# CM9A H00 SERIES

## Current Sensor

### Model Number:

CM9A 1500 H00
CM9A 3500 H00
CM9A 5000 H00

For the electronic measurement of current: DC, AC, pulsed…, with galvanic insulation between the primary and the secondary circuits.

## Features

- Closed loop（compensated）current sensor using the Hall effect
- Galvanic Insulation between primary and secondary
- Insulating plastic case recognized according to UL 94-V0
- Very good linearity
- High accuracy
- Very low offset drift over temperature
- No insertion loss
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

## Applications

- Windmill inverter
- AC variable speed and servo motor drives
- Uninterruptible Power Supplies (UPS)
- Static converters for DC motor drives
- Switch Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Battery management
- Wind energy inverter
- Test and detection devices

## Safety

This sensor must be used according to IEC 61800-5-1.
This sensor must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following manufacture's operating instructions.

*Caution, risk of electrical shock!*

When operating the sensor, certain parts of the module can carry hazardous voltage (e.g., Primary busbar, power supply). Ignore this warning can lead to injury and/or cause serious damage.
This sensor is a built-in device, whose conducting parts must be inaccessible after installation. A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

## Absolute maximum ratings(not operating)

| Parameter | Symbol | Unit | Value |
|---|---|---|---|
| Supply voltage | $V_C$ | V | ± 25.2 |
| Primary conductor temperature | $T_B$ | ℃ | 100 |

※ Stresses above these ratings may cause permanent damage.

※ Exposure to absolute maximum ratings for extended periods may degrade reliability.

## Environmental and mechanical characteristics

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|---|---|---|---|---|---|
| Ambient operating temperature | $T_A$ | ℃ | -40 | | 85 | |
| Ambient storge temperature | $T_S$ | ℃ | -40 | | 90 | |
| Mass | $m$ | Kg | | 4 | | |

## Insulation coordination

| Parameter | Symbol | Unit | Value | Comment |
|---|---|---|---|---|
| Rms voltage for AC insulation test @ 50Hz,1min | $V_d$ | kV | 6 | According to IEC 60664-1 |
| Impulse withstand voltage 1.2/50μs | $V_W$ | kV | 23 | According to IEC 60664-1 |
| Clearance (pri.- sec.) | $d_{Cl}$ | mm | 62.68 | |
| Creepage distance (pri.- sec.) | $d_{Cp}$ | mm | 65.55 | |
| Plastic case | - | - | UL94-V0 | |
| Comparative traking index | $CTI$ | PLC | Level IIIa | |
| Application example | - | - | 2000V | Reinforced insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ, PD2 |
| Application example | - | - | 4000V | Basic insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ, PD2 |

## Electrical data

### CM9A 1500 H00

※ With $T_A$ = 25℃, $V_C$ = ±24V, $R_M$ = 8Ω,unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|---|---|---|---|---|---|
| Primary nominal rms current | $I_{PN}$ | A | -1500 | | 1500 | |
| Primary current, measuring range | $I_{PM}$ | A | -2250 | | 2250 | @±22.8V; 85℃; RM=8Ω<br>Other conditions, please refer to Figure 1 |
| Measuring resistance | $R_M$ | Ω | 0 | | | Maximum measured resistance parameters(Reference Figure 1) |
| Secondary nominal rms current | $I_{SN}$ | mA | -300 | | 300 | |
| Secondary coil resistance | $R_S$ | Ω | | 12 | | @ 25℃ |
| Secondary current,measuring range | $I_S$ | mA | -450 | | 450 | |
| Number of secondary turns | $N_S$ | - | | 5000 | | |
| Theoretical sensitivity | $G_{th}$ | mA/A | | 0.2 | | |
| Supply voltage | $V_C$ | V | ±15 | | ±24 | @ ±5% |
| Current consumption | $I_C$ | mA | | 47+$I_S$ | | @±24V |
| Offset current | $I_O$ | mA | -0.3 | | 0.3 | |
| Offset current temperature drift | $I_{OT}$ | mA | -0.5 | | 0.5 | @ -40℃~85℃ |
| Hysteresis offset current@ $I_P$=0 after $I_{PN}$ | $I_{OM}$ | mA | -0.2 | | 0.2 | |
| Sensitivity error | $\varepsilon_G$ | % | -0.2 | | 0.2 | Exclusive of $I_{OE}$ |
| Linearity error 0…$I_{PN}$ | $\varepsilon_L$ | % of $I_{PN}$ | -0.1 | | 0.1 | Exclusive of $I_{OE}$ |
| Accuracy@ $I_{PN}$ | $X$ | % of $I_{PN}$ | -0.3 | | 0.3 | Exclusive of $I_{OE}$ |
| Response time@ 90% of $I_{PN}$ | $t_r$ | μs | | | 1 | |
| Frequency bandwidth(-3dB) | $BW$ | kHz | | 100 | | |

