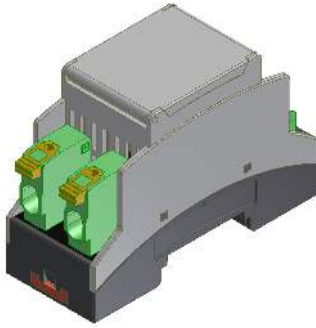


Entube DE

Double Ended - Line to Line Voltage Sensor



OVERVIEW

The Entube-de series is a family of voltage transducers designed for high quality differential measurements in a very compact form factor, and without need for power supplies. This series covers the ranges of $\pm 50V$ to $\pm 1500V$ with up to 50kHz bandwidth and up to 0.2% of signal accuracy.

The Entube-de sensor operates as a differential divider RC-network with an anti-aliasing filter on its output. It generates a $\pm 5V$ or $\pm 10V$ scaled down version of the difference between the two input voltages, which can then be processed by a computer based measurement system.

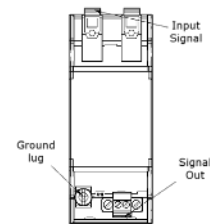
The Entube-de is part of Verivolt's sensing platform, which is aimed at allowing users to laid out multiple distributed sensors with a minimum of cabling required and no power supplies. This platform together with the Entube-de ultra-compact form factor, allows for very high channel densities, while delivering high performance for a low cost.

SPECIFICATION

| Entube DE | 100V | 200V | 300V | 400V | 500V | 750V | 1000V | 1500V |
|--|----------------|--------------|----------------|---------------|---------------|----------------|---------------|---------------|
| Bandwidth (-3dB point) | 85kHz | | 50kHz | | | 25kHz | | |
| Integrated sensor noise (Referenced to input) | < 30 μV | < 60 μV | < 100 μV | < 130 μV | < 170 μV | < 220 μV | < 290 μV | < 400 μV |
| Gain (Using 10V standard output voltage) | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 150 |
| Input Impedance | > 1 M Ω | | > 2 M Ω | | | > 3 M Ω | | |
| Line Output Impedance | 50k Ω | 25k Ω | 33k Ω | 25k Ω | 20k Ω | 20k Ω | 15k Ω | 10k Ω |

HARDWARE DESCRIPTION

The Entube-TE 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).



Signal Layout

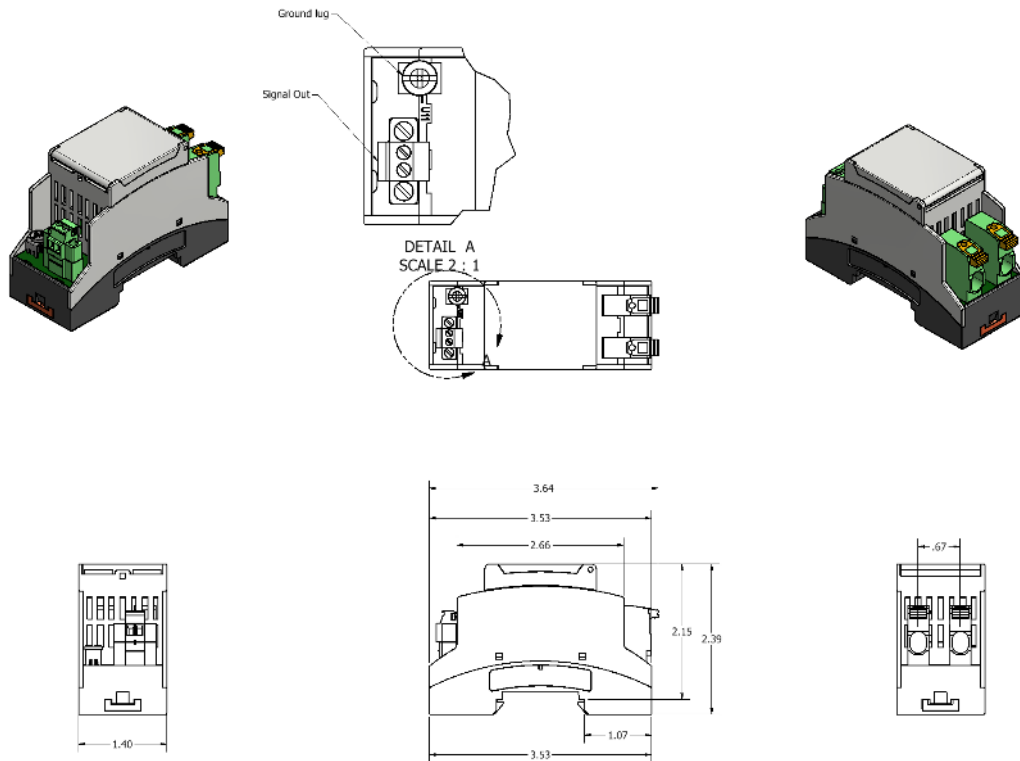
The two input phases connect to the sensor via a Spring-cage, while the conditioned signals from the sensor come out on a standard screw terminals. The Entube DE can be mounted anywhere between the signal source and the data acquisition system. A female-screw on the low voltage side of the sensor allows for DIN rail mounting, and serves as a safety ground.

