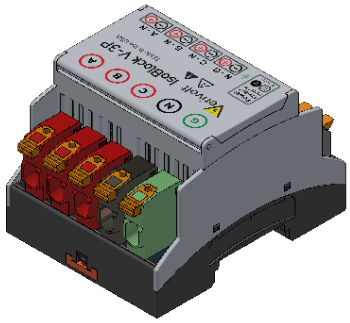
IsoBlock V-3P

Galvanicaly Isolated Differential Voltage Sensor



OVERVIEW

The IsoBlock V-3P module has been designed for high quality three-phase plus Neutral measurements in a very compact form factor, without need for power supplies. This module covers multiple ranges from 150VAC to 1000VAC, with up to 100kHz bandwidth and as high as 0.1% accuracy. The IsoBlock V-3P module operates as a differential divider network with an anti-aliasing filter on its output. It generates a 7VAC scaled down version of the input terminals. Depending on the software configuration, the sensor outputs phase-to-phase voltages for Delta configuration, or phase-to-neutral for Wye configurations. This signal can then be processed by most computer based measurement platforms.

The input of each specific IsoBlock channel has its own isolated reference, and can be configured to suit user needs. One IsoBlock V-3P replaces 4 differential sensors, and only requires one cable for all four signals. This allows for very high channel densities, while delivering high performance for a low cost.

SPECIFICATION

Electrical	
Accuracy	±(0.2% of reading + 0.005% range) or ±(0.1% of reading + 0.005% range)
Max total phase shift at 60Hz	< 0.05°
Max through delay	3.8 µs
Isolation voltage from primary to secondary	> ±1500 V
Max common mode transient voltage for 1 minute	5000 V
Max differential-mode transient voltage at 65°C	2000V
Mechanical	
Mounting Type	DIN Rail
Connectivity	Spring Cage connector
Channels	4 channels
Weight	198 g (7.0 oz)

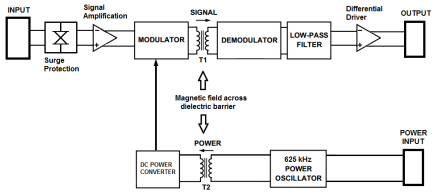
Performance	
Input ranges	±150VAC, ±250VAC, ±500VAC, ±700VAC, ±1000VAC
Bandwidth (-3dB point)	100kHz
Input-Output non-linearity	< 0.04%
Output voltage	7VAC
Gain temperature drift	±50 ppm/°C
Common mode rejection at 60Hz	112 dB
Power Supply Voltage	12V to 28 V
Output type	Differential pair
Output Offset Voltage (Referenced to output)	2σ < ±500 µV (typical) 4σ < ±1 mV (limit)
Differential Input impedance	8MΩ
Insulation impedance	> 10 GΩ || 2pF
Output impedance	20Ω
Environmental	
Operating temperature	– 25 to 70 °C
Storage temperature	– 40 to 80 °C

HARDWARE DESCRIPTION

The IsoBlock V-3P is a differential voltage down-converter designed for 3-phase systems. It outputs all line-to-line and line-to-ground signal pairs. Delta or Wye measurements can be made depending on the input configuration of the digitizer being used (NRSE or Differential).

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



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.

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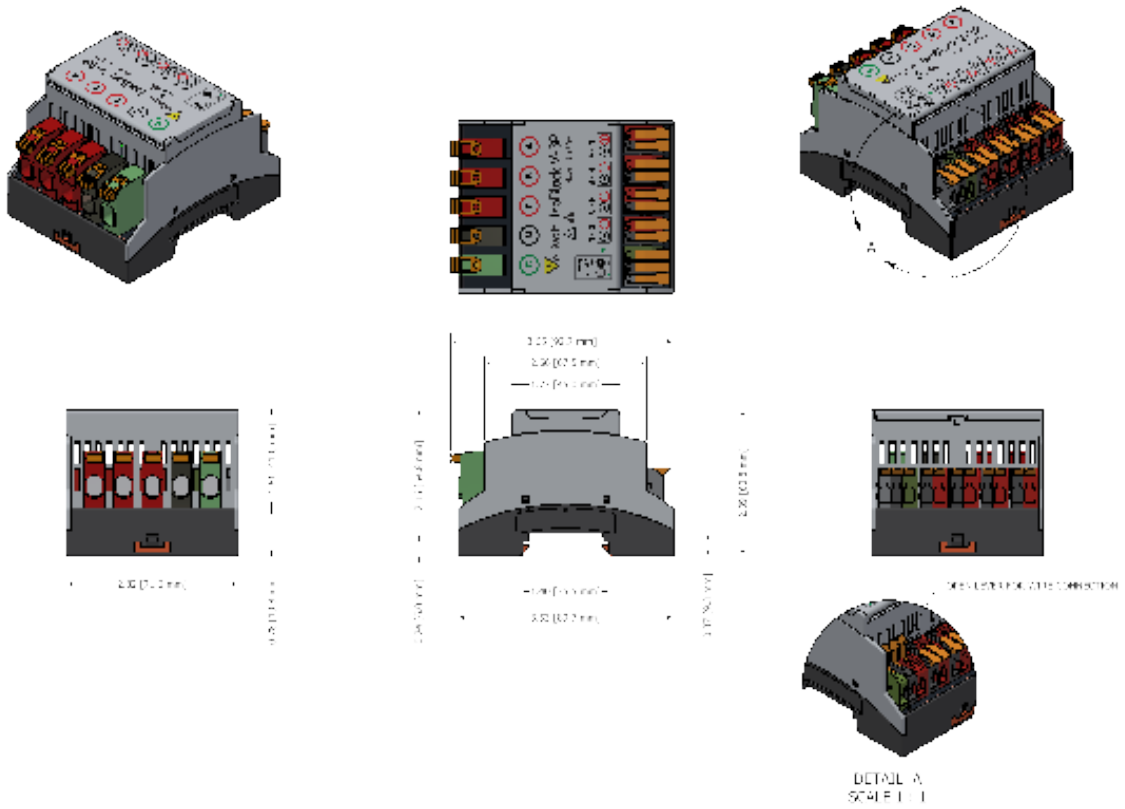
MERCHANICAL DIMENSIONS



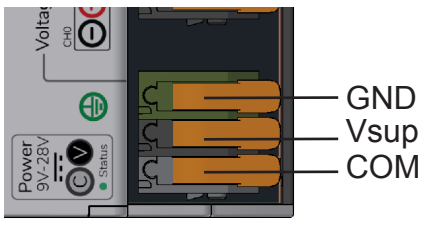
HARDWARE CONFIGURATION

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)

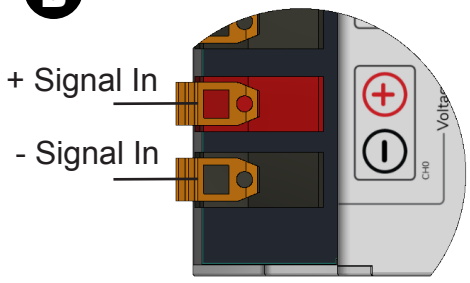
B. Securely connect wire in the 20-6 AWG range between the source of measurement and an available IsoBlock's input spring cage terminal.

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



B



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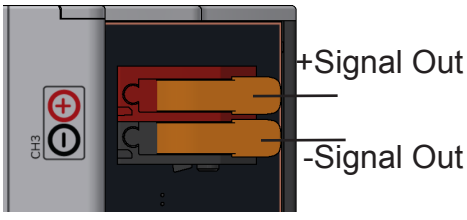

Standards and Certifications

- CE

CE

⚠ WARNING

THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safetyrelated use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.