Current Transducer LA 100-P

For the electronic measurement of currents: DC, AC, pulsed..., with galvanic separation between the primary circuit and the secondary circuit.

I_{PN} = 100 A

Electrical data

I_{PN}	Primary nominal rms current			100		A
I_{PM}	Primary current, measuring range			0 ... ±150		A
R_M	Measuring resistance @		T_A = 70 °C		T_A = 85 °C	
			$R_{M\ min}$ $R_{M\ max}$		$R_{M\ min}$ $R_{M\ max}$	
	with ±12 V	@ ±100 A $_{max}$	0 50		0 42	Ω
		@ ±120 A $_{max}$	0 22		0 14	Ω
	with ±15 V	@ ±100 A $_{max}$	0 110		20 102	Ω
		@ ±150 A $_{max}$	0 33		20 25	Ω
I_{SN}	Secondary nominal rms current			50		mA
K_N	Conversion ratio			1 : 2000		
U_C	Supply voltage (±5 %)			±12 … 15		V
I_C	Current consumption			10 (@ ±15 V) + I_S		mA

Accuracy - Dynamic performance data

			Typ	Max	
X	Accuracy @ I_{PN}, T_A = 25 °C @ ±15 V (±5 %)			±0.45	%
	@ ±12 … 15 V (±5 %)			±0.70	%
ε_L	Linearity error			< 0.15	%
I_O	Offset current @ I_P = 0, T_A = 25 °C			±0.10	mA
I_{OM}	Magnetic offset current [1] @ I_P = 0 and specified R_M, after an overload of 3 × I_{PN}			±0.15	mA
I_{OT}	Temperature variation of I_O −25 °C … +85 °C		±0.05	±0.30	mA
	−40 °C … −25 °C		±0.10	±0.50	mA
t_{ra}	Reaction time		< 500		ns
t_r	Step response time [2] to 90 % of I_{PN}		< 1		μs
di/dt	di/dt accurately followed		> 200		A/μs
BW	Frequency bandwidth (−1 dB)		DC … 200		kHz

General data

T_A	Ambient operating temperature		−40 … +85		°C
T_S	Ambient storage temperature		−40 … +90		°C
R_S	Resistance of secondary winding	@ T_A = 70 °C	120		Ω
		@ T_A = 85 °C	128		Ω
m	Mass		18		g
	Standards		EN 50178: 1997		
			UL 508: 2010		

Notes: [1] Result of the coercive field of the magnetic circuit
[2] With a di/dt of 100 A/μs.

Features

- Closed loop (compensated) current transducer using the Hall effect
- Insulated plastic case recognized according to UL 94-V0.

Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Optimized response time
- Wide frequency bandwidth
- No insertion losses
- High immunity to external interference
- Current overload capability.

Applications

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

Application domain

- Industrial.

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Insulation coordination		
U_d Rms voltage for AC insulation test, 50 Hz, 1 min	2.5	kV
$\hat{U}_W$ Impulse withstand voltage 1.2/50 µs	4.5	kV
	Min	
d_{Cp} Creepage distance	3.8	mm
d_{Cl} Clearance	3.8	mm
CTI Comparative tracking index (group I)	600	

Applications examples

According to EN 50178 and IEC 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

d_{Cp}, d_{Cl}, $\hat{U}_W$	EN 50178	IEC 61010-1
	Rated insulation voltage	Nominal voltage
Basic insulation	300 V	300 V
Reinforced insulation	150 V	150 V

Safety

This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.

This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.

Caution, risk of electrical shock

When operating the transducer, certain parts of the module can carry hazardous voltage (eg. primary busbar, power supply).
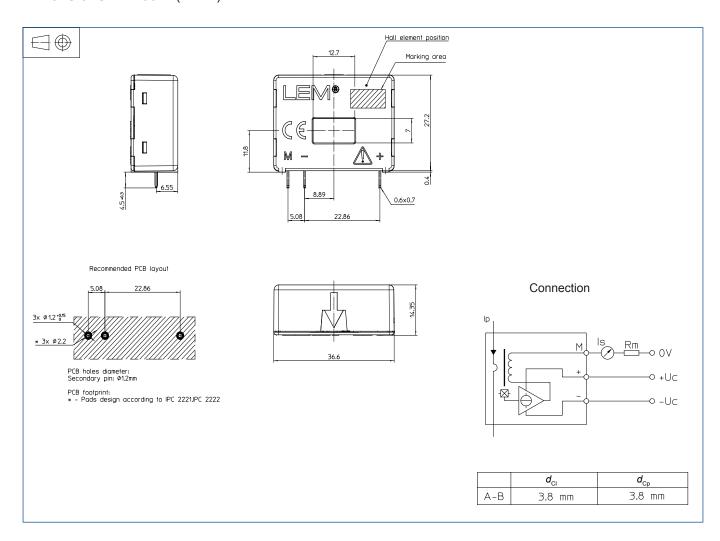Ignoring this warning can lead to injury and/or cause serious damage.
This transducer is a build-in device, whose conducting parts must be inaccessible after installation.
A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

Dimensions LA 100-P (in mm)

Hall element position

Marking area

12.7

27.2

11.8

7

M − +

0.4

6.55

4.5 ±0.3

8.89

0.6x0.7

5.08

22.86

Recommended PCB layout

5.08   22.86

3x ∅ 1.2 +0.15 / 0

* 3x ∅ 2.2

PCB holes diameter:
Secondary pin: ∅1.2mm

PCB footprint:
* – Pads design according to IPC 2221,IPC 2222

14.35

36.6

Connection

Ip

M Is Rm 0V

+ +Uc

− −Uc

	d_{Cl}	d_{Cp}
A–B	3.8 mm	3.8 mm

Mechanical characteristics

- General tolerance   ±0.2 mm
- Primary through-hole   12.7 × 7 mm
- Fastening & Connection of secondary   3 pins
                                                          0.6 × 0.7 mm
- Recommended PCB hole   ∅ 1.2 mm

Remarks

- I_S is positive when I_P flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 100 °C.
- Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.
- Installation of the transducer must be done unless otherwise specified on the datasheet, according to LEM Transducer Generic Mounting Rules. Please refer to LEM document N°ANE120504 available on our Web site: **Products/Product Documentation**.
- In order to achieve the best magnetic coupling, the primary windings have to be wound over the top edge of the device.
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.

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