# Current Transducer LA 25-NP/SP2

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

# $I_{PN}$ = 5-6-8-12-25 At

**RoHS COMPLIANT 2002/95/EC**

16158

## Electrical data

| | | | | | |
|---|---|---|---|---|---|
| $I_{PN}$ | Primary nominal current rms | | 25 | | At |
| $I_{PM}$ | Primary current, measuring range | | 0 .. + 36 | | At |
| $R_M$ | Measuring resistance | | $R_{M\ min}$ | $R_{M\ max}$ | |
| | with + 15 V | @ + 25 At $_{max}$ | 100 | 270 | $\Omega$ |
| | | @ + 36 At $_{max}$ | 100 | 170 | $\Omega$ |
| $I_{SN}$ | Secondary nominal current rms | | 25 | | mA |
| $K_N$ | Conversion ratio | | 1-2-3-4-5 : 1000 | | |
| $V_C$ | Supply voltage (± 5 %) | | 0 .. + 15 | | V |
| $I_C$ | Current consumption | | 10 + $I_S$ | | mA |

## Accuracy - Dynamic performance data

| | | | Typ | Max | |
|---|---|---|---|---|---|
| **X** | Accuracy @ $I_{PN}$, $T_A$ = 25°C | | ± 0.5 | | % |
| $\varepsilon_L$ | Linearity error | | < 0.2 | | % |
| $I_O$ | Offset current [1] @ $I_P$ = 0, $T_A$ = 25°C | | ± 0.05 | ± 0.15 | mA |
| $I_{OM}$ | Magnetic offset current [2] @ $I_P$ = 0 and specified $R_M$, after an overload of 3 x $I_{PN}$ | | ± 0.05 | ± 0.15 | mA |
| $I_{OT}$ | Temperature variation of $I_O$     0°C .. + 25°C | | ± 0.06 | ± 0.25 | mA |
| | + 25°C .. + 70°C | | ± 0.10 | ± 0.35 | mA |
| $t_r$ | Response time [3] to 90 % of $I_{PN}$ step | | < 1 | | µs |
| **di/dt** | di/dt accurately followed | | > 50 | | A/µs |
| **BW** | Frequency bandwidth (- 1 dB) | | DC .. 150 | | kHz |

## General data

| | | | | |
|---|---|---|---|---|
| $T_A$ | Ambient operating temperature | | 0 .. + 70 | °C |
| $T_S$ | Ambient storage temperature | | - 25 .. + 85 | °C |
| $R_P$ | Primary coil resistance per turn | @ $T_A$ = 25°C | < 1.25 | m$\Omega$ |
| $R_S$ | Secondary coil resistance | @ $T_A$ = 70°C | 60 | $\Omega$ |
| $R_{IS}$ | Isolation resistance @ 500 V, $T_A$ = 25°C | | > 1500 | M$\Omega$ |
| *m* | Mass | | 22 | g |
| | Standards | | EN 50178: 1997 | |

Notes:    [1] Measurement carried out after 15 mn functioning
          [2] The result of the coercive field of the magnetic circuit
          [3] With a di/dt of 100 A/µs.

## Features

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

## Special features

- $V_C$ = 0 .. + 15 (± 5 %) V
- $R_S$ = 60 $\Omega$ (@ $T_A$ = 70°C)
- Unidirectional measure.

## 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.

## Current Transducer LA 25-NP/SP2

| **Isolation characteristics** | | | |
|---|---|---|---|
| $V_d$ | Rms voltage for AC insulation test, 50 Hz, 1 min | 2.5 | kV |
| $\hat{V}_w$ | Impulse withstand voltage 1.2/50 µs | 9 | kV |
| | | Min | |
| **dCp** | Creepage distance | 10.63 | mm |
| **dCl** | Clearance | 10.63 | mm |
| **CTI** | Comparative Tracking Index (group IIIa) | 175 | |

## 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

| | EN 50178 | IEC 61010-1 |
|---|---|---|
| **dCp, dCl, $\hat{V}_w$** | Rated insulation voltage | Nominal voltage |
| Basic insulation | 1700 V | 1700 V |
| Reinforced insulation | 600 V | 600 V |

