

Rosemount[™] Synchros Temperature Monitor



- Monitor surface and environmental temperature for machinery health and reliability purposes.
- Mounting flexibility and hazardous approvals to meet application requirements.
- All-encompassing model code containing temperature device, temperature sensor, power module, and mounting hardware.

Emerson Synchros™ Platform

Introduction to Synchros

- Emerson Synchros is an Industrial Internet-of-Things (IIoT) platform that revolutionizes asset and condition monitoring.
- Synchros provides industrial operators with increased accessibility to measurement points, seamless wireless connectivity starting with *WirelessHART*®, various sensor options, and robust data integration.
- The user-centric platform design ensures easy installation and operation while enabling proactive maintenance, minimizing downtime, and improving operational efficiency.

IEC 62591 (*WirelessHART*®), the industry standard

Self-organizing, adaptive mesh routing

- No wireless expertise required; network automatically establishes the best communication paths.
- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, then data will continue to flow because the device already has other established paths. The network will then lay in more communication paths as needed for that device.

Reliable wireless architecture

- Standard Institute of Electrical and Electronics Engineers (IEEE) 802.15.4 radios.
- 2.4 GHz Industrial, Scientific, and Medical (ISM) band sliced into 15 radio channels.
- Time-synchronized channel hopping for increased reliability and avoidance of interference from other radios, Wi-Fi®, and electromagnetic compatibility (EMC) sources.
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environments.

Emerson's wireless devices

Seamless integration via local area networks (LANs) or serial communications to other existing host systems

- Native integration into Ovation™ and DeltaV™(1) is transparent and seamless.
- Gateways interface with existing host systems via LAN or serial communication using industry standard protocols, including OPC DA, OPC UA®, Modbus® Transmission Control Protocol/Internet Protocol (TCP/IP), Ethernet IP & HART®-IP, and Modbus remote terminal unit (RTU).

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(1) DeltaV currently has limitations with the Emerson 1410S Gateway hardware. DeltaV does not support gateway redundancy and only supports a capacity of up to 100 *WirelessHART*® devices. Potential alternatives to bring data from 200 units to DeltaV can be performed through Modbus RTU or OPC DA.

Layered security keeps your network safe

- All wireless data is 128 bit AES encrypted so your data is kept safe.
- All wireless devices are authenticated so you know exactly what is on your network.
- Complete control of your network using the gateway secure web interface.

Ordering information

Specifications and options

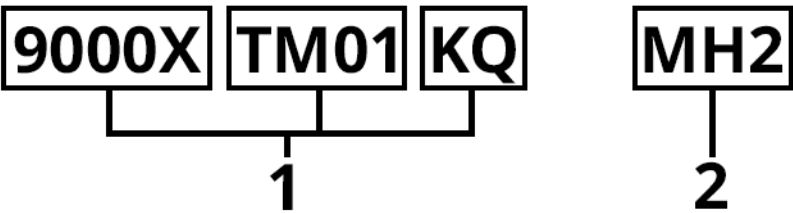
The purchaser of the equipment must specify and select:

- Options
- Mounting hardware and accessories

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 [Figure 1](#).

Figure 1: Model Code Example



- 1. Required model components
- 2. Additional options

Optimizing lead time

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

Required model components

Model

Code	Description	
9000X	Emerson Synchros™ IIoT Platform with <i>Wireless</i> HART Technology®	★

Sensor module

Code	Description	
TM01	Temperature Monitor	★

Product certifications

Code	Description	
KQ	USA, Canada, IECEx, ATEX; Division 1 & Zone 0 for Gas Intrinsically Safe & Division 2 & Zone 21 for Dust Intrinsically Safe	★
NA	No hazardous location approval; ordinary locations	★

Additional options

Mounting bracket

Code	Description	
B9	Temperature "L" mounting bracket for 2-in. pipe mounting - stainless steel (SST) bracket and bolts	★

Mounting hardware

Code	Description	
MH1	Stainless steel mounting band, pipe size ½ in. to 2½ in. (quantity 2)	★
MH2	Stainless steel mounting band, pipe size 3 in. to 4 in. (quantity 2)	★
MH3	Stainless steel mounting band, pipe size 4 in. to 10 in. (quantity 2)	★

Spare parts and accessories

Code	Description
9000X-9000-0001	Spare kit, Synchros™ power module assembly
9000X-9004-0001	Spares kit, stainless steel (SST) mounting band, pipe size ½ in. to 2½ in. (quantity 2)
9000X-9004-0002	Spares kit, SST mounting band, pipe size 3 in. to 4 in. (quantity 2)
9000X-9004-0003	Spares kit, SST mounting band, pipe size 4 in. to 10 in. (quantity 2)
9000X-9005-0001	Spare kit, Synchros corrosion protection isolator
9000X-9007-0001	Kit, spares, mounting bracket hardware, SST remote mount temperature
9000X-9001-0001	Spare kit, Synchros cover O-ring
9000X-9002-0001	Spare kit, Synchros diecast nut
9000X-9003-0001	Spare kit, Synchros diecast foot

