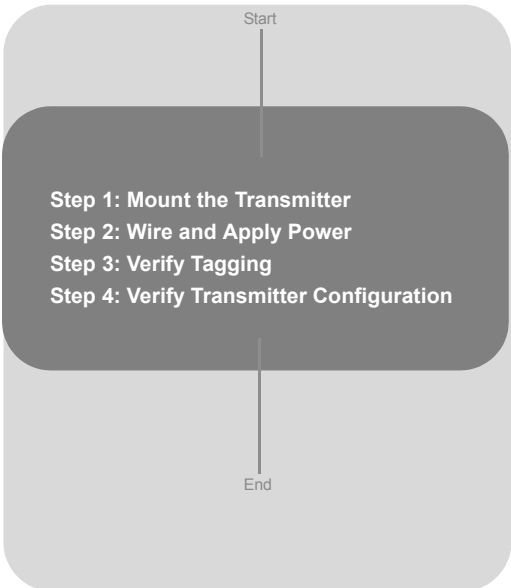
Quick Installation Guide
00825-0100-4769, Rev AA
May 2003

Rosemount 3244MVF MultiVariable Temperature Transmitter

Product Discontinued



FOUNDATION

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May 2003

Rosemount 3244MV

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⚠ IMPORTANT NOTICE

This installation guide provides basic guidelines for the Rosemount® Rosemount 3244MV. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, explosion-proof, flameproof, or intrinsically safe (I.S.) installations. Refer to the Rosemount 3244MV reference manual (document number 00809-0100-4769) for more instruction. The manual and this QIG are also available electronically on www.rosemount.com.

⚠ WARNING

Explosions could result in death or serious injury:

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review the approvals section of this manual for any restrictions associated with a safe installation.

In an Explosion-proof/Flame-proof installation, do not remove the transmitter covers when power is applied to the unit.

Process leaks may cause harm or result in death

- Install and tighten thermowells or sensors before applying pressure.
- Do not remove the thermowell while in operation.

Electrical shock can result in death or serious injury

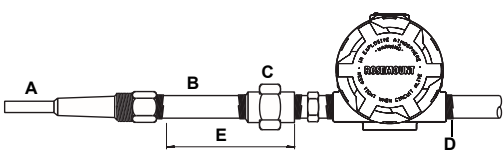
- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

STEP 1: MOUNT THE TRANSMITTER

Mount the transmitter at a high point in the conduit run to prevent moisture from draining into the transmitter housing.

Typical Direct Mount Installation

1. Mount the thermowell to the process container wall. Install and tighten thermowells. Perform a leak check.
2. Attach any necessary unions, couplings, and extension fittings. Seal the fitting threads with silicone or tape (if required).
3. Screw the sensor into the thermowell or directly into the process (depending on installation requirements).
4. Verify all sealing requirements.
5. Attach the transmitter to the thermowell/sensor assembly. Seal all threads with silicone or tape (if required).
6. Install field wiring conduit into the open transmitter conduit entry (for remote mounting) and feed wires into the transmitter housing.
7. Pull the field wiring leads into the terminal side of the housing.
8. Attach the sensor leads to the transmitter sensor terminals (the wiring diagram is located inside the housing cover).
9. Attach and tighten both transmitter covers.



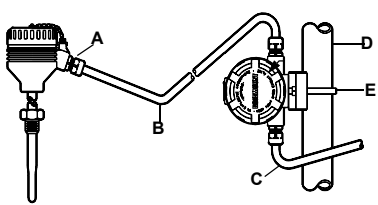
3144-0433QIG

A = Thermowell
B = Extension (Nipple)
C = Union or Coupling
D = Conduit for Field Wiring (dc power)
E = Extension Fitting Length

STEP 1 CONTINUED...

