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 100	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 0.67	± 1.20	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					

Table 2: Rosemount 644R Transmitter Accuracy *(continued)*

	GOST 6651-94	0.00426	-50 to 200	-58 to 392					
Cu 200	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 0.67	± 1.20	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 500	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 0.67	± 1.20	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Cu 1000	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	10	18	± 0.67	± 1.20	± 0.03%
	GOST 6651-2009 /OIML R84:2003	0.004280	-180 to 200	-292 to 392					
	GOST 6651-94	0.004260	-50 to 200	-58 to 392					
Sensor options	**Sensor reference**		**Input ranges**		**Minimum span[1]**		**Digital accuracy[2][4]**		**D/A accuracy [3]**
Thermocouples[5]			**°C**	**°F**	**°C**	**°F**	**°C**	**°F**	**% of span**
Type B	IEC60584-1		85 to 160	185 to 320	100	180	± 8.00	± 14.40	± 0.03%
			160 to 400	320 to 752			± 3.00	± 5.40	
			400 to 1820	752 to 3308			± 1.00	± 1.80	
Type E	IEC60584-1		-200 to 1000	-328 to 1832	50	90	± 0.20	± 0.36	± 0.03%
Type J	IEC60584-1		-100 to 1200	-148 to 2192	50	90	± 0.35	± 0.63	± 0.03%
Type K	IEC60584-1		-180 to 1372	-292 to 2501	50	90	± 0.50	± 0.90	± 0.03%

Table 2: Rosemount 644R Transmitter Accuracy *(continued)*

Type L	DIN 43710	-200 to 900	-328 to 1652	50	90	± 0.35	± 0.63	± 0.03%
Type Lr	GOST 3044-84	-200 to 800	-328 to 1472	50	90	± 0.25	± 0.45	± 0.03%
Type N	IEC60584-1	-180 to 1300	292 to 2372	50	90	± 0.50	± 0.90	± 0.03%
Type R	IEC60584-1	-50 to 200	-58 to 392	100	180	± 0.75	± 1.35	± 0.03%
		200 to 1760	392 to 3200			± 1.00	± 1.80	
Type S	IEC60584-1	-50 to 200	-58 to 392	100	180	± 0.70	± 1.26	± 0.03%
		200 to 1760	392 to 3200			± 1.00	± 1.80	
Type T	IEC60584-1	-200 to 400	-328 to 752	50	90	± 0.35	± 0.63	± 0.03%
Type U	DIN 43710	-200 to 0	-328 to 32	50	90	± 0.80	± 1.44	± 0.03%
		0 to 600	32 to 1112			± 0.40	± 0.72	
Type W3	ASTM E988-96	0 to 2300	32 to 4172	100	180	± 0.60	± 1.08	± 0.03%
Type W5	ASTM E988-96	0 to 2300	32 to 4172	100	180	± 0.40	± 0.72	± 0.03%

Other input types	**Input ranges**	**Minimum span (1)**	**Digital accuracy(2)(4)**	**D/A accuracy(3) % of span**
Linear resistance	0 to 400 Ω	25 Ω	±0.45 Ω	± 0.03%
	0 to 100 kΩ			
Potentiometer(6)	0 to 100%	10%	±0.05%	± 0.03%
Millivolt input	-20 to 100 mV	2.5 mV	± 0.015 mV/°C	± 0.03%
	-100 to 1700 mV	2.5 mV	± 0.100 mV/°C	± 0.03%
	±800 mV	2.5 mV	± 0.100 mV/°C	± 0.03%

(1) *No minimum or maximum span restrictions within the input ranges. Recommended minimum span will hold noise within accuracy specification with damping at zero seconds.*
(2) *The published digital accuracy applies over the entire sensor input range. Digital output can be accessed by HART ® Communication or Rosemount control system.*
(3) *Total analog accuracy is the sum of digital and D/A accuracies.*
(4) *Digital accuracy is the listed values or 0.01% of reading, whichever is greater.*
(5) *Total digital accuracy for thermocouple measurement: sum of digital accuracy and D/A accuracy + 0.5 °C. (cold junction accuracy).*
(6) *Input range for potentiometer is 10 Ω to 100 kΩ.*

Accuracy example

When using a Pt 100 (α = 0.00385) sensor input with a 0-100 °C span:

- Digital accuracy = ± 0.15 °C
- D/A accuracy = ± 0.03% of 100 °C or ± 0.03 °C
- Total accuracy = ± 0.18 °C

