

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.

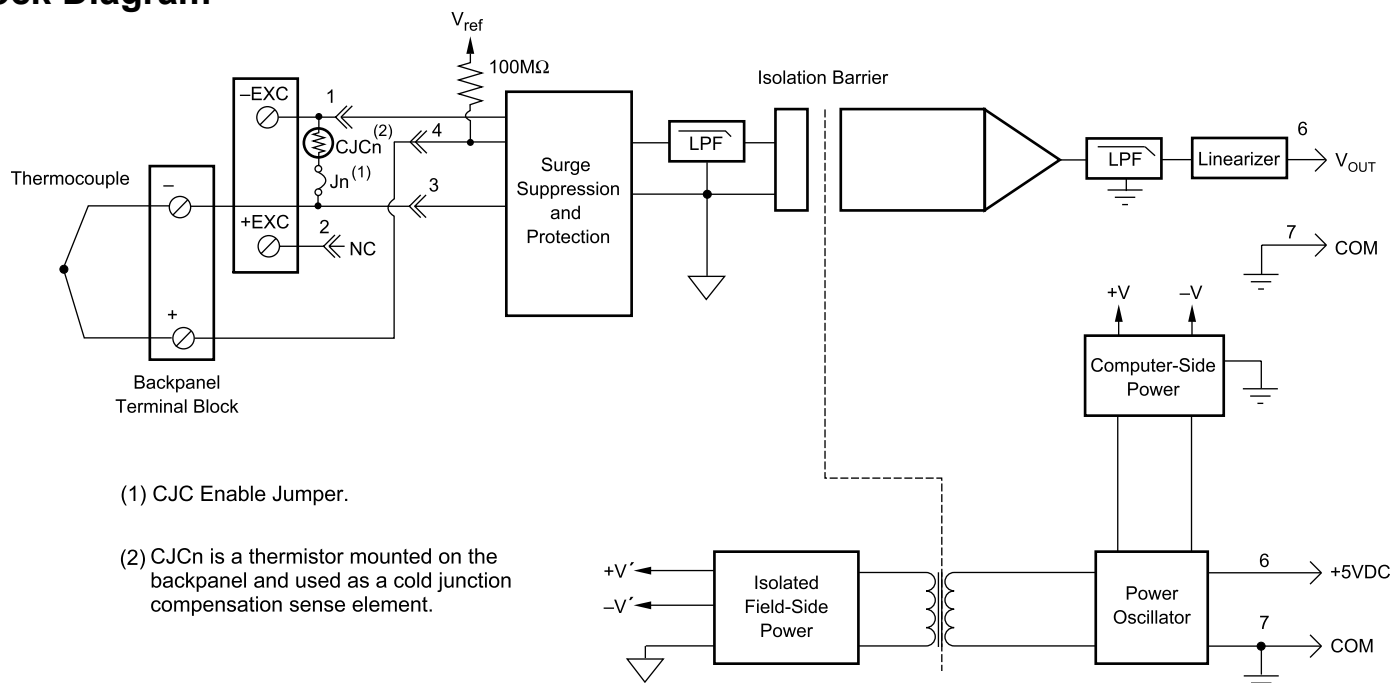
SPECIFICATIONS

Typical at $T_A = +25^\circ\text{C}$ and +5V Power

		DI-8B47
Input Range		-0.1V to +0.5V
Input Bias Current		-25nA
Input Resistance		50M Ω 450k Ω 450k Ω
	Normal	50M Ω
	Power Off	450k Ω
	Overload	450k Ω
Input Protection		240VAC ANSI/IEEE C37.90.1
	Continuous	240VAC
	Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current		0.25mA
Lead Resistance Effect		$\pm 0.02^\circ\text{C}/\Omega$
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		$\pm 20\text{ppm}/^\circ\text{C}$ $\pm 75\text{ppm}/^\circ\text{C}$
	Offset	$\pm 20\text{ppm}/^\circ\text{C}$
	Gain	$\pm 75\text{ppm}/^\circ\text{C}$
Noise		250 μ Vrms
	Output, 100kHz	250 μ Vrms
Bandwidth, -3dB		3Hz
Response Time, 90% Span		150ms
Output Range		0 to +5V
Output Protection		Continuous Short to Ground ANSI/IEEE C37.90.1
	Transient	Continuous Short to Ground ANSI/IEEE C37.90.1
Cold Junction Compensation		$\pm 0.5^\circ\text{C}$ $\pm 1.5^\circ\text{C}$
	Accuracy, 25°C	$\pm 0.5^\circ\text{C}$
	Accuracy, -40°C to +85°C	$\pm 1.5^\circ\text{C}$
Power Supply Voltage		+5VDC $\pm 5\%$
Power Supply Current		30mA
Power Supply Sensitivity		$\pm 25\text{ppm}/\%$
Mechanical Dimensions		1.11" \times 1.65" \times 0.40" (28.1mm \times 41.9mm \times 10.2mm)
Environmental		-40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing
	Operating Temperature	-40°C to +85°C
	Storage Temperature	-40°C to +85°C
	Relative Humidity	0 to 95% Noncondensing

DI-8B47 Linearized Thermocouple Input Module

Block Diagram



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.



241 Springside Drive
Akron, Ohio 44333
330-668-1444

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