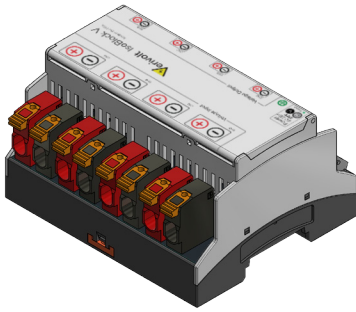# IsoBlock V

Galvanicaly Isolated Differential Voltage Sensor

OVERVIEW

The IsoBlock V module has been designed to provide high-quality isolated differential voltage measurements for aplications requiring scaling of high voltages, as well as superior isolation.

Each IsoBlock V unit hosts four separate isolated channels, each of which can be connected to separate measurement sources while providing a range of functional coverage up to 1500V. The input of each specific IsoBlock channel has its own isolated reference, and can be configured to suit user needs. All processed signals output from the IsoBlock unit are referenced in respect to the ground channel of the user's data acquisition system.

Verivolt designs its IsoBlock V modules with consideration for user great flexibility, high channel-density and low power consumption.

SPECIFICATION

IsoBlock V	50V	100V	200V	300V	500V	750V	1000V	1500V
Bandwidth (-3dB point)	100kHz (100kHz to 1MHz custom)							
Differential input dynamic range	50V	100V	200 V	300 V	500 V	7500 V	1000 V	1500 V

Eletrical

Accuracy (percentage of reading)	±(0.2% of reading + 0.005% range) or ±(0.1% of reading + 0.005% range)
Max total phase shift at 60Hz	< 0.05°
Max Input delay (100kHz versions)	< 2.8 µs
Isolation voltage from primary to secondary	> ±1500 V
Withstanding common mode surge voltage	±5000 V
Withstanding differential mode surge voltage	±2500 V

Mechanical

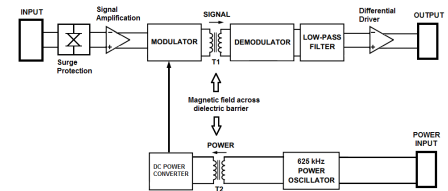|	
Mounting Type	DIN Rail
Connectivity (Connector for power in and signal out to/from the sensor)	Spring Cage connector
Outer Dimensions	3.9" x 3.5" x 2.5"
Channels	4 channels
Weight	198 g (7.0 oz)

Performance

Input-Output non-linearity	< ±0.04%
Integrated channel noise (Referenced to output)	< 1.2 mV
Output voltage	±10V (±5V custom)
Gain temperature drift	±50 ppm/°C
Common mode rejection at 60Hz	112 dB
Power Supply Voltage *	12V to 28 V
Output type	Differential pair
Output Offset Voltage (Referenced to output)	2σ < ±500 µV (typical) 4σ < ±1 mV (limit)
Differential Input impedance	> 10 MΩ
Insulation impedance	> 10 GΩ || 2pF
Output impedance	100Ω

Environmental

Operating temperature	– 25 to 70 °C
Storage temperature	– 40 to 80 °C

* New powering voltage range since January of 2020

HARDWARE DESCRIPTION

The IsoBlock V module is designed to isolate and scale down high voltages found in industrial enviroments. The end result is a signal ready to connect to any data acquisition system, while galvanically isolating the source from it.

Each channel of the IsoBlock module has a galvanic isolation from the input to the output that can eliminate large common mode voltages. In addition to that, each channel also has a protection stage at the input that guards it from surges.

Following the input surge protection stage, there is an amplification stage that brings the input signal to a ±10V range. This signal is modulated into a magnetic field, and then transferred across a galvanic barrier. A demodulating stage recovers the original signal, followed by an anti-aliasing filter and a conditioning stage to output a ±10V differential pair. The figure below shows a block diagram of the process decribed above.

IsoBlock V single channel block diagram.

