

K-No.: 26969

100/150A Current Sensor

For the electronic measurement of currents:
DC, AC, pulsed, mixed with a galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit)



Date: 02.05.2018

Customer: Standard Type

Customers Part no:

Page 1 of 3

Description

- Closed loop (compensation) Current Sensor with magnetic probe
- Printed circuit board mounting
- Casing and materials UL-listed

Characteristics

- excellent accuracy
- very low offset current
- very low temperature dependency and offset current drift
- very low hysteresis of offset current
- short response time
- wide frequency bandwidth
- compact design
- reduced offset ripple

Applications

Mainly used for stationary operation in industrial applications:

- AC variable speed drives and servo motor drives
- static converters for DC motor drives
- Battery supplied applications
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Uninterruptable Power Supplies (UPS)

Electrical data - Ratings

| | | | |
|-----------|---|--------------------------------------|---|
| I_{PN} | Primary nominal RMS current | 100/150 | A |
| V_{OUT} | Output voltage @ $I_{PN}=100A$ | $V_{REF} \pm (0.625 * I_P / I_{PN})$ | V |
| V_{OUT} | Output voltage @ $I_P=0A, \vartheta_A=25^\circ C$ | $V_{REF} \pm 0.001$ | V |
| V_{REF} | External Reference voltage range | 0 ... 4 | V |
| | Internal Reference voltage | 2.5 ± 0.005 | V |
| K_N | Transformation ratio | 1 : 1100 | |

Accuracy – Dynamic performance data

| | | min. | typ. | max. | Unit |
|---|--|-----------|------|-----------|-----------------|
| $I_{P,max}$ | Max. measuring range | ± 270 | | | A |
| X | Accuracy @ $I_{PN}, \vartheta_A=25^\circ C$ | | | 0.7 | % |
| ϵ_L | Linearity | | | 0.1 | % |
| $V_{OUT}-V_{REF}$ | Offset voltage @ $I_P=0A, \vartheta_A=25^\circ C$ | | | ± 1.0 | mV |
| $\Delta V_O / V_{REF} / \Delta \vartheta$ | Temperature drift of V_{OUT} @ $I_P=0A, V_{REF}=2.5V, \vartheta_A$ | | 3 | 10 | ppm/ $^\circ C$ |
| t_r | Response time | | <1 | | μs |
| t_{ra} | Reaction time | | <1 | | μs |
| $f_{BW} (-3dB)$ | Frequency bandwidth | DC...100 | | | kHz |

General data

| | | | | | |
|---------------|---|------|----|------|------------|
| ϑ_A | Ambient operation temperature | -40 | | 85 | $^\circ C$ |
| ϑ_S | Ambient storage temperature (acc. to M3101) | -40 | | 85 | $^\circ C$ |
| m | Mass | | 67 | | g |
| V_C | Supply voltage | 4.75 | 5 | 5.25 | V |
| I_C | Supply current at $I_P = 0A$ and RT | | 15 | | mA |

| | | | | | |
|----------------|--|---|--|------|------------|
| $^1)S_{clear}$ | Clearance (component without solder pad) | 8 | | | mm |
| $^1)S_{creep}$ | Creepage (component without solder pad) | 8 | | | mm |
| $^1)U_{sys}$ | System voltage | | | 600 | V_{RMS} |
| $^1)U_{AC}$ | Working voltage | | | 1000 | V_{RMS} |
| $^1)U_{PD}$ | Rated discharge voltage | | | 1414 | V_{PEAK} |

¹⁾Constructed and manufactured and tested in accordance with IEC 61800-5-1:2007 (primary to secondary)
Basic insulation, Insulation material group 1, Pollution degree 2, Overvoltage category III

| Date | Name | Issue | Amendment |
|------|------|-------|-----------|
| | | 81 | |

| | | | |
|---------------------------|---------------------|-----------------|---------------------|
| Hrg.: R&D-PD NPI D editor | Bearb.: DJ designer | MC-PM: KR check | freig.: JG released |
|---------------------------|---------------------|-----------------|---------------------|

K-No.: 26969

100/150A Current Sensor

For the electronic measurement of currents:
DC, AC, pulsed, mixed with a galvanic Isolation
between the primary circuit (high power) and the
secondary circuit (electronic circuit)



