

K-No.: 25104

**100A Current Sensor Module**  
 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: 15.11.2019

Customer: Standard Type

Customers Part No.:

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**Description**

- Closed loop (compensation)  
Current Sensor with magnetic field 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

**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 rated current, r.m.s	100	A
$R_M$	Load resistance	0 ... 200	$\Omega$
$I_{SN}$	Output rated current, r.m.s	100	mA
$K_N$	Turns ratio	(1) : 1000	

**Accuracy – Dynamic performance data** (with DRV401 @  $V_C = 5V \pm 5\%$ )

		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range @ $R_M = 1.563\Omega$	$\pm 160$			A
X	Measuring accuracy @ $I_{PN}, T_A = 25^\circ C$			0.5	%
$\epsilon_L$	Linearity			0.1	%
$I_0$	Offset current @ $I_P=0, T_A = -40... +85^\circ C$		0.03	0.1	mA
$I_{0H}$	Hysteresis		0.04	0.1	mA
$t_r$	Response time		1		$\mu s$
$\Delta t(I_{P,max})$	Delay time at $di/dt = 100 A/\mu s$		1		$\mu s$
f	Frequency range	DC...100			kHz

**General Data**

		min.	typ.	max.	Unit
$T_A$	Ambient temperature	-40		+85	$^\circ C$
$T_S$	Storage temperature (acc. to M3101)	-40		+85	$^\circ C$
m	Mass		32		g
$R_S$	Secondary coil resistance @ $T_A=85^\circ C$			24	$\Omega$
$C_k$	Coupling capacity		10		pF
	Mechanical Stress according to M3209/3 Settings: 10 – 2000 Hz, 1 min/Decade, 2 hours			2	g
	Constructed and manufactured and tested in accordance with EN 61800-5-1 (Pin 1 – 4 to inner hole) Reinforced insulation, Insulation material group 1, Pollution degree 2, Overvoltage category 3				
$S_{clear}$	clearance (component without solder pad)	12			mm
$S_{creep}$	creepage (component without solder pad)	14			mm
$U_{sys}$	System voltage			600	$V_{RMS}$
$U_{work}$	Working voltage (table 7 acc. to EN61800-5-1)			1400	$V_{RMS}$
$U_{PD}$	Rated discharge voltage			1508	$V_{PEAK}$

**Type Testing** acc. to EN 61800-5-1 (Pin 1 – 4 to inner hole)

$U_W$	HV transient test acc. to M3064 (1.2 $\mu s$ / 50 $\mu s$ -wave form) 5 pulses -> polarity +, 5 pulses -> polarity -			8	kV
$U_d$	Testing voltage acc. to M3014, 60s			3.6	$kV_{RMS}$
$U_e$	Partial discharge voltage test acc. to M3024 with $V_{vor}$			1600	$V_{RMS}$
				2000	$V_{RMS}$

Datum	Name	Index	Änderung
15.11.19	NSch.	81	Data sheet reworked / updated (current status) and max measuring range +/-160 added. Minor change
04.07.17	DJ	81	Typo: Offset current, hysteresis and response time changed. Minor change.

Hrsg.: R&D-PD NPI D editor	Bearb.: DJ designer	MC-PM: NSch. check	freig.: SB released
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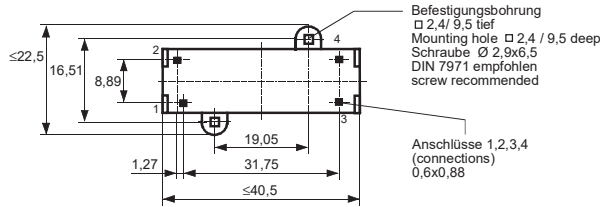
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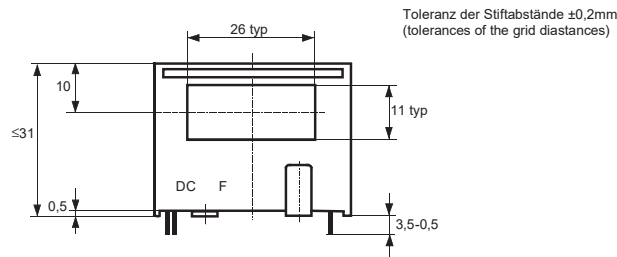
**Mechanical outline (mm):**

General tolerances DIN ISO 2768-c



Connections:

1..4:  $0,6 \times 0,88$  mm

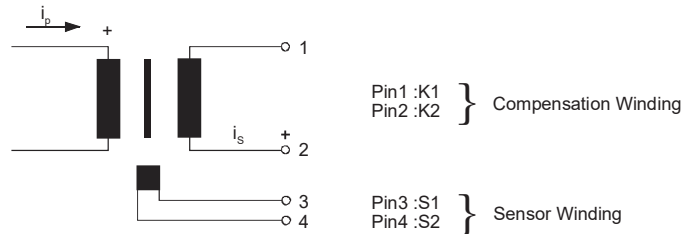


Marking:

4645-X060  
 F DC



**Schematic diagram:**



**Routine Tests:** (Measurements after temperature balance of the samples at room temperature; SC = significant characteristic)

$K_N$	(V)	M3011/6c:	Turns ratio	1 : 1000 $\pm$ 0.5	%
$I_0$	(V)	M3226:	Offset current	< 0.1	mA
$\Delta\Phi$ (K1-K2)	(V)	M3090:	Magnetic Flux compensation core	23.7...27	nVs
$\Delta\Phi$ (S1-S2)	(V)	M3090:	Magnetic Flux sensor	20...35	nVs
$R_s$ (K1-K2)	(V)	M3011/5:	Winding resistance compensation coil	15...18.5	$\Omega$
R (S1-S2)	(V)	M3011/5:	Winding resistance magnetic probe coil	2.5...3.5	$\Omega$
$V_d$	(V)	M3014:	Testing voltage, 1s (Pin 1 – 4 to inner hole)	1.8	kV <sub>RMS</sub>
$V_e$	(AQL1/S4)	M3024:	Partial discharge voltage with $V_{vor}$	1600 2000	V <sub>RMS</sub> V <sub>RMS</sub>

**Other Information:**

- Current direction: A positive output current appears at point  $I_s$ , by primary current in direction of the arrow.
- Temperature of the primary conductor should not exceed 110°C
- For primary current >100A, the linearity error can be bigger than  $\epsilon_L$
- Housing and bobbin material: UL-listed. Flammability class UL 94V-0.

Hrsg.: R&D-PD NPI D  
editor

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designer

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check

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released