Specifications

Functional specifications

Temperature measurement

Integral Type T thermocouple

Output

IEC 62591 (*WirelessHART*®) 2.4 GHz

Humidity limits

0 to 100 percent relative humidity, non-condensing

Update rate

User-selectable, 1 minute to 60 minutes (Default: 5 minutes)

Measurement accuracy

$\pm 1.8^{\circ}\text{F}$ ($\pm 1^{\circ}\text{C}$)⁽²⁾⁽³⁾

Radio frequency from internal antenna

Internal antenna: maximum of 10 mW (10 dBm) EIRP

Physical specifications

Material selection

Emerson provides a variety of Rosemount products with various product options and configurations, including materials of construction that can be expected to perform well in a wide range of applications.

The 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.

Electrical connections

Power module

The device is powered by a field-replaceable, non-rechargeable, intrinsically safe Emerson Synchros™ power module featuring keyed connections that eliminate the risk of incorrect installation.

The Synchros power module contains a lithium-thionyl chloride with a polycarbonate and polybutylene terephthalate (PC/PBT) cover.

The device has a power module lifetime rating of ten years with a one-minute update rate at reference conditions.

(2) At reference conditions: Water at 68 °F (20 °C) in a 1-in. (25 mm) carbon steel pipe.

(3) Total system accuracy varies by application and is impacted by heat loss from environmental factors (clamps, surfaces, etc.)

NOTICE

Reference conditions are at 70 °F (21 °C) and routing data for three additional network devices.

Continuous exposure to ambient temperature limits below -40 or above +185 °F (below -40 or above +85 °C) may reduce specified power module life by up to 20 percent.

Field Communicator terminal connections

HART® clips permanently fixed to communication module

Materials of construction**Enclosure**

Cover	Polycarbonate polybutylene terephthalate (PC/PBT), polymer
Sensor module housing	PEI polymer
Communication module housing	PC/PBT polymer
Paint	N/A
Emerson Synchros™ power module	PC/PBT polymer
Cover O-ring	Silicone

Enclosure ratings

Type 4X and IP66/67

Mounting

Device can be installed onto a pipe with banding (MH1-MH3 options) or mounted to an “L” mounting bracket (B9 option).

Weight

Synchros device	0.85 lb. (0.39 kg)
B9 bracket	0.76 lb. (0.34 kg)

Performance specifications**Electromagnetic compatibility (EMC)**

Meets all industrial environmental requirements of EN61326. Maximum deviation < 1 percent span during EMC disturbance.

Vibration effect

The Rosemount Synchros™ Temperature Monitor in a direct mount configuration (options MH1-MH3) is tested to the following specifications with no effect on performance per IEC 61298-3, 2008.

Test type	Test specification	Test profile
Sinusoidal vibration	IEC 61928-3, 2008 edition	Vibration amplitude 2 g
		Frequency range (Hz) 10 to 1,000
		Displacement peak to peak amplitude (mm) 0.3
		Acceleration amplitude (m/s²) 20

Temperature range and limits

Measurement type	Measurement range
Surface	-40 to +230 °F -40 to +110 °C
Ambient/environmental	-40 to +185 °F -40 to +85 °C

Operating limit	Storage limit
-40 to +185 °F -40 to +85 °C	-40 to +185 °F -40 to +85 °C

Product certifications

Refer to the *Rosemount Synchros Platform Quick Start Guide* for product certification information.

Dimensional drawings

Dimensions are in inches [millimeters].

