

Long Term
Stability

Description

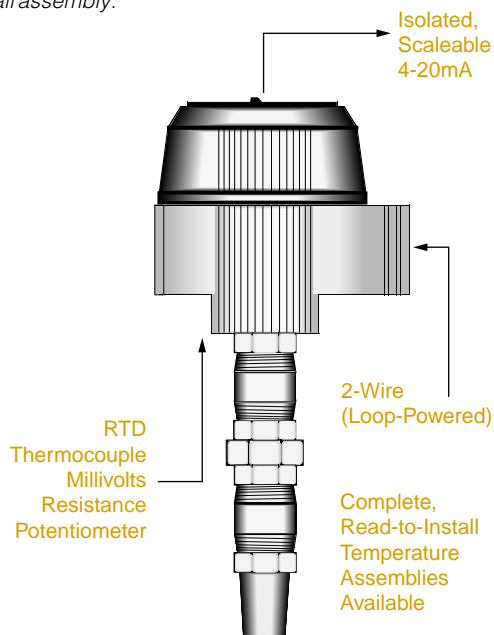
Moore Industries' PC-Programmable Temperature Transmitters—the TRY (isolated) and TRX (non-isolated)—combine smart digital technology with advanced analog operation to deliver superior reliability, accuracy, and ease of use.

Now with even more flexible capabilities, these 2-wire (loop-powered) analog/digital hybrid transmitters program in a minute or less to accept direct inputs from:

- **23 RTD Types**
(2-, 3-, and 4-wire; Pt, Cu and Ni; 10 to 1000Ω)
- **9 Thermocouple Types**
(J, K, E, T, R, S, B, N, and C)
- **Direct Millivolt Sources**
(-50 to 1000mV)
- **Resistance & Potentiometer Devices**
(0 to 4000Ω)

They convert the input to a highly accurate 4-20mA output that is both linear and scaleable with respect to the input—ready for direct interface with readout instruments, recorders, DCSs, and other computer-based SCADA systems.

Figure 1. Compact yet powerful, the 2-wire TRY and TRX transmitters afford full programmability in a rugged, ready-to-install assembly.



Available in a variety of housing styles, the TRY and TRX are ready to install in the control room, in existing hardware, or in their own, complete temperature assembly.

Features

- **Universal plant standard.** No need to specify and stock fixed range transmitters as spares. The TRY and TRX provide programmable input type and output scaling.
- **PC-programmable with Windows® software.** From a single screen, you can choose, and then view to confirm, all of your application-specific operating parameters from a personal computer.
- **Fast measurement cycle.** Delivering an output update up to 8 times per second, these transmitters are twice as fast as comparable microprocessor-based instruments.
- **Enhanced configuration software.** Now *trim* input sensor readings, and *customize* input linearization curves for even greater accuracy. Program output damping to compensate for erratic sensor readings. Use the Configuration Program to calibrate other loop instruments with its innovative Loop Test function.

Certifications



Check the listing on page 4 and the housing information on page 5 for full certification details.

TRY & TRX

PC-Programmable
Temperature Transmitters

Universal Solution

With the TRY & TRX, there's no need to specify and stock an array of single-function instruments. They are the perfect solution:

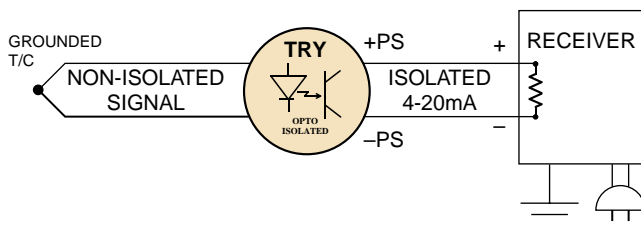
- Convert RTD, T/C, mV, and ohm signals to the linear 4-20mA needed by an indicator, recorder, PC, PLC, DCS, or similar SCADA system.
- Easily customize linearization to process inputs in non-linear, millivolt input applications.
- Trim input readings directly from sensors to achieve maximum relative accuracy. Match performance characteristics with your already-installed hardware.
- Avoid inaccuracies that result from transmitting "weak", low-level sensor signals through a noisy plant by converting them to stable, high-level signals that can withstand long-distance transmission.
- Use true, 4-wire RTD inputs to eliminate signal inaccuracies that result from inevitable lead wire resistance imbalances.
- Increase DCS accuracy by using transmitters calibrated to a specific temperature range in place of direct DCS inputs that are only capable of measuring readings over the entire range of a sensor.
- Reduce installation costs by replacing expensive and fragile sensor wire runs and costly DCS input cards.
- Compensate for erratic input signals with programmable damping values.

