

# DI-5B43 Isolated DC Transducer Amplifier Input Modules

## FEATURES

- Interfaces to DC Displacement Transducers and Other Devices Requiring a Stable DC Supply
- High Level Voltage Outputs
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1-1989 Transient Protection
- Input Protected to 240VAC Continuous
- Fully Isolated Excitation Supply
- 100dB CMR
- 1KHz Signal Bandwidth
- $\pm 0.10\%$  Accuracy
- $\pm 0.02\%$  Linearity
- $\pm 20\mu\text{V}/^\circ\text{C}$  Drift
- CSA Certified; CE Compliant
- Mix and Match DI-5B Types

## DESCRIPTION

Each DI-5B43 displacement transducer module provides a single channel of displacement transducer input which is filtered, isolated, scaled, and converted to a high level analog voltage output (see block diagram). This voltage output is logic switch controlled, which allows these modules to share a common analog bus without the requirement of external multiplexers.

The DI-5B modules are designed with a completely isolated computer side circuit which can be floated to  $\pm 50\text{V}$  from Power Common, pin 16. This complete isolation means that no connection is required between I/O Common and Power Common for proper operation of the output switch. If desired, the output switch can be turned on continuously by simply connecting pin 22, the Read-Enable pin to I/O Common, pin 19.

The DI-5B43 can interface to DC displacement transducers and other devices which require a precision 10VDC supply and produce a high level output. The 1kHz bandwidth significantly reduces ripple and noise inherent in these devices.

Transducer excitation is provided from the module by a very stable 10V source. The excitation supply is fully isolated, allowing the amplifier inputs to operate over the full range of the excitation voltage. This feature offers significant flexibility in real world applications. Ten full scale input ranges are provided, from  $\pm 1\text{V}$  to  $\pm 10\text{V}$ , producing  $\pm 5\text{V}$  full scale output.

The input signal is processed through a preamplifier on the field side of the isolation barrier. This preamplifier has a gain-bandwidth product of 5MHz and is bandwidth limited to 1kHz. After amplification, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ . Special input circuits on the DI-5B43 module provide protection of the signal inputs and the isolated excitation supply up to 240VAC.

## SPECIFICATIONS

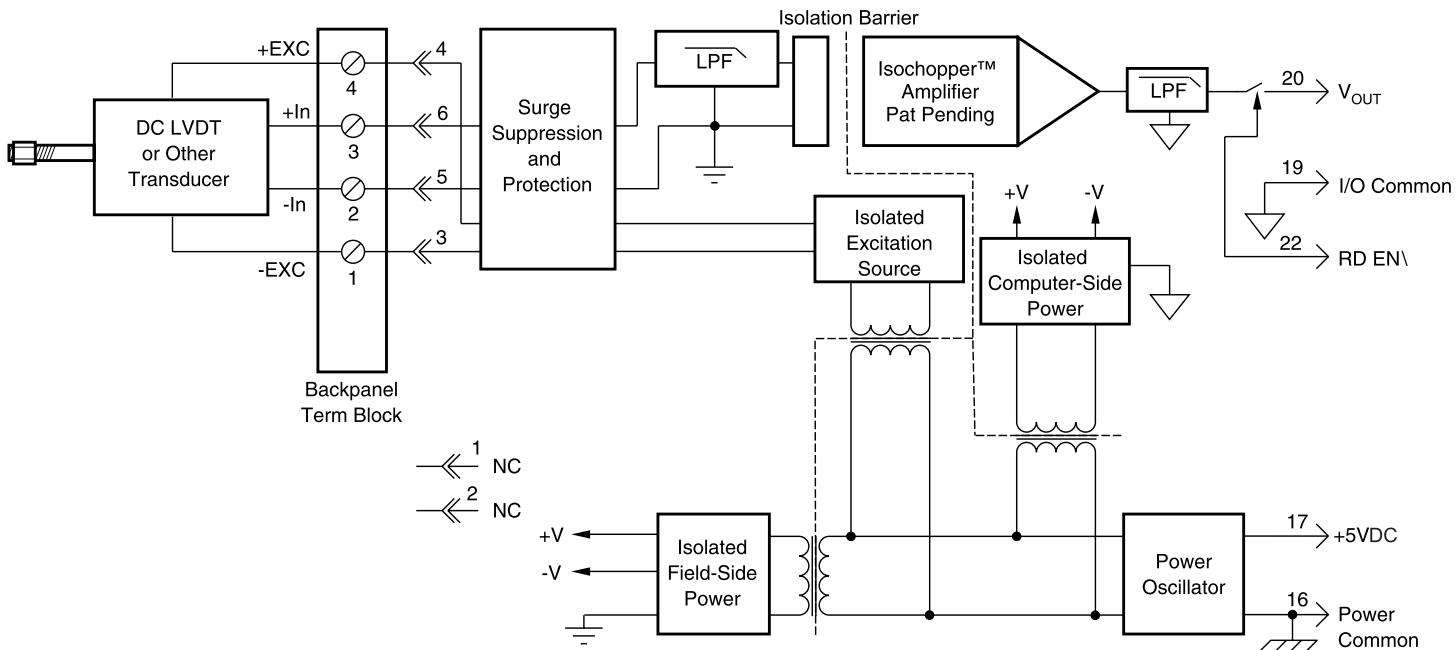
Typical at  $T_A = +25^\circ\text{C}$  and +5V Power