A twisted pair should be used to carry the conditioned signals from the sensor. This will keep good resolution beyond the 10th harmonic on a typical 60Hz system.

| Electrical | |
|--|--|
| Accuracy (percentage of reading) | $\pm 0.2\%$ ($\pm 0.05\%$ Typical) |
| Gain (Using 10V standard output voltage) | |
| Max total phase shift at 60Hz | < 0.05° |
| Common mode rejection | $\pm 2000V$ |
| Withstanding differential mode surge voltage | $\pm 1000V$ |
| Mechanical | |
| Mounting Type | DIN Rail |
| Connectivity In | Clamp cage |
| Connectivity Out | Spring cage |
| Outer Dimensions | 1.4" x 1.4" x 4.5" |
| Weight | 198 g (7.0 oz) |

| Integrated sensor noise (Referenced to input) | |
|---|--|
| Input-Output non-linearity | < 250 ppm |
| Output voltage | $\pm 5V$ ($\pm 10V$ optional) |
| Gain temperature drift | ± 50 ppm/°C |
| Differential input dynamic range | |
| Common mode rejection | 52 dB |
| Power Supply Voltage | None |
| Output type | Double-ended signal |
| Output Offset Voltage | < $\pm 10\mu V$ (on $\pm 10V$ signal) |
| Environmental | |
| Operating temperature | - 25 to 70 °C |
| Storage temperature | - 40 to 80 °C |

MERCHANICAL DIMENSIONS

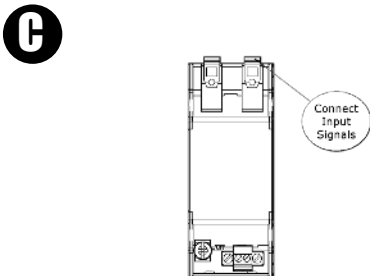
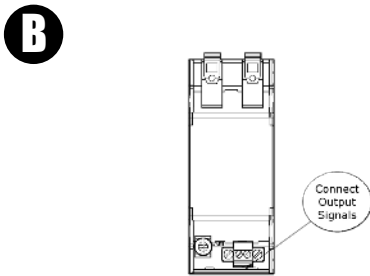
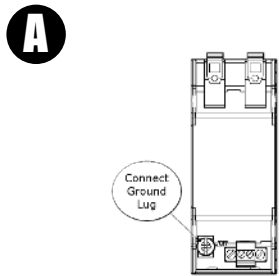


HARDWARE CONFIGURATION

A. Safely connect Data Acquisition ground to ground of sensor.

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

C. Securely connect wire between the source of measurement and an available Entube DE's input clamp cage.



Standards and Certifications

- CE
- RoHS Compliant



DANGER

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 safety-related 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.