EMC - immunity influence < ±0.1% of span

Extended EMC immunity (NAMUR NE 21, A criterion, burst) < ±1% of span

Table 3: Transmitter Accuracy when Ordered with Option Code P8

Sensor options	Sensor reference	α	Input ranges		Minimum span(1)		Digital accuracy(2)		D/A accuracy(3)
2-, 3-, 4-wire RTDs			°C	°F	°C	°F	°C	°F	% of span
Pt 100	IEC 60751	0.003851	-200 to 850	-328 to 1562	10	18	± 0.10	± 0.18	± 0.03%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200					
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562					

(1) *No minimum or maximum span restrictions within the input ranges. Recommended minimum span will hold noise within accuracy specification with damping at zero seconds.*

(2) *The published digital accuracy applies over the entire sensor input range. Digital output can be accessed by HART® Communication or Rosemount control system.*

(3) *Total analog accuracy is the sum of digital and D/A accuracies.*

Accuracy example with P8 option code

When using a Pt 100 (a = 0.00385) sensor input with a 0-100 °C span:

- Digital accuracy = ± 0.10 °C
- D/A accuracy = ± 0.03% of 100 °C or ± 0.03 °C
- Total accuracy = ± 0.13 °C

Table 4: Ambient Temperature Effect

Sensor options	Sensor reference	α	Input ranges		Temperature effects per 1.0 °C (1.8 °F) change in ambient temperature(1)(2)(3)(4)		D/A effect
2-, 3-, 4-wire RTDs			°C	°F	°C	°F	% of span/°C
Pt 10	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.020	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 20	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.010	± 0.0180	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 50	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.004	± 0.0072	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 100	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%

Table 4: Ambient Temperature Effect *(continued)*

	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 200	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 500	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 1000	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 2000	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Pt 10000	IEC 60751	0.003851	-200 to 850	-328 to 1562	± 0.002	± 0.0036	± 0.003%
	JIS C 1604-8	0.003916	-200 to 649	-328 to 1200			
	GOST 6651-2009	0.003910	-200 to 850	-328 to 1562			
Ni 10	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.020	± 0.0360	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 20	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.010	± 0.0180	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 50	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.004	± 0.0072	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 100	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%

Table 4: Ambient Temperature Effect *(continued)*

	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 120	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 200	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 500	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 1000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 2000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Ni 10000	DIN 43760-1987	0.006180	-60 to 250	-76 to 482	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.006170	-60 to 180	-76 to 356			
Cu 5	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.040	± 0.0720	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			

Table 4: Ambient Temperature Effect *(continued)*

	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 10	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.020	± 0.0360	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 20	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.010	± 0.0180	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 50	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.004	± 0.0072	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 100	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 200	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			

Table 4: Ambient Temperature Effect *(continued)*

Cu 500	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Cu 1000	Edison Copper Winding No. 15	0.004270	-200 to 260	-328 to 500	± 0.002	± 0.0036	± 0.003%
	GOST 6651-2009/ OIML R84:2003	0.004280	-180 to 200	-292 to 392			
	GOST 6651-94	0.004260	-50 to 200	-58 to 392			
Sensor options	**Sensor reference**		**Input ranges**		**Temperature effects per 1.0 °C (1.8 °F) change in ambient temperature[1][2][3][4]**		**D/A effect**
Thermocouples			**°C**	**°F**	**°C**	**°F**	**% of span/°C**
Type B	IEC60584-1		85 to 160	185 to 320	± 0.800	± 1.440	± 0.003%
			160 to 400	320 to 752	± 0.100	± 0.180	± 0.003%
			400 to 1820	752 to 3308			
Type E	IEC60584-1		-200 to 1000	-328 to 1832	± 0.025	± 0.045	± 0.003%
Type J	IEC60584-1		-100 to 1200	-148 to 2192	± 0.025	± 0.045	± 0.003%
Type K	IEC60584-1		-180 to 1372	-292 to 2501	± 0.025	± 0.045	± 0.003%
Type L	DIN 43710		-200 to 900	-328 to 1652	± 0.025	± 0.045	± 0.003%
Type Lr	GOST 3044-84		-200 to 800	-328 to 1472	± 0.100	± 0.180	± 0.003%
Type N	IEC60584-1		-180 to 1300	-292 to 2372	± 0.025	± 0.045	± 0.003%
Type R	IEC60584-1		-50 to 200	-58 to 392	± 0.100	± 0.180	± 0.003%
			200 to 1760	392 to 3200			
Type S	IEC60584-1		-50 to 200	-58 to 392	± 0.100	± 0.180	± 0.003%
			200 to 1760	392 to 3200			
Type T	IEC60584-1		-200 to 400	-328 to 752	± 0.025	± 0.045	± 0.003%
Type U	DIN 43710		-200 to 0	-328 to 32	± 0.025	± 0.045	± 0.003%
			0 to 600	32 to 1112			
Type W3	ASTM E988-96		0 to 2300	32 to 4172	± 0.100	± 0.180	± 0.003%
Type W5	ASTM E988-96		0 to 2300	32 to 4172	± 0.100	± 0.180	± 0.003%

