

Rosemount™ X-well™ Technology



Rosemount X-well Technology is the go-to solution for non-intrusive process temperature monitoring. With its unparalleled accuracy and reliability, you can:

- Improve safety
- Decrease design complexity
- Reduce costs
- Increase flexibility

Features and benefits

Rosemount X-well™ Technology provides a Complete Point Solution™ for accurately measuring process temperature in monitoring applications without a thermowell or process penetration.



- Simplify temperature measurement point specification, installation, and maintenance and eliminate possible leak points.
- Calculate a repeatable and accurate process temperature measurement with an in-transmitter heat flux algorithm.
- Measures pipe surface and secondary temperatures while using the thermal conductivity properties of the installation and process piping to provide an accurate process measurement.

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.

Contents

Features and benefits.....	2
Ordering information.....	4
Product specifications.....	30
Product certifications.....	33
Dimensional drawings.....	34

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



- 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 they are needed.
- World-class manufacturing provides globally consistent product from every factory and the capacity to fulfill the needs of any project, large or small.
- Make wireless installation and configuration easy with the Emerson Wireless Gateway.

Sizing & Selection tool

Emerson's Temperature Sizing & Selection is an online tool designed with a focus on temperature measurement education, configuration, and specification.

Temperature Sizing & Selection is comprised of transmitter and Rosemount X-well™ Technology modules. Each module provides guidance on the suitability of the product based on application and performance requirements.

To learn more about X-well's performance in your application, visit [Sizing & Selection](#).

Ordering information

Rosemount X-well™ Technology is available on three industry-leading temperature transmitter platforms (Rosemount 648, 3144S, and 3144P).

For *WirelessHART*® capability, specify the 648 Wireless Temperature Transmitter. For remote mount capability and temperature measurement up to 1202 °F (650 °C), specify the 3144S Temperature Transmitter.

Rosemount 3144S ordering information

Online product configurator

Many products are configurable online using our product configurator. Select the **Configure** button or visit [Emerson.com/global](https://www.emerson.com/global) 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
- 2. Additional options (variety of features and functions that may be added to products)

Specifications and options

The purchaser of the equipment must specify and select:

- Product materials
- Options
- Components

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	
3144S	Temperature transmitter	★

Measurement functionality

Code	Description	
3	Rosemount X-well™ Technology assembly for non-intrusive measurement (with sensor and mounting)	★
4	Single/dual input temperature with X-well Technology capability (transmitter only)	★

Diagnostic functionality

Code	Description	Features	
A	Device, RTD Measurement Protection, and Loop Integrity diagnostic	- Basic transmitter diagnostics (open/short sensor detect) - Process alerts with minimum/maximum tracking - RTD measurement protection - Loop integrity	★
B	Enhanced Safety Integrated Systems (SIS) Proof Testing and Logging (includes RTD Measurement Protection and Loop Integrity diagnostic)	- SIS proof testing and logging - Basic transmitter diagnostics (open/short sensor detect) - Process alerts with minimum/maximum tracking - RTD measurement protection - Loop integrity	★
C	Sensor Health (includes Enhanced SIS, RTD Measurement Protection, and Loop Integrity)	- Thermocouple degradation diagnostic - SIS proof testing and logging - Basic transmitter diagnostics (open/short sensor detect) - Process alerts with minimum/maximum tracking - RTD measurement protection - Loop integrity	★

Performance class

Code	Description	
1	Ultra: 0.09 °F (0.05 °C) accuracy, 20-year stability, 20-year limited warranty, ReadyConnect™ technology	★
4	Classic: 0.14 °F (0.08 °C) accuracy, 10-year stability	★

Transmitter housing material

Connection head material matches transmitter housing material when TR2 remote assemblies are specified.

Code	Description	
A	Aluminum field mount, dual-compartment housing	★
S	Stainless steel (SST) field mount, dual-compartment housing	★

Conduit/cable threads

Connection head conduit/cable threads match transmitter housing conduit/cable threads when TR2 remote assemblies are specified.

Code	Description	
1	½-14 NPT	★
2	M20 x 1.5	★

Transmitter output

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

Rosemount X-well™ process temperature range

Code	Sensor type	Process temperature range	Transmitter mounting style	Performance ⁽¹⁾	
TR1	Standard range	-58 to +572 °F (-50 to +300 °C)	Direct	Industry leading	★
TR2	Extended range	-76 to +1202 °F (-60 to +650 °C)	Remote ⁽²⁾	Industry standard	★

(1) X-well has better expected total probable error when using standard range sensors.

(2) TR2 remote assemblies include connection head, cable glands, and remote cable.

