2-Wire Miniature Universal Temperature/Process Transmitters

ETM1

ETM2

ETM3

PROGRAMMABLE
in the field with your PC and easy to use software.
Can be ordered pre-programmed from Tempco.

Temperature transmitters are used for a variety of reasons. The use of temperature transmitters can eliminate the need for long costly runs of thermocouple wire with less expensive copper signal wire. When the environment is electrically noisy, sending a 4-20 mA signal to the control panel reduces the chance of error.

Design Features:

- ***Three levels of accuracy: ETM1—±0.15% of span***
  ETM2—±0.10% of span
  ETM3—±0.05% of span
- ***Accepts 11 thermocouple types and 3- or 4-wire RTD sensors***
- ***Field programmable with easy to use Windows®-based configuration software and a PC***
- ***Sensor break monitoring, programmable for upscale or downscale***
- ***Full access to all features while in operation***
- ***Temperature linear output***
- ***NAMUR-compliant***
- ***Configuration, editing & reading without external power***
- ***Easy wiring through the large center hole***

The **Tempco ETM Series** of 2-wire transmitters are offered in isolated, non-isolated and high precision isolated versions. They are designed to fit in a standard aluminum, iron or plastic industrial connection head, DIN size B or larger.

Additional Design Features for the Isolated Versions

- ***Fully universal, linearized and isolated 3/4 wire RTD, T/C, mV and Ohm***
- ***Sensor and system error correction***
- ***Low sensor isolation detection***
- ***Simplified loop check up with calibration output***

The **ETM Transmitters** are built using surface mount components and employ digital technology with non-volatile memory to retain the configuration after programming and the cable is removed.

Ordering Code:

	1	2	3	4			5				6
ETM											

Isolation *BOX 1*
1 = Non-Isolated
2 = Isolated
3 = Isolated, High Precision

Input Signal *BOX 2*
R = RTD-Pt100
S = RTD-D100
H = RTD-Pt100
T = Thermocouple
M = mV (ETM2 & ETM3 only)
P = Potentiometer (ETM2 & ETM3 only)

BOX 3
If **thermocouple input**, enter thermocouple **Type Code**; (if not enter **0**)
J = J thermocouple
K = K thermocouple
E = E thermocouple
B = B thermocouple
C = C thermocouple
L = L thermocouple
N = N thermocouple
R = R thermocouple
S = S thermocouple
T = T thermocouple
U = U thermocouple

Minimum Range *BOX 4*
In degrees (t/c and RTD)
mV & ohms (isolated only)
Backfill unused boxes with 0's
Example: 10° = 0010

Maximum Range *BOX 5*
In degrees (t/c and RTD)
mV & ohms (isolated only)
Backfill unused boxes with 0's
Example: 950° = 0950

Units: *BOX 6*
F = °F
C = °C
M = mV Ohms (isolated only)
R = Ohms (isolated only)

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

View Product Inventory @ www.tempco.com

2-Wire Miniature Universal Temperature/Process Transmitters

ETM Specifications

Parameter	ETM1 Non-Isolation	ETM2 Isolation	ETM3 High Precision Isolation
Typical Accuracy:	±0.15% of span	±0.10% of span	±0.05% of span
Galvanic Isolation:	No	1500 Vac, 1 min.	3750 Vac, 1 min.
Thermocouple Types:	J, K, E, B, C, L, N, R, S, T, U		
RTD Types, 3 & 4 wire:	PT100 IEC α=0.00385, PT1000 IEC α=0.00385 and others; Consult Tempco		
Input mV:	N/A	-10 to +500 mV	-10 to +500 mV
Potentiometer / Resistance:	N/A	3/4 wire, 0-2000 Ω	3/4 wire, 0-2000 Ω
Maximum T/C Wire Resistance:	500 Ω	500 Ω	500 Ω
Power Supply:	6.5 to 36 Vdc	6.5 to 36 Vdc	6.5 to 36 Vdc
Output	4 to 20mA, 20-4mA	4 to 20mA, 20-4mA	4 to 20mA, 20-4mA
Linearity Thermocouple:	±0.2%	±0.2%	±0.1%
Linearity RTD:	±0.1%	±0.1%	±0.05%
Sensor Break Monitoring:	Upscale or Downscale, Programmable		
Minimum Span Calibration			
T/C:	2 mV	2 mV	2 mV
RTD:	18°F/10°C	18°F/10°C	18°F/10°C
Potentiometer:	N/A	10 Ω	10 Ω
Temperature Operation & Storage:	-40° to +185°F/-40° to +85°C		
Relative Humidity:	0 to 95%, non-condensing		
Mounting:	DIN B connection head or larger		
Protection: Housing/Terminals:	IP 65/IP 00	IP 50/IP 10	IP 50/IP 10

