

Rosemount™ 148 Temperature Transmitter



- Basic temperature transmitter offers a cost-effective solution for temperature monitoring points.
- Standard transmitter design provides flexible and reliable performance in process environments.
- Experience lower overall installation costs when compared to wiring sensor directly, reducing the need for expensive extension wires, and multiplexers.
- PC-based configuration interface delivers a programmer, cables, and the software needed for transmitter configuration.
- Explore the benefits of a complete point solution from Rosemount Temperature.

Rosemount™ 148 Temperature Transmitter

Basic temperature transmitter offers a cost-effective solution for temperature monitoring points

- DIN B style head mount transmitter
- Variety of DIN B enclosure options
- 4-20 mA analog protocol
- Single sensor capability with universal sensor inputs (RTD, T/C, ohms)
- PC-based configuration

Standard transmitter design provides flexible and reliable performance

- 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
- PC-based configuration interface delivers a programmer, cables, and the software needed for transmitter configuration
- Compensation for ambient temperature enhances transmitter performance

Contents

Rosemount™ 148 Temperature Transmitter.....	2
Ordering information.....	4
Rosemount 148 Configuration Interface Specifications.....	6
Transmitter specifications.....	8
Dimensional drawings.....	13
Product certifications.....	14

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.



Experience global consistency and local support from numerous worldwide Rosemount Temperature manufacturing sites



- World-class manufacturing provides globally consistent product from every factory and the capacity to fulfill the needs of any project, large or small.
 - Experienced Instrumentation Consultants help select the right product for any temperature application and advise on best installation practices.
 - An extensive global network of Emerson service and support personnel can be on-site when and where needed.
-
- Looking to measure more temperature points in a cost effective way? Consider a wireless temperature solution. The Rosemount™ 148 Wireless Temperature Transmitter is solid performing, yet economical.
 - For temperature installations that require reliable measurement, the Rosemount 148 Temperature Transmitter is a cost-effective solution.

Ordering information



The Rosemount™ 148 Temperature Transmitter has a standard transmitter design that provides reliable performance in process environments.

Transmitter features include:

- 4-20 mA analog output
- Variety of DIN B enclosure options
- 3-Point calibration certificate (option code Q4)
- Assemble to sensor option (option code XA)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [Material selection](#) for more information on Material Selection.

Table 1: Rosemount 148 PC-Programmable Temperature Transmitter Ordering Information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description		
148	PC Programmable temperature transmitter		
Transmitter type			
H	DIN B head mount		★
Transmitter output			
N	Analog output		★
Product certifications			Enclosure option codes permitted
I5	USA Intrinsic Safety and Class 1, Division 2	A, U, B, C, N, G, H, L, T, V, Y	★
E5 ⁽¹⁾	USA Explosion-Proof	A, U, G, H	★
K5 ⁽¹⁾	USA Intrinsic Safety, Explosion-Proof, and Class 1, Division 2	A, U, G, H, L, T, V, Y	★
I6	Canada Intrinsic Safety and Class 1, Division 2	A, U, B, C, N, G, H, L, T, V, Y	★

Table 1: Rosemount 148 PC-Programmable Temperature Transmitter Ordering Information (continued)

K6 ⁽¹⁾	Canada Intrinsic Safety, Explosion-Proof, and Class 1, Division 2	A, U, G, H	★	
I1	ATEX Intrinsic Safety	All enclosures	★	
E1 ⁽¹⁾	ATEX Flameproof	A, U, G, H	★	
N1 ⁽¹⁾	ATEX Type n with enclosure	A, U, G, H	★	
NC	ATEX Type n Component without enclosure	N	★	
ND ⁽¹⁾	ATEX Dust	A, U, G, H	★	
I7	IECEX Intrinsic Safety	All enclosures	★	
E7 ⁽¹⁾	IECEX Flameproof and Dust	A, U, G, H	★	
N7 ⁽¹⁾	IECEX Type n with enclosure	A, U, G, H	★	
NG	IECEX Type n without enclosure	N	★	
NA	No approvals	All enclosures	★	
Enclosure options		Material	IP Rating	
A	Connection head	Aluminum	IP68	★
U	Universal head (Junction Box)	Aluminum	IP68	★
B	BUZ head	Aluminum	IP65	★
C	BUZ head	Polypropylene	IP65	★
N	No enclosure	N/A	N/A	★
G	Connection head	SST	IP68	
H	Universal head (Junction Box)	SST	IP68	
S	Sanitary connection head, DIN B	Polished SST	IP66	
F	Sanitary connection head, DIN A	Polished SST	IP66/IP68	
L	TZ-A/BL	Aluminum	IP65	
T	TZ-A/BK	Polyamide	IP65	
V	GN-BL	Aluminum	IP65	
Y	HR-A/BL	Aluminum	IP65	
Conduit entry size				
1	M20 × 1.5 (CM20)			★
2	½-14 in. NPT			★
0	No enclosure			★

