DI-8B47 Linearized Thermocouple Input Modules

FEATURES

- Interfaces to Types J, K and T
- Linearizes Thermocouple Signal
- High Level Voltage Outputs
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1
- Input Protected to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- Low Drift with Ambient Temperature
- Accurate CJC -40°C to +85°C
- CSA, FM, and CE Certifications Pending
- Mix and Match Module Types

DESCRIPTION

DI-8B modules are an optimal solution for monitoring real-world process signals and providing high level signals to a data acquisition system. Each DI-8B47 module isolates, filters, amplifies, and linearizes a single channel of temperature input from a thermocouple and provides an analog voltage output.

Linearization is accomplished using a four breakpoint piecewise linear approximation.

The DI-8B47 can interface to industry standard thermocouple type J, K, and T and has an output signal of 0V to +5V. Each module is cold-junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the mounting backpanel. Upscale open thermocouple detect is provided by an internal pull-up resistor.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B47 module provides protection against accidental connection of power-line voltages up to 240VAC.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

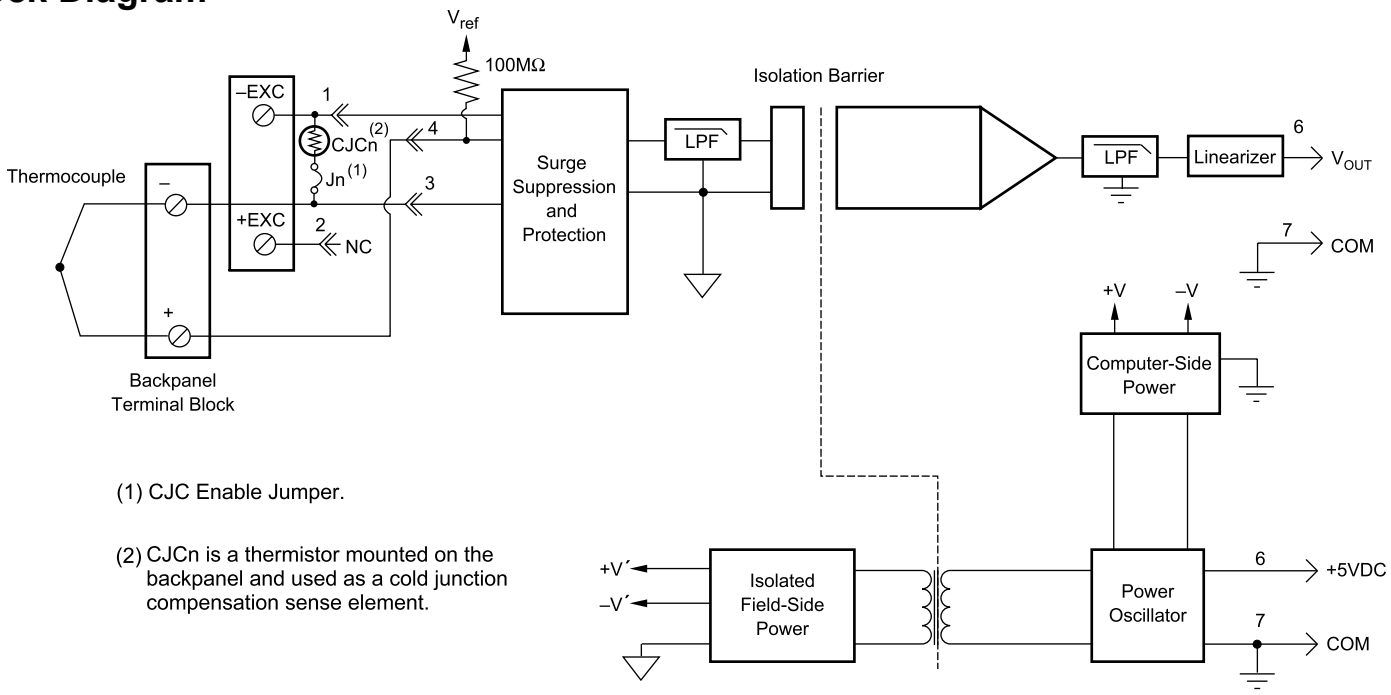
SPECIFICATIONS

Typical at T_A = +25ºC and +5V Power

	DI-8B47
Input Range	-0.1V to +0.5V
Input Bias Current	-25nA
Input Resistance	
Normal	50MΩ
Power Off	450kΩ
Overload	450kΩ
Input Protection	
Continuous	240VAC
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA
Lead Resistance Effect	±0.02˚C/Ω[1]
CMV, Input to Output	1500Vrms max
Transient, Input to Output	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	120dB
NMR	70dB at 60Hz
Accuracy	See Ordering Information on Page 2
Stability	
Offset	±20ppm/ºC
Gain	±75ppm/ºC
Noise	
Output, 100kHz	250µVrms
Bandwidth, -3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0 to +5V
Output Protection	Continuous Short to Ground
Transient	ANSI/IEEE C37.90.1
Cold Junction Compensation	
Accuracy, 25ºC	±0.5ºC
Accuracy, -40ºC to +85ºC	±1.5ºC
Power Supply Voltage	+5VDC ±5%
Power Supply Current	30mA
Power Supply Sensitivity	±25ppm/%
Mechanical Dimensions	1.11" × 1.65" × 0.40" (28.1mm × 41.9mm × 10.2mm)
Environmental	
Operating Temperature	-40ºC to +85ºC
Storage Temperature	-40ºC to +85ºC
Relative Humidity	0 to 95% Noncondensing

DI-8B47 Linearized Thermocouple Input Module

Block Diagram



(1) CJC Enable Jumper.

(2) CJCn is a thermistor mounted on the backpanel and used as a cold junction compensation sense element.

Ordering Information

Model Number	TC Type	Input Range	Accuracy*
DI-8B47J-01	J	0°C to +760°C (+32°F to +1400°F)	±0.24% ±1.82°C
DI-8B47J-02	J	-100°C to +300°C (-148°F to +572°F)	±0.24% ±0.96°C
DI-8B47J-03	J	0°C to +500°C (+32°F to +932°F)	±0.21% ±1.05°C
DI-8B47J-12	J	-100°C to +760°C (-148°F to +1400°F)	±0.24% ±2.10°C
DI-8B47K-04	K	0°C to +1000°C (+32°F to +1832°F)	±0.24% ±2.40°C
DI-8B47K-05	K	0°C to +500°C (+32°F to +932°F)	±0.24% ±1.05°C
DI-8B47K-13	K	-100°C to +1350°C (-148°F to +2462°F)	±0.24% ±3.60°C
DI-8B47K-14	K	0°C to +1200°C (+32°F to +2192°F)	±0.24% ±2.88°C
DI-8B47T-06	T	-100°C to +400°C (+32°F to +392°F)	±0.48% ±2.40°C
DI-8B47T-07	T	0°C to +200°C (+32°F to +392°F)	±0.39% ±0.75°C
* Includes conformity, hysteresis, and repeatability. Does not include CJC Accuracy.			

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