Related information

[Performance](#)

Rosemount X-well™ pipe mount design

Code	Description	Pipe size range (inch)	Pipe size range (DIN)	Image	
PM1	Small Pipe Mount	½ to 1½	DN15 to DN40		★
PM2	Universal Pipe Mount	2 to 60	DN50 to DN1500		★

Code	Description	Pipe size range (inch)	Pipe size range (DIN)	Image	
PM9	Universal Pipe Mount, no banding	2 to 60	DN50 to DN1500		★

Rosemount X-well™ pipe mount material

Code	X-well pipe mount material	Temperature range		
		°F	°C	
MC1	316 stainless steel (SST)	-76 to +842	-60 to +450	★
MC2	Alloy 625	-76 to +1202	-60 to +650	★

Rosemount X-well™ pipe size

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S005	½ in.	DN15	22 mm	★
S007	¾ in.	DN20	27 mm	★
S010	1 in.	DN25	34 mm	★
S012	1¼ in.	DN32	43 mm	★
S015	1½ in.	DN40	49 mm	★
S020	2 in.	DN50	61 mm	★
S025	2½ in.	DN65	77 mm	★
S030	3 in.	DN80	89 mm	★
S040	4 in.	DN100	115 mm	★
S050	5 in.	DN125	140 mm	★
S060	6 in.	DN150	169 mm	★
S080	8 in.	DN200	220 mm	★
S100	10 in.	DN250	273 mm	★
S120	12 in.	DN300	324 mm	★
S140	14 in.	DN350	356 mm	★
S160	16 in.	DN400	407 mm	★
S180	18 in.	DN450	458 mm	★
S200	20 in.	DN500	508 mm	★
S240	24 in.	DN600	610 mm	★

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S260	26 in.	DN650	660 mm	★
S300	30 in.	DN750	762 mm	★
S320	32 in.	DN790	813 mm	★
S360	36 in.	DN900	915 mm	★
S400	40 in.	DN1000	1016 mm	★
S420	42 in.	DN1050	1070 mm	★
S480	48 in.	DN1200	1219 mm	★
S520	52 in.	DN1300	1321 mm	★
S560	56 in.	DN1400	1423 mm	★
S600	60 in.	DN1500	1524 mm	★

Additional options

Rosemount X-well™ corrosion protection inlay

Corrosion protection inlay placed between mount and pipe prevents galvanic corrosion between dissimilar metals.

Code	Description	
P1	Corrosion protection inlay - material NBR	

Rosemount X-well™ remote mount cable length

Required when you order TR2 extended range sensor.

Code	Description	
L12	12 ft. (3.66 m) shielded cable	★
L24	24 ft. (7.32 m) shielded cable	
L75	75 ft. (22.86 m) shielded cable	

Rosemount X-well™ remote mount cable armor type

Code	Description	
AC	PVC-coated armored cable lead wire extension	

Retrofit kit

Code	Description	Details	Image	
R9	Universal Pipe Mount to Small Pipe Mount retrofit kit	Includes U-bolt, nuts, thin washers, and tall spacers. Allows retrofitting of Universal Pipe Mount down to 0.5 to 1.5 in. (DN-15-40).		★

Local wireless device access

Code	Description	
BLE	Bluetooth® configuration and maintenance	★

Display type

Code	Description	
M6	Graphical LCD display with Quick Service buttons	★
M7	Graphical LCD display (Quick Service buttons disabled)	★

Transmitter mounting bracket

Code	Description	Image	
B4	Stainless steel (SST) U-bolt mounting bracket, 2-inch pipe mount		★
BE	316 SST U-bolt mounting bracket, 2-inch pipe mount		★
B5	SST L-bolt mounting bracket, 2-inch pipe and panel mount		★
BH	316 SST L-bolt mounting bracket, 2-inch pipe and panel mount		★

Tagging and fastener material

Code	Description	
Y2	316 stainless steel (SST) name plate, top tag, wire-on tag, and fasteners	★

RFID tagging

Code	Description	Example image	
Y3	RFID tag		★

Transient protection

Code	Description	
T1	Transient terminal block	★

Extended product warranty

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

Software configuration

Required for Rosemount X-well factory configuration of specific pipe characteristics.

Code	Description	
C1	Custom software configuration (requires <i>Configuration Data Sheet</i> - available on Emerson.com)	★

5-point calibration

Code	Description	
P5	5-point calibration (requires Q4 option code to generate calibration certificate)	★

Alarm limit

Code	Description	
C4	NAMUR alarm and saturation levels, High alarm	★
C5	NAMUR alarm and saturation levels, Low alarm	★
C6	Custom alarm and saturation signal levels, High alarm (requires C1 and <i>Configuration Data Sheet</i> - available on Emerson.com)	★
C7	Custom alarm and saturation signal levels, Low alarm (requires C1 and <i>Configuration Data Sheet</i> - available on Emerson.com)	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	★

Ground screw

Code	Description	
G1	External ground screw assembly	★

Conduit plug

Code	Description	
DO	316 stainless steel (SST) conduit plug	★

Conduit electrical connector

Available with intrinsically safe approvals only. For FM Intrinsically Safe or non-incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain 4X rating.