## Safety

⚠️

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).
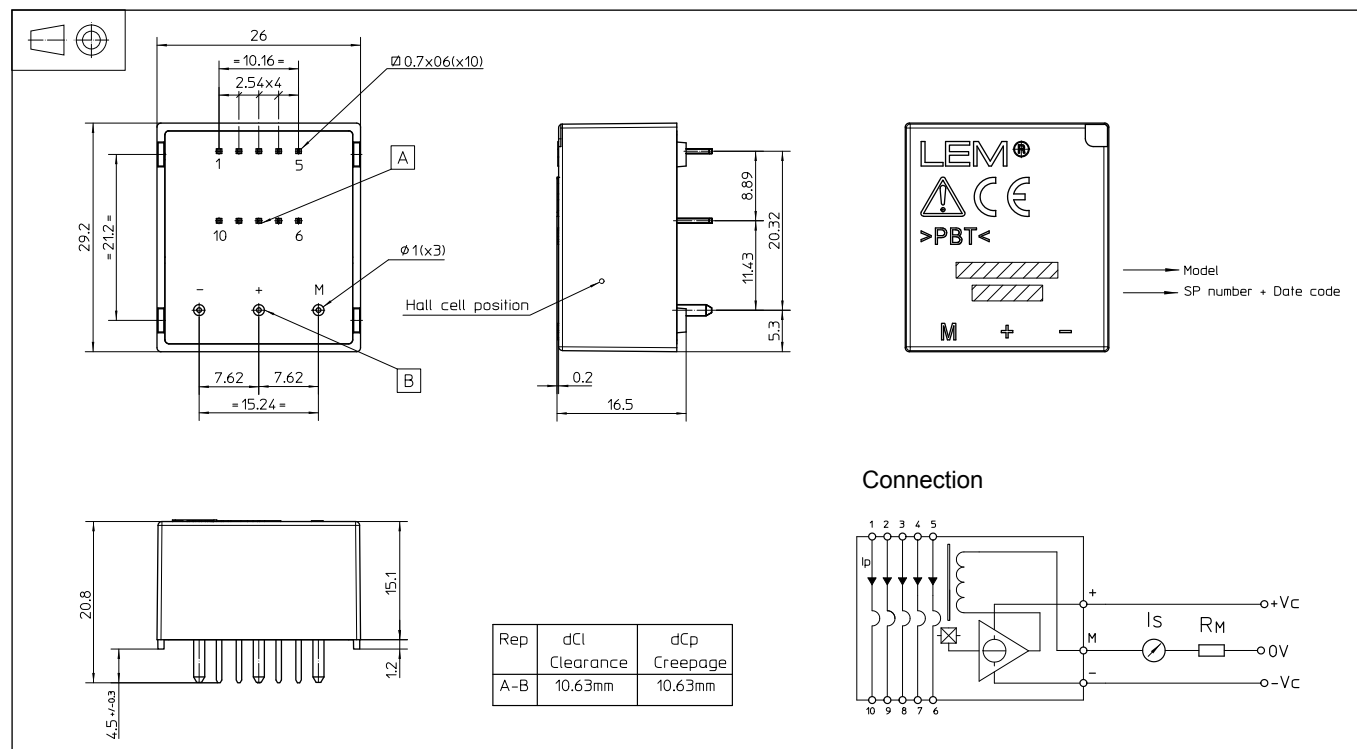Ignoring this warning can lead to injury and/or cause serious damage.
This transducer is a build-in device, whose conducting parts must be inaccessible after installation.
A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

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![LEM logo]

## Dimensions LA 25-NP/SP2 (in mm)



Connection

| Rep | dCl Clearance | dCp Creepage |
|-----|---------------|--------------|
| A–B | 10.63mm | 10.63mm |

| Number of primary turns | Primary current | | Nominal output current $I_{SN}$ [mA] | Turns ratio $K_N$ | Primary resistance $R_P$ [mΩ] | Primary insertion inductance $L_P$ [µH] | Recommended connections |
|---|---|---|---|---|---|---|---|
| | nominal $I_{PN}$ [A] | maximum $I_P$ [A] | | | | | |
| 1 | 25 | 36 | 25 | 1 / 1000 | 0.3 | 0.023 | |
| 2 | 12 | 18 | 24 | 2 / 1000 | 1.1 | 0.09 | |
| 3 | 8 | 12 | 24 | 3 / 1000 | 2.5 | 0.21 | |
| 4 | 6 | 9 | 24 | 4 / 1000 | 4.4 | 0.37 | |
| 5 | 5 | 7 | 25 | 5 / 1000 | 6.3 | 0.58 | |

## Mechanical characteristics

- General tolerance — ± 0.2 mm
- Fastening & connection of primary — 10 pins 0.7 x 0.6 mm
- Fastening & connection of secondary — 3 pins Ø 1 mm
- Recommended PCB hole — 1.2 mm

## Remark

- $I_S$ is positive when $I_P$ flows from terminals 1, 2, 3, 4, 5 to terminals 10, 9, 8, 7, 6.