Table 4: Ambient Temperature Effect *(continued)*

Other input types	Input ranges	Temperature effects per 1.0 °C (1.8 °F) change in ambient temperature[1][2][3][4]	D/A effect % of span/°C
Linear resistance	0 to 400 Ω	± 2 mΩ	± 0.003%
	0 to 100 kΩ	± 0.2 Ω	± 0.003%
Potentiometer	0 to 100%	± 0.005%	± 0.003%
Millivolt input	-20 to 100 mV	± 0.2 µV	± 0.003%
	-100 to 1700 mV	± 36 µV	± 0.003%
	±800 mV	± 32 µV	± 0.003%

(1) *Temperature effects listed in table or 0.002% of input range per °C, whichever is greater*
(2) *Change in ambient is with reference to the calibration temperature of the transmitter 25 °F (77 °F) from factory.*
(3) *Ambient temperature effect specification valid over minimum temperature span of 28 °C (50 °F).*
(4) *Temperature effects (change / °C) are not intended to limit the change in errors in any one degree, but rather to serve in defining a "butterfly" error band over the full ambient temperature range and includes the errors defined by "Accuracy" at the narrowest point (room temp).*

Temperature effects example

When using a Pt 100 (α = 0.00385) sensor input with a 0-100 °C span at 35 °C ambient temperature:

- Digital temperature effects: 0.002 °C × (35 – 25) = 0.02 °C
- D/A effects: [0.003% of 100] × (35 – 25) = 0.03 °C
- Worst case error: Digital + D/A + Digital temperature effects + D/A effects = 0.15 °C + 0.03 °C + 0.02 °C + 0.03 °C = 0.23 °C
- Total probable error: $\sqrt{0.15^2+0.03^2+0.02^2+0.03^2} = 0.157\,^{\circ}C$

Input specifications

RTD input

Connection type	2-, 3-, and 4-wire
Basic accuracy (e.g. Pt100)	≤ 0.15 °C
Cable resistance per wire (max.)	50 Ω
Sensor current	< 0.15 mA
Effect of sensor cable resistance (3-/4-wire)	< 0.002 Ω/Ω
Sensor cable, wire-wire capacitance	Max. 30 nF (Pt1000 & Pt10000 IEC and JIS + Ni1000 & NI10000) Max. 50 nF (others than above)
Sensor error detection, programmable	None, shorted, broken, shorted or broken
	NOTICE Regardless of the sensor error detection configuration, shorted sensor error detection will be disabled if the lower limit for the configured sensor type is lower than the constant detection limit for shorted sensor.
Detection limit for shorted sensor	15 Ω
Sensor error detection time (RTD element)	≤ 70 ms
Sensor error detection time (for 3rd and 4th wire)	≤ 2000 ms

Linear resistance input

Input range	0 Ω...100 kΩ
Minimum span	25 Ω
Connection type	2-, 3-, or 4-wire
Cable resistance per wire (maximum)	50 Ω
Sensor current	< 0.15 mA
Effect of sensor cable resistance (3-/4-wire)	< 0.002 Ω/Ω
Sensor cable, wire-wire capacitance	Maximum 30 nF (Lin. R > 400 Ω)
	Maximum 50 nF (Lin. R ≤ 400 Ω)
Sensor error detection, programmable	None, broken

Potentiometer input

Potentiometer	10 Ω...100 kΩ
Input range	0...100%
Minimum span	10%
Connection type	3-, 4-, or 5-wire (5-wire only for dual input device)
Cable resistance per wire (maximum)	50 Ω
Sensor current	< 0.15 mA
Effect of sensor cable resistance (4-/5-wire)	< 0.002 Ω/Ω
Sensor cable, wire-wire capacitance	Maximum 30 nF (Potentiometer > 400 Ω)
	Maximum 50 nF (Potentiometer ≤ 400 Ω)
Sensor error detection, programmable	None, shorted, broken, shorted or broken
	Note Regardless of the sensor error detection configuration, shorted sensor error detection will be disabled if the configured potentiometer size is lower than the constant detection limit for shorted sensor.
Detection limit for shorted sensor	15 Ω
Sensor error detection time, wiper arm	≤ 70 ms (no shorted sensor detection)
Sensor error detection time, element	≤ 2000 ms
Sensor error detection time (4th and 5th wire)	≤ 2000 ms

mV input

Measurement range	-800...+800 mV (bipolar)
	-100 to 1700 mV
Minimum span	2.5 mV
Input resistance	10 MΩ
Sensor cable, wire-wire capacitance	Maximum 30 nF (input range: -100...1700 mV)
	Maximum 50 nF (input range: -20...100 mV)
Sensor error detection, programmable	None, broken