Code	Description	
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★

Cold temperature

Code	Description	
BR6	-76 °F (-60 °C) cold temperature operation	★

Calibration certification

Code	Description	
Q4	Calibration certificate	
QP	Calibration certificate and tamper evident seal	★

Quality certification for safety

Code	Description	
QT	Safety certified to IEC 61508 with certificate of failure modes, effects, and diagnostic analysis (FMEDA) data	

Line filter

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

Shipboard approval

Code	Description	
SBS	American Bureau of Shipping (ABS) type approval	★
SBV	Bureau Veritas (BV) type approval	★
SDN	Det Norske Veritas (DNV) type approval	★
SLL	Lloyd's Register (LR) type approval	★

Product certifications

Code	Description	
K1	ATEX Flameproof, Intrinsic Safety	★
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
K5	USA Explosion-proof, Intrinsically Safe, Division 2	★
E5	USA Explosion-proof	★
I5	USA Intrinsically Safe, Division 2	★
K6	Canada Explosion-proof, Intrinsically Safe, Division 2	★
E6	Canada Explosion-proof	★
I6	Canada Intrinsically Safe, Division 2	★
K7	IECEx Flameproof, Intrinsic Safety	★
E7	IECEx Flameproof	★

Code	Description	
I7	IECEx Intrinsic Safety	★

Rosemount 3144P ordering information

Online product configurator

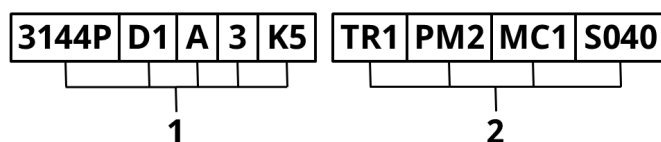
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Model codes

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 2](#).

Figure 2: Model code example



1. Required model components
2. Required model components

Specifications and options

The purchaser of the equipment must specify and select:

- Product materials
- Options
- Components

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

Options only applicable when **Measurement Configuration 3** is specified.

Model

Code	Description	
3144P	Temperature transmitter	★

Housing style

Code	Description	Material	Conduit entry size	
D1	Field mount housing, dual-compartment housing	Aluminum	½-14-inch NPT	★
D2	Field mount housing, dual-compartment housing	Aluminum	M20 x 1.5 (CM20)	★

Code	Description	Material	Conduit entry size	
D3	Field mount housing, dual-compartment housing	Aluminum	PG 13.5 (PG11)	★
D4	Field mount housing, dual-compartment housing	Aluminum	JIS G ½	★
D5	Field mount housing, dual-compartment housing	Stainless steel	½–14-inch NPT	★
D6	Field mount housing, dual-compartment housing	Stainless steel	M20 x 1.5 (CM20)	★
D7	Field mount housing, dual-compartment housing	Stainless steel	PG 13.5 (PG11)	★
D8	Field mount housing, dual-compartment housing	Stainless steel	JIS G ½	★
D9	Field mount housing, dual-compartment housing	Aluminum, ultra low copper	½–14-inch NPT	
D0	Field mount housing, dual-compartment housing	Aluminum, ultra low copper	M20 x 1.5 (CM20)	

Transmitter output

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

Measurement configuration

Code	Description	
3	Rosemount X-well™ Technology assembly for non-intrusive measurement (with sensor and mounting)	
4	Single/dual input temperature with X-well Technology capability (transmitter only)	

Product certifications

Code	Description	
NA	No approval	
E5	USA Explosion-proof approval	
I5	USA Intrinsically Safe and non-incendive	
K5	USA Intrinsically Safe, non-incendive & explosion-proof combo	
I6	Canada Intrinsically Safe and Division 2	
K6	Canada Intrinsically Safe and Explosion-proof combo	
E1	ATEX flameproof approval	
I1	ATEX intrinsic safety approval	
K1	ATEX intrinsic safety, flameproof	
E7	IECEx flameproof approval	
I7	IECEx Intrinsic Safety	
K7	IECEx Intrinsic Safety, flameproof	

Rosemount X-well™ process temperature range

Code	Sensor type	Process temperature range	Transmitter mounting style	
TR1	Standard range	-58 to +572 °F (-50 to +300 °C)	Direct	★