		<b>DI-5B43</b>
Input Range		$\pm 1\text{V}$ to $\pm 10\text{V}$
Input Bias Current		$\pm 0.05\text{nA}$
Input Resistance:	Normal Power Off Overload	2M $\Omega$ (minimum) 2M $\Omega$ (minimum) 2M $\Omega$ (minimum)
Input Protection:	Continuous Transient	240Vrms max ANSI/IEEE C37.90.1-1989
Excitation Voltage, $V_{\text{exc}}$		+10.0Vdc $\pm 2\text{mV}$
Excitation Current		40mA (maximum)
Excitation Load Regulation		$\pm 5\text{ppm}/\text{mA}$
Excitation Stability		$\pm 15\text{ppm}/^\circ\text{C}$
Isolated Excitation Protection:		240Vrms max ANSI/IEEE C37.90.1-1989
CMV, Input to Output: Continuous Transient		1500Vrms max ANSI/IEEE C37.90.1-1989
CMR (50Hz or 60Hz)		100dB
NMR (-3db at 1kHz)		120db per decade above 1kHz
Accuracy*		$\pm 0.1\%$ Span $\pm 10\mu\text{V}$ RTI
Nonlinearity		$\pm 0.02\%$ Span
Stability:	Input Offset Output Offset Gain	$\pm 20\mu\text{V}/^\circ\text{C}$ $\pm 40\mu\text{V}/^\circ\text{C}$ $\pm 50\text{ppm}/^\circ\text{C}$
Noise:	Input, 0.1Hz to 10Hz Output, 100kHz	0.4 $\mu\text{V}$ rms 5mV p-p
Bandwidth, -3dB		1kHz
Response Time, 90% Span		750 $\mu\text{s}$
Output Range		$\pm 5\text{V}$
Output Resistance		50 $\Omega$
Output Protection		Continuous Short to Ground
Output Selection Time (to $\pm 1\text{mV}$ of $V_{\text{out}}$ )		6 $\mu\text{s}$ at $C_{\text{load}} = 0$ to 2000pF
Output Enable Control		
	Max Logic "0"	+0.8V
	Min Logic "1"	+2.4V
	Max Logic "1"	+36V
	Input Current, "0,1"	0.5 $\mu\text{A}$
Power Supply Voltage		+5VDC $\pm 5\%$
Power Supply Current		200mA full excitation load 100mA no excitation load
Power Supply Sensitivity		$\pm 200\mu\text{V}/\%$ RTI*
Mechanical Dimensions		2.28" $\times$ 2.26" $\times$ 0.60" (58mm $\times$ 57mm $\times$ 15mm)
Environmental		
	Operating Temperature	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
	Storage Temperature	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
	Relative Humidity	0 to 95% Noncondensing
	RFI Susceptibility	$\pm 0.5\%$ Span Error at 400MHz, 5W, 3ft

\*Includes nonlinearity, hysteresis and repeatability; RTI=Referenced to Input.

# DI-5B43 Isolated DC Transducer Amplifier Input Modules

## Block Diagram



## Ordering Information

Model Number	Maximum Input	Excitation
DI-5B43-01	±1V	+10.0Vdc @ 40mA
DI-5B43-02	±2V	+10.0Vdc @ 40mA
DI-5B43-03	±3V	+10.0Vdc @ 40mA
DI-5B43-04	±4V	+10.0Vdc @ 40mA
DI-5B43-05	±5V	+10.0Vdc @ 40mA
DI-5B43-06	±6V	+10.0Vdc @ 40mA
DI-5B43-07	±7V	+10.0Vdc @ 40mA
DI-5B43-08	±8V	+10.0Vdc @ 40mA
DI-5B43-09	±9V	+10.0Vdc @ 40mA
DI-5B43-10	±10V	+10.0Vdc @ 40mA



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

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