## Electrical data

### CM9A 3500 H00

※ With $T_A$ = 25℃, $V_C$ = ±24V, $R_M$ = 8Ω,unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|---|---|---|---|---|---|
| Primary nominal rms current | $I_{PN}$ | A | -3500 | | 3500 | |
| Primary current, measuring range | $I_{PM}$ | A | -4500 | | 4500 | @±22.8V; 85℃; RM=8Ω<br>Other conditions, please refer to Figure 1 |
| Measuring resistance | $R_M$ | Ω | 0 | | | Maximum measured resistance parameters(Reference Figure 1) |
| Secondary nominal rms current | $I_{SN}$ | mA | -700 | | 700 | |
| Secondary coil resistance | $R_S$ | Ω | | 12 | | @ 25℃ |
| Secondary current,measuring range | $I_S$ | mA | -900 | | 900 | |
| Number of secondary turns | $N_S$ | - | | 5000 | | |
| Theoretical sensitivity | $G_{th}$ | mA/A | | 0.2 | | |
| Supply voltage | $V_C$ | V | ±15 | | ±24 | @ ±5% |
| Current consumption | $I_C$ | mA | | 47+$I_S$ | | @±24V |
| Offset current | $I_0$ | mA | -0.5 | | 0.5 | |
| Offset current temperature drift | $I_{0T}$ | mA | -0.5 | | 0.5 | @ -40℃~85℃ |
| Hysteresis offset current@ $I_P$=0 after $I_{PN}$ | $I_{0M}$ | mA | -0.2 | | 0.2 | |
| Sensitivity error | $\varepsilon_G$ | % | -0.2 | | 0.2 | Exclusive of $I_{OE}$ |
| Linearity error 0…$I_{PN}$ | $\varepsilon_L$ | % of $I_{PN}$ | -0.1 | | 0.1 | Exclusive of $I_{OE}$ |
| Accuracy@ $I_{PN}$ | $X$ | % of $I_{PN}$ | -0.3 | | 0.3 | Exclusive of $I_{OE}$ |
| Response time@ 90% of $I_{PN}$ | $t_r$ | μs | | | 1 | |
| Frequency bandwidth(-3dB) | $BW$ | kHz | | 100 | | |