Sensor error detection time (TC element) ≤ 70 ms

Output and HART® specifications

Normal range, programmable 3.8...20.5/20.5...3.8 mA

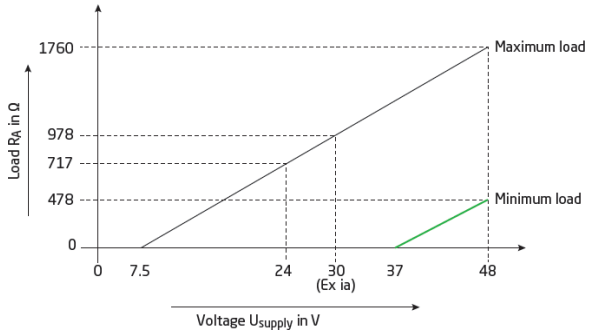
Extended range (output limits), programmable 3.5...23/23...3.5 mA

Updating time 10 ms

Load (current output) ≤ (V_{supply} - 7.5)/0.023 [Ω]

Load stability < 0.01% of span/100 Ω(1)

Output load



Sensor error indication, programmable 3.5...23 mA(2)

NAMUR NE43 upscale > 21 mA

NAMUR NE43 downscale < 3.6 mA

HART® protocol revisions HART® 7

Programmable input/ output limits(3) Error current: Enable/disable

Set error current: 3.5 mA...23 mA

Input When the input signal exceeds either of the programmable lower and upper limits, the device will output a user defined error current. Setting input limits ensures that any out of range measurements can be uniquely identified and flagged via the transmitter output, resulting in improved asset and material protection (e.g. thermal runaway of a reaction process) can be mitigated.

Table 5: Rosemount Alarm and Saturation Values

Units - mA	Min	Max	Rosemount	NAMUR
High alarm	21	23	21.75	21.0
Low alarm(1)	3.5	3.75	3.75	3.6

(1) Of span = Of the presently selected range.
(2) Shorted sensor error detection is ignored at TC and mV input.
(3) Programmable input and current output limits are available to increase system safety and integrity.

Table 5: Rosemount Alarm and Saturation Values *(continued)*

Units - mA	Min	Max	Rosemount	NAMUR
High saturation	20.5	20.9(2)	20.5	20.5
Low saturation	3.7(3)	3.9	3.9	3.8

(1) *Requires 0.1 mA gap between low alarm and low saturation values.*
(2) *Rail mount transmitters have a high saturation max of 0.1 mA less than the high alarm setting, with a max value of 0.1 mA less than the high alarm max.*
(3) *Rail mount transmitters have a low saturation min of 0.1 mA greater than the low alarm setting, with a minimum of 0.1 mA greater than the low alarm min.*

Output

When the current output exceeds either of the programmable upper and lower limits, the device will output a user-defined error current.

Product certifications

Rev: 1.1

European Directive information

A copy of the EU Declaration of Conformity can be found at the end of this guide. The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount.

Ordinary location certification

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Installing equipment in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 USA Intrinsically Safe (IS) and Division 2/Zone 2

Certificate	80072530
Standards	UL Std No 913 Ed. 8, UL 60079-0 Ed. 5, UL 60079-11 Ed. 6, UL 60079-15 Ed. 4, UL 61010-1 Ed. 3
Markings	Class I, Division 1, Groups A, B, C, D Class I, Zone 0: AEx ia IIC T6...T4 Class I, Zone 1: AEx ib [ia] IIC T6...T4 Class I, Division 2, Groups A, B, C, D Class I, Zone 2: AEx nA IIC T6...T4 Class I, Zone 2: AEx nA [ic] IIC T6...T4 when installed per Control Drawing 00644-8000

Table 6: IS Input Parameters vs Temperature Range

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
U_i: 30 VDC	T4: -50 °C ≤ T_a ≤+85 °C	U_i: 30 VDC	T4: -50 °C ≤ T_a ≤ +85 °C
I_i: 120 mA	T5: -50 °C ≤ T_a ≤ +70 °C	I_i: 100 mA	T5: -50 °C ≤ T_a ≤ +75 °C
P_i: 900 mW	T6: -50 °C ≤ T_a ≤ +55 °C	P_i: 750 mW	T6: -50 °C ≤ T_a ≤ +60 °C
L_i: 0 uH	N/A	L_i: 0 uH	N/A
C_i: 1.0 nF	N/A	C_i: 1.0 nF	N/A

