



- High Accuracy
- Broad Bandwidth
- Low Zero-drift

Shenzhen Hangzhi Precision Electronics Co., Ltd.

**Product Model:** HCV4000

**Measurement Range:** DC  $\pm$  4000V

**Accuracy:** 0.2%

## HCV4000 High-precision Voltage Sensor

HCV series high-precision voltage sensor is a voltage sensor that can measure DC, AC, pulse and various irregular waveforms under the condition of complete isolation of the primary side and the secondary side. It is mainly used in the field of measurement verification and measurement calibration that requires high accuracy, and rail transit, power quality analysis, power analyzer, medical, aerospace, missile, ship and other fields that require high sensitivity, high stability and high reliability.

### Product photo



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## Features

- ◇ Excellent linearity and accuracy
- ◇ Extremely high resolution
- ◇ Extremely low offset voltage
- ◇ Fast response speed
- ◇ Extremely small angle difference
- ◇ Analog output
- ◇ Extremely high stability and sensitivity
- ◇ Extremely low temperature drift
- ◇ Strong anti-interference ability
- ◇ Extremely low noise
- ◇ Broadband

## Application Domain

- ◇ Metrology Verification and Calibration
- ◇ Instrumentation (such as power analyzer)
- ◇ Battery detection
- ◇ Power
- ◇ New Energy
- ◇ Aerospace
- ◇ Laboratory voltage measurement
- ◇ Medical equipment (such as nuclear magnetic resonance MRI)
- ◇ Power control
- ◇ Ship
- ◇ Rail Transit
- ◇ Industrial Measurement

## Electrical Performance

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Primary RMS voltage	$V_{PN}$	—	—	2800	—	Vac
Measurement voltage	$V_{PM}$	—	—	$\pm 4000$	$\pm 4400$	Vdc
Working voltage	$V_C$	$\pm 5\%$	—	+15	—	Vdc
Power consumption	$I_C$	$V_{PM}$ range	—	$130 + V_S/R_L$	—	mA
Transformation ratio	$K_N$	input: utput	—	4000:10	—	V/V
Secondary rated output voltage	$V_S$	Primary rated voltage	—	$\pm 10$	—	V
Secondary output internal current limiting resistor	$R_{Lin}$		—	100	—	$\Omega$
Secondary output load	$R_L$		—	>2k	—	$\Omega$



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**Remark:**

1. The internal current-limiting resistor of the secondary output is 100 ohms, which is connected in series with the external secondary output load resistor. When sampling, it is necessary to consider the voltage division of the internal current-limiting resistor.

The secondary output load resistance is large enough to ignore the influence of the internal output current limiting resistor voltage divider.

2. The power supply can be a standard +15V power supply, or it can be customized as a +12V single power supply according to customer needs.

### Accuracy Measurement

项目	符号	测试条件	最小值	标称	最大值	单位
Accuracy	$X_e$	Rated voltage, 25±10°C	—	—	0.2	%
Linearity error	$\epsilon_L$	—	—	—	0.1	%
Zero offset current	$V_O$	25±10°C	—	—	±10	mV
Response time	$t_f$	Step response up 90%* $V_{PN}$	—	—	±10	μS
Frequency bandwidth (-3dB)	F	—	0	—	50	kHz

### Safety Characteristics

Parameter	Symbol	Measuring Conditions	Value	Unit
Insulation voltage / Between primary and secondary	Vd	50Hz, 1min	6	KV
Creepage distance / Between primary and shield	$d_{CP}$	—	83	mm
Clearance distance / Between primary and shield	$d_{CI}$	—	76	mm
Comparative tracking index	CTI	—	600	

Remarks: After the customized model has reinforced insulation, the isolation voltage can withstand 10KV.

### General Characteristics

Parameter	Symbol	Measuring Condition	Min	Typ	Max	Unit
Ambient operating temperature	$T_A$	—	-40	—	+75	°C
Storage temperature range	$T_s$	—	-55	—	+95	°C
Mass	M	—	—	610±5		g
primary resistance	$R_p$	—		> 4M		Ω
Primary power consumption (rated)	$P_p$	—		2		W

Remarks: The primary current limiting resistor can be customized according to customer requirements.



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## Application Links and Instructions

