

April 1995

Data Sheet 3.50

Description

The TCT Thermocouple Transmitter accepts millivolt input from any standard thermocouple and converts it to either a standard current or voltage output to indicate process temperature. The TCT interfaces to recording, monitoring and controlling instruments, or directly to a computer for computer process control-type systems. The TCT features complete isolation, automatic compensation for changes in reference junction temperature, and high input impedance to minimize signal errors.

Extremely versatile, the TCT transmitter can handle a wide selection of input and output ranges, including narrow-span input (optionally, as low as 2-5mV) and low voltage output (0-1V). The TCT can also be equipped with a variety of options, including linearization, RFI protection, dual temperature input ranges, reversed input/output signals and an elevated zero option.

The standard housing used with the TCT thermocouple transmitter is a corrosion-resistant CSA approved aluminum case with a "U-Back" mounting bracket that mounts into a 3" by 7-1/2" installation space. Other available housings include a plug-in card for high density rack mounting and a panel mount housing that allows for flush-panel mounting. In addition, a Euro-style plug-in housing is also available that allows for the mounting of 24 channels in a 19" rack, and each channel can have dual isolated outputs. Housing enclosures used with TCT transmitters include explosion-proof, fiberglass, oiltight, watertight, and transparent-cover enclosures.

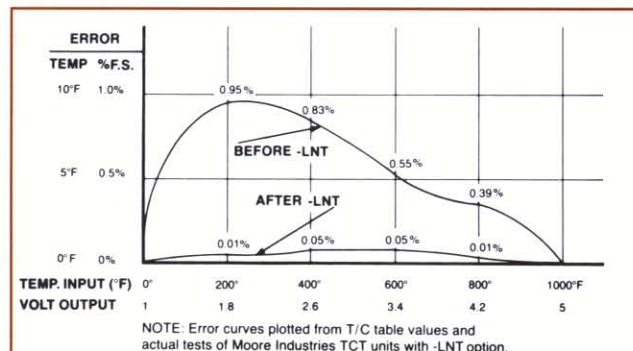


Moore Industries' TCT converts millivolt input from any standard thermocouple to a current or standard voltage output to measure process temperature.

Features

- **Complete isolation.** Isolation of input, output and power terminals prevents false input due to ground loop currents.
- **Increased signal accuracy.** Common mode rejection ratio of 120 dB (1,000,000:1) up to 500 volts rms minimizes errors from induced common mode voltage.
- **Failsafe action.** Output is driven upscale to 150% of span if a thermocouple burns out or the input circuit opens. With the -DD option, output is driven downscale on thermocouple burnout.
- **High input impedance.** Input impedance of at least 10 megohms along with minimum offset drift and low frequency cutoff eliminate the problem of converting common mode voltage to normal mode when extended thermocouple leads are used.
- **RFI protection.** With -RF option, a patented filter assembly is provided that prevents radio frequency interference from entering the unit or rack.

ISA Type J Thermocouple



The -LNT option offers low cost linearization and provides a minimum 10:1 improvement in the linearity curve of types E, J, K, R, S and T ISA rated thermocouples.

Specifications

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| <p>Adjustments 22-turn potentiometers Zero: Adjusts output to 0% for offsets upto $\pm 20\%$ of span without -LNT (linearization) option. Adjusts output to 0% for offsets up to $\pm 10\%$ of factory set input temperature points with -LNT. Span: Output is fully adjustable over a preselected input range to 100% of selected output span.</p> | <p>Isolation Input, output and power supply are transformer isolated (standard on both ac and dc powered units). Common mode rejection exceeds 120dB at 60Hz with a limit of 500V rms.</p> <p>Linearity Output linear with respect to input millivolts Characterization: With -LNT option, provides a minimum of 10:1 improvement $\pm 0.1\%$ in the linearity curve of the specified thermocouple temperature range (standard ranges only)</p> <p>Certification CSA</p> <p>Weight Approx. 2 lbs. (908 grams)</p> | <p>*Options -DD Downscale open input drive **EZ Elevated zero input (required for all inputs exceeding standard zero adjustment capability—specify input for 0% out) -FU 400mA power fuse for PC housing (requires engineering for STD and AB housings) -LNT Thermocouple linearization (not available with -ST, -RO, or -DR options) -LSA Lower span – 2-5 mVFS input (consult factory for specifications) -RF RFI/EMI protection 50V/m-abc=$\pm 0.1\%$ F.S. as defined by SAMA Standard 33.1. With -RF option, input is isolated from output 500vdc. -ST Selectable thermocouple type (not available with -LNT)</p> |
| <p>Performance Calibration Capability (linearity and repeatability): $\pm 0.1\%$ of span $\pm 0.25\%$ of span for LSA Frequency Response: 5 Hz (3dB point) Reference Junction: Cold junction compensated Input Impedance: 10 megohms minimum Burnout Protection: Upscale drive standard; downscale drive optional Ripple: Less than 10mV P/P at max. load and max. span Load Effect: $\pm 0.01\%$ of span from 0 to max. load resistance (current output) Line Voltage Effect: $\pm 0.005\%/1\%$ line change (ac or dc)</p> | <h3>Ordering Specifications</h3> <p>Unit TCT</p> <p>Standard Input Ranges (Thermocouple, all standard ISA types) 5-10MVFS: 5-10 mVFS 10-20MVFS: 10-20 mVFS 20-50MVFS: 20-50 mVFS (Refer to -LSA option for narrow spans)</p> <p>Output Current Ranges 1-5MA: 1-5mA into 0-4800Ω 4-20MA: 4-20mA into 0-1200Ω load 10-50MA: 10-50mA into 0-480Ω load Voltage: 1-5Vdc standard into 20KΩ minimum, 0-5Vdc, 0-10Vdc with LNT (other ranges available)</p> <p>Power Input 24DC: 24Vdc $\pm 10\%$ 45DC: 45Vdc $\pm 10\%$ 117AC, 220AC, 240AC 50/60Hz $\pm 10\%$ 5 watts maximum</p> | <p>*Housings UB Standard U-back bracket AB Angle bracket mounting CP Conduit termination for standard units D2 Conduit termination with aluminum safety cover to meet Class I, Gp. A,B,C,D Div. 2 requirements. EX Explosion-proof enclosure, CL1, Div. 1 FG Fiberglass enclosure, NEMA 12 GP General-purpose enclosure, NEMA 1 OT Oiltight enclosure, NEMA 12 PC Plug-in card housing (24Vdc & 45Vdc power only) PM Panel-mount enclosure TCE Transparent cover enclosure, NEMA 4 WT Watertight enclosure, NEMA 4</p> |
| <p>Ambient Temperature Range: -29°C to $+82^{\circ}\text{C}$ (-20°F to $+180^{\circ}\text{F}$) Effect on amplifier: $\pm 0.005\%$ /$^{\circ}\text{F}$ over above range Effect on cold junction compensation: $\pm 1^{\circ}\text{C}$ (LSA +2$^{\circ}$) maximum offset per 100$^{\circ}\text{C}$ ambient change</p> <p>Output Operational feedback amplifier current source; output limited to 150% of max. output range value.</p> | | |

When ordering, specify:

Unit / Input Range / Output Range / Power Input / Options [Housing]

Model number example: TCT/J5-10MVFS/4-20MA/45DC/-EZ14 [STD]

*For more information on additional and individual housings or options, refer to the separate housing data sheet or consult local representative or the factory.

**EZ option will be required if input millivolts, corresponding to 0% output, falls outside of $\pm 20\%$ of the selected calibration range.