Rosemount X-well™ pipe mount design

Code	Description	Pipe size range (inch)	Pipe size range (DIN)	Image	
PM1	Small Pipe Mount	½ to 1½	DN15 to DN40		★
PM2	Universal Pipe Mount	2 to 60	DN50 to DN1500		★
PM9	Universal Pipe Mount, no banding	2 to 60	DN50 to DN1500		★

Rosemount X-well™ pipe mount material

Code	X-well pipe mount material	
MC1	316 stainless steel (SST)	★

Rosemount X-well™ pipe size

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S005	½ in.	DN15	22 mm	★
S007	¾ in.	DN20	27 mm	★
S010	1 in.	DN25	34 mm	★
S012	1¼ in.	DN32	43 mm	★
S015	1½ in.	DN40	49 mm	★
S020	2 in.	DN50	61 mm	★
S025	2½ in.	DN65	77 mm	★
S030	3 in.	DN80	89 mm	★
S040	4 in.	DN100	115 mm	★
S050	5 in.	DN125	140 mm	★
S060	6 in.	DN150	169 mm	★
S080	8 in.	DN200	220 mm	★
S100	10 in.	DN250	273 mm	★
S120	12 in.	DN300	324 mm	★
S140	14 in.	DN350	356 mm	★
S160	16 in.	DN400	407 mm	★
S180	18 in.	DN450	458 mm	★
S200	20 in.	DN500	508 mm	★
S240	24 in.	DN600	610 mm	★
S260	26 in.	DN650	660 mm	★
S300	30 in.	DN750	762 mm	★
S320	32 in.	DN790	813 mm	★
S360	36 in.	DN900	915 mm	★
S400	40 in.	DN1000	1016 mm	★
S420	42 in.	DN1050	1070 mm	★
S480	48 in.	DN1200	1219 mm	★
S520	52 in.	DN1300	1321 mm	★
S560	56 in.	DN1400	1423 mm	★
S600	60 in.	DN1500	1524 mm	★

Additional options

Rosemount X-well™ corrosion protection inlay

Corrosion protection inlay placed between mount and pipe prevents galvanic corrosion between dissimilar metals.

Code	Description	
P1	Corrosion protection inlay - material NBR	

Retrofit kit

Code	Description	Details	Image	
R9	Universal Pipe Mount to Small Pipe Mount retrofit kit	Includes U-bolt, nuts, thin washers, and tall spacers. Allows retrofitting of Universal Pipe Mount down to 0.5 to 1.5 in. (DN-15-40).		★

Plantweb™ advanced diagnostic functionality

Code	Description	
DA1	HART® sensor and process diagnostic suite: thermocouple diagnostic, minimum/maximum tracking	★

Display

Code	Description	
M5	LCD display	★

External ground

Code	Description	
G1	External ground lug assembly	★

Transient protector

Code	Description	
T1	Integral transient protector	★

Software configuration

Required for Rosemount X-well™ factory configuration of specific pipe characteristics.

Code	Description	
C1	Custom configuration of date, descriptor, and message (requires Rosemount 3144P Configuration Data Sheet with order)	★

Line filter

Code	Description	
F5	50 Hz line voltage filter	★

Alarm level configuration

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

Low alarm

Code	Description	
C8	Low alarm (standard Rosemount alarm and saturation values)	★

Five-point calibration

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

Calibration certification

Code	Description	
Q4	Calibration certificate (3-point calibration)	★
QG	Calibration certificate and GOST verification certificate	★
QP	Calibration certificate and tamper evident seal	★

Shipboard certification

Code	Description	
SBS	American Bureau of Shipping (ABS) Type Approval	★
SBV	Bureau Veritas (BV) Type Approval	★
SDN	Det Norske Veritas (DNV) Type Approval	★
SLL	Lloyd's Register (LR) Type Approval	★

Cold temperature

Code	Description	
BR6	-76 °F (-60 °C) cold temperature operation	★

Conduit electrical connector

Available with intrinsically safe approvals only. For FM Intrinsically Safe or non-incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain 4X rating.

Code	Description	
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★

HART® revision configuration

Code	Description	
HR7 ⁽¹⁾	Configured for HART Revision 7	★

(1) HART® Revision 7 is required for Rosemount X-well Technology on 3144P.

Extended product warranty

Code	Description	
WR3	Three-year limited warranty	★
WR5	Five-year limited warranty	★

Rosemount 648 ordering information

Online product configurator

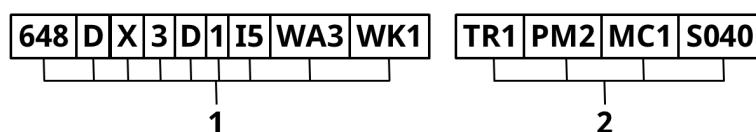
Many products are configurable online using our product configurator.