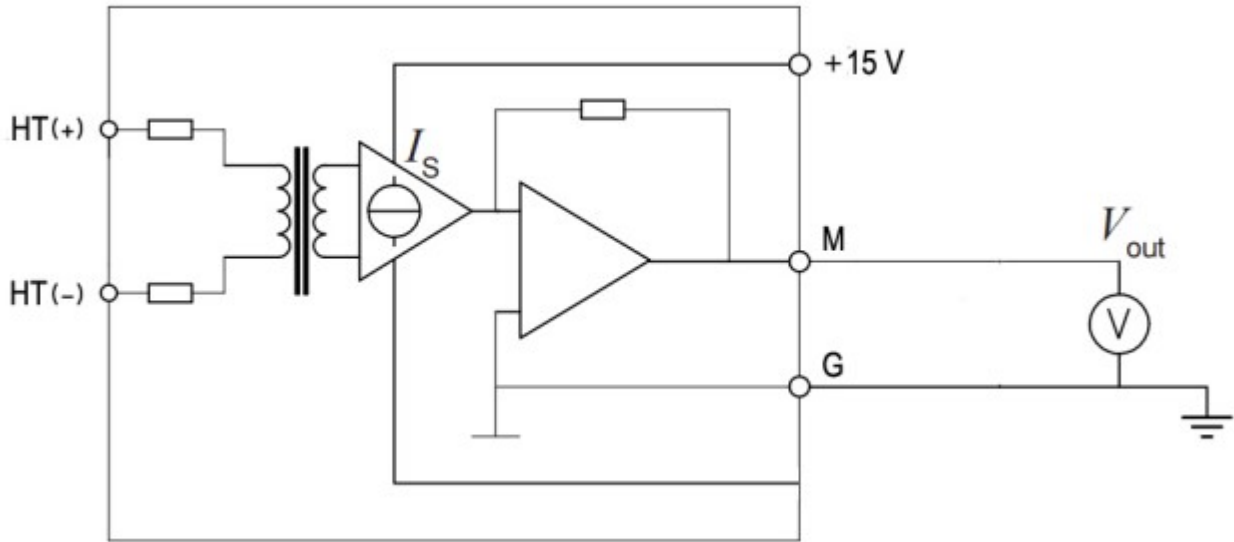


Figure 1 Electrical Connection Diagram

Test instruction:

By measuring the output  $V_{out}$  voltage (relative to GND), the measured voltage  $V_p$  of the primary side can be obtained according to the following formula:

$$V_p = K_N * V_{out}$$

port definition

◇ The input terminal of the measured voltage is two M5 copper studs, and the input terminal is defined as:

HT (+): connected to the positive pole of the measured voltage

HT (-): connected to the negative electrode of the measured voltage

◇ The output terminal is a phoenix terminal with 4 PIN5.08 spacing, and the output terminal is defined as:

+ : +15V

NC: no connection

M : Measurement signal output terminal

G : common ground terminal



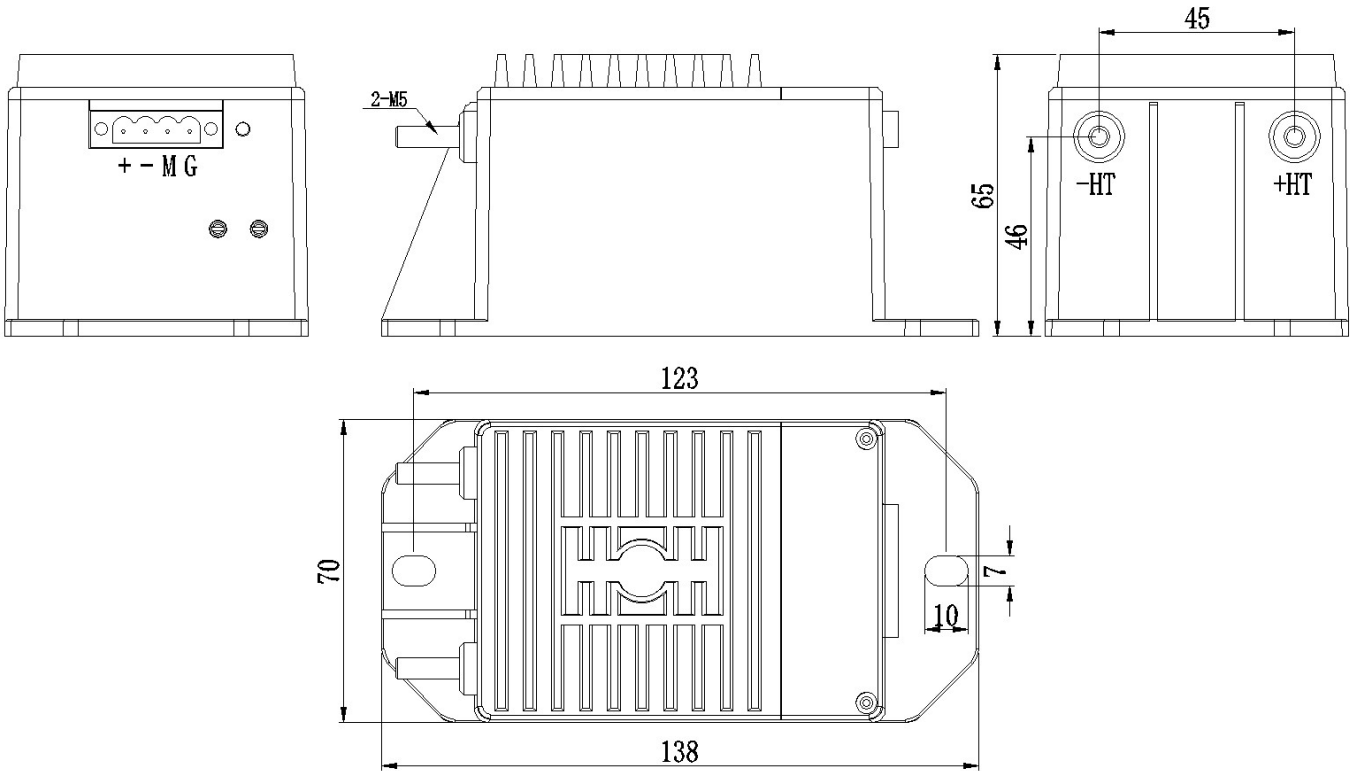
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## Dimensions

Unit: mm



## Packing List & Dimensions

Package dimensions (L x W x H): 157mm x 155mm x 100mm

Item	Description	Quantity	Comments
HCV4000	Voltage sensor	1	/
	Phoenix terminal	1	/