Common Pre-Programmed Miniature Temperature Transmitters

Part Number	Version/ Isolation	Input	Range Zero	Range Span	Unit
ETM20103	ETM1/no	K tc	0	200	°F
ETM20104	ETM1/no	J tc	0	200	°F
ETM20105	ETM2/yes	RTD	0	200	°F
ETM20106	ETM1/no	K tc	0	500	°F
ETM20107	ETM1/no	J tc	0	500	°F
ETM20108	ETM2/yes	RTD	0	400	°F
ETM20109	ETM1/no	K tc	0	200	°C
ETM20110	ETM1/no	J tc	0	200	°C
ETM20111	ETM1/no	K tc	0	400	°C
ETM20112	ETM1/no	J tc	0	400	°C
ETM30003	ETM3/yes	K tc	0	500	°F
ETM30004	ETM3/yes	J tc	0	500	°F
ETM30005	ETM3/yes	RTD	0	400	°F
ETM30006	ETM3/yes	K tc	0	200	°C
ETM30007	ETM3/yes	J tc	0	200	°C
ETM30008	ETM3/yes	RTD	0	200	°C

Note: For dimensions and wiring information, see page 12-48.

Un-Programmed Miniature Transmitters

ETM20001 For Non-Isolated Version
ETM20002 For Isolated Version
ETM30002 For High Precision Isolated Version

Universal Field Programming Kit

For programming ETM30002 miniature head mounted Isolated High Precision transmitters and all other Tempco transmitters for sensor type and range. Includes USB Interface and, all required cables and software. Includes hard carrying case. Connects to a USB port on the PC. Compatible with 32 or 64 bit Windows XP (SP2+), Vista, Windows 7, 8, 8.1, or 10.

Part Number: **ETM90006**

Lite Field Programming Kit

For programming ETM20001, ETM20002, miniature head mounted non-isolated and isolated transmitters for sensor type and range. Includes USB Interface and all required cables and software. Includes storage bag. Connects to a USB port on the PC. Compatible with 32 or 64 bit Windows XP (SP2+), Vista, Windows 7, 8, 8.1, or 10.

Part Number: **ETM90007**

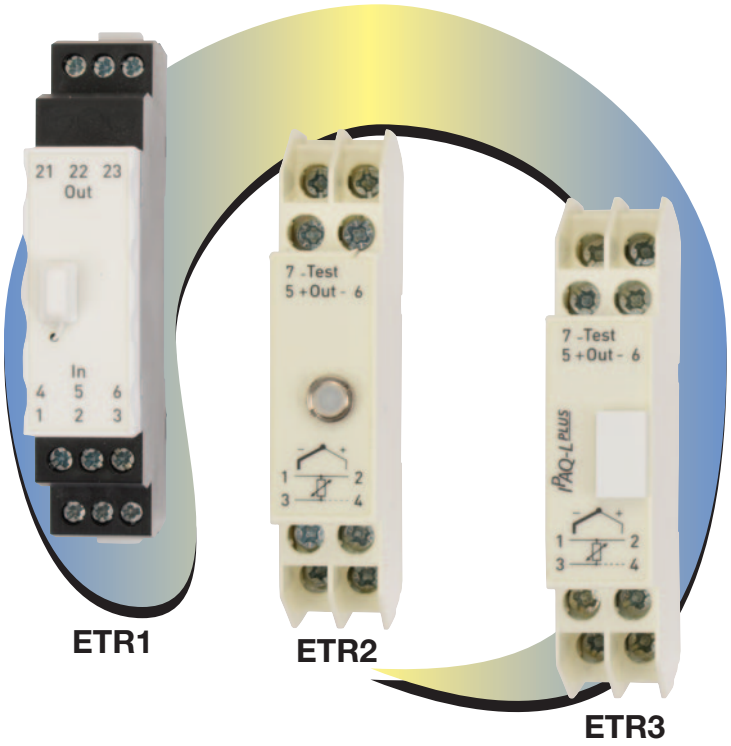
All Items Available from Stock

Ordering Information

Order a common unit by part number from the table or create an ordering code by filling in the boxes with the appropriate number and/or letter designation for your requirements and a part number will be assigned, or choose a pre-assigned configuration.

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

2-Wire Panel Rail Mount Universal Temperature/Process Transmitters



PROGRAMMABLE
in the field with your PC and easy to use software. Can be ordered pre-programmed from Tempco.