(1) Approval Codes E1, N1, N7, ND, E5, K5, K6, and E7 require an enclosure.

Table 2: Options (include with selected model number)

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Alarm level configuration		
A1	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★

Table 2: Options (include with selected model number) (continued)

Calibration certificate		
Q4	Calibration certificate (3-point Calibration)	★
Line filter		
F6	60 Hz Line voltage filter	★
External ground option (available w/enclosures U, H)		
G1	External ground lug assembly	★
Cover chain option (available w/enclosures U, H)		
G3	Cover chain	★
Cable gland option		
G2	Cable gland–explosion proof–7.5 mm - 11.9 mm	★
G4	Cable gland–explosion proof, thin wire - 3.0 mm - 8.0 mm	★
Conduit electrical connector		
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size Mini, 4-pin, male connector (minifast®)	★
Assemble to options		
XA	Sensor specified separately and assembled to transmitter	★
Typical model number: 148 H N I5 U1 A1 XA		

Rosemount 148 Configuration Interface Specifications

Configuration software

Note

The Rosemount™ configuration software is compatible with Microsoft® Windows™ XP, Windows 7 32-bit and Windows 7 64-bit. It is not compatible with Windows NT and Windows 2000.

The Rosemount 148 PC-based configuration software for the Rosemount 148 allows comprehensive configuration of the transmitters. Used in conjunction with various Rosemount or user-supplied hardware modems, the software provides the tools necessary to configure the 148 Transmitters including the following parameters:

- Sensor type
- Number of wires
- Engineering units
- Transmitter tag information
- Damping
- Alarming parameters

Configuration hardware

The Rosemount™ 148 Configuration Interface has 3 hardware options as follows:

Software only

- (Part #: 00148-1601-0002)
- Customer must provide appropriate communications hardware (modem, power supply, etc.).

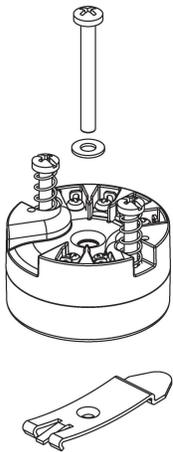
Serial modem and software

- (Part #: 00148-1601-0004)
- Serial modem
- Customer must provide separate loop power supply and resistor.
- Requires PC serial port
- Suitable for use with powered loops

USB modem and software

- (Part #: 00148-1601-0003)
- USB (Universal Serial Bus) modem
- Customer must provide separate loop power supply and resistor.
- Requires PC with USB port
- Suitable for use with powered loops

Figure 1: Rosemount 148 Transmitter Accessories



- A. Mounting hardware
- B. Transmitter
- C. Rail clip

Table 3: Rosemount 148 Transmitter Accessories

External ground screw assembly kit	00644-4431-0001
Kit, hardware for mounting a Rosemount 148 to a DIN rail (see left picture-top hat rail, symmetric)	00248-1601-0001
Snap rings kit (used for assembly to DIN plate style sensor)	00644-4432-0001

Transmitter specifications

Functional specifications

Inputs

User-selectable; sensor terminals rates to 42.4 Vdc. See [Transmitter accuracy and ambient temperature effects](#) for sensor options.

Output

Two wire 4–20 mA DC, linear with temperature or input

Isolation

Input/Output isolation tested to 500 Vac rms (707 Vdc) at 50/60 Hz.