Typical Remote Mount Installation

1. Mount the thermowell to the process container wall. Install and tighten thermowells. Perform a leak check.
2. Attach a connection head to the thermowell.
3. Insert sensor into the thermowell and wire the sensor to the connection head (the wiring diagram is located inside the connection head).
4. Mount the transmitter to a 2-in. (50 mm) pipe or a panel using one of the optional mounting bracket (B4 bracket is shown below).
5. Attach cable glands to the shielded cable running from the connection head to the transmitter conduit entry.
6. Run the shielded cable from the opposite conduit entry on the transmitter back to the control room.
7. Insert shielded cable leads through the cable entries into the connection head / transmitter. Connect and tighten cable glands.
8. Connect the shielded cable leads to the connection head terminals (located inside the connection head) and to the sensor wiring terminals (located inside the transmitter housing).



644-0000b05b

A = Cable Gland
B = Shielded Cable from Sensor to Transmitter
C = Shielded Cable from Transmitter to Control Room
D = 2-in. (50 mm) pipe
E = B4 Mounting Bracket

STEP 2: WIRE AND APPLY POWER

1. Remove terminal block cover
2. Ensure the sensor wires are inside the terminal area.
3. Connect sensor wires according to Figure 1.
4. Tighten sensor terminal screws.

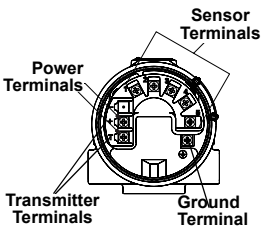
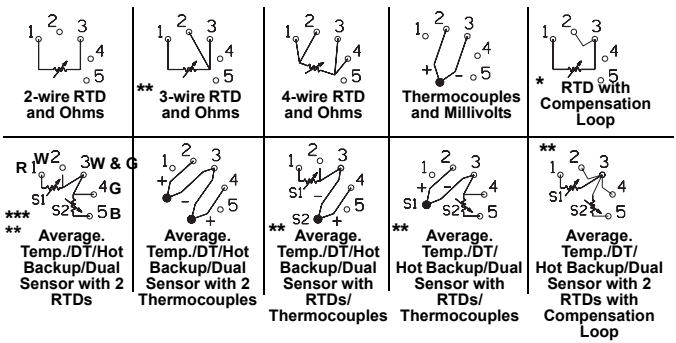


Figure 1. Transmitter Sensor Wiring Diagram



* *Transmitter must be configured for a 3-wire RTD in order to recognize an RTD with a compensation loop.*

** *Rosemount 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.*

*** *Typical wiring configuration of a Rosemount dual-element RTD is shown (R=Red, W=White, G=Green, B=Black*

STEP 2 CONTINUED...

Power the Transmitter

The transmitter requires between 9 and 32 Vdc to operate and provide complete functionality. The dc power supply should provide power with less than 2% ripple.

Power Filter

A fieldbus segment requires a power conditioner to isolate the power supply filter and decouple the segment from other segments attached to the same power supply.

Power Connections

Use copper wire of sufficient size to ensure that the voltage across the transmitter power terminals is not below 9 Vdc.

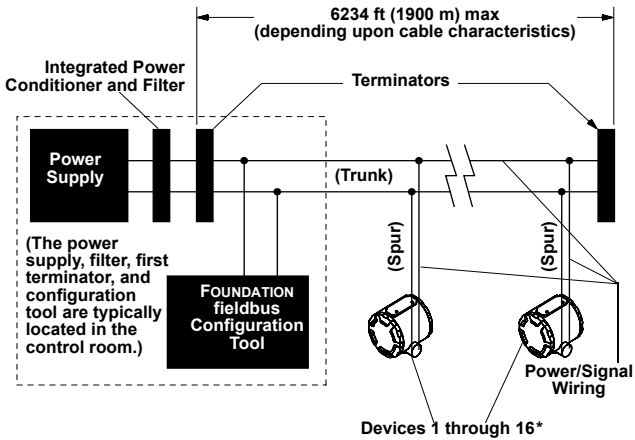
To connect power to the transmitter, follow the steps below:

1. Remove the transmitter cover to expose the transmitter terminal block. Do not remove transmitter covers in explosive atmospheres when the circuit it live.
2. Connect the power leads to the terminals marked “+” and “T”. The power terminals are not polar sensitive, meaning that the electrical polarity of the power leads is not significant when connected to the power terminals. The use of crimped lugs is recommended when wiring to screw terminals.
3. Tighten the terminal screws to ensure adequate contact. No additional power wiring is necessary.
4. Replace the transmitter cover, tightening the cover threads at least one-third turn after the o-ring contacts the housing. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

NOTE
After installation, it may take several seconds for the LCD meter to function once power is applied to the transmitter.

STEP 2 CONTINUED...

Typical Configuration for Fieldbus Networking



NOTE
Each segment in a fieldbus trunk must be terminated at both ends.

STEP 2 CONTINUED...

Ground the Transmitter

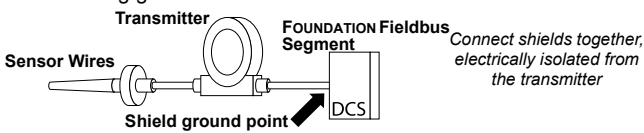
Proper ground is crucial to reliable temperature readings

Ungrounded Thermocouple, mV, and RTD/Ohm Inputs

Each process installation has different requirements for grounding. Use the grounding options recommended by the facility for the specific sensor type, or begin with grounding Option 1 (the most common).

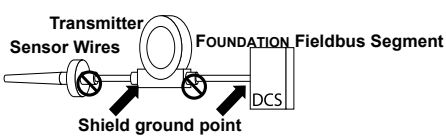
Option 1 (recommended for ungrounded transmitter housing):

1. Connect signal wiring shield to the sensor wiring shield.
2. Ensure the two shields are tied together and electrically isolated from the transmitter housing.
3. Ground shield at the power supply end only.
4. Ensure that the sensor shield is electrically isolated from the surrounding grounded fixtures.



Option 2 (recommended for grounded transmitter housing):

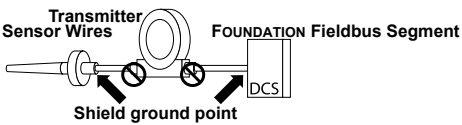
1. Connect sensor wiring shield to the transmitter housing (only if the housing is grounded).
2. Ensure the sensor shield is electrically isolated from surrounding fixtures that may be grounded.
3. Ground signal wiring shield at the power supply end.



STEP 2 CONTINUED...

Option 3:

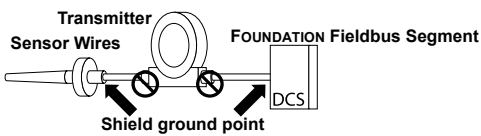
1. Ground sensor wiring shield at the sensor, if possible.
2. Ensure that the sensor wiring and signal wiring shields are electrically isolated from the transmitter housing and other fixtures that may be grounded.
3. Ground signal wiring shield at the power supply end.



Option 4:

Grounded Thermocouple Inputs

1. Ground sensor wiring shield at the sensor.
2. Ensure that the sensor wiring and signal wiring shields are electrically isolated from the transmitter housing and other fixtures that may be grounded.
3. Ground signal wiring shield at the power supply end.



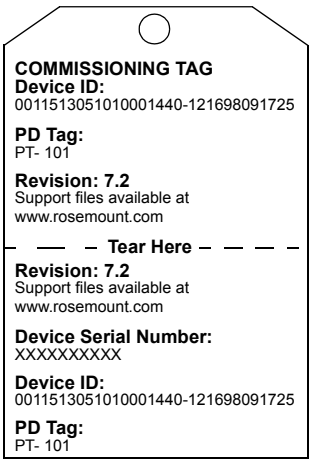
STEP 3: VERIFY TAGGING

Commissioning (Paper) Tag

To identify which device is at a particular location use the removable tag provided with the transmitter. Ensure that the physical device tag (PD Tag field) is properly entered in both places on the removable commissioning tag and tear off the bottom portion for each transmitter.

