

# NxxxH Series Current Sensor

The NxxxH series is a current transducer which operates on the principle of magnetic compensation. It measures DC, AC or pulse currents and their combinations, with galvanic isolation techniques used to separate the



## Features

- Non-contact measurement of high current
- Close-Loop measurement (compensated)
- Max. measuring range  $\pm 200\text{A}$  (DC or AC peak)
- Nearly zero magnetic hysteresis
- Superior temperature stability and linearity
- High frequency bandwidth typ. 150kHz
- RoHs compliance (Lead-Free)

## Applications

- Home appliances
- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Battery management systems
- Uninterruptible power supplies (UPS)
- Switched-mode power supplies (SMPS)
- Overcurrent protections
- Short circuit protections

## Advantages

- Accurately measures AC, DC and pulse currents
- Fast response  $< 0.5\mu\text{s}$
- High immunity from external interference
- Excellent current overload capacity

## Standards

- EN 61000-4 Series
- IEC60068-2 Series
- EN 50178: 1998
- IEC62109-1: 2010
- IEC61800-3: 2017
- IEC61800-5-1: 2016

# Absolute maximum ratings

| Symbol         | Parameter                                | Min. | Max. | Unit |
|----------------|--|------|------|------|
| $V_{DD\ max.}$ | Maximum supply voltage (not destructive) | -15  | 15   | V    |
| $I_{pm}$       | Maximum measuring current                | -200 | 200  | A    |
| $T_A$          | Ambient operating temperature            | -40  | 85   | °C   |
| $T_S$          | Storage temperature range                | -40  | 100  | °C   |
| $V_{ESD-HBM}$  | ESD sensitivity HBM (Human Body Model)   | 4    | 8    | kV   |

Stresses above these ratings may cause permanent damage. Exposure to absolute maximum ratings for extended periods may degrade reliability.

# Specifications ( $T_A= 25^{\circ}C$ , $V_{DD}= \pm 15.0V$ )

| Symbol       | Parameter  | n50H                               | n502H                               | n100H                              | n1002H                              | n125H                              | n1252H                              | Unit        |
|--------------|--|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|-------------|
| $V_{DD}$     | Supply voltage                                       | $\pm 12 \dots 15$                  |                                     |                                    |                                     |                                    |                                     | V           |
| $I_C$        | Current consumption @ $I_P=0$ without $I_{OE}$       | <10                                |                                     |                                    |                                     |                                    |                                     | mA          |
| $I_{pn}$     | Current nominal measuring range                      | $\pm 50$                           | $\pm 50$                            | $\pm 100$                          | $\pm 100$                           | $\pm 125$                          | $\pm 125$                           | A           |
| $I_{pm}$     | Current maximum measuring range                      | $\pm 90$                           | $\pm 150$                           | $\pm 150$                          | $\pm 180$                           | $\pm 200$                          | $\pm 200$                           | A           |
| $K_n$        | Conversion ratio                                     | 1:1,000                            | 1:2,000                             | 1:1,000                            | 1:2,000                             | 1:1,000                            | 1:2,000                             |             |
| $I_{sn}$     | Secondary nominal rms current                        | $\pm 50$                           | $\pm 25$                            | $\pm 100$                          | $\pm 50$                            | $\pm 125$                          | $\pm 75$                            | mA          |
| $R_S$        | Coil resistance @25 °C                               | < 30                               | < 100                               | < 30                               | < 100                               | < 30                               | < 100                               | $\Omega$    |
| $T_{clot}$   | Temperature coefficient of $I_{OUT}$ @-40°C ...85 °C | $\pm 0.3$ Typ. /<br>$\pm 0.5$ Max. | $\pm 0.15$ Typ. /<br>$\pm 0.3$ Max. | $\pm 0.3$ Typ. /<br>$\pm 0.5$ Max. | $\pm 0.15$ Typ. /<br>$\pm 0.3$ Max. | $\pm 0.3$ Typ. /<br>$\pm 0.5$ Max. | $\pm 0.15$ Typ. /<br>$\pm 0.3$ Max. | mA          |
| $\epsilon_L$ | Non-linearity error @ $\pm I_{pn}$ without offset    | <0.1                               | <0.1                                | <0.1                               | <0.1                                | <0.1                               | <0.1                                | %/ $I_{pn}$ |
| $I_{OE}$     | Offset current @ $I_P=0$                             | $\pm 0.2$                          | $\pm 0.1$                           | $\pm 0.2$                          | $\pm 0.1$                           | $\pm 0.2$                          | $\pm 0.1$                           | mA          |
| $T_{RA}$     | Step response to 10% of $I_{pn}$                     | <0.3                               |                                     |                                    |                                     |                                    |                                     | $\mu s$     |
| $T_R$        | Step response to 90% of $I_{pn}$                     | <0.5                               |                                     |                                    |                                     |                                    |                                     | $\mu s$     |
| <b>BW</b>    | Frequency bandwidth (-3dB)                           | 150                                |                                     |                                    |                                     |                                    |                                     | kHz         |
| <b>di/dt</b> | di/dt accurately followed                            | >100                               |                                     |                                    |                                     |                                    |                                     | A/ $\mu s$  |

