



# **Current Sensor User Manual**

**CNE301I-SP1**

**V1.03**



**湖南银河电气有限公司**  
HUNAN YINHE ELECTRIC CO., LTD.

## Thank you for choosing the YINHE ELECTRIC Current Sensor

This manual is provided by HUNAN YINHE ELECTRIC Co., Ltd. for the current sensor. It offers users relevant precautions for installation and debugging, operation and use, as well as daily maintenance. Please read it carefully before installation and use. This manual is provided with the product and should be kept properly for reference and maintenance purposes.

## Statement

We have compiled this manual with great care. However, we do not guarantee the complete accuracy of the content in this manual. Since our products are continuously being improved and updated, we reserve the right to modify the content of this manual at any time without prior notice. We are not liable for any direct, indirect, intentional, or unintentional damage and potential hazards caused by the improper use of the content included in this manual.

## Safety Operation Knowledge

- ◆ Before using the product, please read the user manual carefully.
- ◆ When moving the product, please disconnect the power supply and remove all connected cables first.
- ◆ If you find any damage to the casing, fasteners, power cord, connecting cables, or connected equipment, please immediately disconnect the device from the power source.
- ◆ If there is any doubt about the safe operation of the equipment, please immediately shut down the device and its accessories, and contact our company's technical support department as soon as possible to resolve the issue.

## 1. Product Overview

The CNE301I-SP1 is a current sensor that can measure direct current (DC), alternating current (AC), pulse, and various irregular waveform currents under the condition of complete isolation between the primary and secondary sides. It is mainly used in fields that require high accuracy for metrological verification and calibration, as well as in fields such as new energy, power quality analysis, power analyzers, and medical applications that require high sensitivity, stability, and reliability.

## 2. Technical Features

- Extremely high accuracy
- Excellent linearity
- High stability
- High sensitivity
- High resolution
- Low temperature drift
- Low offset current
- Low insertion loss
- Strong anti-interference capability
- Fast response speed
- Low noise
- Minimal phase difference
- Wide bandwidth
- Analog output

## 3. Application Scenarios

- Metrological verification and calibration
- Laboratory current measurement
- Instrumentation (e.g., power analyzers)
- Medical equipment (e.g., MRI)
- Battery pack inspection
- Power control
- Power supplies
- Ships
- New energy
- Rail transit
- Aerospace
- Industrial measurement

#### 4. Electrical Performance

The following performance indicators are specified at a default ambient temperature ( $T_A$ ) of  $25^{\circ}\text{C}$  ( $\pm 5^{\circ}\text{C}$ ), supply voltage ( $U_C$ ) of  $\pm 18\text{V}$ , and a load resistance ( $R_M$ ) of  $34\Omega$ . Special conditions are noted separately.

| Item                           | Symbol       | Test Conditions                                      | Value    |           |           | Unit     |
|--------------------------------|--------------|------------------------------------------------------|----------|-----------|-----------|----------|
|                                |              |                                                      | Minimum  | Nominal   | Maximum   |          |
| Primary rated current(DC)      | $I_{PN\ DC}$ | --                                                   | -300     | --        | 300       | A        |
| Primary Rated Current (AC rms) | $I_{PN\ AC}$ | --                                                   | --       | 212       | --        | A        |
| Primary Overload Current       | $I_{P\ OL}$  | 1 minute/hour                                        | -360     | --        | 360       | A        |
| Supply Voltage (DC)            | $U_C$        | Full range                                           | $\pm 12$ | $\pm 15$  | $\pm 18$  | V        |
| Current Consumption            | $I_C$        | Within $I_{P\ OL}$ range                             | $\pm 20$ | $\pm 170$ | $\pm 210$ | mA       |
| Current Ratio                  | $K_N$        | Input: Output                                        | 2000:1   |           |           | --       |
| Rated Output Current           | $I_{SN}$     | Primary rated current                                | --       | $\pm 150$ | --        | mA       |
| Measurement Resistance         | $R_M$        | $U_C: \pm 12\text{ V}, I_{PN\ DC}: \pm 300\text{ A}$ | 0        | --        | 5         | $\Omega$ |
|                                |              | $U_C: \pm 15\text{ V}, I_{PN\ DC}: \pm 300\text{ A}$ | 0        | --        | 20        | $\Omega$ |
|                                |              | $U_C: \pm 18\text{ V}, I_{PN\ DC}: \pm 300\text{ A}$ | 0        | --        | 34        | A        |