## Electrical data

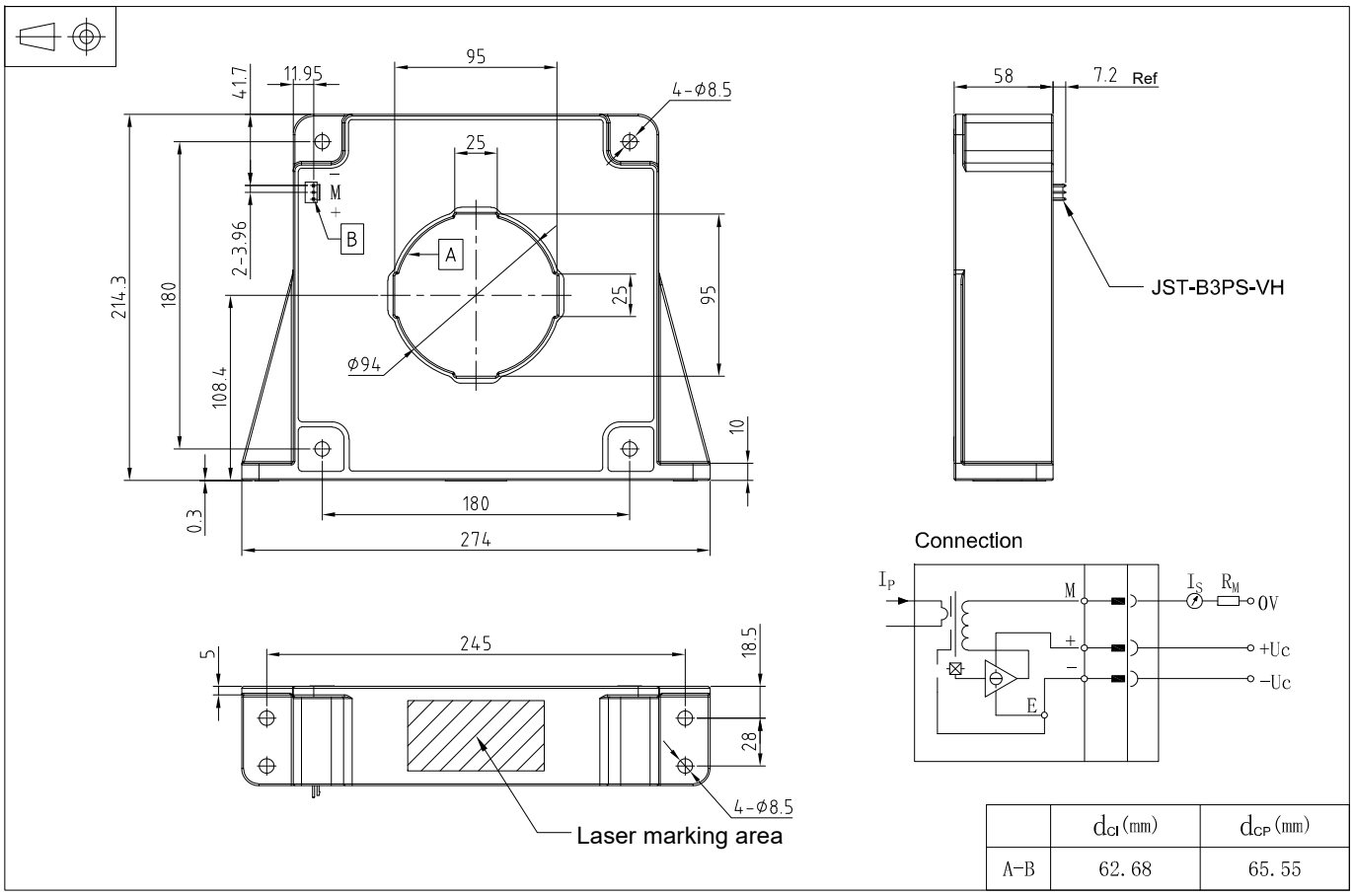
### CM9A 5000 H00

※ With $T_A$ = 25℃, $V_C$ = ±24V, $R_M$ = 5Ω,unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|---|---|---|---|---|---|
| Primary nominal rms current | $I_{PN}$ | A | -5000 | | 5000 | |
| Primary current, measuring range | $I_{PM}$ | A | -5500 | | 5500 | @±22.8V; 85℃; RM=1.66Ω<br>Other conditions, please refer to Figure 1 |
| Measuring resistance | $R_M$ | Ω | 0 | | | Maximum measured resistance parameters(Reference Figure 1) |
| Secondary nominal rms current | $I_{SN}$ | mA | -1000 | | 1000 | |
| Secondary coil resistance | $R_S$ | Ω | | 12 | | @ 25℃ |
| Secondary current,measuring range | $I_S$ | mA | -1200 | | 1200 | |
| Number of secondary turns | $N_S$ | - | | 5000 | | |
| Theoretical sensitivity | $G_{th}$ | mA/A | | 0.2 | | |
| Supply voltage | $V_C$ | V | | ±24 | | @ ±5% |
| Current consumption | $I_C$ | mA | | 47+$I_S$ | | @±24V |
| Offset current | $I_0$ | mA | -0.5 | | 0.5 | |
| Offset current temperature drift | $I_{0T}$ | mA | -0.5 | | 0.5 | @ -40℃~85℃ |
| Hysteresis offset current@ $I_P$=0 after $I_{PN}$ | $I_{0M}$ | mA | -0.2 | | 0.2 | |
| Sensitivity error | $\varepsilon_G$ | % | -0.2 | | 0.2 | Exclusive of $I_{OE}$ |
| Linearity error 0…$I_{PN}$ | $\varepsilon_L$ | % of $I_{PN}$ | -0.1 | | 0.1 | Exclusive of $I_{OE}$ |
| Accuracy@ $I_{PN}$ | $X$ | % of $I_{PN}$ | -0.3 | | 0.3 | Exclusive of $I_{OE}$ |
| Response time@ 90% of $I_{PN}$ | $t_r$ | μs | | | 1 | di/dt=75A/μs |
| Frequency bandwidth(-3dB) | $BW$ | kHz | | 100 | | |