Supply voltage DC

Standard: 12 to 42.4 V

Intrinsic Safety: 12 to 30 V

Minimum voltage across terminals

12 Vdc

Humidity limits

0 - 95% relative humidity, non-condensing

NAMUR recommendations

The Rosemount™ 148 meets the following NAMUR recommendations:

- NE 21 - Electromagnetic compatibility (EMC) for process and laboratory apparatus
- NE 43 - Standard of the signal level breakdown information of digital transmitters

Temperature limits

Operating Limit

-40 to 185 °F (-40 to 85 °C)

Storage Limit

-58 to 248 °F (-50 to 120 °C)

Turn-on time

Specification performance is achieved less than six seconds after power is applied to the transmitter and when damping value is set to zero seconds.

Update rate

Less than 0.5 seconds

Damping

32 seconds maximum, 5 seconds default.

Recommended minimum measuring span

10 °C (18 °F)

Software detected failure mode

The values at which the transmitter drives its output in failure mode depends on device configuration. The device can be configured to meet NAMUR-compliant (NAMUR recommendation NE 43) operation. The values for standard and NAMUR-compliant operation are as follows:

Table 4: Available Alarm Range

Units - mA	Min	Max	Rosemount	Namur
High alarm	21	23	21.75	21
Low alarm ⁽¹⁾	3.5	3.75	3.75	3.6
High saturation	20.5	20.9 ⁽²⁾	20.5	20.5
Low saturation ⁽¹⁾	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.

Certain hardware failures, such as microprocessor failures, will always drive the output to greater than 23 mA.

Performance specifications

Material selection

Emerson provides a variety of Rosemount™ product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

EMC (Electromagnetic Compatibility)

Meets all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation < 1% span during EMC disturbance.

Power supply effect

Less than ± 0.0055 of span per volt

Vibration effect

The Rosemount™ 148 is tested to the following specifications with no effect on performance:

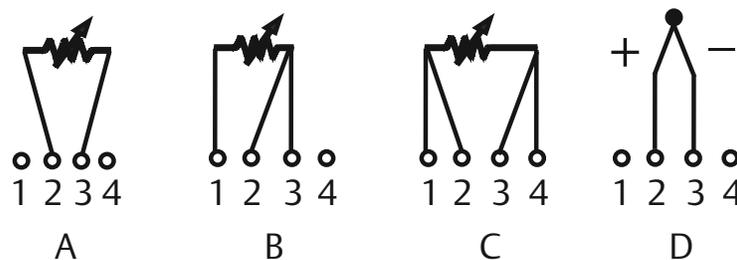
Frequency	Vibration
10 to 60 Hz	0.35 mm displacement
60 to 1000 Hz	5 g peak acceleration

Stability

For RTD and thermocouple inputs, the transmitter will have a stability of $\pm 0.15\%$ of reading or $0.15\text{ }^{\circ}\text{C}$ (whichever is greater) for twelve months.

Sensor connections

Figure 2: 148 Sensor Connections Diagram



- A. 2-wire and V
- B. 3-wire RTD and V
- C. 4-wire RTD and V⁽¹⁾
- D. T/C

Transmitter accuracy and ambient temperature effects

Note

The accuracy and ambient temperature effect is the greater of the fixed and percent of span values (see example below).

(1) Emerson provides 4-wire sensors for all single element RTDs. You can use these RTDs in 3-wire configurations by leaving the unneeded leads disconnected and insulated with electrical tape.

Table 5: Rosemount™ 148 Transmitter Input Options, Accuracy, and Ambient Temperature Effects