NEW!

NEW!

NEW!

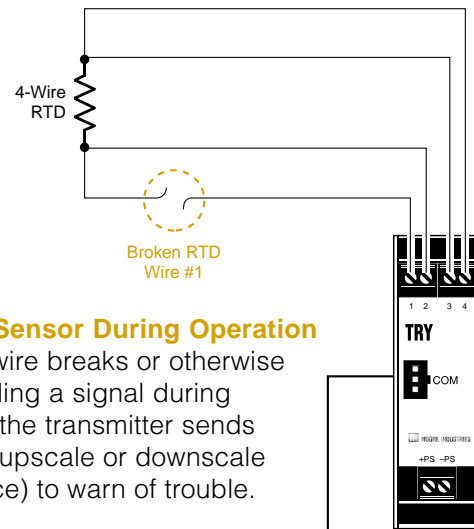
Figure 2. The TRY delivers complete isolation to stop ground loops from affecting signal accuracy.



Total Sensor Diagnostics

Our programmable transmitters perform continuous sensor diagnoses. This industry-first, and patented, Moore Industries feature may save you thousands in production costs, and hours of troubleshooting time, by letting you know when a problem occurs, and its type and location.

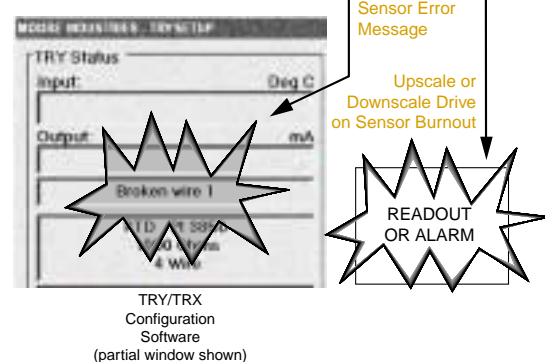
Figure 3. Total Sensor Diagnostics saves troubleshooting time.



Monitors Sensor During Operation

If an RTD wire breaks or otherwise stops sending a signal during operation, the transmitter sends the output upscale or downscale (your choice) to warn of trouble.

Then our transmitters go a step further. By connecting your PC running the TRY/TRX Configuration Software to the instrument, the RTD wire(s) causing the problem are identified via a plain-English error message on the software window. Specific error messages eliminate the work of removing the sensor or checking all lead wires to diagnose a problem. This advantage is especially valuable during startup.



New
Features

Intelligent Configuration Software

Configuring the TRY & TRX is as simple as point-and-click. Improved linearization and trimming capabilities make it an even more valuable tool.

All you need is a PC running Windows (v3.1 or '95), our TRY/TRX Configuration Software, and a Configuration Cable (software and cable supplied with each order).

In minutes, you can begin configuring your transmitter:

- Input type and range (zero and full scale)
- 4-20mA output range (zero and full scale)
- Reference junction compensation or no reference junction compensation for T/C inputs
- Linearization or no linearization
- Temperature readout in °F or °C
- 50Hz or 60Hz noise rejection
- Broken wire detection ON or OFF for calibration
- Upscale or downscale on sensor burnout
- Custom instrument tag (up to 40 characters) and instrument serial number
- NEW! • Custom Input Linearization (up to 85 points)
- NEW! • Custom Input Trimming to Actual Sensors
- NEW! • Loop Test Fixed Output for Easy Calibration of other instruments in the Loop
- NEW! • Damping Time for Erratic Signal Compensation (0-5 seconds)

Figure 4. All operating parameters can be set, and then viewed, on a single software screen.