## Insulation characteristics

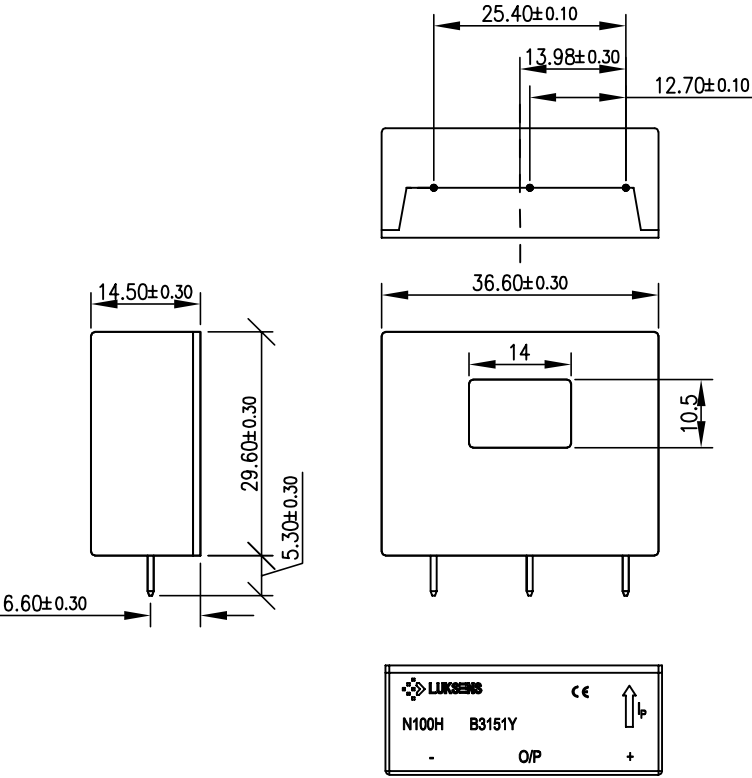
| Symbol                 | Parameter                                     | Value | Unit | Comment |
|------------------------|---|-------|------|---------|
| <b>V<sub>0</sub></b>   | Insulation voltage for isolation, 50Hz, 1 min | 3,000 | V    |         |
| <b>R<sub>iso</sub></b> | Isolation resistance @500VDC                  | >500  | MΩ   |         |