Select the **Configure** button or visit [Emerson.com/global](https://emerson.com/global) 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 [Figure 3](#).

Figure 3: Model code example



1. Required model components
2. Required model components

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

Options only applicable when **Measurement Configuration 3** is specified.

Model

Code	Description	
648	Temperature transmitter	★

Transmitter type

Code	Description	
D	Wireless field mount	★

Transmitter output

Code	Description	
X	Wireless	★

Measurement configuration

Code	Description	
3	Rosemount X-well™ Technology assembly for non-intrusive measurement (with sensor and mounting)	
4	Single/dual input temperature with X-well Technology capability (transmitter only)	

Housing style

Code	Description	Material	
D	Dual-compartment housing	Aluminum	★
E	Dual-compartment housing	SST	★

Conduit entry size

Code	Description	
1	½-14 NPT	★

Product certifications

Code	Description	
NA	No approval	★
I5	USA Intrinsically Safe, Non-Incendive	★
I6	Canada Intrinsically Safe	★
I1	ATEX Intrinsic Safety	★
I7	IECEx Intrinsic Safety	★

Wireless update rate

Code	Description	
WA3	User configurable update rate, 2.4 GHz DSSS, IEC 62591 (<i>WirelessHART</i>)	★

Wireless antenna and SmartPower

Black power module must be shipped separately; order Model 701PBKKF or Part #00753-9220-0001.

Code	Description	
WK1	External antenna, adapter for Black Power Module (I.S. Power Module sold separately)	★
WK2	External antenna, extra long life power module adapter, Intrinsically Safe	★
WM1	Extended range, external antenna, adapter for Black Power Module (I.S. Power Module sold separately)	
WM2	Extended range, external antenna, extra long life power module adapter, Intrinsically Safe	

Rosemount X-well™ process temperature range

Code	Sensor type	Process temperature range	Transmitter mounting style	
TR1	Standard range	-58 to +572 °F (-50 to +300 °C)	Direct	★

Rosemount X-well™ pipe mount design

Code	Description	Pipe size range (inch)	Pipe size range (DIN)	Image	
PM1	Small Pipe Mount	½ to 1½	DN15 to DN40		★
PM2	Universal Pipe Mount	2 to 60	DN50 to DN1500		★
PM9	Universal Pipe Mount, no banding	2 to 60	DN50 to DN1500		★

Rosemount X-well™ pipe mount material

Code	X-well pipe mount material	
MC1	316 stainless steel (SST)	★

Rosemount X-well™ pipe size

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S005	½ in.	DN15	22 mm	★

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S007	¾ in.	DN20	27 mm	★
S010	1 in.	DN25	34 mm	★
S012	1¼ in.	DN32	43 mm	★
S015	1½ in.	DN40	49 mm	★
S020	2 in.	DN50	61 mm	★
S025	2½ in.	DN65	77 mm	★
S030	3 in.	DN80	89 mm	★
S040	4 in.	DN100	115 mm	★
S050	5 in.	DN125	140 mm	★
S060	6 in.	DN150	169 mm	★
S080	8 in.	DN200	220 mm	★
S100	10 in.	DN250	273 mm	★
S120	12 in.	DN300	324 mm	★
S140	14 in.	DN350	356 mm	★
S160	16 in.	DN400	407 mm	★
S180	18 in.	DN450	458 mm	★
S200	20 in.	DN500	508 mm	★
S240	24 in.	DN600	610 mm	★
S260	26 in.	DN650	660 mm	★
S300	30 in.	DN750	762 mm	★
S320	32 in.	DN790	813 mm	★
S360	36 in.	DN900	915 mm	★
S400	40 in.	DN1000	1016 mm	★
S420	42 in.	DN1050	1070 mm	★
S480	48 in.	DN1200	1219 mm	★
S520	52 in.	DN1300	1321 mm	★
S560	56 in.	DN1400	1423 mm	★
S600	60 in.	DN1500	1524 mm	★

Additional options

Rosemount X-well™ corrosion protection inlay

Corrosion protection inlay placed between mount and pipe prevents galvanic corrosion between dissimilar metals.

Code	Description	
P1	Corrosion protection inlay - material NBR	

Retrofit kit

Code	Description	Details	Image	
R9	Universal Pipe Mount to Small Pipe Mount retrofit kit	Includes U-bolt, nuts, thin washers, and tall spacers. Allows retrofitting of Universal Pipe Mount down to 0.5 to 1.5 in. (DN-15-40).		★

Display

Code	Description	
M5	LCD display	★

Software configuration

Required for Rosemount X-well factory configuration of specific pipe characteristics.