Table 7: IS Output Parameters per Terminal Configuration

Parameters	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U_o	7.2 VDC	7.2 VDC
I_o	12.9 mA	7.3 mA
P_o	23.3 mW	13.2 mW
L_o	200 mH	667 mH
C_o	13.5 uF	13.5 uF

Table 8: Division 2/Zone 2 Input Parameters vs Temperature Range

Supply voltage	Temperature range
37 VDC max	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +70 °C T6: -50 °C ≤ T_a ≤ +55 °C
30 VDC max	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +75 °C T6: -50 °C ≤ T_a ≤ +60 °C
NIFW Vmax = 30 VDC, C_i = 1 nF, L_i = 0	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +75 °C T6: -50 °C ≤ T_a ≤ +60 °C

Special Conditions for Safe Use (X):

1. Install per Installation Drawing 00644-8000 as appropriate.
2. Install in accordance with the US National Electrical Code (NEC) for the US and in accordance with the Canadian Electrical Code (CEC) for Canada.
3. The transmitter must be installed in suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for the US the National Electrical Code (NEC).
4. If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
5. For Div 2/Zone 2 applications, the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed. Cable entry devices and blanking elements shall fulfil the same requirements.
6. Use supply wires with a rating of at least 5 K above the ambient temperature.
7. For Div 2/Zone 2 applications, the temperature transmitter requires connecting to Class 2 Power Supply with Transient protection. See installation drawing as appropriate.

Canada

I6 Canada Intrinsically Safe (IS) and Division 2/Zone 2

Certificate: 80072530

Standards: CSA C22.2 No. 157-92 (R2012), CAN/CSA C22.2 No. 60079-0:11, CAN/CSA C22.2 No. 60079-11:11, CAN/CSA C22.2 No. 60079-15:12, CSA 61010-1-12

Markings: Class I, Division 1, Groups A, B, C, D
Ex ia IIC T6...T4
Ex ib [ia] IIC T6...T4
Class I, Division 2, Groups A, B, C, D
Ex nA IIC T6...T4
Ex nA [ic] IIC T6...T4
when installed per Control Drawing 00644-8000

Table 9: IS Input Parameters vs Temperature Range

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
U_i: 30 VDC	T4: -50 °C ≤ T_a ≤+85 °C	U_i: 30 VDC	T4: -50 °C ≤ T_a ≤ +85 °C
I_i: 120 mA	T5: -50 °C ≤ T_a ≤ +70 °C	I_i: 100 mA	T5: -50 °C ≤ T_a ≤ +75 °C
P_i: 900 mW	T6: -50 °C ≤ T_a ≤ +55 °C	P_i: 750 mW	T6: -50 °C ≤ T_a ≤ +60 °C
L_i: 0 uH	N/A	L_i: 0 uH	N/A
C_i: 1.0 nF	N/A	C_i: 1.0 nF	N/A

Table 10: IS Output Parameters per Terminal Configuration

Parameters	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U_o	7.2 VDC	7.2 VDC
I_o	12.9 mA	7.3 mA
P_o	23.3 mW	13.2 mW
L_o	200 mH	667 mH
C_o	13.5 uF	13.5 uF

Table 11: Division 2/Zone 2 Input Parameters vs Temperature Range

Supply voltage	Temperature range
37 VDC max	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +70 °C T6: -50 °C ≤ T_a ≤ +55 °C
30 VDC max	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +75 °C T6: -50 °C ≤ T_a ≤ +60 °C
NIFW Vmax = 30 VDC, C_i = 1 nF, L_i = 0	T4: -50 °C ≤ T_a ≤ +85 °C T5: -50 °C ≤ T_a ≤ +75 °C T6: -50 °C ≤ T_a ≤ +60 °C

Special Conditions for Safe Use (X):

1. Install per Installation Drawing 00644-8000 as appropriate.
2. Install in accordance with the US National Electrical Code (NEC) for the US and in accordance with the Canadian Electrical Code (CEC) for Canada.

3. The transmitter must be installed in suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for the US the National Electrical Code (NEC).
4. If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
5. For Div 2/Zone 2 applications, the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed. Cable entry devices and blanking elements shall fulfil the same requirements.
6. Use supply wires with a rating of at least 5 K above the ambient temperature.
7. For Div 2/Zone 2 applications, the temperature transmitter requires connecting to Class 2 Power Supply with Transient protection. See installation drawing as appropriate.