Sensor type	Input ranges ⁽¹⁾		Recommended min. span ⁽²⁾	Accuracy ⁽³⁾		Temperature effects ⁽³⁾⁽⁴⁾	
	°C	°F		°C (°F)	Fixed	% of span	Fixed
2-, 3-, 4-wire RTDs							
Pt 100 $\alpha = 0.00385$ (IEC 751)	-200 to 850	-328 to 1562	10 °C (18 °F)	0.3 °C	± 0.15	0.009 °C	0.006 %
Pt 100 $\alpha = 0.003916$ (JIS 1604)	-200 to 645	-328 to 1193	10 °C (18 °F)	0.3 °C	± 0.15	0.009 °C	0.006 %
Ni120 (Edison Curve No. 7)	-70 to 300	-94 to 572	10 °C (18 °F)	0.24 °C	± 0.15	0.006 °C	0.006 %
Cu 50 $\alpha = 0.00428$ (GOST 6651-94)	-185 to 200	-301 to 392	10 °C (18 °F)	0.51 °C	± 0.15	0.009 °C	0.006 %
Cu 100 $\alpha = 0.00426$ (GOST 6651-94)	-50 to 200	-58 to 392	10 °C (18 °F)	0.51 °C	± 0.15	0.009 °C	0.006 %
Cu 100 $\alpha = 0.00428$ (GOST 6651-94)	-185 to 200	-301 to 392	10 °C (18 °F)	0.51 °C	± 0.15	0.009 °C	0.006 %
Ohms	0 to 2000 Ω		20 Ω	1.1 Ω	± 0.15	0.042 Ω	0.006 %
Thermocouples⁽⁵⁾							
Type B (NIST monograph 175) ⁽⁶⁾	100 to 1820	212 to 3308	25 °C (45 °F)	2.25 °C	± 0.15	0.084 °C	0.006 %
Type J (NIST monograph 175)	-180 to 760	-292 to 1400	25 °C (45 °F)	0.75 °C	± 0.15	0.03 °C	0.006 %
Type K (NIST monograph 175) ⁽⁷⁾	-180 to 1372	-292 to 2502	25 °C (45 °F)	0.75 °C	± 0.15	0.03 °C	0.006 %
Type N (NIST monograph 175)	-200 to 1300	-328 to 2372	25 °C (45 °F)	1.2 °C	± 0.15	0.03 °C	0.006 %
Type R (NIST monograph 175)	0 to 1768	32 to 3214	25 °C (45 °F)	1.8 °C	± 0.15	0.09 °C	0.006 %
Type S (NIST monograph 175)	0 to 1768	32 to 3214	25 °C (45 °F)	1.5 °C	± 0.15	0.09 °C	0.006 %
MV	-10 to 100 mV		3 mV	0.045 mV	± 0.15	0.0015 mV	0.006 %

(1) Input ranges are for transmitter only. Actual sensor (RTD or Thermocouple) operating ranges may be more limited.

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

(3) Total accuracy/temperature effect is sum of fixed and percent of span.

(4) Change in ambient is with reference to the calibration temperature of the transmitter at 68 °F (20 °C) from factory.

(5) For thermocouple measurements additional 0.5 °C (CJC) is added to fixed accuracy.

(6) Fixed accuracy for NIST Type B is ± 5.4 °F (± 3.0 °C) from 212 to 572 °F (100 to 300 °C).

(7) Fixed accuracy for NIST Type K is ± 1.3 °F (± 0.7 °C) from -292 to -130 °F (-130 to -90 °C).

Transmitter accuracy example

When using a Pt 100 ($\alpha = 0.00385$) sensor input with a 0 to 100 °C span:

Transmitter temperature effects example

Transmitters can be installed in locations where the ambient temperature is between -40 and 85 °C (-40 and 185 °F). In order to maintain excellent accuracy performance, each transmitter is individually characterized over this ambient temperature range at the factory.

When using a Pt 100 ($\alpha = 0.00385$) sensor input with a 0–100 °C span at 30 °C ambient temperature:

- Fixed temperature effects: $0.009\text{ °C} \times (30 - 20) = 0.09\text{ °C}$
- % of span effects: $[0.006\% \text{ of } 100] \times (30 - 20) = 0.06\text{ °C}$
- Total temperature effects: 0.15 °C