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

Line filter

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

5-Point calibration

Code	Description	
C4	5-point calibration (requires Q4 option code to generate a Calibration Certificate)	★

Calibration certificate

Code	Description	
Q4	Calibration certificate (3-point calibration)	★

Cable gland option

Code	Description	
G2	Cable gland (0.30 in. (7.5 mm) – 0.47 in. (11.9 mm))	★
G4	Thin wire cable gland (0.12 in. (3 mm) – 0.31 in. (8 mm))	★

Extended product warranty

Code	Description	
WR3	3-year limited warranty	★

Code	Description	
WR5	5-year limited warranty	★

Rosemount 214XW ordering information

Online product configurator

Many products are configurable online using our product configurator.

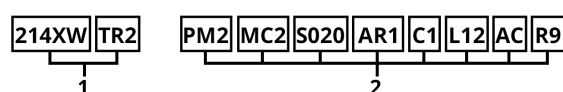
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Model codes

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 4](#).

Figure 4: Model Code Example



1. Required model components
2. Additional options

Specifications and options

The purchaser of the equipment must specify and select:

- Product materials
- Options
- Components

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	
214XW	Rosemount X-well™ Technology spare parts	★

Rosemount X-well™ sensor type

Code	Description	Process temperature range	Transmitter mounting style	Performance ⁽¹⁾	
TR1	Standard range	-58 to +572 °F (-50 to +300 °C)	Direct	Industry leading	★
TR2	Extended range	-76 to +1202 °F (-60 to +650 °C)	Remote	Industry standard	★
TR0	No sensor	N/A	N/A	N/A	★

⁽¹⁾ X-well has better expected total probable error when using standard range sensors.

Related information[Performance](#)**Rosemount X-well™ pipe mount design**

Code	Description	Pipe size range (inch)	Pipe size range (DIN)	Image	
PM1	Small Pipe Mount	½ to 1½	DN15 to DN40		★
PM2	Universal Pipe Mount	2 to 60	DN50 to DN1500		★
PM9	Universal Pipe Mount, no banding	2 to 60	DN50 to DN1500		★

Optional model components**Rosemount X-well™ pipe mount material**

Code	X-well pipe mount material	Temperature range		
		°F	°C	
MC1	316 stainless steel (SST)	-76 to +842	-60 to +450	★
MC2	Alloy 625	-76 to +1202	-60 to +650	★

Rosemount X-well™ pipe size

Code	Suitable pipe sizes (diameter)			
	Inches	DIN	Millimeters	
S005	½ in.	DN15	22 mm	★
S007	¾ in.	DN20	27 mm	★
S010	1 in.	DN25	34 mm	★
S012	1¼ in.	DN32	43 mm	★
S015	1½ in.	DN40	49 mm	★
S020	2 in.	DN50	61 mm	★
S025	2½ in.	DN65	77 mm	★
S030	3 in.	DN80	89 mm	★
S040	4 in.	DN100	115 mm	★
S050	5 in.	DN125	140 mm	★
S060	6 in.	DN150	169 mm	★
S080	8 in.	DN200	220 mm	★
S100	10 in.	DN250	273 mm	★
S120	12 in.	DN300	324 mm	★
S140	14 in.	DN350	356 mm	★
S160	16 in.	DN400	407 mm	★
S180	18 in.	DN450	458 mm	★
S200	20 in.	DN500	508 mm	★
S240	24 in.	DN600	610 mm	★
S260	26 in.	DN650	660 mm	★
S300	30 in.	DN750	762 mm	★
S320	32 in.	DN790	813 mm	★
S360	36 in.	DN900	915 mm	★
S400	40 in.	DN1000	1016 mm	★
S420	42 in.	DN1050	1070 mm	★
S480	48 in.	DN1200	1219 mm	★
S520	52 in.	DN1300	1321 mm	★
S560	56 in.	DN1400	1423 mm	★
S600	60 in.	DN1500	1524 mm	★

Rosemount X-well™ corrosion protection inlay

Corrosion protection inlay placed between mount and pipe prevents galvanic corrosion between dissimilar metals.

Code	Description	
P1	Corrosion protection inlay - material NBR	

Connection head

Code	Description	
AR1	Aluminum connection head	★
SR1	Stainless steel (SST) connection head	★

Conduit entry

Code	Description	
C1	½-inch NPT	★
C2	M20 x 1.5	★

Rosemount X-well™ remote mount cable length

Required when you order TR2 extended range sensor.