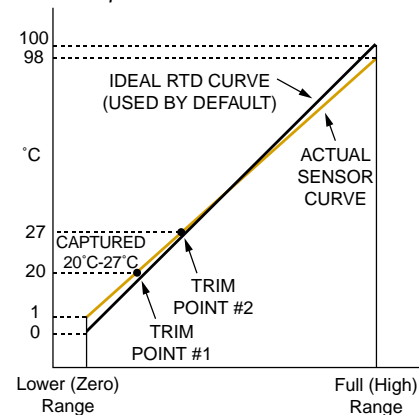


Trim to Specific Curve Segments

The TRY & TRX can be trimmed with two data points within the selected zero and span measurement range. This allows a complete process range to be monitored, while placing measurement emphasis on a critical segment of the range.

In the figure below, the ideal RTD curve is optimized between 20°C and 27°C to match the curve of the sensor used. This provides incredible precision over a limited portion of span, while measuring the remainder of the span with outstanding accuracy.

Figure 5. The TRY & TRX can be set to measure the segment most critical to the process.



TRY & TRX

PC-Programmable
Temperature Transmitters

Specifications

Performance

Input Accuracy:

Refer to Table 1

Output Accuracy: ±0.03% of input span setting + Input Accuracy

Reference Junction Compensation Accuracy: ±0.45°C

Stability: Error is in % of conformance range

| Stability | Input to Output | | |
|--------------|-----------------|------|------|
| | 1yr | 3yrs | 5yrs |
| T/C, mV | 0.11 | 0.18 | 0.24 |
| RTD Ohm Pot. | 0.13 | 0.22 | 0.28 |

Isolation: For TRY in HPP housing, 1500Vrms input to output; For TRY in DIN housing, 500Vrms input to output to case

Measurement Cycle:

Output updates 8 times per second

Output Response:

256msec, max., for output to reach full scale in response to a 10-90% step change on input

Linearity: 0.1% of span, within rated ranges

Ripple: 10mV peak-to-peak, max.

Performance (continued)

Power Supply and Load Effect:

Negligible within power and load limits

Over-Voltage Protection:

4V, max, on Input; 48V, max, on Output; 48V Reverse Polarity protection on output

Load Capability: 500Ω @ 24V, typical;

TRY $\Omega = (\text{Supply Voltage} - 10V) \div 0.024A$;

TRX $\Omega = (\text{Supply Voltage} - 8V) \div 0.024A$

Burnout Protection:

Total Sensor Diagnostics user-selected via Windows configuration software; Upscale to 24mA or Downscale to 3.3 mA

Output Current Limiting:

21.4mA for Input Over-range; 23.6mA for sensor failure or broken wire

T/C Input Impedance:

40MΩ, nominal

RTD Excitation:

250μA, ±10%

RTD Lead Wire Resistance Maximum:

RTD resistance + 2 times the lead wire resistance must be less than 4000Ω; Recommend <35Ω per wire for 3-wire RTD inputs; <5Ω per wire for 10Ω Cu inputs

Ambient Conditions

Operating and Storage Range:

-40°C to +85°C (-40°F to +185°F)

Ambient Conditions (continued)

Relative Humidity:

0-95%, non-condensing

Effect of Ambient Temperature on Accuracy:

±0.015% of span per °C change, max (+ 0.001% of Ω reading for RTD inputs)

Effect of Ambient Temperature on Reference Junction Compensation:

±0.015°C/°C change

RF/EMI Immunity:

20V/m @ 20-1000MHz, when tested according to SAMA standard 33.1.