# CM9A H00 SERIES

## Dimensions（in mm. 1 mm = 0.0394 inch）




| | $d_{CI}$ (mm) | $d_{CP}$ (mm) |
|---|---|---|
| A-B | 62.68 | 65.55 |

## Mechanical characteristics

| | |
|---|---|
| ✧ General tolerance | ±0.5 mm |
| ✧ Primary hole<br>or | Φ94mm<br>95mm×25mm |
| ✧ Connection of secondary | |
| ✧ Sensor vertical fastening | 4pc Φ8.5mm through-hole<br>4pc M8 metal screws |
| ✧ Sensor horizontal fastening | 4pc Φ8.5mm through-hole<br>4pc M8 metal screws |
| Recommended fastening torque | 6 N•m (±10%) |
| ✧ Terminal model | JST-B3PS-VH |

## Remarks

- ✧ $I_S$ and $I_P$ are in the same direction, when $I_P$ flows in the direction of arrow.
- ✧ Temperature of the primary conductor should not exceed 100℃.
- ✧ For security , do not install a current sensor with primary current or secondary power supply.

This is a standard model. For different applications (measurement, secondary connections…), please contact CHIPSENSE.

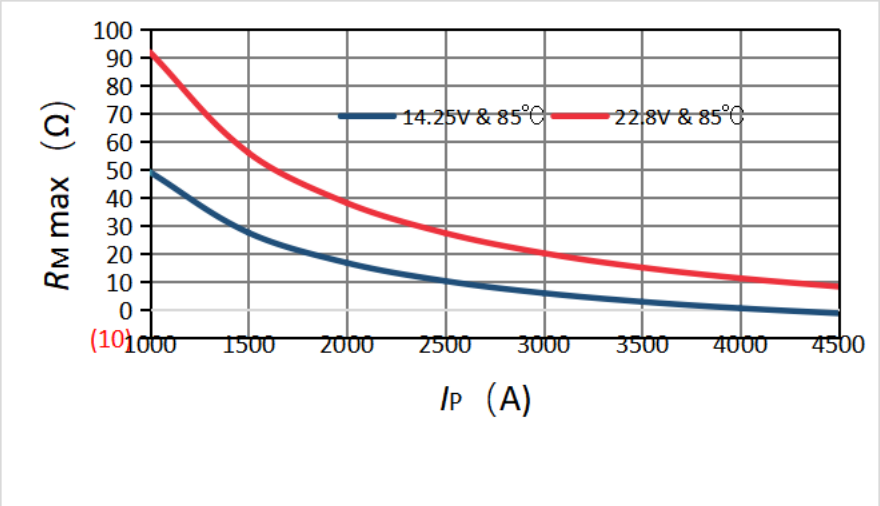



Figure 1. Maximum measurement resistance

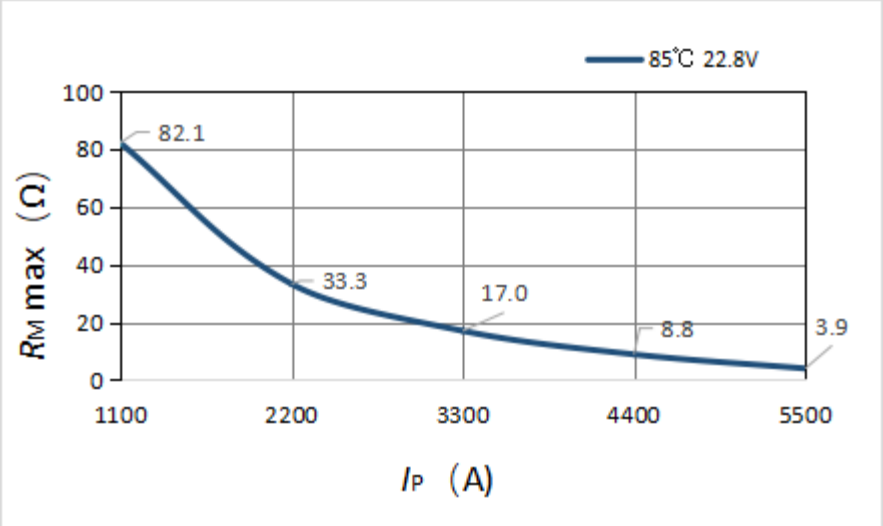



Figure 2. Maximum measurement resistance