Code	Description	
L12	12 ft. (3.66 m) shielded cable	★
L24	24 ft. (7.32 m) shielded cable	
L75	75 ft. (22.86 m) shielded cable	

Rosemount X-well™ remote mount cable armor type

Code	Description	
AC	PVC-coated armored cable lead wire extension	

Tagging and fastener material

Code	Description	
Y2	316 stainless steel (SST) name plate, top tag, wire-on tag, and fasteners	★

RFID tagging

Code	Description	Example image	
Y3	RFID tag		★

Retrofit kit

Code	Description	Details	Image	
R9	Universal Pipe Mount to Small Pipe Mount retrofit kit	Includes U-bolt, nuts, thin washers, and tall spacers. Allows retrofitting of Universal Pipe Mount down to 0.5 to 1.5 in. (DN-15-40).		★

Product certifications

Code	Description	
K1	ATEX Flameproof, Intrinsic Safety	★
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
K5	USA Explosion-proof, Intrinsically Safe, Division 2	★
E5	USA Explosion-proof	★
I5	USA Intrinsically Safe, Division 2	★
K6	Canada Explosion-proof, Intrinsically Safe, Division 2	★
E6	Canada Explosion-proof	★
I6	Canada Intrinsically Safe, Division 2	★
K7	IECEX Flameproof, Intrinsic Safety	★
E7	IECEX Flameproof	★
I7	IECEX Intrinsic Safety	★

Product specifications

For Rosemount 3144S Temperature Transmitter specifications, see *Rosemount 3144S Product Data Sheet* - available on [Emerson.com](https://www.emerson.com).

For Rosemount 3144P Temperature Transmitter specifications see [Rosemount 3144P Temperature Transmitter Product Data Sheet](#).

For Rosemount 648 Temperature Transmitter specifications, see [Rosemount 648 Wireless Temperature Transmitter Product Data Sheet](#).

Material selection

Emerson provides a variety of Rosemount products with various product options and configurations.

This includes 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 when specifying products, materials, options, and components for the application. Examples of process parameters include:

- All chemical components
- Temperature

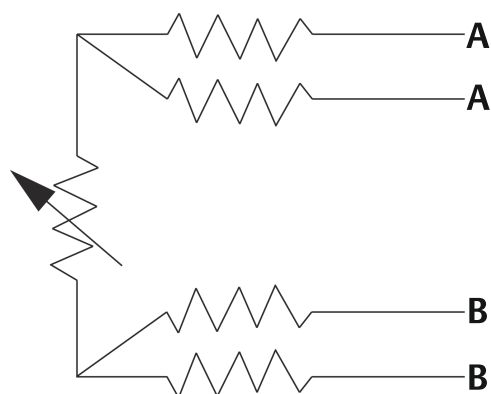
- Pressure
- Flow rate
- Abrasives
- Contaminants

Emerson is not able to evaluate or guarantee the compatibility of the process fluid or other process parameters with the products, options, configurations, or materials of construction selected.

Standard range Rosemount X-well™ sensor (TR1) specifications

Sensor type	Pt100 Ω RTD, single element, 4-wire
Nominal resistance	In accordance with IEC 60751, the nominal resistance is defined: 100 Ω RTD at 32 °F (0 °C) $\alpha = 0.00385 \Omega \times ^\circ\text{C}/\Omega$, averaged between 32 and 212 °F (0 and 100 °C)
Process temperature range	-58 to +572 °F (-50 to +300 °C)
Ambient temperature range	-40 to +185 °F (-40 to +85 °C)
Self-heating	0.15 K/mW when measured as defined in IEC 60751
Insulation resistance	1,000 M Ω minimum insulation resistance when measured at 500 Vdc at room temperature
Sheath material	316 stainless steel (SST) with mineral insulated cable construction and silver tip.
Lead wires	PTFE-insulated, silver-coated copper wire. See Figure 5 .
Identification data	The model and serial numbers are engraved directly on the spring-loaded adapter.

Figure 5: Sensor Lead Wire Termination - Standard Range Sensor (TR1)



Single element 4-wire

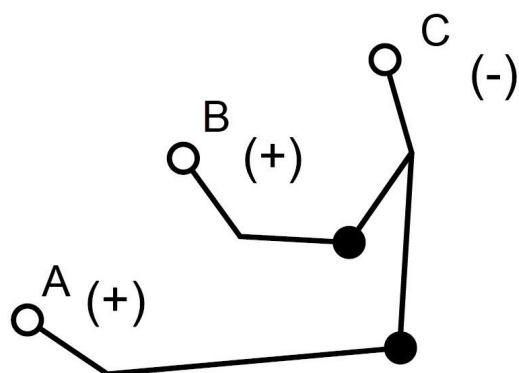
- A. Red
- B. White

Extended range Rosemount X-well™ sensor (TR2) specifications

Sensor type	Thermocouple Type N, dual element, 3-wire
Process temperature range	-76 to +1202 °F (-60 to +650 °C)

Ambient temperature range	-76 to +185 °F (-60 to +85 °C)
Sheath material	Alloy 600 and alloy 600 tip
Lead wires	Nicrosil(+) and Nisil(-) (see Figure 6)
Identification data	The model and serial numbers are engraved directly on the spring loaded adapter.