## General characteristics

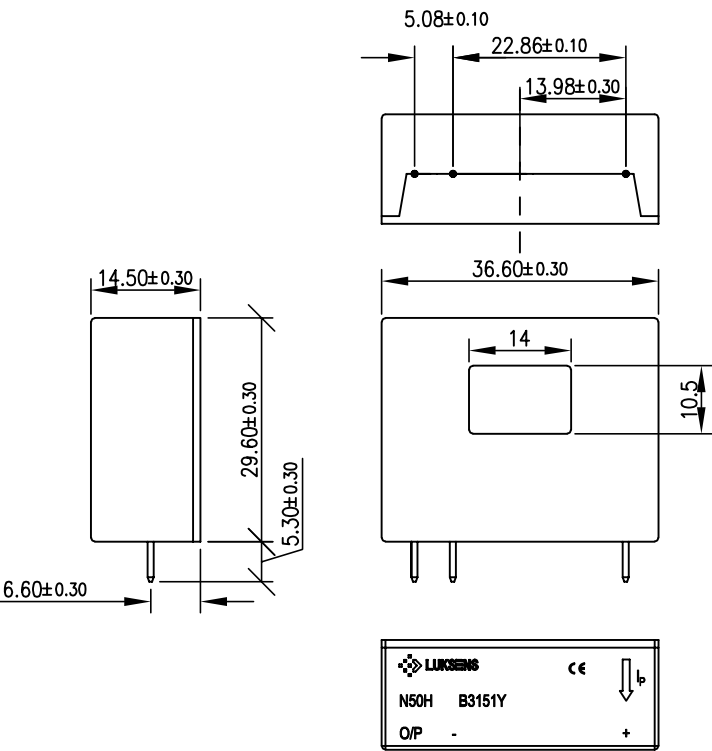
| Symbol       | Parameter               | Value     | Unit | Comment                        |
|--------------|-------------------------|-----------|------|--------------------------------|
| <b>m-HSE</b> | Housing material        | V0        |      | Flame retardant UL 94          |
| <b>m-CDT</b> | Conductor material      | H62       |      | Busbar version                 |
| <b>m-FC</b>  | Flux collector material | Permalloy |      | Superior magnetic permeability |

# Dimension (mm)

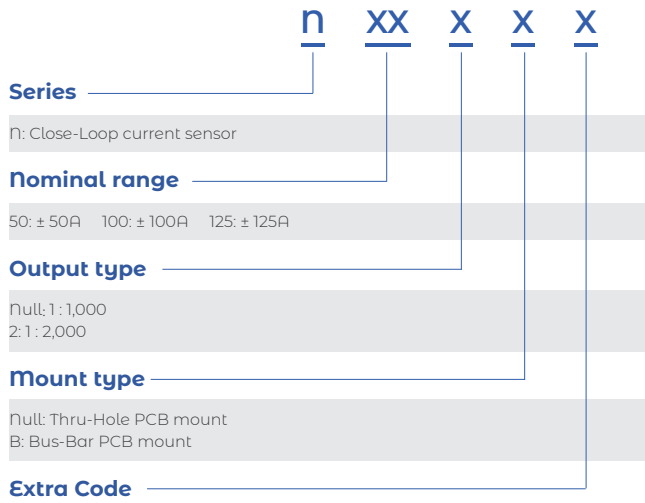
N100, N1002H, N125H, N1252H



N50H, N502H



# Name Guide Description



## Notes

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# Safety and Environment



The product is to be installed by manufacturer trained personnel or competent person trained in accordance with manufacturer installation instructions.

With respect to applicable standards IEC 61010-1/ EN 61010-1 *safety requirements for electrical equipment for measurement, control and laboratory use part 1 general requirements*, the product should be used in limited energy secondary circuits.



## Risk of electrical shock

Certain parts of the module can carry hazardous voltage during the operation process of the product because hazardous live voltage of primary conductor, power supply occurs, injury and/or serious damage will be caused if this warning is ignored.

Conducting parts must be inaccessible after installation of the product. Additional protection including shield or protective housing could be used according to IEC 60664 Insulation coordination for equipment within low-voltage supply systems.

Disconnection of the main supply will protect against possible injury and serious damage.



## ESD protection

Damage from an ESD event will occur if the personnel is not well grounded when handling.

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