- The isolation barrier of every device is tested with a 5 second partial discharge of 1800V for 5 seconds, with a detection threshold of 150pC.
- Withstanding common mode surge voltage is 2 seconds half sinewave.
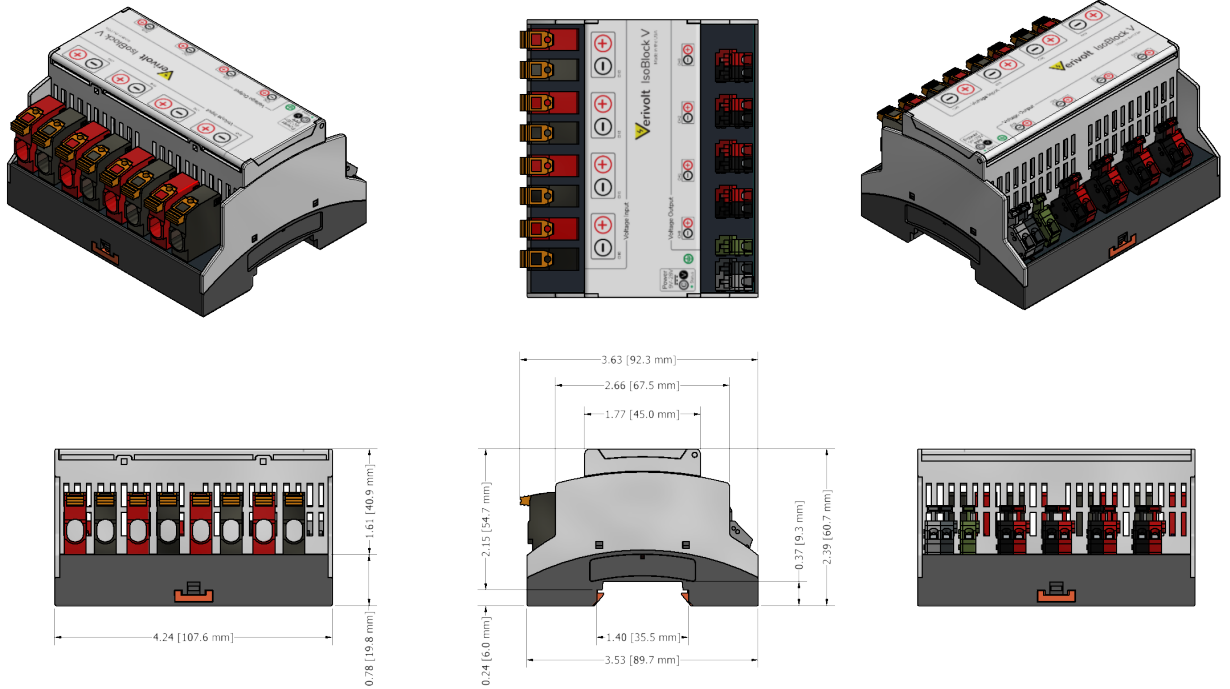- Withstanding differential mode surge voltage is 4 seconds half sinewave.

MERCHANICAL DIMENSIONS

HARDWARE CONFIGURATION

A. Connect external power source to power the unit. For proper functioning the power supply should provide a voltage between 12V and 28V with at least 4W continuous and three times surge during module start-up. (10ms)

B. Securely connect wire in the 20-6 AWG range between the source of measurement and an available IsoBlock's input spring cage terminal.

C. Securely connect one end of a twisted pair to the output terminals, and the other end to the inputs of your data acquisition unit

A

GND
Vsup
COM

B

+ Signal In
- Signal In

C

+Signal Out
-Signal Out
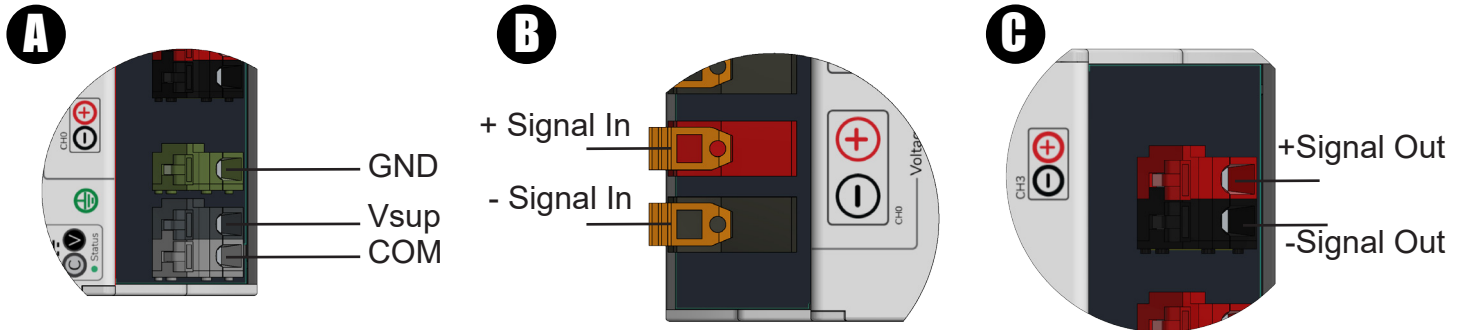
Standards and Certifications

● CE

$\mathsf{C}\mathsf{E}$