Total transmitter error

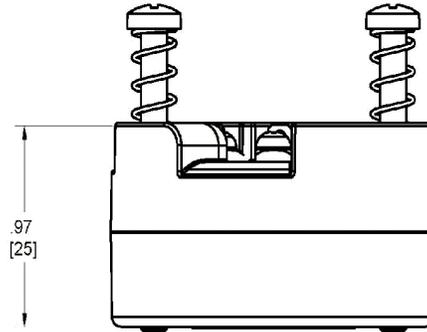
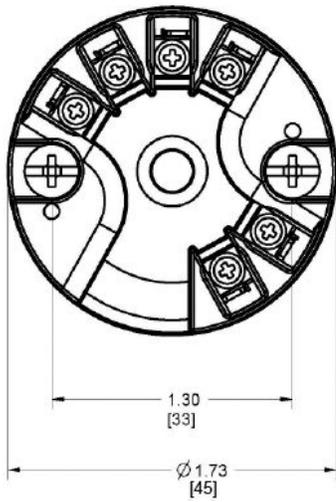
- Worst case error: Fixed accuracy + % of span + Fixed temperature effects + % of span effects = $0.30\text{ °C} + 0.15\text{ °C} + 0.09\text{ °C} + 0.06\text{ °C} = 0.60\text{ °C}$
- Total Probable Transmitter Error: $\sqrt{0.30^2 + 0.15^2 + 0.09^2 + 0.06^2} = 0.352\text{ °C}$

Dimensional drawings

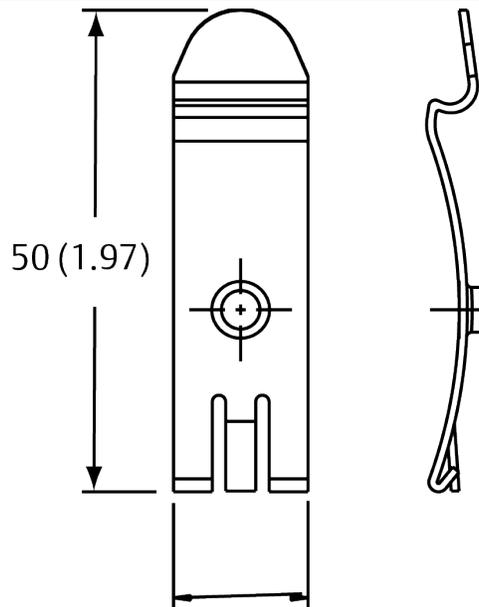
Figure 3: Rosemount™ 148 Temperature Transmitter

Top view

Side view



DIN Rail mounting kit



Dimensions are in millimeters (inches).

Product certifications

Rev: 0.1

European Directive Information

A copy of the EU Declaration of Conformity can be found at the end of the Quick Start 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 a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

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

E5 Explosionproof and Dust-Ignitionproof

Certificate	1091070
Standards used	FM Class 3600-2011, FM Class 3611-2004, FM Class 3615-2006, FM 3616-2011, UL Std. No. 60079-0: Ed.6, UL Std. No. 50E
Markings	CL I/II/III, DIV 1, GP B, C, D, E, F, G; when installed per Rosemount™ drawing 00644-1059; Type 4X; IP66/68

I5 Intrinsic Safety and Nonincendive

Certificate	1091070
Standards used	FM Class 3600-2011, FM Class 3610-2010, FM Class 3611-2004, UL Std. No. 60079-0: Ed.6, UL Std. No. 60079-11: Ed. 6, UL Std. No. 50E
Markings	CL I/II/III, DIV 1, GP A, B, C, D, E, F, G; NI CL1, DIV 2, GP A, B, C, D when installed per Rosemount drawing 00148-1056; Type 4X; IP66/68

Canada

I6 Canada Intrinsically Safe

Certificate	1091070
Standards used	CAN/CSA C22.2 No. 0-10, CSA Std. C22.2 No. 25-1966, CAN/CSA C22.2 No. 94-M91, CAN/CSA C22.2 No. 157-92, CSA C22.2 No. 213-M1987, CAN/CSA C22.2 No. 60079-11:14, C22.2 No 60529-05
Markings	IS CL I, DIV 1 GP A, B, C, D when installed per Rosemount drawing 00148-1056; CL I DIV 2 GP A, B, C, D; Type 4X; IP66/68