Figure 2: Rosemount 9000X Series Synchros Temperature Monitor Dimensions

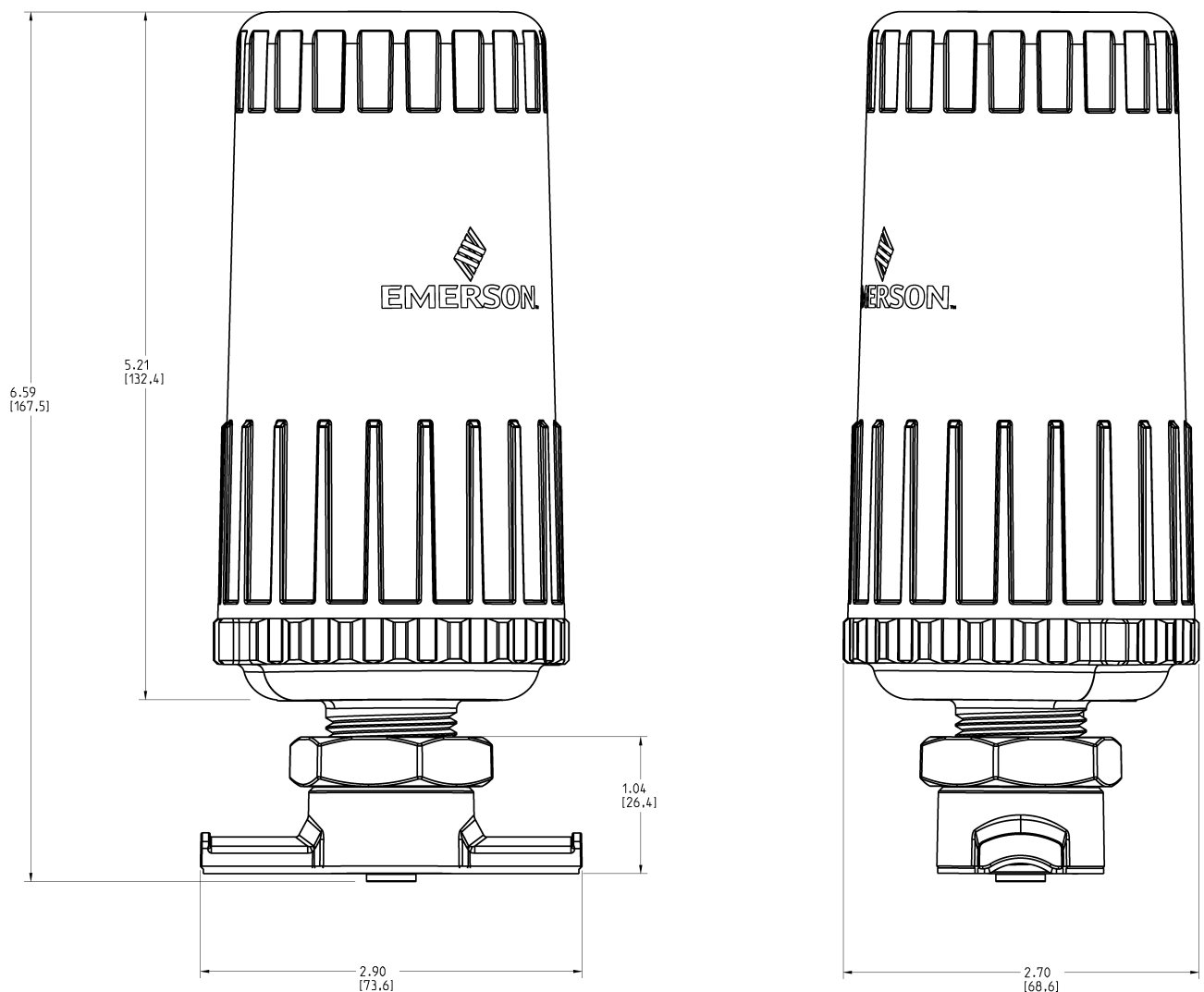


Figure 3: Pipe Mounting Configuration (Options: MH1 - MH3)

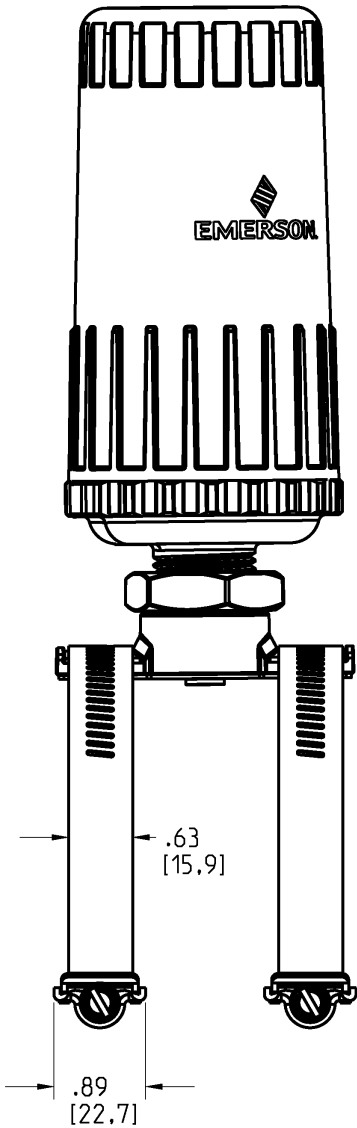


Figure 4: "L" Bracket Mounting Configuration (Option B9)

