## DATAFORTH<sup>®</sup>

# **8B47**

## Linearized Thermocouple Input Modules

### Description

8B modules are an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B47 module isolates, filters, amplifies, and linearizes a single channel of temperature input from a thermocouple and provides an analog voltage output (Figure 1).

Linearization is accomplished using a four breakpoint piecewise linear approximation.

The 8B47 can interface to industry standard thermocouple types J, K, and T and has an output signal of 0 to +5V. Each module is coldjunction 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 3-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 8B47 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

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

#### **Features**

- Interfaces to Types J, K, and T Thermocouples
- Linearizes Thermocouple Signal
- High-Level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- Low Drift with Ambient Temperature
- Accurate CJC -40°C to +85°C
- C-UL-US Listed
- CE Compliant
- ATEX Compliance Pending
- Mix and Match Module Types on Backpanel

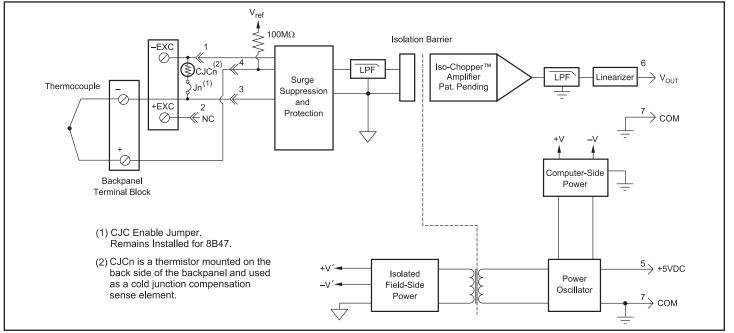


Figure 1: 8B47 Blok Diagram

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#### For information call 800-444-7644

#### **Specifications** Typical\* at T<sub>A</sub> = +25°C and +5VDC power

Ordering I	nformation

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A 1
8B47
−0.1V to +0.5V −25nA
50ΜΩ 200kΩ 200kΩ
240VAC ANSI/IEEE C37.90.1
1500Vrms max ANSI/IEEE C37.90.1 120dB 70dB at 60Hz
See Ordering Information
±20ppm/°C ±75ppm/°C
250µVrms 3Hz 150ms
0V to +5V Continuous Short to Ground ANSI/IEEE C37.90.1
±0.5°C ±1.5°C Upscale ≰ 0s
+5VDC ±5% 30mA ±100ppm/%
1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
-40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing ISM, Group 1 Class A ISM, Group 1 Performance A ±0.5% Span Error Performance B

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\*Contact factory or your local Dataforth sales office for maximum values.

(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals. 120VAC between –Input and +EXC or –EXC terminals. 120VAC between +EXC and –EXC terminals.

(2) Includes conformity, hysteresis and repeatability. Does not include CJC accuracy.

Model	TC Type <sup>‡</sup>	Input Range	Output Range	Accuracy <sup>(2)</sup>	
8B47J-01	J	0°C to +760°C (+32°F to +1400°F)	0V to +5V	±0.10%	±0.76°C
8B47J-02	J	–100°C to +300°C (–148°F to +572°F)	0V to +5V	±0.20%	±0.80°C
8B47J-03	J	0°C to +500°C (+32°F to +932°F)	0V to +5V	±0.20%	±1.00°C
8B47J-12	J	–100°C to +760°C (–148°F to +1400°F)	0V to +5V	±0.20%	±1.72°C
8B47K-04	K	0°C to +1000°C (+32°F to +1832°F)	0V to +5V	±0.15%	±1.50°C
8B47K-05	K	0°C to +500°C (+32°F to +932°F)	0V to +5V	±0.15%	±0.75°C
8B47K-13	K	–100°C to +1350°C (–148°F to +2462°F)	0V to +5V	±0.15%	±2.18°C
8B47K-14	K	0°C to +1200°C (+32°F to +2192°F)	0V to +5V	±0.15%	±1.80°C
8B47T-06	Т	–100°C to +400°C (–148°F to +752°F)	0V to +5V	±0.20%	±1.00°C
8B47T-07	Т	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20%	±0.40°C

Output

#### <sup>‡</sup>Thermocouple Alloy Combinations

Standards: DIN IEC 584, ANSI MC96-1-82, JIS C 1602-1981

Туре	Material
J	Iron vs. Copper-Nickel
K	Nickel-Chromium vs. Nickel-Aluminum
T	Copper vs. Copper-Nickel

#### Installation Notes:

- 1.) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-Hazardous Locations Only.
- 2.) WARNING Explosion Hazard Substitution of Any Components May Impair Suitability for Class I, Division 2.
- 3.) WARNING Explosion Hazard Do Not Disconnect Equipment Unless Power Has Been Switched Off or The Area is Known to be Non-Hazardous.

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