K6 CSA Intrinsically Safe, Explosionproof, and Division 2

Certificate	1091070
Standards used	CAN/CSA C22.2 No. 0-10, CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std. C22.2 No. 142-M1987, CAN/CSA C22.2 No. 157-92, CSA C22.2 No. 213-M1987, C22.2 No 60529-05
Markings	XP CL I/II/III, DIV 1, GP B, C, D, E, F, G when installed per Rosemount drawing 00644-1059; IS CL I, DIV 1 GP A, B, C, D when installed per Rosemount drawing 00148-1056; CL I DIV 2 GP A, B, C, D; Type 4X, IP66/68; Conduit Seal not required

Europe

E1 ATEX Flameproof

Certificate	FM12ATEX0065X
Standards used	EN 60079-0: 2012+A11:2013, EN 60079-1: 2014, EN 60529:1991 +A1:2000 + A2:2013
Markings	 II 2 G Ex db IIC T6...T1 Gb, T6(-50 °C ≤ Ta ≤ +40 °C), T5...T1(-50 °C ≤ Ta ≤ +60 °C); see Table 6 for process temperatures.

Specific conditions of use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than four joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 266 °F (130 °C).
7. Non-standard paint options may cause risk of electrostatic discharge. Avoid installations that cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

I1 ATEX Intrinsic Safety

Certificate	Baseefa18ATEX0090X
Standards used	EN IEC 60079-0: 2018, EN 60079-11: 2012
Markings	 II 1 G Ex ia IIC T5/T6 Ga, T5(-60 °C ≤ Ta ≤ +80 °C), T6(-60 °C ≤ Ta ≤ +60 °C). See Table 7 for entity parameters.

Special conditions of use (X):

1. The equipment, if supplied without an enclosure, must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than $1\text{G}\Omega$; light alloy or zirconium enclosures must be protected from impact and friction if located in a Zone 0 environment.

N1 ATEX Zone 2 - with enclosure

Certificate	Baseefa18ATEX0091X
Standards used	EN IEC 60079-0:2018, EN 60079-15:2010
Markings	 II 3 G Ex nA IIC T5/T6 Gc, T5(-60°C ≤ Ta ≤ +80°C), T6(-60°C ≤ Ta ≤ +60°C);

NC ATEX Zone 2 - without enclosure

Certificate	Baseefa18ATEX0091X
Standards used	EN IEC 60079-0:2018, EN 60079-15:2010
Markings	 II 3 G Ex nA IIC T5/T6 Gc, T5(-60°C ≤ Ta ≤ +80°C), T6(-60°C ≤ Ta ≤ +60°C)

Special condition of use (X):

1. The equipment, if supplied without an enclosure, must be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60529 and EN 60079-15 and be located in an area of pollution degree 2 or better as defined in IEC 60664-1.

ND ATEX Dust-Ignitionproof

Certificate	FM12ATEX0065X
Standards used	EN 60079-0: 2012+A11:2013, EN 60079-31:2014, EN 60529:1991 +A1:2000 + A2:2013
Markings	 II 2 D Ex tb IIIC T130 °C Db, (-40 °C ≤ Ta ≤ +70 °C); IP66 See Table 6 for process temperatures.

Specific conditions of use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than four joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 266 °F (130 °C).
7. Non-standard paint options may cause risk of electrostatic discharge. Avoid installations that cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

International

E7 IECEx Flameproof

Certificate	IECEX FMG 12.0022X
Standards used	IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-31:2013
Markings	Ex db IIC T6...T1 Gb, T6(-50 °C ≤ Ta ≤ +40 °C), T5...T1(-50 °C ≤ Ta ≤ +60 °C); Ex tb IIIC T130 °C Db, (-40 °C ≤ Ta ≤ +70 °C); IP66 See Table 6 for process temperatures.

Specific conditions of use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than four joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 266 °F (130 °C).
7. Non-standard paint options may cause risk of electrostatic discharge. Avoid installations that cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

I7 IECEx Intrinsic Safety

Certificate	IECEX BAS 18.0062X
Standards	IEC 60079-0:2017, IEC 60079-11:2011
Markings	Ex ia IIC T5/T6 Ga, T5(-60 °C ≤ Ta ≤ +80 °C), T6(-60 °C ≤ Ta ≤ +60 °C) See Table 7 for entity parameters.

