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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

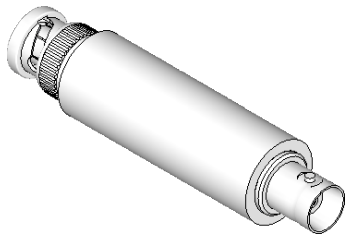
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# 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.

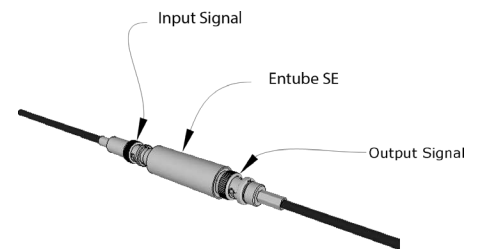
## SPECIFICATION

Entube SE	100V	200V	300V	400V	500V	750V	1000V	1500V
<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 $\mu V$
<b>Gain (Using 10V standard output voltage)</b>	10	20	30	40	50	75	100	150
<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 $\Omega$
<b>Withstanding Voltage</b>	$\pm 1000V$		$\pm 2000V$			$\pm 3000V$		

Mechanical	100V	200V	300V	400V	500V	750V	1000V	1500V
<b>Input connector (1-Pin Coaxial)</b>	BNC					SHV		
<b>Outer Dimensions (Cylindrical shape)</b>	0.68" $\varnothing$ x 3.0"					0.68" $\varnothing$ x 3.29"		
<b>Weight</b>	34 g (1.2 oz)					180g ( 6.3 oz)		

## HARDWARE DESCRIPTION

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



Signal Layout

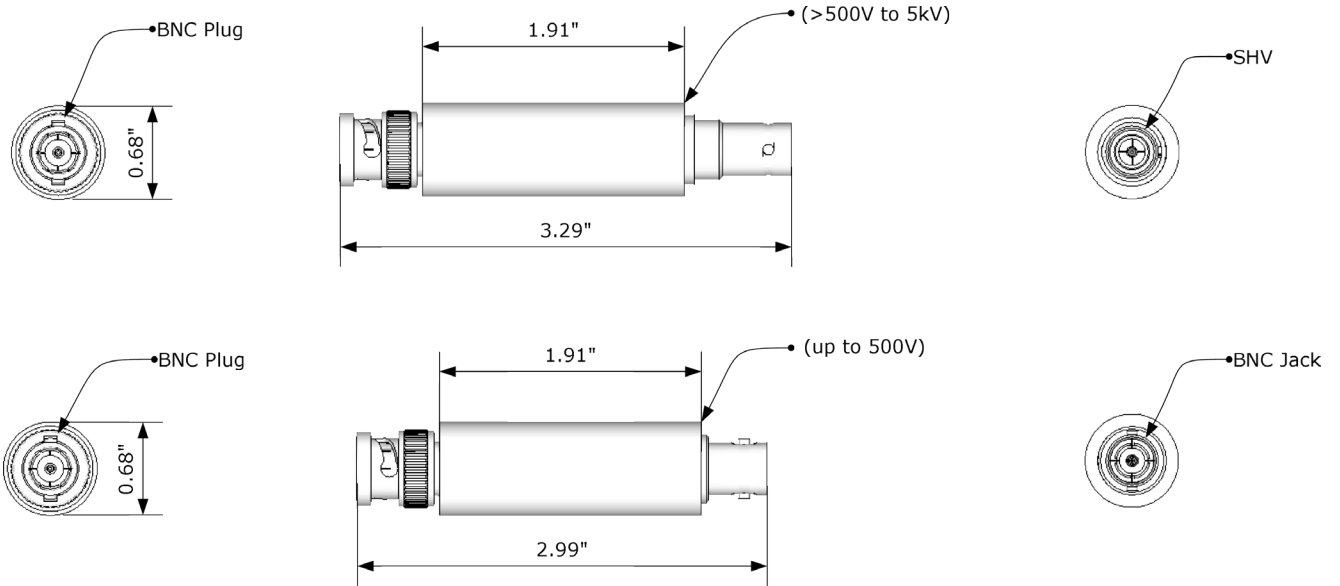
The input connect to the sensor via a Spring-cage, while the conditioned signals from the sensor come out on a standard screw terminals. The Entube SE can be mounted anywhere between the signal source and the data acquisition system. A female-screw on the low voltage side of the sensor allows for DIN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

Integrated sensor noise (Referenced to input)	
Input-Output non-linearity	< 750 ppm
Output voltage	$\pm 5V$ ( $\pm 10V$ optional)
Gain temperature drift	$\pm 50$ ppm/ $^{\circ}C$
Differential input dynamic range	
Power Supply Voltage	None
Output type	Single-ended signal
Output Offset Voltage	< $\pm 10\mu V$ (on $\pm 10V$ signal)
Environmental	
Operating temperature	- 25 to 70 $^{\circ}C$
Storage temperature	- 40 to 80 $^{\circ}C$

Electrical	
Accuracy ( $2\sigma / 3\sigma$ )*	$\pm 0.2\% / 0.4\%$

# MERCHICAL DIMENSIONS

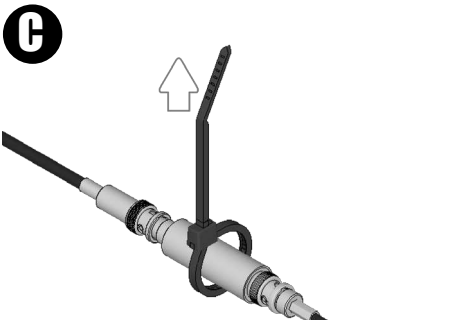
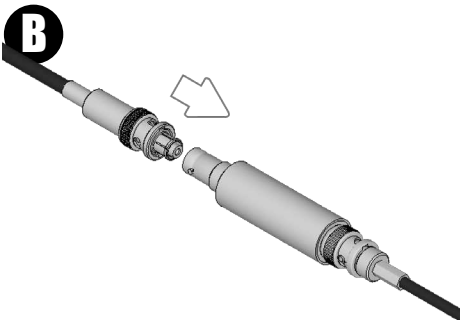
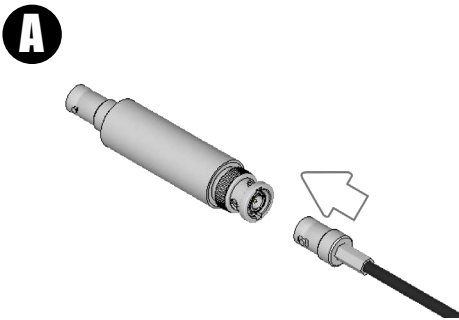


# HARDWARE CONFIGURATION

**A.** SConnect BNC cable to sensor output. Make sure the BNC jack is connected to DAQ or at least properly grounded.

**B.** Make sure Input Signal cable is de-energized to avoid arcing. Verify if input connectors are clean. Plug input signal into input connector of sensor.

**C.** Secure sensor to avoid accidental disconnection during operation



### 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.