(10V/m @ 80-1000MHz, 1K AM, when tested according to IEC 1000-4-3-1995)

Common Mode Rejection: 100dB, min, @ 50/60Hz

Normal Mode Rejection:

100dB, typical, @ 1V peak-to-peak, 50/60Hz

Adjustments

All settings made using Windows-based configuration program, then stored in non-volatile memory

Weight

HPP-style housing: 65 g (2.3 oz)
DIN-style housing: 184 g (6.5 oz)
LH housing styles: 549 g (19.4 oz)

Certifications¹



Factory Mutual Research Corporation (FMRC)

Intrinsically Safe – HPP:

Class I, II, III, Division 1, Groups A, B, C, D, E, F, G

Non-Incendive – HPP:

Class I, Division 2, Groups A, B, C, D

Suitable for:

Class II, Division 2, Groups F and G

Class III, Division 2

Explosion-Proof[‡] – LH2:

Class I, Division 1, Groups A*, B, C, D;

T6; NEMA 4X; IP66

Dust Ignition-Proof[‡] – LH2:

Class II and III, Division 1, Groups E, F, G



Canadian Standards Association (CSA)

Intrinsically Safe – HPP:

Class I, Division 1, Groups A, B, C, D

Non-Incendive – HPP:

Class I, Division 2, Groups A, B, C, D

General (Ordinary) Location – DIN/HPP



European Approvals by:

EECS/BASEEFA – LH:

Type N: Ex N IIC; T6 (@ 40°C_{amb}), IP54

CENELEC Approved by KEMA

Intrinsically Safe – HPP:

EEx ia IIC T4(@ 60°C_{amb})/T5(@ 40°C_{amb})



Standards Association of Australia (SAA)

Intrinsically Safe – HPP:

EEx ia IIC; T4(@ 60°C_{amb})/T5(@ 40°C_{amb})



NEPSI-China

Intrinsically Safe – HPP:

Ex ia IIC; T4 (@ 60°C_{amb})/T5(@ 40°C_{amb})



CE Conformant – EMC Directive 89/336/EEC

EN 50081-2, 1993 and EN 50082-2, 1995

^{*} For Group A only, all conduits must be sealed within 18 inches

[‡] 60°C (140°F) Maximum Ambient Temperature

[†] With the exception of CE certification, all other certifications for the TRX in the DIN housing are pending

Ordering Information

| Unit | Input | Output | Power | Options | Housing |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRY Isolated, PC-Programmable Temperature Transmitter | PRG Programmable with supplied Configuration Software (see Table 1 for descriptions of available input types; Factory Configuration available) | 4-20MA User scaleable with supplied software | 10-42DC 10-30DC Required for -ISA, ISC, ISCN, ISE, ISF, and NE options | -ISA SAA approved intrinsically safe (IS) (HPP) -ISC CSA approved IS (HPP) -ISCN NEPSI approved IS (HPP) -ISE CENELEC approved IS (HPP) | DIN DIN-style aluminum housing mounts on 32mm G-type (EN50035) and 35mm Top Hat (EN50022) rails HPP Hockey-puck housing for mounting in standard connection heads LH1NS* Connection head (FM approved, NEMA 4X, IP66) with two entry ports: ½-inch NPT cable and process—black PBT polyester cover LH1MS* Connection head (FM approved, NEMA 4X, IP66) with two entry ports: M20 cable and ½-inch NPT process—black PBT polyester cover LH1CS* Connection head with two entry ports: M20 cable and G½ (BSP) process—black PBT polyester cover LH1NX Connection head with ½NPT entry and mounting plate for customer's air duct opening—black PBT polyester cover LH2MS*‡ Explosion-proof connection head (FM approved, Class I, Div 1, Groups A**,B,C,D; Class II, Groups E,F,G; Class III) with two entry ports: ½-inch NPT cable and process—black metal cover LH2MS*‡ Explosion-proof connection head (FM approved, Class I, Div 1, Groups A**,B,C,D; Class II, Groups E,F,G; Class III) with two entry ports: M20 cable and ½-inch NPT process—black metal cover CH6 Plastic connection head CH17 CSA & UL approved explosion-proof housing for use in Class I, Div 1, Groups A,B,C,D; Class II, Groups E,F,G; Class III |
| TRX Non-Isolated, PC-Programmable Temperature Transmitter | PRG Programmable with supplied Configuration Software (see Table 1 for descriptions of available input types; Factory Configuration available) | 4-20MA User scaleable with supplied software | 8-42DC 8-30DC Required for -ISA, -ISC, -ISCN, -ISE, -ISF, -NE options | -ISF FM approved IS (HPP) -NE BASEEFA approved Type N w/ LH (HPP) | NOTE: Add "P" suffix to any LH housing for 2-inch pipe mounting hardware. (e.g., LH1NSP) ** For Group A (only) all conduits must be sealed within 18 inches. ‡ LH2 Explosion-proof certification carries 60°C (140°F) max ambient temperature restriction. Other connection heads, cabinets, and enclosures also available. Ask your Interface Solutions Expert for details. |