NOTE

The device description loaded in the host system must be at the same revision as this device. The device description can be downloaded from www.rosemount.com.



STEP 4: VERIFY TRANSMITTER CONFIGURATION

Each Foundation fieldbus host or configuration tool has a different way of displaying and performing configurations. Some use Device Descriptions (DD) or DD methods for configuration and to display data consistently across platforms. There is no requirement that a host or configuration tool support these features.

The following is the minimum configuration requirement for a temperature measurement. This guide is designed for systems not using DD methods. For a complete list of parameters and configuration information refer to the Rosemount 3244MV Temperature Transmitter with Foundation Fieldbus Reference Manual (document number 00809-0100-4769).

STEP 4 CONTINUED...

Transducer Function Block

This block contains temperature measurement data, including Sensor 1, Sensor 2, and differential and terminal temperatures. It also includes information about sensor types, engineering units, linearization reranging, damping, temperature compensation, and diagnostics. At a minimum, verify the parameters in Table 1.

Table 1. Transducer Block ParametersTransducer Block Parameters

Parameter	Comments
Typical Configuration	
Configure Input 1	
SENSOR_TYPE	example: “Pt 100_A_385 (IEC 751)”
SENSOR_CONNECTIONS	example: “2-wire”, “3-wire”, “4-wire”
Configure Input 2 (if used)	
SENSOR_TYPE_2	example: “Pt 100_A_385 (IEC 751)”
SENSOR_CONNECTIONS_2	example: “2-wire”, “3-wire”, “4-wire”
Sensor Matching Configuration	
Configure Input 1	
SENSOR_TYPE	“User Defined, Calvandu”
SENSOR_CONNECTIONS	example: “2-wire”, “3-wire”, “4-wire”
SENSOR_CAL_METHOD	set to “User Trim Standard”
SPECIAL_SENSOR_A	enter sensor specific coefficients
SPECIAL_SENSOR_B	enter sensor specific coefficients
SPECIAL_SENSOR_C	enter sensor specific coefficients
SPECIAL_SENSOR_R0	enter sensor specific coefficients
Configure Input 2 (if used)	
SENSOR_TYPE_2	example: “User Defined, Calvandu”
SENSOR_CONNECTIONS_2	example: “2-wire”, “3-wire”, “4-wire”
SENSOR_CAL_METHOD_2	set to “User Trim Standard”
SPECIAL_SENSOR_A_2	enter sensor specific coefficients
SPECIAL_SENSOR_B_2	enter sensor specific coefficients
SPECIAL_SENSOR_C_2	enter sensor specific coefficients
SPECIAL_SENSOR_R0_2	enter sensor specific coefficients

STEP 4 CONTINUED...

Analog Input (AI) Function Block

The AI block processes field device measurements and makes the outputs available to other function blocks. The output value of the AI block is in engineering units and contains a status indicating the quality of the measurements. Use the Channel number to define the variable that the AI block processes. At a minimum, verify the parameters of the AI block in Table 2.

Table 2. AI Block Parameters(1)

Parameter	Comments
CHANNEL	Choices: 1. Sensor 1 2. Housing Temperature 3. Sensor 2 4. Differential Temperature
L_TYPE	For most measurements, set to “DIRECT”
XD_SCALE	Set desired measurement range and units. Units must be one of the following: • mV • Ohms • °C • °F • °R • K
OUT_SCALE	For “DIRECT” L_TYPE, set OUT_SCALE to match XD_SCALE
HI_HI_LIM HI_LIM LO_LIM LO_LO_LIM	Process alarms. Must be within the range defined by “OUT_SCALE”

(1) Configure one AI Block for each desired measurement

NOTE

To make changes to the AI block, the BLOCK_MODE (TARGET) must be set to OOS (out of service). Once the changes are made, return the BLOCK_MODE TARGET to AUTO.