Date: 02.05.2018

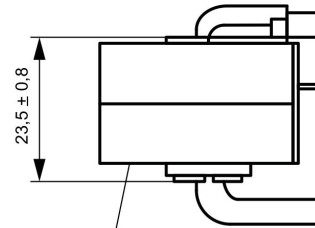
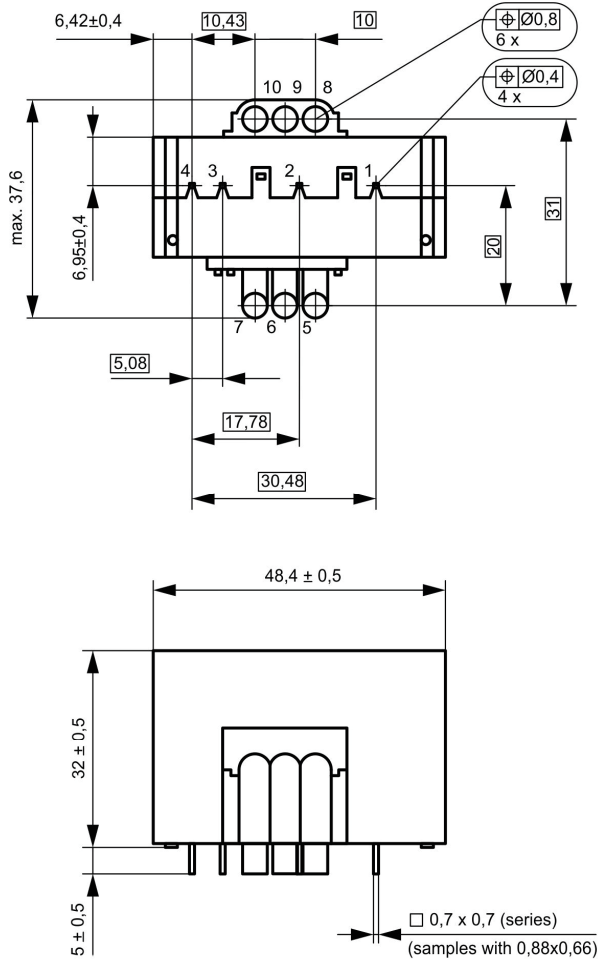
Customer: Standard Type

Customers Part no:

Page 2 of 3

Mechanical outline (mm):

General tolerances DIN ISO 2768-c



Marking

Prüfmaß
(test dimension)

Connections:
Pins 1-4: 0.88mm x 0.66mm
Pins 5-10: Ø4.5mm

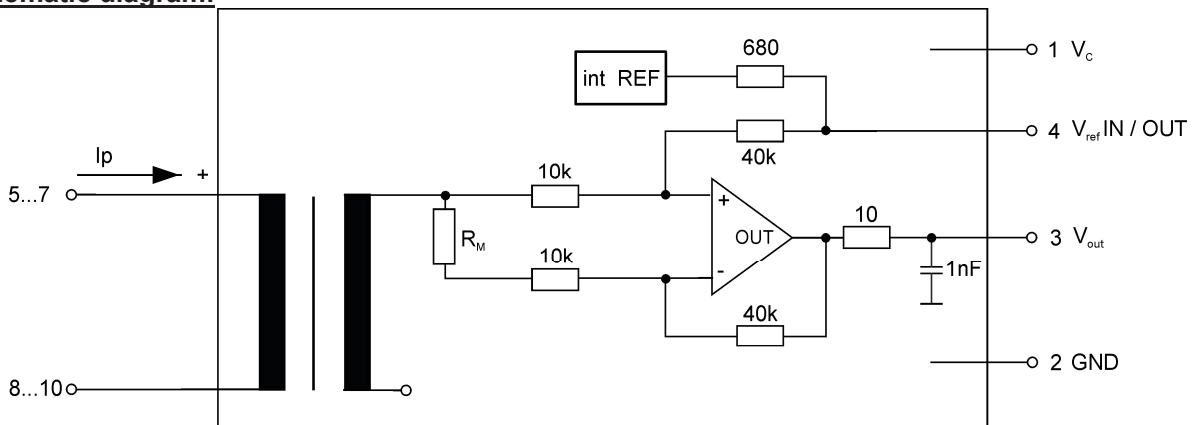
Marking:

4647-X262
F DC

F: Factory
DC: Datecode

Datecode Format: [YWW]
Example: J04: 2017, Week 4

Schematic diagram:



Hrg.: R&D-PD NPI D
editor

Bearb.: DJ
designer

MC-PM: KRe
check

freig.: JG
released

K-No.: 26969

100/150A Current Sensor

For the electronic measurement of currents:
DC, AC, pulsed, mixed with a galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit)