Figure 6: Sensor Lead Wire Termination - Extended Range Sensor (TR2)



- A. Orange
B. Pink
C. White

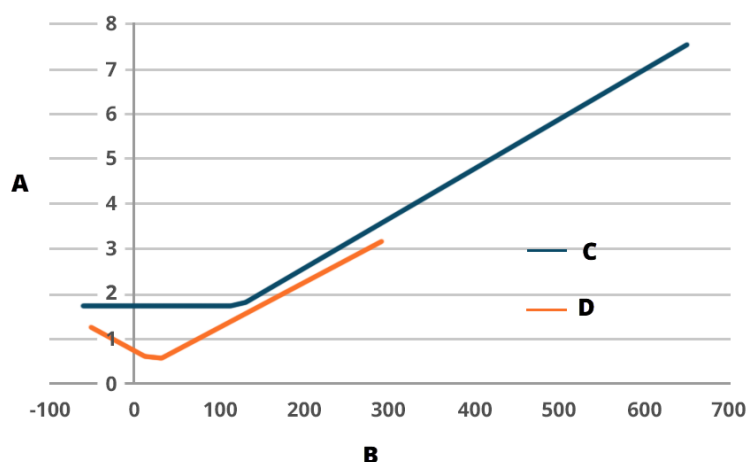
Performance

Total probable error (TPE) includes sensing element accuracies, lab uncertainty, Rosemount X-well™ repeatability, transmitter digital accuracy, and transmitter ambient temperature effects.

Table 1: Total Probable Error

Transmitter	Extended range sensor ⁽¹⁾		Standard range sensor	
	°C	°F	°C	°F
Rosemount 648 Wireless Temperature Transmitter	N/A	N/A	0.5 °C + 0.01*(process temperature - ambient temperature)	0.9 °F + 0.01*(process temperature - ambient temperature)
Rosemount 3144P Temperature Transmitter	N/A	N/A		
Rosemount 3144S Temperature Transmitter	±1.75 °C or ±(0.65 °C + 0.011*(process temperature - ambient temperature)) Whichever is greater	±3.15 °F or ±(1.17 °F + 0.011*(process temperature - ambient temperature)) Whichever is greater		

(1) Additional ±0.05 °C (±0.9 °F) to TPE for ambient temperatures below -40 °C (-40 °F).

Figure 7: X-well Total Probable Error at 23 °C (73 °F) Ambient Temperature

- A. TPE ($\pm^{\circ}\text{C}$)
 B. Process temperature ($^{\circ}\text{C}$)
 C. Extended range sensor
 D. Standard range sensor

X-well system time response is a function of pipe material, pipe thickness, process temperature, ambient temperature, process fluid properties, and flow conditions. Response time is fastest in applications with highly conductive pipe materials, thick pipe walls, liquid processes, and high velocity flow conditions.

To generate a performance estimate for your specific application, visit [Sizing & Selection](#).

Pipe mount specifications

Vibration effect

Universal Pipe Mount	No effect on performance per the requirements of IEC 60770-1: 2010 field or pipeline with medium vibration level (10 - 60 Hz 0.3 mm displacement peak amplitude/60-1000 Hz 2g).
Small Pipe Mount	No effect on performance per the requirements of IEC 61298-3: 1998 field or pipeline with medium vibration level (10-150 Hz 0.15 mm displacement peak amplitude/60-1000 Hz 1g).

Product certifications

For Rosemount 3144S Temperature Transmitter product certifications, refer to the [Rosemount 3144S Temperature Transmitter with X-well Technology Quick Start Guide](#).

For Rosemount 3144P Temperature Transmitter product certifications, refer to the [Rosemount 3144P Temperature Transmitter with Rosemount X-well Technology Quick Start Guide](#) (available on www.Emerson.com).

For Rosemount 648 Temperature Transmitter product certifications, refer to the [Rosemount 648 Wireless Temperature Transmitter with Rosemount X-well Technology Quick Start Guide](#) (available on www.Emerson.com).

Dimensional drawings

For Rosemount 3144S Temperature Transmitter dimensional drawings, see [3144S dimensional drawings](#).

For Rosemount 3144P Temperature Transmitter dimensional drawings, see [3144P Dimensional Drawings](#).

For Rosemount 648 Temperature Transmitter dimensional drawings, see [648 Dimensional Drawings](#).

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

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