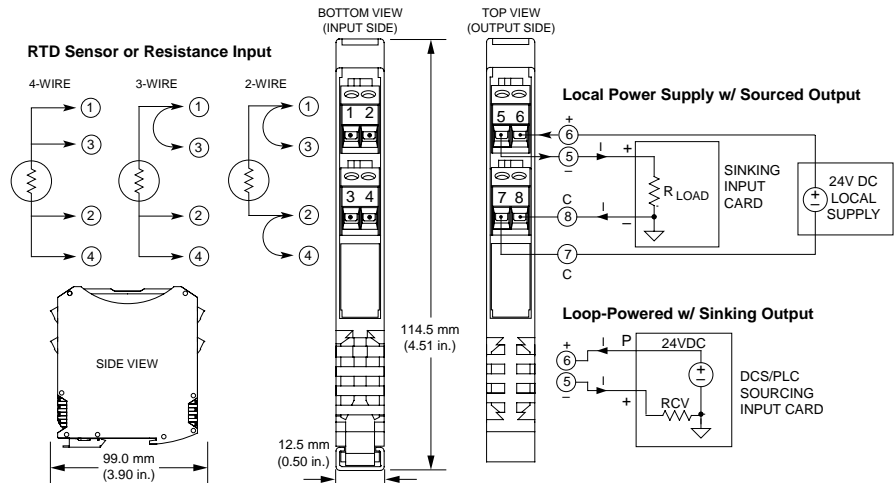




Transmitters: TT230 Series

TT235 Isolated RTD/resistance input two-wire transmitter



RTD (Pt, Ni, Cu) or 0-450 ohm input ♦ 4-20mA output (sink/source) ♦ 12-32V DC loop/local power

Description

The TT235 model is a space-saving two-wire transmitter that isolates and converts an RTD sensor input to a proportional 4-20mA signal. Power is received from the output loop current or a DC supply when using a three-wire connection. The transmitter provides sensor excitation plus performs linearization, lead-wire compensation, and lead-break detection.

Setup and calibration are fast and easy with a convenient USB connection to your PC and Acromag's Windows configuration software.

Advanced signal processing capabilities, variable range input, and convenient USB programming make this instrument a very versatile temperature measurement device. These transmitters can withstand harsh industrial environments and operate reliably across a wide temperature range with very low drift. They feature RFI, EMI, ESD, EFT, and surge protection plus low radiated emissions.

Key Features & Benefits

- Easy setup and digital calibration via USB with Windows configuration software
- Selectable RTD or linear resistance input type: Pt RTD (100Ω, 200Ω, 500Ω, or 1000Ω), Ni RTD (120Ω), Cu RTD (10Ω), or Resistance (0-450Ω)
- 1500V isolation between input/output circuits
- Space-saving 12.5mm (0.5 inch) unit with pluggable terminals for convenient wiring
- High accuracy, linearity, stability, and reliability
- Supports normal or reverse-acting output
- Supports sink or source output wiring
- User-selectable filtering (none, low, med., high)
- Fast response (as low as 22ms)
- Selectable upscale or downscale operation for sensor errors and lead-break detection
- NAMUR-compliant output loop current
- Shock (25g) and vibration (4g) resistant
- Wide ambient operation (-40 to 80°C)
- CE compliant. UL/cUL Class 1 Div 2 Zone 2 approvals (pending)



TT230 Series Transmitter Configuration Software is downloadable (FREE) from www.acromag.com. Windows XP, Vista, 7, & 8

TT235 Model software allows you to configure transmitters offline, save the file, and download into units later, at your convenience.



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Performance Specifications

IMPORTANT: To prevent damage or errors from grounded PCs and surges, Acromag strongly recommends use of their USB-ISOLATOR when configuring a TT230 Series transmitter.

■ USB Interface

USB Connector

USB Mini-B type socket, 5-pin.

USB Data Rate

12Mbps. USB v1.1 and 2.0 compatible.

USB Transient Protection

Transient voltage suppression on power and data lines.

USB Cable Length

5.0 meters maximum.

Driver

Not required. Uses built-in Human Interface Device (HID) USB drivers of the Windows operating system.

■ Input

Default Configuration

100Ω Pt RTD, $\alpha=0.00385$, -200 to 850°C input, 4-20mA output, upscale break detect, medium filter.

Input Configuration

Two-, three- or four-wire sensor input connections. Programs in °C, °K, °F, or ohmic integer values only.

