



# 8B36

## Potentiometer 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 8B36 input module isolates, filters, and amplifies a single channel of potentiometer input and provides an analog voltage output (Figure 1).

Excitation for the potentiometer is provided by 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 (equal to or less than 0.25mA) which minimizes self-heating of the potentiometer.

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 8B36 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 Potentiometers up to 10,000Ω
- High-Level Voltage Output
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 120dB CMR
- 70dB NMR at 60Hz
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- C-UL-US Listed
- CE Compliant
- ATEX Compliance Pending
- Mix and Match Module Types on Backpanel

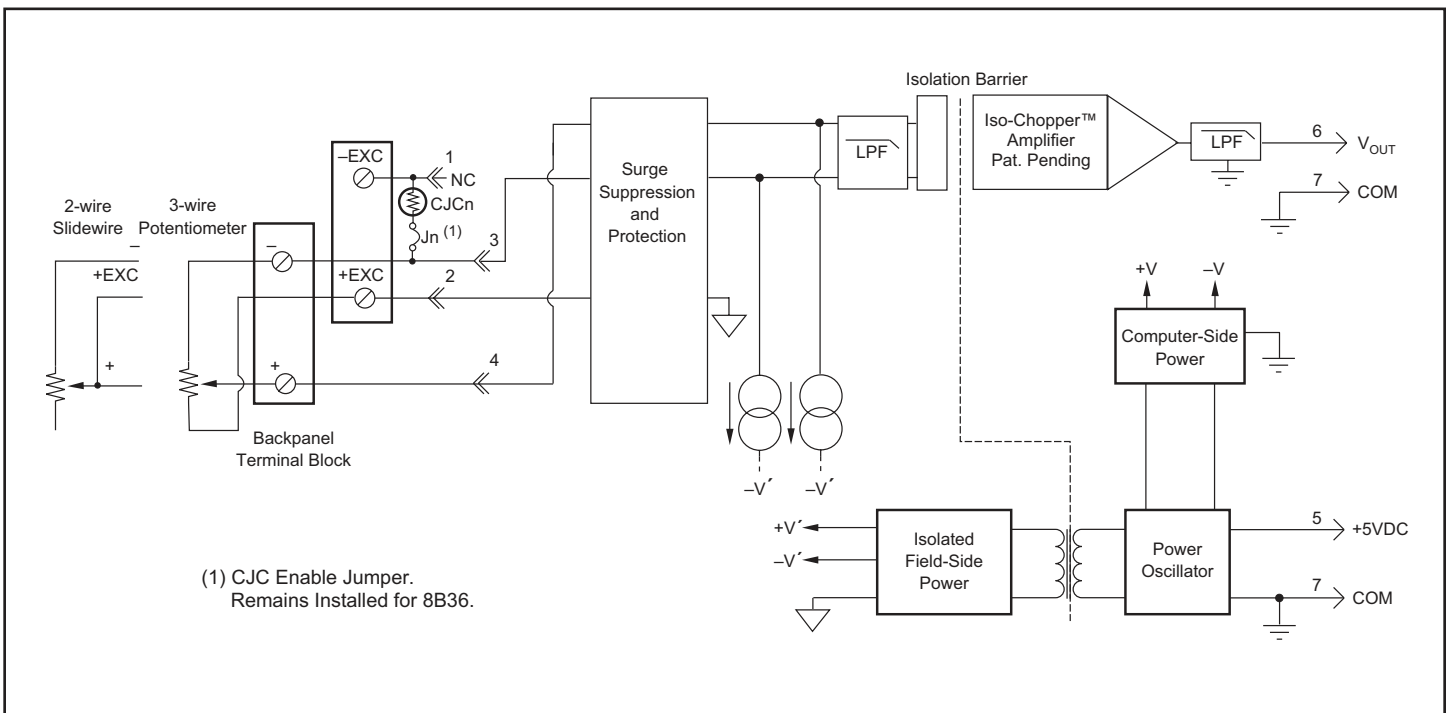


Figure 1: 8B36 Block Diagram

**Specifications** Typical\* at  $T_A = +25^\circ\text{C}$  and +5VDC power

Module	8B36
Input Range	0 to 10k $\Omega$
Input Resistance	
Normal	50M $\Omega$
Power Off	200k $\Omega$
Overload	200k $\Omega$
Input Protection	
Continuous <sup>(1)</sup>	240VAC
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA; 100 $\Omega$ , 500 $\Omega$ , 1k $\Omega$ Sensor 0.10mA; 10k $\Omega$ Sensor
Lead Resistance Effect	$\pm 0.01\Omega/\Omega$ ; 100 $\Omega$ , 500 $\Omega$ , 1k $\Omega$ Sensor $\pm 0.02\Omega/\Omega$ ; 10k $\Omega$ Sensor
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 <sup>(2)</sup>	$\pm 0.05\%$ Span
Linearity	$\pm 0.02\%$ Span
Stability	
Offset	$\pm 20\text{ppm}/^\circ\text{C}$
Gain	$\pm 50\text{ppm}/^\circ\text{C}$
Noise	
Output, 100kHz	200 $\mu\text{Vrms}$
Bandwidth, -3dB	3Hz
Response Time, 90% Span	150ms
Output Range	0V to +5V
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 $\pm 5\%$
Power Supply Current	25mA
Power Supply Sensitivity	$\pm 75\text{ppm}/\%$
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 $^\circ\text{C}$ to +85 $^\circ\text{C}$
Storage Temperature Range	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
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 $\pm 0.5\%$ 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.

(2) Includes linearity, hysteresis and repeatability.

**Ordering Information**

Model	Input Range	Output Range
8B36-01	0 to 100 $\Omega$	0V to +5V
8B36-02	0 to 500 $\Omega$	0V to +5V
8B36-03	0 to 1k $\Omega$	0V to +5V
8B36-04	0 to 10k $\Omega$	0V to +5V

**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.