Design Features:

- *Three levels of accuracy: ETR1—±0.15% of span*
  ETR2—±0.10% of span
  ETR3—±0.05% of span
- *Accepts 11 thermocouple types and 3- or 4-wire RTD sensors*
- *Field programmable with easy to use Windows®-based configuration software and a PC*
- *Sensor break monitoring, programmable for upscale or downscale*
- *Full access to all features while in operation*
- *Temperature linear output*
- *NAMUR-compliant*
- *Configuration, editing & reading without external power*
- *Easy wiring with captive clamp style wire connections*

Temperature transmitters are used for a variety of reasons. The use of temperature transmitters can eliminate the need for long costly runs of thermocouple wire with less expensive copper signal wire. When the environment is electrically noisy, sending a 4-20 mA signal to the control panel reduces the chance of error.

The **Tempco ETR Series** of 2-wire transmitters is offered in isolated, non-isolated and high precision isolated versions. They are designed to fit directly on a standard 35 mm DIN rail.

Additional Design Features for the Isolated Versions

- *Fully universal, linearized and isolated 3/4 wire RTD, T/C, mV and Ohm*
- *Sensor and system error correction*
- *Low sensor isolation detection*
- *Simplified loop check up with calibration output*

The **ETR Transmitters** are built using surface mount components and employ digital technology with non-volatile memory to retain the configuration after programming and the cable is removed.

Ordering Code:

	1	2	3	4				5				6
ETR												

Isolation *BOX 1*
1 = Non-Isolated
2 = Isolated
3 = Isolated, High Precision

Input Signal *BOX 2*
R = RTD-Pt100
S = RTD-D100
H = RTD-Pt100
T = Thermocouple
M = mV (ETM2 & ETM3 only)
P = Potentiometer (ETR2 & ETR3 only)

BOX 3
If **thermocouple input**, enter thermocouple **Type Code**; (if not enter **0**)
J = J thermocouple
K = K thermocouple
E = E thermocouple
B = B thermocouple
C = C thermocouple
L = L thermocouple
N = N thermocouple
R = R thermocouple
S = S thermocouple
T = T thermocouple
U = U thermocouple

Minimum Range *BOX 4*
In degrees (t/c and RTD)
mV & ohms (isolated only)
Backfill unused boxes with 0's
Example: 10° = 0010

Maximum Range *BOX 5*
In degrees (t/c and RTD)
mV & ohms (isolated only)
Backfill unused boxes with 0's
Example: 950° = 0950

Units: *BOX 6*
F = °F
C = °C
M = mV Ohms (isolated only)
R = Ohms (isolated only)

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

View Product Inventory @ www.tempco.com

2-Wire Panel Rail Mount Universal Temperature/Process Transmitters

ETR Specifications

Parameter	ETR1 Non-Isolation	ETR2 Isolation	ETR3 High Precision Isolation
Typical Accuracy:	±0.15% of span	±0.10% of span	±0.05% of span
Galvanic Isolation:	No	1500 Vac, 1 min.	3750 Vac, 1 min.
Thermocouple Types:	J, K, E, B, C, L, N, R, S, T, U		
RTD Types, 3 & 4 wire:	PT100 IEC α=0.00385, PT1000 IEC α=0.00385 and others; Consult Tempco		
Input mV:	N/A	-10 to +500 mV	-10 to +500 mV
Potentiometer / Resistance:	N/A	3/4 wire, 0-2000 Ω	3/4 wire, 0-2000 Ω
Maximum T/C Wire Resistance:	500 Ω	500 Ω	500 Ω
Power Supply:	8 to 32 Vdc	8 to 30 Vdc	7.5 to 36 Vdc
Output	4 to 20mA, 20-4mA	4 to 20mA, 20-4mA	4 to 20mA, 20-4mA
Linearity Thermocouple:	±0.2%	±0.2%	±0.1%
Linearity RTD:	±0.1%	±0.1%	±0.05%
Sensor Break Monitoring:	Upscale or Downscale, Programmable		
Minimum Span Calibration			
T/C:	2 mV	2 mV	2 mV
RTD:	18°F/10°C	18°F/10°C	18°F/10°C
Potentiometer:	N/A	10 Ω	10 Ω
Temperature Operation & Storage:	-4° to +158°F/-20° to +70°C		
Relative Humidity:	0 to 95%, non-condensing		
Mounting:	DIN, 35 mm (for DIN rail see page 13-95)		
Protection: Housing/Terminals:	IP 20	IP 20	IP 20

