

## CSCA-A Series

### Hall-Effect Based Open-Loop Current Sensors



#### DESCRIPTION

The CSCA-A Series of open-loop current sensors are based on the principles of the Hall-effect wherein a Hall-effect device (HED) produces an output voltage linearly related to the amplitude and phase of a magnetic field applied to it.

Current flowing through a primary conductor generates a rotating magnetic field around the conductor. This field is collected by a core of magnetically sensitive material and

concentrated in the gap in this core. The HED is located in this core gap. Therefore, the HED output is directly proportional to the amplitude and phase of the primary current.

The HED output is trimmed for gain and offset calibration such that the CSCA-A Series sensor provides a predefined output sensitivity versus primary current.

#### FEATURES

- Measures ac, dc and impulse currents
- Competitive cost/performance ratio
- Low power consumption
- Compact size
- High level of electrical isolation between primary and secondary circuits
- Large primary aperture
- RoHS compliant
- CE, UL approvals (pending)

#### POTENTIAL APPLICATIONS

- Variable speed drives
- Ground fault detectors
- Current feedback control systems
- Robotics
- UPS and telecommunication power supplies
- Welding power supplies
- Automotive - Battery management systems
- Watt meters

# CSCA-A Series

**SPECIFICATIONS** (all specifications are at  $\pm 15$  Vdc supply and  $25\text{ }^{\circ}\text{C}$  [ $77\text{ }^{\circ}\text{F}$ ] ambient temperature unless otherwise specified)

Characteristic	Symbol	Parameter
Nominal current	$I_{PN}$	See product selection guide
Peak measuring range (ac peak)	$I_{PK}$	See product selection guide
Nominal output voltage at $I_{PN}$	$V_{SN}$	$4\text{ V} \pm 1\%$
Supply voltage	$V_{CC}$	$\pm 15\text{ Vdc} \pm 5\%$
Supply current	$I_{CC}$	17 mA typ.
Accuracy at $I_{PN}$ <sup>1</sup>	X	$\leq \pm 2\%$ of $I_{PN}$
Linearity <sup>2</sup>	$E_I$	$< \pm 1\%$
Zero current offset	$V_O$	$\leq \pm 20\text{ mV}$
Residual offset after $I_{PN}$	$V_{OR}$	$\leq \pm 20\text{ mV}$
Thermal drift of offset	$V_{OT}$	$\leq \pm 3\text{ mV}/^{\circ}\text{C}$ @ $I_{PN} = 50\text{ A}$ $\leq \pm 1.5\text{ mV}/^{\circ}\text{C}$ @ $I_{PN} = 100\text{ A to } 600\text{ A}$
Thermal drift of gain	$V_{ST}$	$\leq \pm 4\text{ mV}/^{\circ}\text{C}$
Response time <sup>3</sup>	$t_R$	3 $\mu\text{s}$ to 7 $\mu\text{s}$
di/dt accuracy followed	di/dt	$\geq 50\text{ A}/\mu\text{s}$
Bandwidth	f	dc to 50 kHz
Isolation voltage	$V_D$	3 kV, 50 Hz, 60 sec
Rated insulation voltage	$V_I$	849 V reinforced
Output resistance	$R_S$	$\geq 10\text{ k}\Omega$
Ambient operating temperature	$T_A$	$-10\text{ }^{\circ}\text{C}$ to $80\text{ }^{\circ}\text{C}$ [ $14\text{ }^{\circ}\text{F}$ to $176\text{ }^{\circ}\text{F}$ ]
Ambient storage temperature	$T_S$	$-25\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$ [ $-13\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$ ]

**NOTES:**

<sup>1</sup> For  $I_P > I_{PN}$  then X is the same percentage value but of  $I_P$

<sup>2</sup> Independent linearity per the Instrument Society of America

<sup>3</sup> At 90% of  $I_P$

<sup>4</sup> Appropriate specification items defined using the guidance of EN50178

# Hall-Effect Based Open Loop Current Sensors

**MOUNTING DIMENSIONS (For reference only. mm)**

CSCA-A-001	CSCA-A-002
<b>Pins arrangement</b>	<b>Pins arrangement</b>
1. + 15 V	1. + 15 V
2. - 15 V	2. - 15 V
3. Output	3. Output
4. Ground	4. Ground