Special condition of use (x):

1. The equipment, if supplied without an enclosure, must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than 1GΩ; light alloy or zirconium enclosures must be protected from impact and friction if located in a Zone 0 environment.

N7 IECEx Zone 2 - with enclosure

Certificate	IECEX BAS 18.0063X
Standards	IEC 60079-0:2017, IEC 60079-15:2010
Markings	Ex nA IIC T5/T6 Gc; T5(-60 °C ≤ Ta ≤ +80 °C), T6(-60 °C ≤ Ta ≤ +60 °C)

NG IECEx Type n - without enclosure

Certificate	IECEX BAS 18.0063X
Standards	IEC 60079-0:2017, IEC 60079-15:2010
Markings	Ex nA IIC T5/T6 Gc; T5(-60 °C ≤ Ta ≤ +80 °C), T6(-60 °C ≤ Ta ≤ +60 °C)

Special condition of use (X):

1. The equipment, if supplied without an enclosure, must be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60529 and IEC 60079-15 and be located in an area of pollution degree 2 or better as defined in IEC 60664-1

Brazil

I2 Brazil Intrinsic Safety

Certificate	UL-BR 19.0202X
Standards	ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-11:2013
Markings	Ex ia IIC T5 Ga (-60°C ≤ Ta ≤ +80°C); Ex ia IIC T6 Ga (-60°C ≤ Ta ≤ +60°C) See Table 7 for entity parameters.

Special condition of use (x):

1. The equipment, if supplied without an enclosure, must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than 1GΩ; light alloy or zirconium enclosures must be protected from impact and friction if located in a Zone 0 environment (areas that required EPL Ga).

Combinations

K5	Combination of E5 and I5
-----------	--------------------------

Tables

Table 6: Process Temperatures

Temperature class	Ambient temperatures	Process temperature without LCD cover (°C)			
		No ext.	3-in.	6-in.	9-in.
T6	-50 °C to +40 °C	55	55	60	65
T5	-50 °C to +60 °C	70	70	70	75
T4	-50 °C to +60 °C	100	110	120	130
T3	-50 °C to +60 °C	170	190	200	200
T2	-50 °C to +60 °C	280	300	300	300
T1	-50 °C to +60 °C	440	450	450	450
T130°C	-40°C to +70°C	100	110	110	120

Table 7: Entity Parameters

	Loop terminals + and -	Sensor terminals 1 to 4
Voltage U_i	30 V	30 V
Current I_i	266 mA	26 mA
Power P_i	1 W	191 mW
Capacitance C_i	0 nF	1.54 nF
Inductance L_i	0 mH	0 μ H

Global Headquarters

Emerson Automation Solutions
6021 Innovation Blvd.
Shakopee, MN 55379, USA

+1 800 999 9307 or +1 952 906 8888

+1 952 949 7001

RFQ.RMD-RCC@Emerson.com

North America Regional Office

Emerson Automation Solutions
8200 Market Blvd.
Chanhassen, MN 55317, USA

+1 800 999 9307 or +1 952 906 8888

+1 952 949 7001

RMT-NA.RCCRF@Emerson.com

Latin America Regional Office

Emerson Automation Solutions
1300 Concord Terrace, Suite 400
Sunrise, FL 33323, USA

+1 954 846 5030

+1 954 846 5121

RFQ.RMD-RCC@Emerson.com

Europe Regional Office

Emerson Automation Solutions Europe
GmbH
Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar
Switzerland

+41 (0) 41 768 6111

+41 (0) 41 768 6300

RFQ.RMD-RCC@Emerson.com

Asia Pacific Regional Office

Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461

+65 6777 8211

+65 6777 0947

Enquiries@AP.Emerson.com

Middle East and Africa Regional Office

Emerson Automation Solutions
Emerson FZE P.O. Box 17033
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates

+971 4 8118100

+971 4 8865465

RFQ.RMTMEA@Emerson.com

 [Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)

 [Twitter.com/Rosemount_News](https://twitter.com/Rosemount_News)

 [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)

 [Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)

©2019 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is mark of one of the Emerson family of companies. All other marks are the property of their respective owners.