When Ordering, specify: Unit / Input / Output / Power / Option(s) [Housing]
Model number example: TRY / PRG / 4-20MA / 10-30DC / -ISF [LH2MSP]

NOTE:
Factory Mutual (FM) certifications apply to the transmitter (TRY or TRX) and the LH2NS and LH2MS connection head combination ONLY. Sensor, thermowell or fixed immersion sensor components are not included in the certifications.

Everything You Need is Included...

Each TRY or TRX order comes with one copy of our Configuration Software on a 3½-inch floppy disk (Windows 3.1 and Windows '95 compatible). To order additional copies, specify Moore Industries' part number 235-75120-01.

A TRY/TRX Configuration Cable is also included with each order. To order additional or replacement cables, specify Moore Industries' part number 803-040-26, or 803-039-26 for the special cable equipped with its own, self-powered input-to-output isolation circuit for operation in areas of high ground potentials.

TRY & TRX

PC-Programmable
Temperature Transmitters

Table 1. Input Types, Ranges, Minimum Span and Maximum Range Specifications, and Accuracy of the TRY & TRX

| Input | Type | α^* | Ω | Conformance Range | Minimum Span | Input Accuracy** | | Maximum Range |
|------------|------------------------------------|------------|----------------------------------|------------------------------------|----------------|------------------|---------|------------------------------------|
| RTD | Platinum | 0.003750 | 1000 | -50 to 500°C -58 to 932°F | 10°C (18°F) | ±0.11°C | ±0.2°F | -100 to 560°C -148 to 1040°F |
| | | 0.003850 | 100, 200, 300, 400, 500, 1000 | -200 to 850°C -328 to 1562°F | | ±0.21°C | ±0.38°F | -240 to 960°C -400 to 1760°F |
| | | 0.003902 | 100, 200, 400 500, 1000 | -100 to 650°C -148 to 1202°F | | ±0.15°C | ±0.27°F | -150 to 720°C -238 to 1328°F |
| | | 0.003911 | 100, 500 | -200 to 630°C -328 to 1166°F | | ±0.17°C | ±0.31°F | -235 to 710°C -391 to 1310°F |
| | | 0.003916 | 100 | -200 to 510°C -328 to 950°F | | ±0.14°C | ±0.25°F | -240 to 580°C -400 to 1076°F |
| | | 0.003923 | 98.129 | -200 to 600°C -328 to 1112°F | | ±0.16°C | ±0.29°F | -235 to 680°C -391 to 1256°F |
