



## Isolated Transmitters



## Thermocouple Input

These models convert sensor inputs to proportional process current or voltage output signals.

### Models

250T: Loop-powered transmitter series

350T: DC-powered transmitter series

450T: AC-powered transmitter series

### Input Ranges

- Thermocouple types J, K, T, R, S, E, B
- Linearized thermocouple (custom ranges)

### Output Ranges

- DC current: 4 to 20mA
- DC voltage: 0 to 5V or 0 to 10V

### Power Requirements

- 250T: 12 to 50V DC @ 20mA (loop-powered)

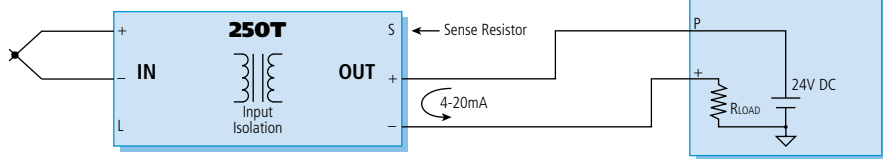
- 350T: DC voltage source (see table below)

Output range	Power
4 to 20mA	10 to 36V DC @ 30mA
0 to 5V	10 to 36V DC @ 9mA
0 to 10V	12.5 to 36V DC @ 9mA

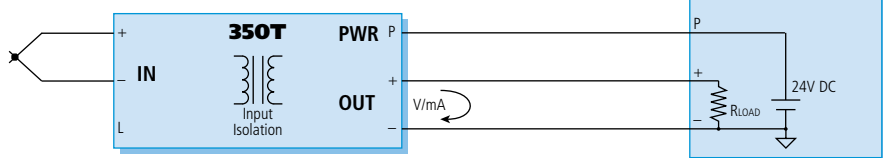
- 450T: 115V or 230V AC, ±10%, 50 to 60Hz

Output range	Power
4 to 20mA	115V AC @ 0.050A
4 to 20mA	230V AC @ 0.025A
0 to 5V, 0 to 10V	115V AC @ 0.020A
0 to 5V, 0 to 10V	230V AC @ 0.010A

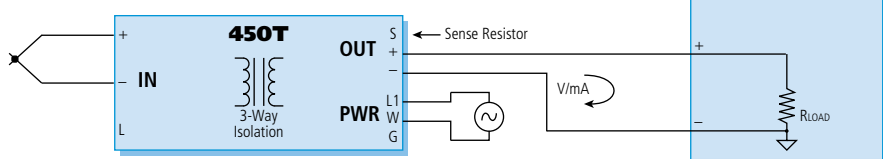
## 250T Loop-Powered (2-wire) Transmitter



## 350T DC-Powered (3-wire) Transmitter



## 450T AC-Powered (4-wire) Transmitter



## Special Features

- Excellent accuracy and stability ensure reliable measurements in harsh industrial environments.
- Field-selectable input types reduce stocking requirements.
- Thermocouple reference junction compensation reduces drift and corrects nonlinearity.
- TC linearizer (5-slope) improves accuracy.
- TC break detection indicates open circuit failures with selectable up/downscale operation.
- RFI and EMI resistance minimize the effects of environmental noise.
- 75% span adjustment enables precise application calibration.
- 1500V AC peak isolation (250V AC or 354V DC continuous) prevents ground loops.

### 250T models:

Input isolated from output/power.

### 350T models:

Input isolated from output and power. Output and power share a common.

### 450T models:

3-way isolation. Input, output, and power circuits are isolated from each other.

## Performance

### Ambient Temperature Range

Operating: -13 to 185°F (-25 to 85°C).  
Storage: -40 to 185°F (-40 to 85°C).

### Accuracy

±0.1% of calibrated span or ±0.01mV, whichever is greater. Includes repeatability, hysteresis, terminal point linearity, and adjustment resolution.

### Ambient Temperature Effect

Less than ±0.01% of output span per °F (±0.018% per °C). ±0.025% of output span per °F (±0.045% per °C) for narrow span units. (Specification includes the combined effects of zero and span over temperature).

### Noise Resistance

RFI: Less than ±0.5% of output span effect.  
EMI: Less than ±0.25% of output span effect.

### Noise Rejection

Common Mode: 130dB at 60Hz, 100 ohm unbalance.  
Normal Mode: 30dB at 60Hz, 100 ohm source.

### Response Time

Output reaches 98% of output span in 300ms.

### Bandwidth

-3dB at 3 Hz, typical.

### Output Compliance

250T:  $R_{LOAD} (max.) = (V_{SUPPLY} - 12V) / 20mA$ .  
350T:  $R_{LOAD} (max.) = (V_{SUPPLY} - 2.5V) / 20mA$ .  
450T:  $R_{LOAD} = 600$  ohms.

### Linearization (-xLxx) Option

5-segment TC linearizer provides minimum 10 to 1 improvement ±0.1% in the linearity curve.