Common Pre-Programmed Rail Mount Temperature Transmitters

Part Number	Version/ Isolation	Input	Range Zero	Range Span	Unit
ETR20101	ETR1/no	K tc	0	200	°F
ETR20102	ETR1/no	J tc	0	200	°F
ETR20103	ETR2/yes	RTD	0	200	°F
ETR20104	ETR1/no	K tc	0	500	°F
ETR20105	ETR1/no	J tc	0	500	°F
ETR20106	ETR2/yes	RTD	0	400	°F
ETR20107	ETR1/no	K tc	0	200	°C
ETR20108	ETR1/no	J tc	0	200	°C
ETR20109	ETR1/no	K tc	0	400	°C
ETR20110	ETR1/no	J tc	0	400	°C
ETR30002	ETR3/yes	K tc	0	500	°F
ETR30003	ETR3/yes	J tc	0	500	°F
ETR30004	ETR3/yes	RTD	0	400	°F
ETR30005	ETR3/yes	K tc	0	200	°C
ETR30006	ETR3/yes	J tc	0	200	°C
ETR30007	ETR3/yes	RTD	0	200	°C

Note: For dimensions and wiring information, see page 12-49.

Un-Programmed Rail Mount Transmitters

ETR20001 For Non-Isolated version
ETR20002 For Isolated version
ETR30001 For Isolated High Precision version

Universal Field Programming Kit

For programming ETR30001 DIN rail mount Isolated High Precision transmitters nd all other Tempco transmitters for sensor type and range. Includes USB Interface and, all required cables and software. Includes hard carrying case. Connects to a USB port on the PC. Compatible with 32 or 64 bit Windows XP (SP2+), Vista, Windows 7, 8, 8.1, or 10.

Part Number: **ETM90006**

Lite Field Programming Kit

For programming ETR20001, ETR20002, DIN rail mount non-isolated and isolated transmitters for sensor type and range. Includes USB Interface and all required cables and software. Includes storage bag. Connects to a USB port on the PC. Compatible with 32 or 64 bit Windows XP (SP2+), Vista, Windows 7, 8, 8.1, or 10.

Part Number: **ETM90007**

All Items Available from Stock

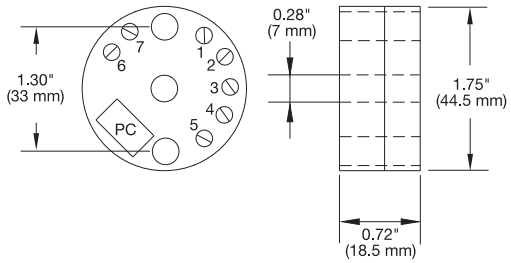
Ordering Information

Order a common unit by part number from the table or create an ordering code by filling in the boxes with the appropriate number and/or letter designation for your requirements and a part number will be assigned, or choose a pre-assigned configuration.

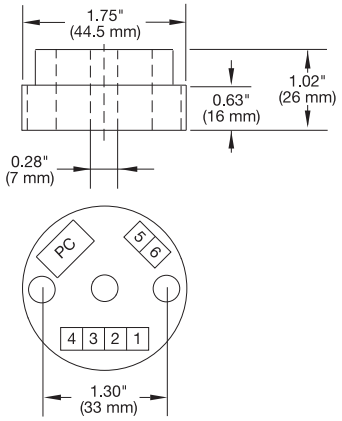
⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

Wiring Diagrams for 2-Wire Miniature Head Temperature/Process Transmitters

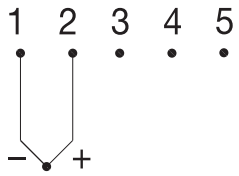
ETM1 Non-Isolated



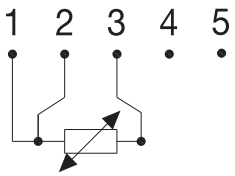
ETM2 Isolated and ETM3 Isolated High Precision



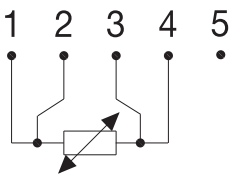
Input Connections for ETM1, ETM2 and ETM3