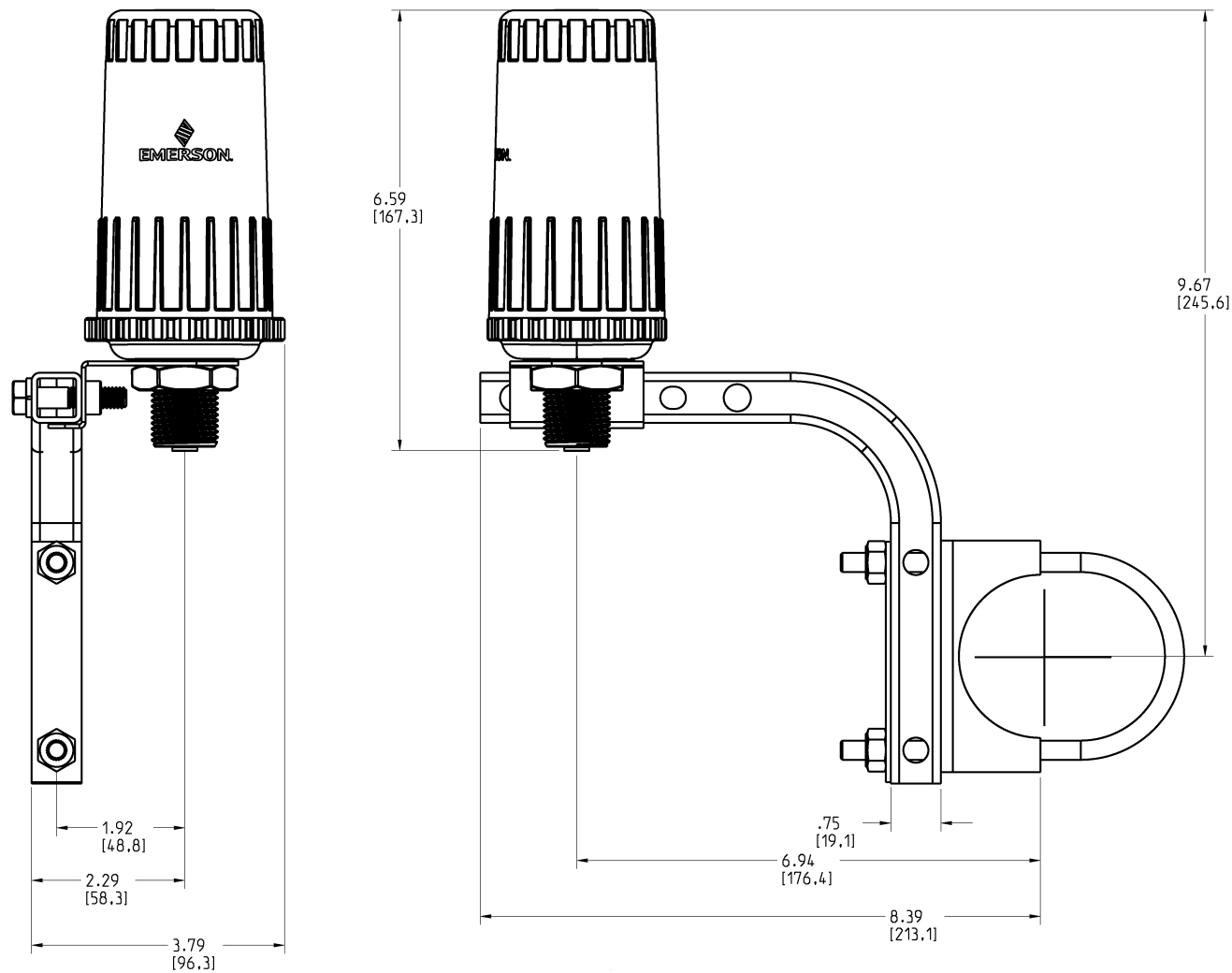
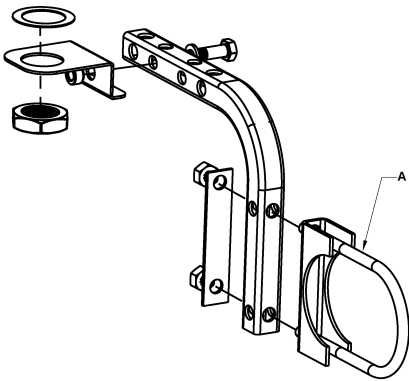


Figure 5: U-Bolt for Pipe Mounting



A. 2-inch U-bolt for pipe mounting

For more information: [Emerson.com/global](https://emerson.com/global)

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