Input Ranges

Input Type	Input Range	Accuracy ²
RTD, Pt 100Ω	-200 to 850°C (-328 to 1562°F)	±0.2°C, ±0.019%
RTD, Pt 200Ω	-200 to 850°C	±0.3°C, ±0.029%
RTD, Pt 500Ω	-200 to 850°C	±0.5°C, ±0.048%
RTD, Pt 1000Ω	-200 to 850°C	±1.0°C, ±0.095%
RTD, Ni 120Ω (Minco 7-120)	-80 to 320°C (-112 to 608°F)	±0.08°C, ±0.020%
RTD, Cu 10Ω (Minco 16-9)	-200 to 270°C (-328 to 518°F)	±0.5°C, ±0.106%
Resistance (linear) ¹	0 to 450Ω	±0.05Ω, ±0.010%

Note 1: Linear resistance input range approaches but does not include 0Ω and 500Ω. If exactly 0Ω or 500Ω is measured, break detection is triggered.

Note 2: Rated accuracy (in °C and % of span) applies for input spans greater than 5% of input full-scale.

Input Scaling Adjust

Zero: 0 to 95% of range, typical.

Full scale: 5 to 100% of full scale range, typical.

Lead Break (Sensor Burnout) Detection

Configurable for either upscale or downscale.

■ Output

Output Range

4 to 20mA DC.
Under-range capability 3.5mA.
Over-range capability 24mA.

Output Compliance

$R_{LOAD} = (V_{SUPPLY} - 11V) / 0.020A$.
 $R_{LOAD} = 0$ to 650 ohms @ 24V DC.

Output DAC Resolution

16-bit D/A converter

Output Accuracy

Better than ±0.05% of span, typical (±0.1% max.) for nominal input spans. Includes the effects of repeatability, terminal point conformity, and linearization, but does not include sensor error.

Ambient Temperature Effect

Better than ±0.008% per °C of input span or ±80ppm/°C, typical. Includes the combined effects of zero and span drift over temperature.

Output Response Time (for step input change)

No filter: 22ms.
Low filter: 50ms.
Medium filter: 160ms.
High filter: 1210ms.

■ Environmental

Operating temperature

-40 to 80°C (-40° to 176°F).

Storage temperature

-40 to 85°C (-40 to 185°F).

Relative humidity

5 to 95% non-condensing.

Power Requirement

12-32V DC SELV (Safety Extra Low Voltage), 24mA maximum.

Shock and Vibration Immunity

Vibration: 4g, per IEC 60068-2-64.
Shock: 25g, per IEC 60068-2-27.

Electromagnetic Compatibility (EMC) Compliance

Radiated Emissions: BS EN 61000-6-4, CISPR 16.
RFI: BS EN 61000-6-2, IEC 61000-4-3.
Conducted RFI: BS EN 61000-6-2, IEC 61000-4-6.
ESD: BS EN 61000-6-2, IEC 61000-4-2.
EFT: BS EN 61000-6-2, IEC 61000-4-4.
Surge Immunity: BS EN 61000-6-2, IEC 61000-4-5.

Approvals

CE compliant. UL/cUL listing pending.
Designed for Class I; Division 2; Groups ABCD; Zone 2

■ Physical

General

General-purpose enclosure designed for mounting on 35mm "T-type" DIN rail.

Case Material

Self-extinguishing polyamide, UL94 V-0 rated, color light gray. General-purpose NEMA Type 1 enclosure.

I/O Connectors

Removable plug-in terminal blocks rated for 12A/250V; AWG #26-12, stranded or solid copper wire.

Dimensions

12.5 x 114.5 x 99.0 mm (0.5 x 4.51 x 3.90 inches).

Shipping Weight

0.22 kg (0.5 pounds) packed.

Ordering Information

Models

TT235-0600

Transmitter, isolated RTD/resistance input.

Services

TT230-Config/Cal

Factory custom configuration/calibration service. Specify input type, input/output zero and full-scale values, filtering, and sensor fault settings on order.

Software

TTC-SIP (recommend one kit per customer)

Software Interface Package for Acromag TT Series transmitters. Includes configuration software CD-ROM (5040-944), isolator (USB-ISOLATOR) and two USB cables (4001-112, 4001-113).

Accessories

See www.acromag.com for more information.

USB-ISOLATOR

USB-to-USB isolator, includes USB cable (4001-112).

ISO9001
AS9100



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