Thermocouple

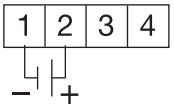


RTD– PT100, PT1000
3-wire

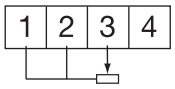


RTD– PT100, PT1000
4-wire

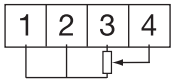
Additional Input Connections for Isolated ETM2 and ETM3



mV

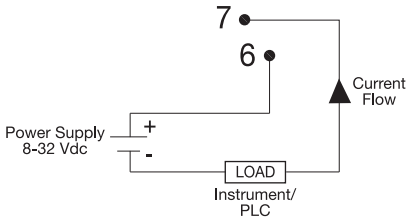


Potentiometer 3-wire

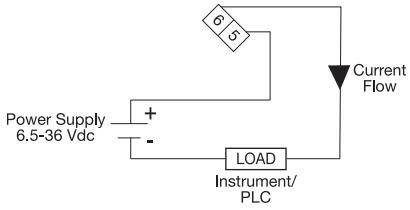


Potentiometer 4-wire

Output Connections for ETM1, ETM2 and ETM3



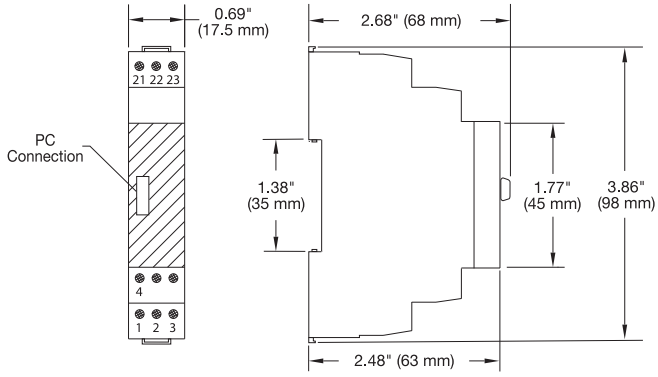
ETM1



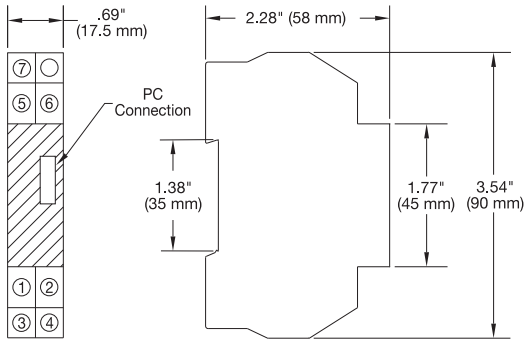
ETM2 & ETM3

Wiring Diagrams for 2-Wire DIN Rail Mount Temperature/Process Transmitters

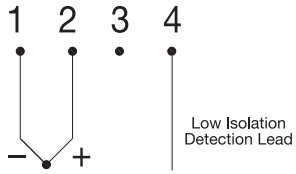
ETR1 Non-Isolated



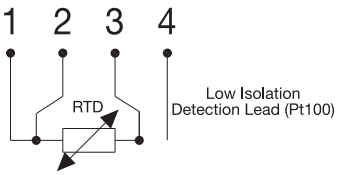
ETR2 Isolated and ETR3 Isolated High Precision



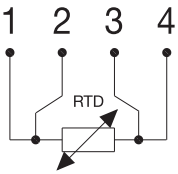
Input Connections for ETR1, ETR2 and ETR3



Thermocouple

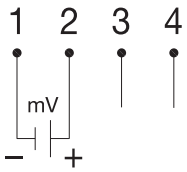


RTD– PT100, PT1000
3-wire

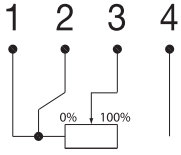


RTD– PT100, PT1000
4-wire

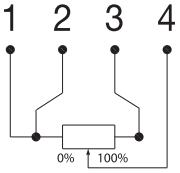
Additional Input Connections for Isolated ETR2 and ETR3



mV

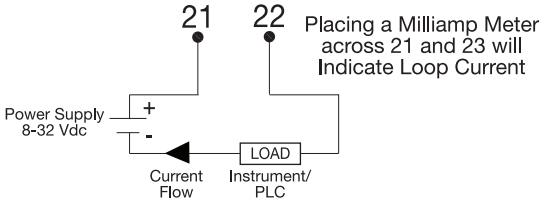


Potentiometer 3-wire

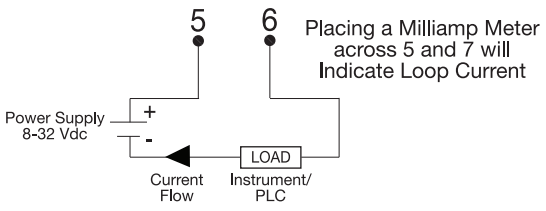


Potentiometer 4-wire

Output Connections for ETR1, ETR2 and ETR3



ETR1 Non-Isolated



ETR2 Isolated
ETR3 Isolated High Precision