Europe

I1 ATEX Intrinsic Safety

Certificate: DEKRA 21ATEX0003X

Standards: EN60079-0:2012+A11:2013, EN60079-11: 2012

Markings: Ⓔx II 1 G Ex ia IIC T6...T4 Ga
II 2(1) G Ex ib [ia Ga] IIC T6...T4 Gb
II 1 D Ex ia IIIC Da
I 1 M Ex ia I Ma
when installed per Control Drawing 00644-8001

Input parameters (Power terminals)	Output parameters (Sensor terminals)
U_i: 30 Vdc	U_o: 7.2 Vdc
I_i: 120 mA	I_o: 7.3 mA
P_i: See table below	P_o: 13.2 mW
L_i: 0 uH	L_o: 667 mH
C_i: 1.0 nF	C_o: 13.5 uF

Pi per Channel	Temperature class	Maximum ambient temperature
900 mW	T6	+50 °C
	T5	+65 °C
	T4	+85 °C
750 mW	T6	+55 °C
	T5	+70 °C
	T4	+85 °C
610 mW	T6	+60 °C
	T5	+75 °C
	T4	+85 °C

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.2 mm (group IIC), or 2 mm (group IIB, IIA, I), or any thickness (group III), electrostatic charges shall be avoided.
2. For EPL Ga, if the enclosure is made of aluminum, it must be installed such that ignition sources due to impact and friction sparks are excluded.
3. For EPL Da, the surface temperature "T" of the enclosure, for a dust layer with a maximum thickness of 5 mm, is the ambient temperature +20 K.

N1 ATEX Zone 2

Certificate: DEKRA 21ATEX0004X

Standards: EN60079-0:2012+A11:2013, EN60079-7:2015+A1:2018, EN60079-11:2012, EN60079-15:2010

Markings: Ⓔx II 3 G Ex nA IIC T6...T4 Gc
II 3 G Ex ec IIC T6...T4 Gc
II 3 G Ex ic IIC T6...T4 Gc
II 3 D Ex ic IIIC Dc
when installed per Control Drawing 00644-8001

Supply/input to transmitter			**Temperature class**	**Maximum ambient temperature**
Ex nA & Ex ec	**Ex ic** **L_i = 0 µH** **C_i = 1.0 nF**	**Ex ic** **U_i = 48 Vdc** **L_i = 0 µH** **C_i = 1.0 nF**		**Single and dual input**
V_{max} = 37 Vdc	U_i = 37 Vdc	P_i = 851 mW per channel	T4	+85 °C
			T5	+70 °C
			T6	+55 °C
V_{max} = 30 Vdc	U_i = 30 Vdc	P_i = 700 mW per channel	T4	+85 °C
			T5	+75 °C
			T6	+60 °C

Table 12: Maximum Output of Transmitter

Ex nA & Ex ec	**Ex ic**
Vmax = 7.2 Vdc	U_o = 7.2 Vdc I_o = 7.3 mA P_o = 13.2 mW L_o = 667 mH C_o = 13.5 µF

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.2mm (group IIC), or 2mm (group IIB, IIA, I), or any thickness (group III), electrostatic charges shall be avoided.

2. The transmitter shall be installed in an enclosure providing a degree of protection of not less than IP54 in accordance with EN 60079-0, which is suitable for the application and correctly installed, e.g. in an enclosure that is in type of protection Ex n or Ex e.
3. Additional, for Ex nA or Ex ec, the area inside the enclosure shall be pollution degree 2 or better, as defined in EN 60664-1.
4. For EPL Dc, the surface temperature "T" of the enclosure, for a dust layer with a maximum thickness of 5mm, is the ambient temperature +20K.

International

I7 IECEx Intrinsic Safety

Certificate	IECEx DEK 21.0002X
Standards	IEC 60079-0: 2011, IEC 60079-11: 2011
Markings	Ex ia IIC T6...T4 Ga Ex ib [ia Ga] IIC T6...T4 Gb Ex ia IIIC Da Ex ia I Ma when installed per Control Drawing 00644-8002

Input parameters (Power terminals)	Output parameters (Sensor terminals)
U_i: 30 Vdc	U_o: 7.2 Vdc
I_i: 120 mA	I_o: 7.3 mA
P_i: See table below	P_o: 13.2 mW
L_i: 0 uH	L_o: 667 mH
C_i: 1.0 nF	C_o: 13.5 uF

Pi per channel	Temperature class	Maximum ambient temperature
900 mW	T6	+50 °C
	T5	+65 °C
	T4	+85 °C
750 mW	T6	+55 °C
	T5	+70 °C
	T4	+85 °C
610 mW	T6	+60 °C
	T5	+75 °C
	T4	+85 °C

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.2 mm (group IIC), or 2 mm (group IIB, IIA, I), or any thickness (group III), electrostatic charges shall be avoided.
2. For EPL Ga, if the enclosure is made of aluminum, it must be installed such that ignition sources due to impact and friction sparks are excluded.
3. For EPL Da, the surface temperature "T" of the enclosure, for a dust layer with a maximum thickness of 5 mm, is the ambient temperature +20 K.