## Ordering Information

Select one option from each column. Example: 450T-TC3-Y-1-DIN-NCR-C  
To order factory calibration, append "-C" to end of model number. Specify ranges on order.

Base	Input	Mounting	Approval
250T	-TC1	-RL00*	-DIN -N4 -NCR
	-TC3*	-SL00*	-ST -N12 -DT1
	-JL00*	-EL00*	-SM -XP
	-KL00*	-BL00*	
	-TL00*		

Note:  
All 250Ts have 4 to 20mA output and are loop-powered.

Base	Input	Output	Mounting	Approval
350T	-TC1	-RL00*	-Y	-DIN -NCR
	-TC3*	-SL00*	-V0	
	-JL00*	-EL00*	-V5	
	-KL00*	-BL00*		
	-TL00*			

Note:  
All 350Ts accept 10 to 36V DC power supply.

Base	Input	Output	Power	Mounting	Approval
450T	-TC1	-RL00*	-Y	-1	-DIN -NCR
	-TC3*	-SL00*	-V0	-2	
	-JL00*	-EL00*	-V5		
	-KL00*	-BL00*			
	-TL00*				

## Input Options

### Nonlinearized Input Options (output linear to millivolts)

-TC1: Thermocouple;  
Field-selectable for J,K,T,R,S,E,B

Type J:  
Span: 100 to 760°C (180 to 1368°F)  
Zero: -100 to 450°C (-148 to 842°F)

Type K:  
Span: 100 to 1200°C (180 to 2160°F)  
Zero: -100 to 600°C (-148 to 1112°F)

Type T:  
Span: 150 to 400°C (270 to 720°F)  
Zero: -150 to 300°C (-238 to 572°F)

Type E:  
Span: 100 to 700°C (180 to 1260°F)  
Zero: -100 to 350°C (-148 to 662°F)

Type R:  
Span: 550 to 1750°C (990 to 3150°F)  
Zero: 0 to 1200°C (32 to 2192°F)

Type S:  
Span: 550 to 1750°C (990 to 3150°F)  
Zero: 0 to 1200°C (32 to 2192°F)

Type B:  
Span: 1000 to 1820°C (1800 to 3276°F)  
Zero: 0 to 1000°C (32 to 2192°F)

-TC3\*: Narrow span TC, Field selectable J,K,T,R,S,E,B;  
(spans from 3 to 5mV); . Specify ranges on order.

### Linearized Input Options

(output linear to temperature for spans over 5mV  
consult factory for spans under 5mV)

-JL00\*: Linearized TC for Type J  
Specify ranges on order.

-KL00\*: Linearized TC for Type K  
Specify ranges on order.

-TL00\*: Linearized TC for Type T  
Specify ranges on order.

-RL00\*: Linearized TC for Type R  
Specify ranges on order.

-SL00\*: Linearized TC for Type S  
Specify ranges on order.

-EL00\*: Linearized TC for Type E  
Specify ranges on order.

-BL00\*: Linearized TC for Type B  
Specify ranges on order.

### Input Impedance

Without TC Break Detection: 1.0M ohm at 10mV span, typical; input current, ±10nA, typical.

With TC Break Detection: 400K ohm at 10mV span; input current, ±25nA, typical (±30nA, max.).

### Output Options (350T, 450T only)

-Y: 4 to 20mA DC.

-V0: 0 to 10V DC into 10K ohms or greater

-V5: 0 to 5V DC into 5K ohms or greater

## Power Options (450T only)

-1: 115V AC power

-2: 230V AC power

## Mounting Options

### Mountings

-DIN: DIN rail G or T mount

-ST: SNAPTRACK mount [250T only]

-SM: Surface-mount [250T only]

### External housings

-N4: NEMA 4, water-tight [250T only], holds two

-N12: NEMA 12, oil-tight [250T only], holds two

-XP: Explosion-proof NEMA 4 [250T only], holds one

## Approval Options

-NCR: No certification/approval required.

-DT1: CSA approval, Div. 2 hazardous locations:  
Class I; Div. 2; Groups A, B, C, D [250T only].

## Ordering Notes

\* Unit requires factory calibration. Append "-C" to end of model number. Specify ranges on order.

† Units are shipped separately from any optional enclosures (i.e. units are not installed in any external housing).

## Accessories

### Power supplies

See Power Supplies on Page 199.

### DIN RAIL 3.0

### DIN RAIL 16.7

DIN rail strip, Type T, 3 inches (75mm) or 16.7 inches (425mm)

### 20RM-16-DIN

19" rack-mount kit with DIN rail. Holds sixteen 250T/350Ts or ten 450T transmitters.

### 350T-N4-WM

NEMA 4 water-tight enclosure, wall-mount. Holds two 350Ts or one 450T transmitter.

### 350T-N12-WM

NEMA 12 oil-tight enclosure, wall-mount. Holds two 350Ts or one 450T transmitter.