PRODUCT CERTIFICATIONS

Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA
Rosemount Temperature GmbH – Germany
Emerson Process Management Asia Pacific – Singapore

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales representative.

ATEX Directive (94/9/EC)

Rosemount Inc. complies with the ATEX Directive.

Electro Magnetic Compatibility (EMC) (89/336/EEC)

3244MV Smart Temperature Transmitter with Dual Sensor Input and Foundation Fieldbus Digital Signal: EN 50081-1: 1992; EN 50082-2:1995; EN 61326-1:1997 + A1: 1998

Hazardous Locations Installations

North American Certifications

Factory Mutual (FM) Approvals

E5 Explosion-Proof for Class I, Division 1, Groups A, B, C, and D. Dust-Ignition Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition Proof for Class III, Division 1 hazardous locations. Non-Incendive for Class I, Division 2, Groups A, B, C, and D (T4A). Explosion-Proof approval when connected in accordance with Rosemount drawing 03144-0220. For Group A, seal all conduits within 18 inches of enclosure; otherwise, conduit seal not required for compliance with NEC 501-5a(1).

I5 Intrinsically Safe for Class I, II, and III, Division 1, Groups A, B, C, D, E, F, and G. Temp Code T4 (T_{amb} = –60 to 60 °C). Non-Incendive for Class I Division 2, Groups A, B, C, and D T4 (T_{amb} = –60 to 60 °C). Intrinsically safe and Non-Incendive when installed in accordance with Rosemount drawing 03144-0221.

Canadian Standards Association (CSA) Approvals

E6 Explosion-Proof for Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 hazardous locations. Suitable for Class I, Division 2, Groups A, B, C, and D. Conduit seal not required. Ambient Temperature Limit: –50 to 85 °C.

I6 Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 hazardous locations when installed in accordance with Rosemount drawing 03144-0222.
Ambient Temperature Limit: –50 to 85 °C

European Certifications

E9 CENELEC Flame-Proof Approval
Certificate Number: KEMA01ATEX2181
ATEX Marking: ⟨Ex⟩ II 2 G
CE 1180
EEx d IIC T6 (-40 °C ≤ T_{amb} ≤ 70 °C)
EEx d IIC T5 (-40 °C ≤ T_{amb} ≤ 80 °C)
Maximum Supply Voltage = 55V

N1 CENELEC Type n
Certificate Number: BAS98ATEX 3358 X
ATEX Marking: ⟨Ex⟩ II 3 GD
EEx nL IIC T5 (T_{amb} = –40 to 70 °C)
T80 °C (T_{amb} = –20 to 70 °C)
Maximum Supply Voltage = 55V

Special Conditions for Safe Use (x):
The apparatus is not capable of withstanding the 500V insulation test required by Clause 9.1 of EN 50021: 1998. This must be taken into account when installing the apparatus.

I1 CENELEC Intrinsic Safety
Certificate Number: BAS98ATEX 1357 X
ATEX Marking: ⟨Ex⟩ II 1 GD
EEx ia IIC T4 (T_{amb} = –60 to 60 °C)
T80 °C (T_{amb} = –20 to 60 °C)

Table 3. Input Entity Parameter

Power/Communications	Sensor Connections
U_i = 30 V dc	U_o = 24.3 V
I_i = 300 mA	I_o = 12 mA
P_i = 1.30 W	P_o = 0.06 W
C_i = 0.005 µF	C_o = 0.108 µF
L_i = 20 µH	L_o = 179 mH

Special Conditions for Safe Use (x):
The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN 50020: 1994. This must be taken into account when installing the apparatus.