N7 IECEx Zone 2

Certificate: IECEx DEK 21.0002X

Standards: IEC 60079-0:2011, IEC 60079-7: 2015, IEC 60079-11: 2011, IEC 60079-15: 2010

Markings: Ex nA IIC T6...T4 Gc
Ex ec IIC T6...T4 Gc
Ex ic IIC T6...T4 Gc
Ex ic IIIC Dc
when installed per Control Drawing 00644-8002

Supply/input to transmitter			**Temperature class**	**Maximum ambient temperature**
Ex nA & Ex ec	**Ex ic** **L_i = 0 µH** **C_i = 1.0 nF**	**Ex ic** **U_i = 48 Vdc** **L_i = 0 µH** **C_i = 1.0 nF**		**Single and dual input**
Vmax = 37 Vdc	U_i = 37 Vdc	P_i = 851 mW per channel	T4	+85 °C
			T5	+70 °C
			T6	+55 °C
Vmax = 30 Vdc	U_i = 30 Vdc	P_i = 700 mW per channel	T4	+85 °C
			T5	+75 °C
			T6	+60 °C

Table 13: Maximum Output of Transmitter

Ex nA & Ex ec	**Ex ic**
Vmax = 7.2 Vdc	U_o = 7.2 Vdc I_o = 7.3 mA P_o = 13.2 mW L_o = 667 mH C_o = 13.5 µF

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.2mm (group IIC), or 2mm (group IIB, IIA, I), or any thickness (group III), electrostatic charges shall be avoided.

2. The transmitter shall be installed in an enclosure providing a degree of protection of not less than IP54 in accordance with EN 60079-0, which is suitable for the application and correctly installed, e.g. in an enclosure that is in type of protection Ex n or Ex e.
3. Additional, for Ex nA or Ex ec, the area inside the enclosure shall be pollution degree 2 or better, as defined in EN 60664-1.
4. For EPL Dc, the surface temperature "T" of the enclosure, for a dust layer with a maximum thickness of 5mm, is the ambient temperature +20K.

China

I3 China (NEPSI) Intrinsic Safety

Certificate	GYJ21.1036X
Standards	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010, GB12476.1-2013, GB12476.4-2010
Markings	Ex ia IIC T4/T5/T6 Ga Ex ib [ia Ga] IIC T4/T5/T6 Gb Ex iaD 20 T80 °C/T95 °C/T130 °C Ex ibD [iaD 20]21 T80 °C/T95 °C/T130 °C

Special Condition for Safe Use (X):

See certificate for special conditions.

N3 China (NEPSI) Zone 2

Certificate	GYJ21.1036X
Standards	GB3836.1-2010, GB3836.4-2010, GB3836.8-2014, GB3836.20-2010
Markings	Ex nA [ic Gc] IIC T6...T4 Gc Ex ic IIC T6...T4 Gc

Special Condition for Safe Use (X):

See certificate for special conditions.

Declaration of conformity

EMERSON

EU Declaration of Conformity

No: RMD 1160 Rev. B

CE

We,

Rosemount, Inc.
6021 Innovation Boulevard
Shakopee, MN 55379-4676
USA

declare under our sole responsibility that the product,

Rosemount™ 248R, 644R, 644T Temperature Transmitters with RK Option Code

manufacturer,

Rosemount, Inc.
6021 Innovation Boulevard
Shakopee, MN 55379-4676
USA

to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.

(signature)	Vice President of Global Quality (function)
Mark Lee (name)	August 30, 2021 (date of issue)

EMERSON

EU Declaration of Conformity

No: RMD 1160 Rev. B

CE

ATEX Directive (2014/34/EU)

DEKRA 21ATEX0003X – Intrinsic Safety Certificate

Equipment Group II Category 1 G (Ex ia IIC T6…T4 Ga)
Equipment Group II Category 2(1) G (Ex ib [ia Ga] IIC T6…T4 Gb)
Equipment Group II Category 1 D (Ex ia IIIC Da)
Equipment Group I Category M1 (Ex ia I Ma)

DEKRA 21ATEX0004X – Zone 2 Certificate

Equipment Group II Category 3 G (Ex nA IIC T6…T4 Gc)
Equipment Group II Category 3 G (Ex ec IIC T6…T4 Gc)
Equipment Group II Category 3 G (Ex ic IIC T6…T4 Gc)
Equipment Group II Category 3 D (Ex ic IIIC Dc)

Harmonized Standards:

EN 60079-0:2012+A11: 2013 (a review against EN IEC 60079-0:2018, which is harmonized, shows no significant changes relevant to this equipment so EN 60079-0:2012_A11:2013 continues to represent "State of the Art"), EN 60079-7:2015+A1:2018, EN 60079-11:2012, EN 60079-15:2010