| | | 0.003926 | 100, 470, 500 | -200 to 630°C -328 to 1166°F | | ±0.17°C | ±0.31°F | -235 to 710°C -391 to 1310°F |
| | | 0.003928 | 100 | -200 to 850°C -328 to 1562°F | | ±0.21°C | ±0.38°F | -260 to 962°C -436 to 1763.6°F |
| | Nickel | 0.000672 | 120 | -80 to 320°C -112 to 608°F | 10°C (18°F) | ±0.16°C | ±0.29°F | -100 to 360°C -148 to 680°F |
| | Copper | 0.000427 | 9.035 | -50 to 250°C -58 to 482°F | 100°C (180°F) | ±1.2°C | ±2.16°F | -65 to 280°C -85 to 536°F |
| Ω | Direct resistance or Potentiometer | n/a | n/a | 0-4000 Ω | 30 Ω | ±0.4 Ω | | n/a |
| T/C | J | n/a | n/a | -180 to 770°C -292 to 1418°F | 35°C 63°F | ±0.28°C | ±0.5°F | -210 to 770°C -346 to 1418°F |
| | K | n/a | n/a | -150 to 1372°C -238 to 2501.6°F | 40°C 72°F | ±0.3°C | ±0.54°F | -270 to 1390°C -454 to 2534°F |
| | E | n/a | n/a | -170 to 1000°C -274 to 1832°F | 35°C 63°F | ±0.26°C | ±0.47°F | -270 to 1013°C -454 to 1855.4°F |
| | T | n/a | n/a | -200 to 400°C -328 to 752°F | 20°C 36°F | ±0.24°C | ±0.43°F | -270 to 407°C -454 to 764.6°F |
| | R | n/a | n/a | 0 to 1768°C 32 to 3214.4°F | 50°C 90°F | ±0.71°C | ±1.28°F | -50 to 1786°C -58 to 3246.8°F |
| | S | n/a | n/a | 0 to 1768°C 32 to 3214.4°F | 50°C 90°F | ±0.71°C | ±1.28°F | -50 to 1786°C -58 to 3246.8°F |
| | B | n/a | n/a | 400 to 1820°C 752 to 3308°F | 75°C 135°F | ±0.43°C | ±0.77°F | 200 to 1836°C 392 to 3336.8°F |
| | N | n/a | n/a | -130 to 1300°C -202 to 2372°F | 45°C 81°F | ±1.33°C | ±2.39°F | -270 to 1316°C -454 to 2400.8°F |
| | C | n/a | n/a | 0 to 2315°C 32 to 4199°F | 100°C 180°F | ±1.16°C | ±2.09°F | 0 to 2338°C 32 to 4240.4°F |
| Millivolts | DC | n/a | n/a | -50 to 1000mV | 4mV | ±0.04mV | | -50 to 1000mV |

* α values with both 32 and 128-point linearization curves are available. (Lower resolution values provided for compatibility with older units.)

**Accuracy ratings are expressed as a percent of the total conformance range, at spans larger than recommended minimums. (Accuracy ratings for RTD inputs apply at 25°C)

Figure 5. The DIN-style TRY is ideal for Control Room or Cabinet Installations.

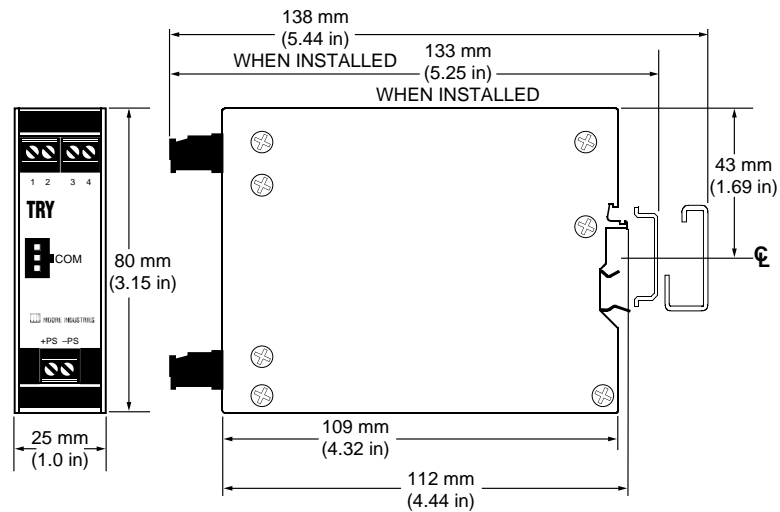


Figure 6. Use the HPP-style Hockey-puck Housing for Installation in Field Enclosures.