#### 5. Precision - Dynamic Parameters

| Item                    | Symbol          | Test Conditions                               | Value   |         |         | Unit                   |
|-------------------------|-----------------|-----------------------------------------------|---------|---------|---------|------------------------|
|                         |                 |                                               | Minimum | Nominal | Maximum |                        |
| Accuracy                | $X_e$           | Input DC                                      | --      | --      | 0.01    | %                      |
| Linearity               | $\varepsilon_L$ | --                                            | --      | --      | 50      | $\mu\text{A/A}$        |
| Zero Offset Current     | $I_0$           | $25^{\circ}\text{C}$                          | --      | --      | 6       | $\mu\text{A}$          |
| Zero Offset Current     | $I_{0T}$        | Within the entire operating temperature range | --      | --      | 15      | $\mu\text{A}$          |
| Response Time           | $t_r$           | --                                            | --      | --      | 1       | $\mu\text{s}$          |
| Current Following Speed | $di/dt$         | --                                            | 100     | --      | --      | $\text{A}/\mu\text{s}$ |
| Bandwidth (-3 dB)       | $BW$            | --                                            | 0       | --      | 100     | kHz                    |

Note: All "%" and " $\mu\text{A/A}$ " refer to the full-scale secondary current.

## 6. General Characteristics

| Item                      | Symbol               | Test Conditions | Value   |         |         | Unit |
|---------------------------|----------------------|-----------------|---------|---------|---------|------|
|                           |                      |                 | Minimum | Nominal | Maximum |      |
| Working Temperature Range | <b>T<sub>A</sub></b> | --              | -40     | --      | +85     | °C   |
| Storage Temperature Range | <b>T<sub>S</sub></b> | --              | -45     | --      | +90     | °C   |
| Mass                      | <b>m</b>             | --              | 130±10  |         |         | g    |

## 7. Security features

| Item                             |                                                                             | Symbol               | Test Conditions | Value   |         |         | Unit |
|----------------------------------|-----------------------------------------------------------------------------|----------------------|-----------------|---------|---------|---------|------|
|                                  |                                                                             |                      |                 | Minimum | Nominal | Maximum |      |
| Withstand Voltage                | Between Primary and Secondary Sides<br>Between Secondary Side and Enclosure | <b>U<sub>d</sub></b> | 50Hz,1min       |         | 5       |         | kV   |
| Transient Isolation Voltage      | Between Primary and Secondary Sides                                         | <b>U<sub>w</sub></b> | 50μs            |         | 10      |         | kV   |
| Comparative Tracking Index (CTI) |                                                                             | <b>CTI</b>           | IEC-60112       |         | 275     |         | V    |

