



Isolated Transmitters



270i Isolators DC Current Input

The 270i accepts a process current input and provides an isolated 4 to 20mA process current output signal. Power is received from the input signal current.

These isolators use transformer isolation to effectively break the electrical path between the transmitted signal and the receiving device. This eliminates ground loops, reduces noise, and helps protect against transients for more accurate and reliable measurements.

This product is also extremely easy to install. All units are factory calibrated for loads up to 600 ohms to eliminate any need for load trim adjustments.

Input Range

- 4 to 20mA DC

Output Range

- 4 to 20mA DC

Power Requirement

- 12 to 50V DC @ 20mA (loop-powered), power is derived from the input signal current. Loop-burden: 10.8V@250 ohm output load.

Approvals

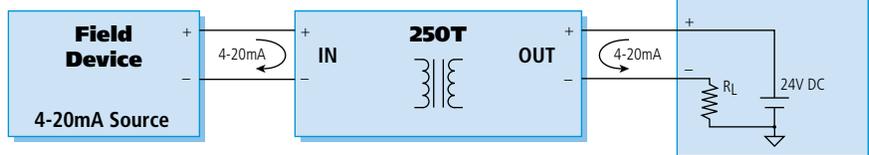
CSA: C22.2 No. 142

Class I; Division 1; Groups A, B, C, D
 Class I; Division 2; Groups A, B, C, D
 Class II; Division 1; Groups E, F, G

270i Isolator Diagram



250T Isolator Diagram



For more information about the 250T Transmitter, refer to Page 144.

Special Features

- Excellent accuracy and stability ensure reliable measurements in harsh industrial environments.
- 1500V AC peak isolation (250V AC or 354V DC continuous) prevents ground loops.
- RFI and EMI resistance minimize the effects of environmental noise.
- Calibration is independent of the load to eliminate load compensation adjustments
- Zero and span adjustment enable precise calibration.
- Compact, 1-inch wide housing uses less space for easier installation in control panels.
- Input current sense resistor simplifies field diagnostics

Performance

Input

Input Range

4 to 20mA input. Power is derived from the input signal loop. Input current should be limited to less than 50mA to prevent damage to the isolator. In the event of an open output circuit, the input loop voltage drop is limited to 20V, nominal. Isolator has reverse polarity protection.

Zero and span

Zero and span trim adjustments utilize 22-turn potentiometers accessible from front of the unit.

Input voltage drop

The voltage drop is a function of the input current and load resistance and is calculated as follows:

$$\text{Input Voltage Drop} = 5.4V \text{ DC} + (0.0216A \times R_{LOAD})$$

Example ($R_{LOAD} = 250 \text{ ohms}$):

$$\text{Input Voltage Drop} =$$

$$5.4V \text{ DC} + (0.0216A \times 250 \text{ ohms}) = 10.8V \text{ DC}.$$

Current sense resistor

A built-in 10 ohm ($\pm 0.1\%$) resistor can monitor input current to the isolator. Wiring to the isolator's input terminals determines if this resistor is included in the current loop. Use of this resistor provides a test signal of 40 to 200mV, representing 4 to 20mA.

Continued on the next page.



Performance (continued)

Output

Output Range

4-20mA DC output.

A. For R_{LOAD} from 50 to 600 ohms, connect R_{LOAD} between Output (+) and Output (-) terminals.

B. For R_{LOAD} from 0 to 50 ohms, connect R_{LOAD} between Output (S) and Output (-) terminals. For optimum performance at low values of R_{LOAD} , the isolator has a built-in pad resistor of 50 ohms.

1. Input Voltage Drop (input sense resistor not used):
 $V_{DROP} = 5.4V DC + (0.0216A \times (R_{LOAD} + 50 \text{ ohms}))$

2. Input Voltage Drop (input sense resistor used):
 $V_{DROP} = 5.6V DC + (0.0216A \times (R_{LOAD} + 50 \text{ ohms}))$

Accuracy

$\pm 0.1\%$ of output span. Error includes the combined effects of isolator repeatability, hysteresis, terminal point linearity and adjustment resolution.

Load resistance effect

Less than $\pm 0.1\%$ of output span as load resistance is changed over entire range. Allows use of isolator, within resistance load range, without the need to recalibrate the isolator for a particular load.

Output ripple

Less than $\pm 0.1\%$ of the maximum output span.

Bandwidth

-3dB at 3Hz, typical.

Response time

For a step input, the output reaches 98% of output span in 180ms, typical.

Environmental

Ambient temperature range

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

Storage: -40 to 185°F (-40 to 85°C).

Ambient temperature effect

Less than $\pm 0.006\%$ of output span per °F ($\pm 0.01\%$ per °C) over the ambient temperature range for reference test conditions. This specification includes the combined effects of zero and span over temperature.

Isolation

The input and output circuits are isolated from each other for common-mode voltages up to 250V AC, or 354V DC off ground, on a continuous basis (will withstand 1500V AC dielectric strength test for one minute without breakdown).

Noise rejection

Common mode: 110dB at 60Hz, typical.

RFI resistance

Less than $\pm 0.5\%$, of output span effect.

EMI resistance

Less than $\pm 0.25\%$ of output span effect.

Surge withstand capability (SWC)

Input/Output terminations rated per ANSI/IEEE C37.90-1978. Unit is tested to a standardized test waveform that is representative of surges (high frequency transient electrical interference), observed in actual installations.

Ordering Information

Select one option from each column. Example: 270i-20MA-DIN-NCR

Base	Input	Mounting	Approval
270i	-20MA	-DIN -N4 -ST -N12 -SM -XP	-NCR -DT1

Input Options

-20MA: 4.0 to 20.0mA DC

Mounting Options

Mountings

-DIN: DIN rail G or T mount

-ST: SNAPTRACK mount

-SM: Surface-mount

External housings

-N4: NEMA 4, water-tight, holds two

-N12: NEMA 12, oil-tight, holds two

-XP: Explosion-proof NEMA 4, 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.

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 270i isolators.