EMC Directive (2014/30/EU)

Harmonized Standard: EN 61326-1:2013

RoHS Directive (2011/65/EU)

Harmonized Standard: EN 50581:2012

ATEX Notified Bodies

DEKRA Certification B.V. [Notified Body Number: 0344]
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185
6802 ED Arnhem The Netherlands

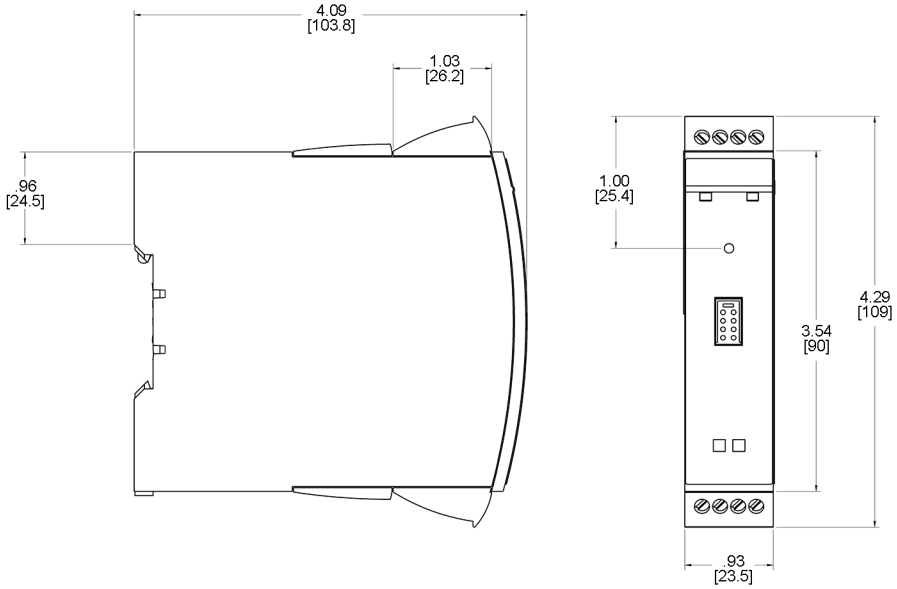
ATEX Notified Body for Quality Assurance

SGS FIMKO OY [Notified Body Number: 0598]
Takomotie 8
FI-00380 HELSINKI
Finland

Dimensional drawings

Single Sensor Input

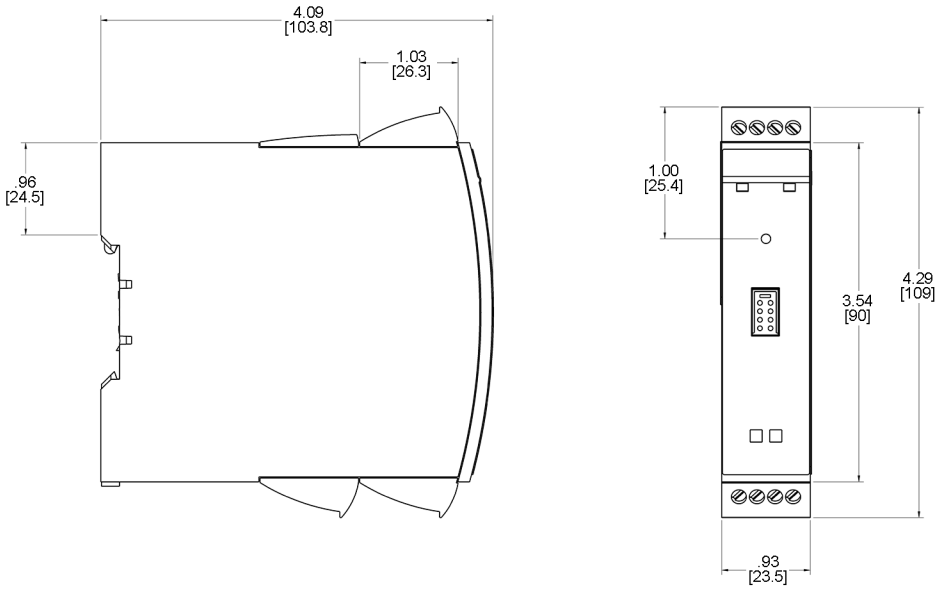
Figure 2: Single Sensor Input



Dimensions are in inches (millimeters).

Dual Sensor Input

Figure 3: Dual Sensor Input



Dimensions are in inches (millimeters).

00813-0300-4728
Rev. AA
December 2021

For more information: **www.emerson.com**

ROSEMOUNT™

EMERSON™