## 8. Outline Dimensions and Port Definitions

### 8.1、 Outline Dimensions (Unit: mm)

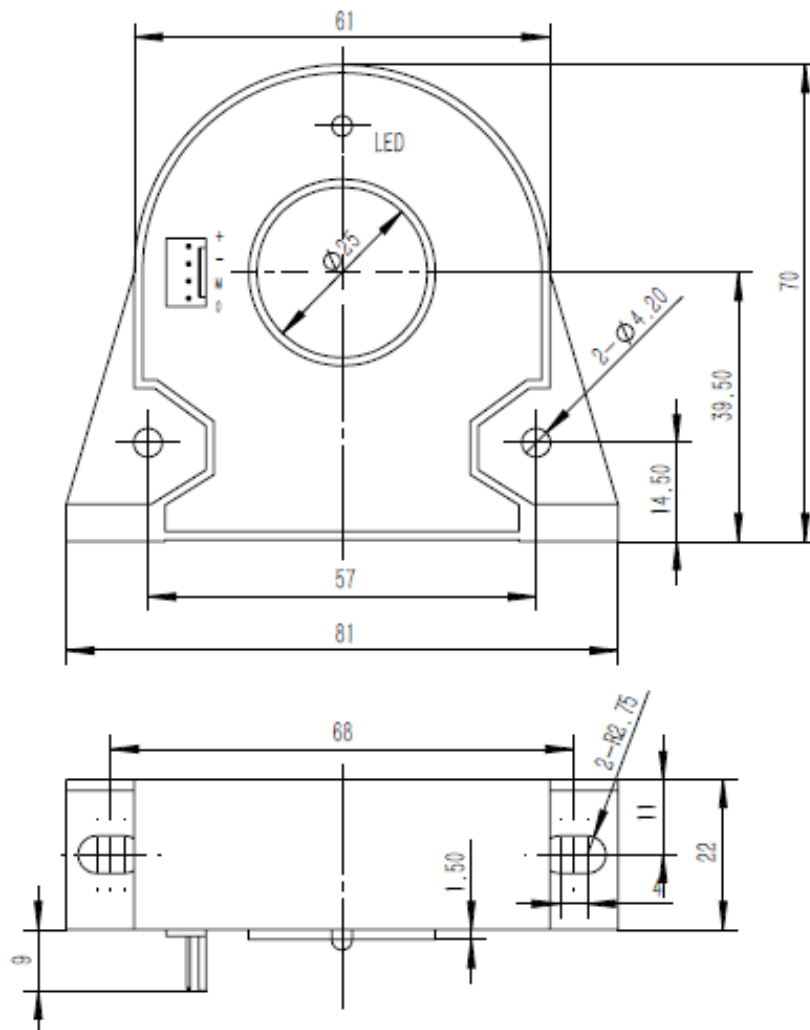


Figure 1: Outline Drawing

Description of the Outline Drawing: The outline dimensions and tolerance for installation positioning dimensions are in accordance with the Grade C standard of GB/T1804-2000.

### 8.2、 Port Definitions

- Output Terminal Pin Functions:

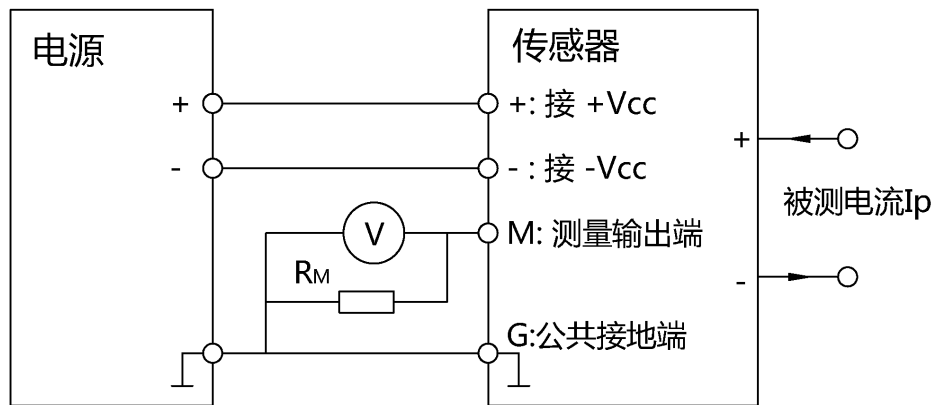
+ : +Vcc

- : - Vcc

M: Measurement Signal Output Terminal

0 or G: Common Ground Terminal

## 9. Application Connection and Description



Electrical connection diagram

### Electrical connection diagram:

The primary current  $I_P$  can be obtained by measuring the current  $I_s$  flowing through  $R_M$  or the voltage drop  $U_R$  across  $R_M$ , according to the following formula:

$$I_P = K_N * I_s = K_N * (U_R / R_M)$$

### LED Indicator Light Description:

Under normal operating conditions, the effective LED indicator light remains constantly on. If the indicator light goes out, it indicates that the current sensor is in a non-zero flux state, such as when the bus current exceeds the range. At this time, the sensor enters a scanning state, and the output current is no longer proportional to the input current signal. Once the bus current returns to within the range, the sensor will resume normal operation.

## 10. Packing List

| Item No. | Name           | Model and Specification | Quantity | Note |
|----------|----------------|-------------------------|----------|------|
| 1        | Current Sensor | CNE301I-SP1             | 1 piece  |      |
| 2        | User Manual    | CNE301I-SP1             | 1copy    |      |

## 11. Precautions

- When powering on, the power supply for the current sensor must be turned on first, followed by the measurement circuit current. When powering off, disconnect the measurement circuit current first, then the current sensor power supply. Failure to do so may result in a decrease in sensor accuracy or damage to the sensor.
- When the sensor is powered on or connected to the measurement circuit current, the secondary side must not be open-circuited.
- This module is a standard sensor. For special applications or requirements, please contact us.
- We reserve the right to modify this sensor manual without prior notice.



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