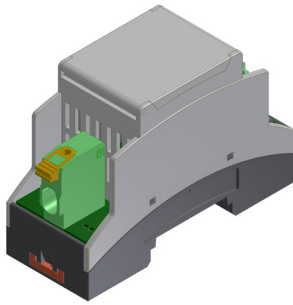


# Entube SE

Single Ended - Voltage Sensor



## OVERVIEW

The Entube SE series is a family of voltage transducers designed for high quality single ended measurements in a very compact form factor, and without need for power supplies. This series covers the ranges of  $\pm 50V$  to  $\pm 2000V$  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.

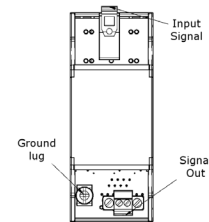
The Entube SE is part of Verivolt's sensing platform, which is aimed at allowing users to laid out multiple distributed sensors with a minimum of cabling required and no power supplies. This platform together with the Entube-de ultra-compact form factor, allows for very high channel densities, while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

## SPECIFICATION

Entube DE	100V	200V	300V	400V	500V	750V	1000V	1500V	2000V
<b>Bandwidth (-3dB point)</b>	85kHz		50kHz			25kHz			
<b>Integrated sensor noise (Referenced to input)</b>	< 30 $\mu V$	< 60 $\mu V$	< 100 $\mu V$	< 130 $\mu V$	< 170 $\mu V$	< 220 $\mu V$	< 290 $\mu V$	< 400 $\mu V$	< 500 $\mu V$
<b>Gain (Using 10V standard output voltage)</b>	10	20	30	40	50	75	100	150	200
<b>Input Impedance</b>	> 1 M $\Omega$		> 2 M $\Omega$			> 3 M $\Omega$			
<b>Line Output Impedance</b>	50k $\Omega$	25k $\Omega$	33k $\Omega$	25k $\Omega$	20k $\Omega$	20k $\Omega$	15k $\Omega$	10k $\Omega$	7.5k $\Omega$

## HARDWARE DESCRIPTION

The Entube SE is a voltage divider designed to measure single phases with reference to ground.



Signal Layout

The input connect to the sensor via a Spring-cage, while the conditioned signals from the sensor come out on a standard screw terminals. The Entube SE 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  $\pm 50$  ppm/°C

### Differential input dynamic range

Common mode rejection 52 dB

Power Supply Voltage None

Output type Double-ended signal

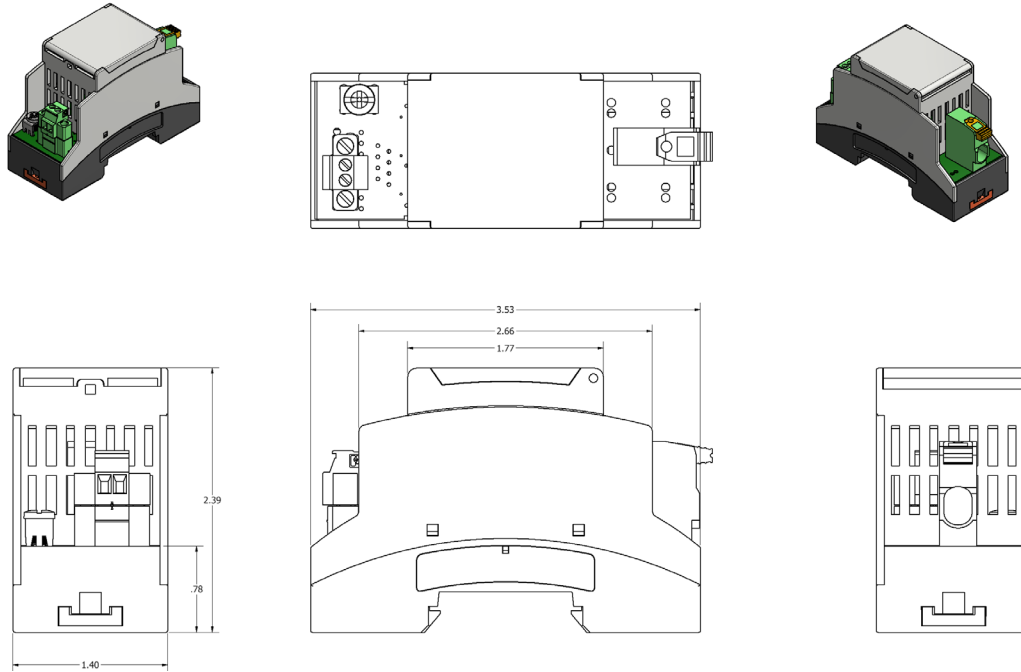
Output Offset Voltage <  $\pm 10\mu V$   
(on  $\pm 10V$  signal)

### Environmental

Operating temperature - 25 to 70 °C

Storage temperature - 40 to 80 °C

# MERCHAL DIMENSIONS



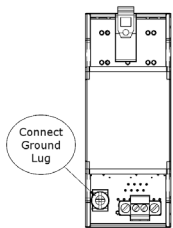
# HARDWARE CONFIGURATION

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

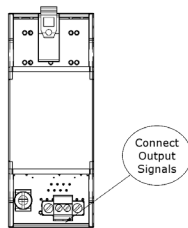
**B.** Securely connect one end of a twisted pair to the output terminals, and the other end to the inputs of your breakout board or data acquisition unit

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

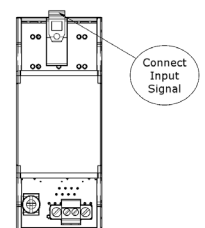
**A**



**B**



**C**



## Standards and Certifications

- CE



## 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.