

CR2A H00 SERIES

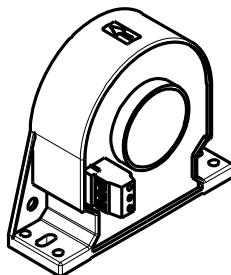
Current Sensor

Model Number:

CR2A 300 H00

CR2A 400 H00

CR2A 500 H00



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

Features

- ✧ Closed loop (compensated) current sensor using the Hall Effect
- ✧ Galvanic separation 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:
 - EN50178: 1997
 - IEC 61010-1: 2000
 - UL 508: 2010

Applications

- ✧ 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 61010-1.

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.

CR2A H00 SERIES

Absolute maximum ratings(not operating)

| Parameter | Symbol | Unit | Value |
|------------------------------------|------------------|--------------------|------------|
| Supply voltage | V_C | V | ± 25.2 |
| Primary conductor temperature | T_B | $^{\circ}\text{C}$ | 100 |
| ESD rating, Human Body Model (HBM) | V_{ESD} | kV | 4 |

- ※ 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 | $^{\circ}\text{C}$ | -40 | | 85 | |
| Ambient storage temperature | T_S | $^{\circ}\text{C}$ | -40 | | 90 | |
| Mass | m | g | | 80 | | |
| Standards | EN 50178, IEC 61010-1, UL 508C | | | | | |

Insulation coordination

| Parameter | Symbol | Unit | Value | Comment |
|--|--------|------|---------------------|--|
| Rms voltage for AC insulation test,@ 50Hz,1min | V_d | kV | 5 | |
| Comparative tracking index | CTI | PLC | 3 | |
| Application example | - | - | 300V CAT III PD2 | Reinforced insulation,according to EN 50178, EN 61010-1 |
| Application example | - | - | 600V CAT III PD2 | Basic insulation,according to EN 50178, EN 61010-1 |

CR2A H00 SERIES

Electrical data

CR2A 300 H00

※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 15\text{V}$, $R_L = 20\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|-----------------|---------------|------------------|------------|-----------------------|--|
| Primary nominal rms current | I_{PN} | A | -300 | | 300 | |
| Primary current, measuring range | I_{PM} | A | -500 | | 500 | |
| Measuring resistance | R_M | Ω | 0 0 0 0 | | 97 45 187 99 | @ $\pm 15\text{V}$, 85°C , $\pm 300\text{A}$ @ $\pm 15\text{V}$, 85°C , $\pm 500\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 300\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 500\text{A}$ |
| Secondary nominal rms current | I_{SN} | mA | -100 | | 100 | |
| Secondary coil resistance | R_S | Ω | | | 25 33 | @ 25°C @ 85°C |
| Secondary current, measuring range | I_S | mA | -166.7 | | 166.7 | |
| Number of secondary turns | N_S | - | | 3000 | | |
| Theoretical sensitivity | G_{th} | mA/A | | 0.333 | | |
| Supply voltage | V_C | V | ± 15 | | ± 24 | @ $\pm 5\%$ |
| Current consumption | I_C | mA | | $35 + I_S$ | | |
| Zero offset current | I_O | mA | -0.2 | | 0.2 | |
| Thermal drift of offset current | I_{OT} | mA | -0.5 | ± 0.2 | 0.5 | @ $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Residual current @ $I_P=0$ after I_{PN} | I_{OM} | mA | -0.1 | | 0.1 | |
| Sensitivity error | \mathcal{E}_G | % | -0.2 | | 0.2 | Exclusive of I_{OE} |
| Linearity error 0... I_{PN} | \mathcal{E}_L | % of I_{PN} | -0.1 | | 0.1 | Exclusive of I_{OE} |
| Accuracy @ I_{PN} | X | % of I_{PN} | -0.5 | | 0.5 | Exclusive of I_{OE} |
| Response time @ 90% of I_{PN} | t_r | μs | | 0.5 | 1 | |
| Frequency bandwidth (-3dB) | BW | kHz | 100 | | | |

CR2A H00 SERIES

Electrical data

CR2A 400 H00

※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 15\text{V}$, $R_L = 20\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|-----------------|---------------|------------------|------------|-----------------------|--|
| Primary nominal rms current | I_{PN} | A | -400 | | 400 | |
| Primary current, measuring range | I_{PM} | A | -600 | | 600 | |
| Measuring resistance | R_M | Ω | 0 0 0 0 | | 92 41 158 75 | @ $\pm 15\text{V}$, 85°C , $\pm 400\text{A}$ @ $\pm 15\text{V}$, 85°C , $\pm 600\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 400\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 600\text{A}$ |
| Secondary nominal rms current | I_{SN} | mA | -100 | | 100 | |
| Secondary coil resistance | R_S | Ω | | | 45 60 | @ 25°C @ 85°C |
| Secondary current, measuring range | I_S | mA | -150 | | 150 | |
| Number of secondary turns | N_S | - | | 4000 | | |
| Theoretical sensitivity | G_{th} | mA/A | | 0.25 | | |
| Supply voltage | V_C | V | ± 15 | | ± 24 | @ $\pm 5\%$ |
| Current consumption | I_C | mA | | $35 + I_S$ | | |
| Zero offset current | I_O | mA | -0.2 | | 0.2 | |
| Thermal drift of offset current | I_{OT} | mA | -0.5 | ± 0.2 | 0.5 | @ $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Residual current @ $I_P=0$ after I_{PN} | I_{OM} | mA | -0.1 | | 0.1 | |
| Sensitivity error | \mathcal{E}_G | % | -0.2 | | 0.2 | Exclusive of I_{OE} |
| Linearity error 0... I_{PN} | \mathcal{E}_L | % of I_{PN} | -0.1 | | 0.1 | Exclusive of I_{OE} |
| Accuracy @ I_{PN} | X | % of I_{PN} | -0.5 | | 0.5 | Exclusive of I_{OE} |
| Response time @ 90% of I_{PN} | t_r | μs | | 0.5 | 1 | |
| Frequency bandwidth (-3dB) | BW | kHz | 100 | | | |

