

# 8B35

## Linearized 4-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 8B35 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 a precision current source. Excitation current does not flow in the input signal leads, which allows RTD measurements to be made independently of lead resistance. 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 the 8B35 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
- True 4-Wire Input
- 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

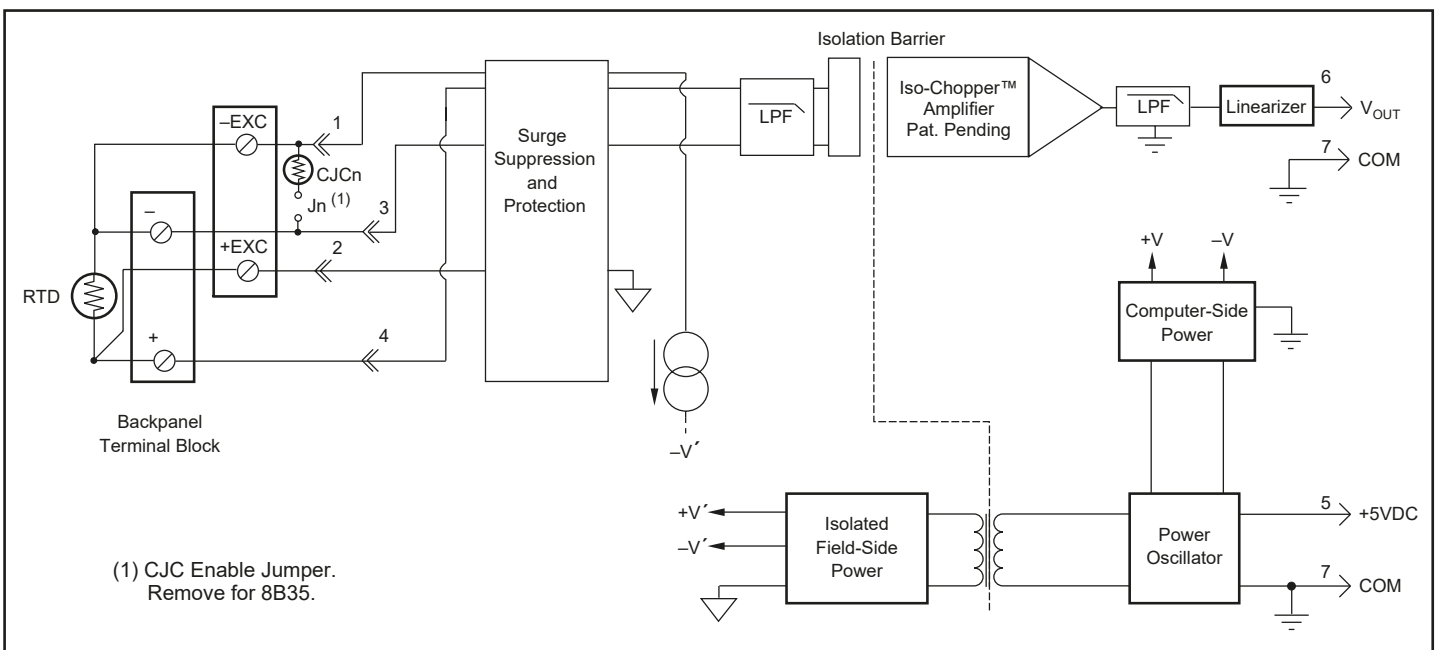


Figure 1: 8B35 Block Diagram

## Specifications

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

| Module                             | 8B35  |
|------------------------------------|---|
| Input Range Limits                 | –200°C to +850°C (100Ω Pt)                          |
| Input Resistance                   |   |
| Normal                             | 50MΩ  |
| Power Off                          | 200kΩ   |
| Overload                           | 200kΩ   |
| Input Protection                   |   |
| Continuous <sup>(1)</sup>          | 240VAC  |
| Transient                          | ANSI/IEEE C37.90.1                                  |
| Sensor Excitation Current          | 0.25mA  |
| Lead Resistance Effect             | ±0.005°C/Ω <sup>(2)</sup>                           |
| 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                |   |
| +EXC, –EXC lead                    | Downscale, 1s                                       |
| –IN lead                           | Downscale, 40s                                      |
| +IN lead                           | Upscale, 40s  |
| Power Supply Voltage               | +5VDC ±5%   |
| Power Supply Current               | 25mA  |
| Power Supply Sensitivity           | ±75ppm/%  |
| Mechanical Dimensions<br>(h)(w)(d) | 1.11" x 1.65" x 0.40"<br>(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 <sup>(3)</sup> |
|-------------------|--|--------------|-------------------------|
| <b>100Ω Pt **</b> |  |              |                         |
| 8B35-01           | –100°C to +100°C<br>(–148°F to +212°F) | 0V to +5V    | ±0.20°C                 |
| 8B35-02           | 0°C to +100°C<br>(+32°F to +212°F)     | 0V to +5V    | ±0.10°C                 |
| 8B35-03           | 0°C to +200°C<br>(+32°F to +392°F)     | 0V to +5V    | ±0.20°C                 |
| 8B35-04           | 0°C to +600°C<br>(+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.