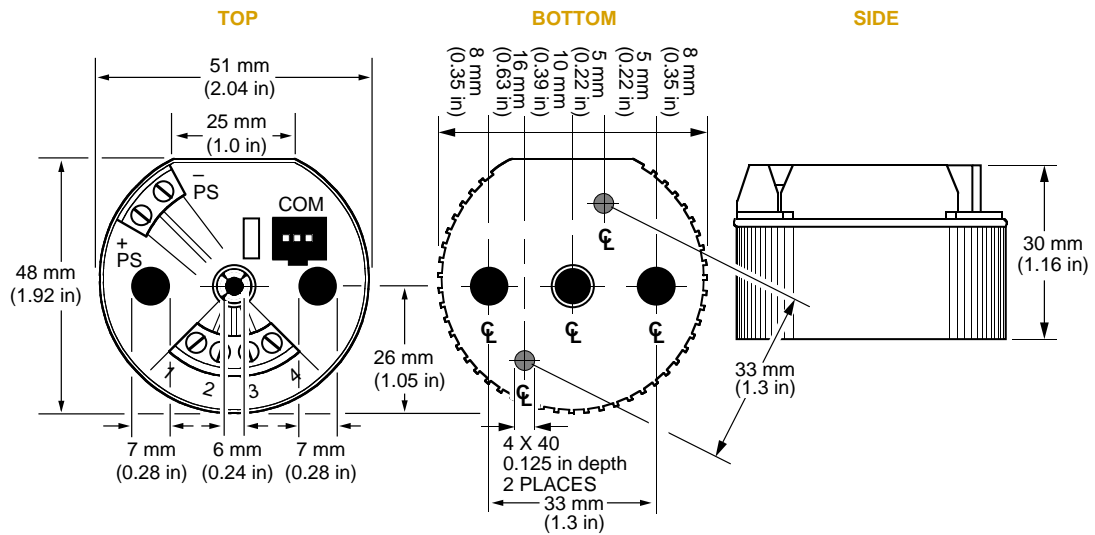
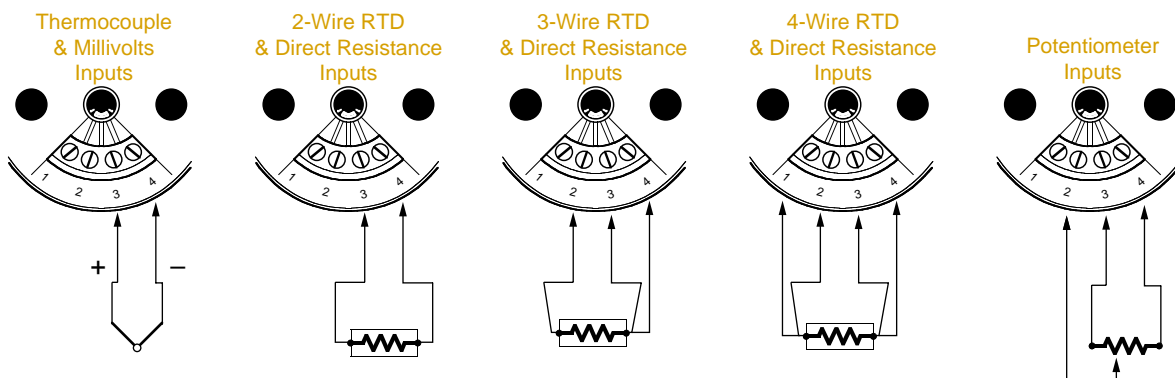


Figure 7. Connecting the TRY/TRX to Input.



TRY&TRX

PC-Programmable
Temperature Transmitters

Figure 8. The TRY and TRX Feature Rugged, Fully Certified, Ready-to-Install Housing Styles.