CR2A H00 SERIES

Electrical data

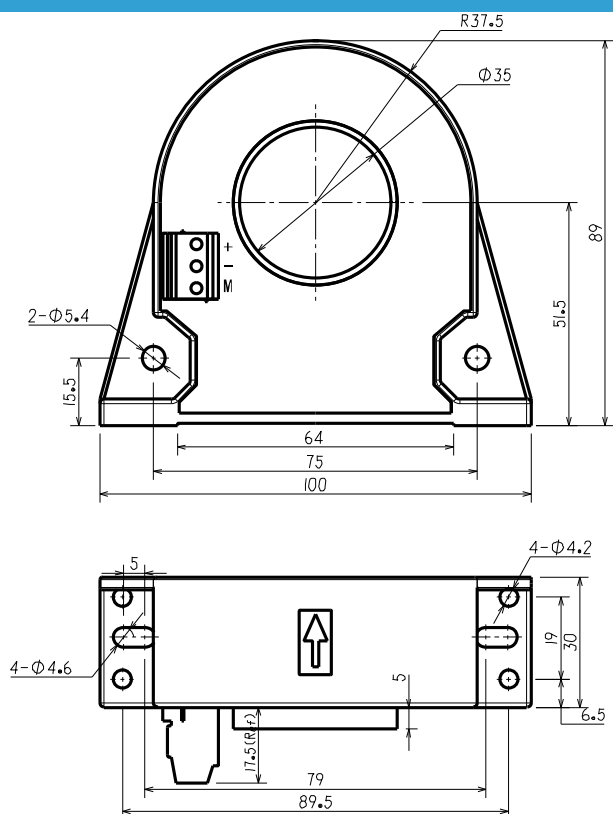
CR2A 500 H00

※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 15\text{V}$, $R_L = 20\Omega$, unless otherwise noted.

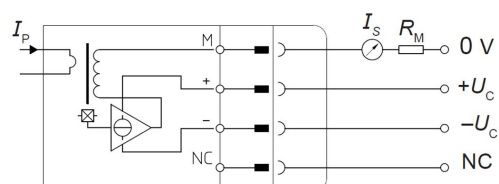
| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|-----------------|---------------|------------------|------------|-----------------------|--|
| Primary nominal rms current | I_{PN} | A | -500 | | 500 | |
| Primary current, measuring range | I_{PM} | A | -800 | | 800 | |
| Measuring resistance | R_M | Ω | 0 0 0 0 | | 87 36 153 70 | @ $\pm 15\text{V}$, 85°C , $\pm 500\text{A}$ @ $\pm 15\text{V}$, 85°C , $\pm 800\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 500\text{A}$ @ $\pm 24\text{V}$, 85°C , $\pm 800\text{A}$ |
| Secondary nominal rms current | I_{SN} | mA | -100 | | 100 | |
| Secondary coil resistance | R_S | Ω | | | 50 65 | @ 25°C @ 85°C |
| Secondary current, measuring range | I_S | mA | -160 | | 160 | |
| Number of secondary turns | N_S | - | | 5000 | | |
| Theoretical sensitivity | G_{th} | mA/A | | 0.2 | | |
| Supply voltage | V_C | V | ± 15 | | ± 24 | @ $\pm 5\%$ |
| Current consumption | I_C | mA | | $35 + I_S$ | | |
| Zero offset current | I_O | mA | -0.2 | | 0.2 | |
| Thermal drift of offset current | I_{OT} | mA | -0.5 | ± 0.2 | 0.5 | @ $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| Residual current @ $I_P = 0$ after I_{PN} | I_{OM} | mA | -0.1 | | 0.1 | |
| Sensitivity error | \mathcal{E}_G | % | -0.2 | | 0.2 | Exclusive of I_{OE} |
| Linearity error 0... I_{PN} | \mathcal{E}_L | % of I_{PN} | -0.1 | | 0.1 | Exclusive of I_{OE} |
| Accuracy @ I_{PN} | X | % of I_{PN} | -0.5 | | 0.5 | Exclusive of I_{OE} |
| Response time @ 90% of I_{PN} | t_r | μs | | 0.5 | 1 | |
| Frequency bandwidth (-3dB) | BW | kHz | 100 | | | |

CR2A H00 SERIES

Dimensions (in mm. 1 mm = 0.0394 inch)



Connection



Mechanical characteristics

| | |
|--------------------------------|--|
| ◇ General tolerance | ±0.3 mm |
| ◇ Primary hole | Φ35.0mm |
| Transduce vertical fastening | 2pc Φ5.4 mm through-hole 2pc M5 metal screws 2pc Φ5 flat washer |
| Recommended fastening torque | 1.2N•m (±10%) |
| ◇ Connection of secondary | JK126-500-3P |
| Transduce horizontal fastening | 2pc 4.6*9.6 waist-type hole 2pc M4 metal screws 2pc Φ4 flat washer 4 pc Φ4.2mm through-hole 4 pc M4 metal screws |
| Recommended fastening torque | 0.9N•m (±10%) |

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°C.
- ◇ Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.

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