IA CENELEC Fieldbus Intrinsically Safe Concept (FISCO)
Certificate Number: BAS98ATEX1357X
ATEX Marking: ⟨Ex⟩ II 1 GD
CE 1180
EEx ia IIC T4 (T_{amb} = -60 °C to 60 °C)
T80 °C (T_{amb} = –20 to 60 °C)

Table 4. Input Entity Parameters

Loop / Power	Sensor
U_i = 15 V	U_o = 24.3 V dc
I_i = 215 mA (IIC) I_i = 500 mA (IIB)	I_o = 12 mA
P_i = 2 W (IIC) P_i = 5.32 W (IIB)	P_o = 0.06 W
C_i = 5 nF	C_o = 0.108 μF
L_i = 0 μH	L_o = 179 mH

Special Condition for Safe Use (X):
The apparatus is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN 50020: 1994. This must be taken into account when installing the apparatus.

Australian Certifications

Standard Australia Quality Assurance Services (SAA) Approvals

E7 Flameproof Approval
EX d IIC T6 (T_{amb} = –20 to 60 °C)

I7 SAA Intrinsic Safety
Certificate Number: AUSEx3826X
Ex ia IIC T4 (-60 °C ≤ T_{amb} ≤ 60 °C)
IP66

Table 5. Input Entity Parameters

Loop / Power	Sensor
U_i = 30 V dc	U_o = 24.3 V dc
I_i = 300 mA	I_o = 12 mA
P_i = 1.3 W	P_o = 0.061 W
C_i = 0.005 μF	C_o = 0.108 μF
L_i = 20 μH	L_o = 179 mH

Special Condition for Safe Use (X):

1. It is a condition of safe use that for Ex ia applications, the equipment is to be housed in an enclosure that provides an ingress protection rating of not less than IP20.
2. It is a condition of safe use that the installation shall be carried out in according with Rosemount drawing 00644-1044.
3. It is a condition of safe use that a user may fit an optional LCD indicator to Model 3244 Temperature Transmitter certified in this certificate after installation subject to the conditions requirement of this certificate.

N7 SAA Type n
Certificate Number: AUSEx3826X
Ex n IIC T5 (-50 °C ≤ T_{amb} ≤ 75 °C)
Ex n IIC T6 (-50 °C ≤ T_{amb} ≤ 60 °C)
IP66

Table 6. Input Entity Parameters

Loop / Power
U_n = 55 V
P_n = 1.3 W

Special Condition for Safe Use (X):

For the label with more than one type of approval marking on it, on completion of installation of the apparatus, the irrelevant marking code(s) shall be permanently scribed off.

IG SAA Fieldbus Intrinsically Safe Concept (FISCO)
Certificate Number: AUS Ex 3826X
Ex ia IIC T4 (–60 to 60 °C)
IP66

Table 7. Input Entity Parameters

Loop / Power	Sensor
U_i = 17.5 V	U_o = 24.3 V
I_i = 380 mA	I_o = 12 mA
P_i = 5.32 W	P_o = 0.061 W
C_i = 0.005 μF	C_o = 0.108 μF
L_i = 10 μH	L_o = 179 mH

Special Condition for Safe Use (X):

For the label with more than one type of marking on it, on completion of installation of the apparatus, the irrelevant marking marking code(s) shall be permanently scribed off.

Japanese Certifications

Japanese Industrial Standard (JIS) Flameproof Certification

E4 Without optional meter:
Ex d IIB T6 (T_{amb} = 60 °C)
With optional meter:
Ex d IIB T4 (T_{amb} = 60 °C)

Combination Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

K5 Combination of E5 and I5

KB Combination of K5 and C6

C6 Combination of E6 and I6

KA Combination of E5 and E6

K7 Combination of I7, N7, and E7

Additional Certifications

American Bureau of Shipping (ABS) Type Approval

ABS Type Approval for temperature measurements in hazardous locations on ABS Classed Vessels, Marine and Offshore Installations. Type Approval is based on Factory Mutual (FM) Approvals; therefore, specify order code K5. Please contact your Emerson Process Management representative if a copy of the certification is required.

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