

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.:

Page 1 of 2

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	Ω
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 @ $R_M = 1.563\Omega$	± 160			A
X	Measuring accuracy @ $I_{PN}, T_A = 25^\circ C$			0.5	%
ϵ_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		μs
$\Delta t(I_{P,max})$	Delay time at $di/dt = 100 A/\mu s$		1		μs
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	Ω
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 μs / 50 μs -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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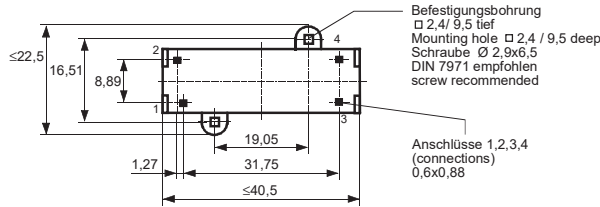
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Page 2 of 2

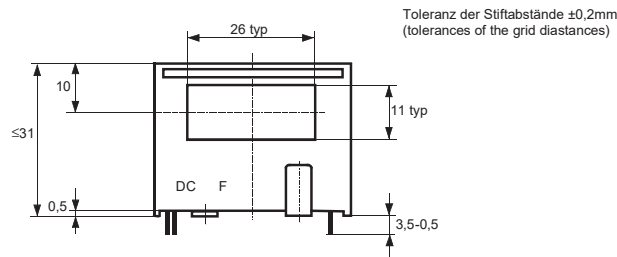
Mechanical outline (mm):

General tolerances DIN ISO 2768-c



Connections:

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

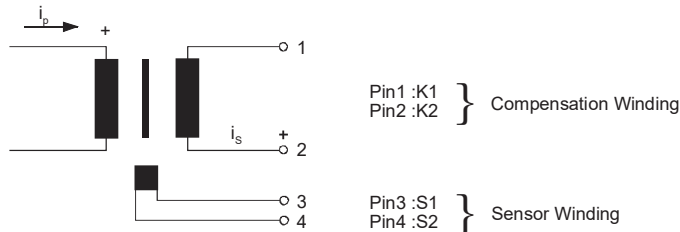


Marking:

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	Ω
R (S1-S2)	(V)	M3011/5:	Winding resistance magnetic probe coil	2.5...3.5	Ω
V_d	(V)	M3014:	Testing voltage, 1s (Pin 1 – 4 to inner hole)	1.8	kV _{RMS}
V_e	(AQL1/S4)	M3024:	Partial discharge voltage with V_{vor}	1600 2000	V _{RMS} V _{RMS}

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 ϵ_L
- Housing and bobbin material: UL-listed. Flammability class UL 94V-0.

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