Date: 02.05.2018

Customer: Standard Type

Customers Part no:

Page 3 of 3

Electrical data: (investigate by a type checking)

| | | min. | typ. | max. | Unit |
|--|--|------|----------------------------------|------|------------------|
| $V_{C,tot}$ | maximum supply voltage (without function) | | | 6 | V |
| I_C | Supply Current with primary current | | $15mA + I_P * K_N + V_{OUT}/R_L$ | | mA |
| $I_{OUT,SC}$ | Short circuit output current | | ± 20 | | mA |
| R_S | Secondary coil resistance @ $\vartheta_A = 85^\circ C$ | | | 15 | Ω |
| R_P | Primary wire resistance per turn @ $\vartheta_A = 25^\circ C$ | | 0.07 | | m Ω |
| $R_{i,REF}$ | Internal resistance of Reference output | | 680 | | Ω |
| $R_{i,Vout}$ | Output resistance of V_{OUT} | | 10 | | Ω |
| R_L | External recommended resistance of V_{OUT} | 1 | | | k Ω |
| C_L | External recommended capacitance of V_{OUT} | | | 500 | pF |
| $X_{TI} / \Delta\vartheta$ | Temperature drift of X @ $\vartheta_A = -40^\circ C \dots 85^\circ C$ | | | 40 | ppm/ $^\circ C$ |
| $\Delta V_O = \Delta(V_{OUT} - V_{REF})$ | Sum of any offset drift including: | | 2 | 5 | mV |
| V_{Ot} | Long term drift of V_O | | 1 | | mV |
| V_{OT} | Temperature drift of V_O @ $\vartheta_A = -40^\circ C \dots 85^\circ C$ | | 1 | | mV |
| V_{OH} | Hysteresis of V_{OUT} @ $I_P = 0A$ (caused by $I_P = 10 \times I_{PN}$) | | 0.4 | 0.8 | mV |
| $\Delta V_O / \Delta V_C$ | Supply voltage rejection ratio | | 0.1 | | mV/V |
| V_{OSS} | Offsetripple (with 1 MHz-Filter, first order) | | 8 | 20 | mV _{PP} |
| V_{OSS} | Offsetripple (with 100 kHz-Filter, first order) | | 4 | | mV _{PP} |
| V_{OSS} | Offsetripple (with 20 kHz-Filter, first order) | | 2 | | mV _{PP} |
| C_k | Coupling capacity (primary - secondary) | | 10 | | pF |
| | Mechanical stress according to M3209/3 Settings: 10-2000Hz, 1min/oct, 2 hours | | 2 | | g |

Routine-Tests: (Measurement after temperature balance of the samples at room temperature, SC=significant characteristic)

| | | | | | |
|---------------------|-------------------|--|--|-----------------|-------------------|
| V_{OUT} (SC) | (100%) M3011/6: | Output voltage | | $625 \pm 0.7\%$ | mV |
| $V_{OUT} - V_{REF}$ | (100%) M3226: | Offset voltage | | ± 1.0 | mV |
| U_d | (100%) M3014: | Test voltage, 1s | | 1.8 | kV _{RMS} |
| U_{PDE} | (AQL 1/S4) M3024: | Partial discharge voltage (extinction) | | 1.5 | kV _{RMS} |
| $U_{PD} * 1.875$ | | | | 1.875 | kV _{RMS} |

Type-Tests: (Precondition acc. to M3236)

| | | | | | |
|------------------|---|------|-------|--|--------------------|
| \hat{U}_W | HV transient test acc. to M3064 (1.2 μs / 50 μs) 5 pulses -> polarity +, 5 pulses -> polarity - | | 6 | | kV _{PEAK} |
| U_d | Test voltage acc. to M3014 | (5s) | 3.6 | | kV _{RMS} |
| U_{PDE} | Partial discharge voltage (extinction) | | 1.5 | | kV _{RMS} |
| $U_{PD} * 1.875$ | acc. to M3024 | | 1.875 | | kV _{RMS} |

Other instructions:

- Current direction: A positive output voltage vs. V_{REF} appears at point V_{OUT} , if primary current flows in direction of the arrow sign on Sensor package.
- Temperature of the primary conductor should not exceed 105 $^\circ C$.
- Housing and bobbin material UL-listed: Flammability class 94V-0.

Hrg.: R&D-PD NPI D
editor

Bearb.: DJ
designer

MC-PM: KR
check

freig.: JG
released