



8B34

Linearized 2- or 3-Wire RTD 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 8B34 input module isolates, filters, amplifies, and linearizes a single channel of temperature input from an RTD and provides an analog voltage output (Figure 1).

RTD excitation is provided from the module using two matched current sources. When using a 3-wire connection, this method allows equal currents to flow through the sensor leads, canceling the effects of lead resistances. The excitation currents are small (0.25mA) which minimizes self-heating of the RTD.

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 8B34 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 100Ω Platinum RTDs
- Linearizes RTD 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
- C-UL-US Listed
- CE Compliant
- ATEX Compliance Pending
- Mix and Match Module Types on Backpanel

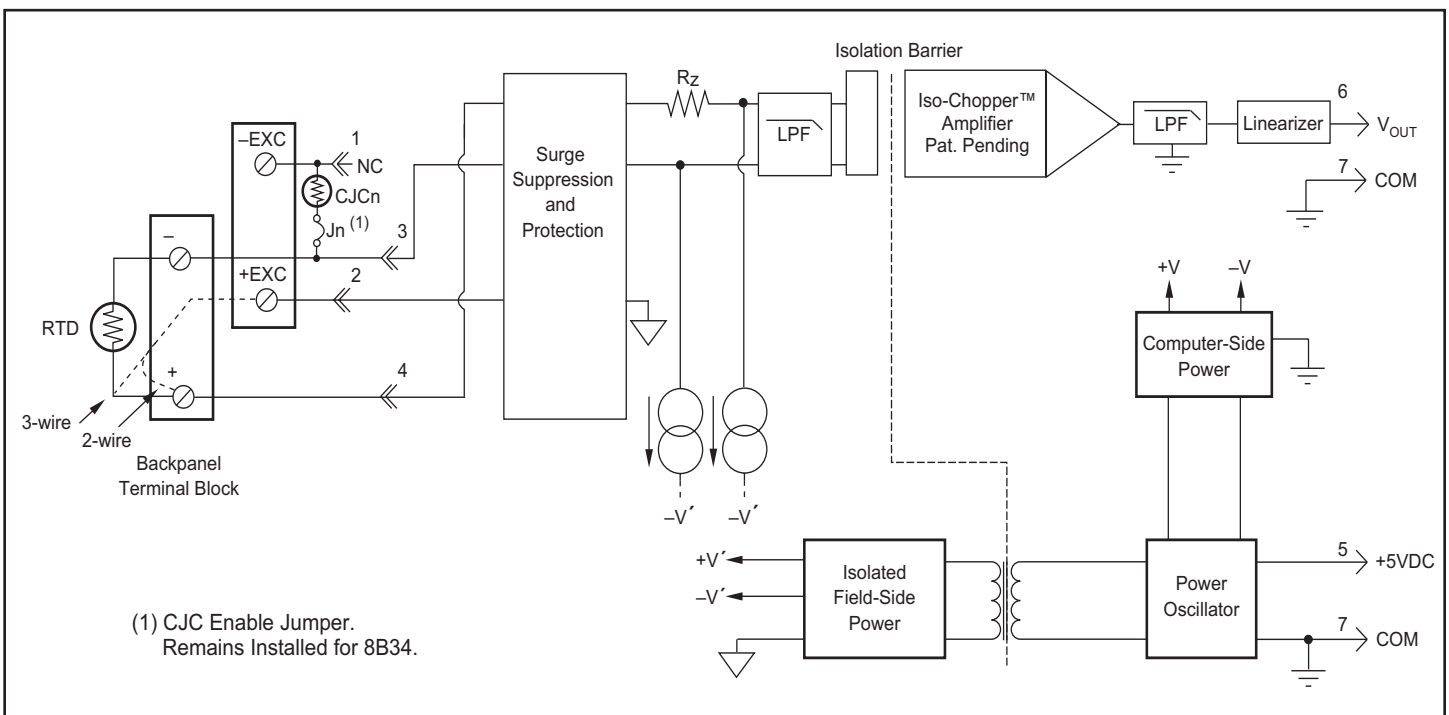


Figure 1: 8B34 Block Diagram

Specifications Typical* at T_A = +25°C and +5VDC power

| Module | 8B34 |
|------------------------------------|---|
| Input Range Limits | -200°C to +850°C (100Ω Pt) |
| Input Resistance | |
| Normal | 50MΩ |
| Power Off | 200kΩ |
| Overload | 200kΩ |
| Input Protection | |
| Continuous ⁽¹⁾ | 240VAC |
| Transient | ANSI/IEEE C37.90.1 |
| Sensor Excitation Current | 0.25mA |
| Lead Resistance Effect | ±0.02°C/Ω ⁽²⁾ |
| CMV, Input to Output | 1500Vrms max |
| Transient, Input to Output | ANSI/IEEE C37.90.1 |
| CMR (50 or 60Hz) | 120dB |
| NMR | 70dB at 60Hz |
| Accuracy | See Ordering Information |
| Stability | |
| Offset | ±20ppm/°C |
| Gain | ±50ppm/°C |
| Noise | |
| Output, 100kHz | 200μVrms |
| Bandwidth, -3dB | 3Hz |
| Response Time, 90% Span | 150ms |
| Output Range | See Ordering Information |
| Output Protection | Continuous Short to Ground |
| Transient | ANSI/IEEE C37.90.1 |
| Open Input Response | Downscale |
| Open Input Detection Time | 1s |
| Power Supply Voltage | +5VDC ±5% |
| Power Supply Current | 25mA |
| Power Supply Sensitivity | ±75ppm/% |
| Mechanical Dimensions (h)(w)(d) | 1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm) |
| Environmental | |
| Operating Temperature Range | -40°C to +85°C |
| Storage Temperature Range | -40°C to +85°C |
| Relative Humidity | 0 to 95% Noncondensing |
| Emissions EN61000-6-4 | ISM, Group 1 |
| Radiated, Conducted | Class A |
| Immunity EN61000-6-2 | ISM, Group 1 |
| RF | Performance A ±0.5% Span Error |
| ESD, EFT | Performance B |

NOTES :

*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) "Ω" refers to the resistance in one lead.

(3) Includes conformity, hysteresis and repeatability.

Ordering Information

| Model | Input Range | Output Range | Accuracy ⁽³⁾ |
|-------------------|--|--------------|-------------------------|
| 100Ω Pt ** | | | |
| 8B34-01 | -100°C to +100°C (-148°F to +212°F) | 0V to +5V | ±0.20°C |
| 8B34-02 | 0°C to +100°C (+32°F to +212°F) | 0V to +5V | ±0.10°C |
| 8B34-03 | 0°C to +200°C (+32°F to +392°F) | 0V to +5V | ±0.20°C |
| 8B34-04 | 0°C to +600°C (+32°F to +1112°F) | 0V to +5V | ±0.45°C |

****RTD Standards**

| Type | Alpha Coefficient | DIN | JIS | IEC |
|---------|-------------------|-----------|-----------------|---------|
| 100Ω Pt | 0.00385 | DIN 43760 | JIS C 1604-1989 | IEC 751 |

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.