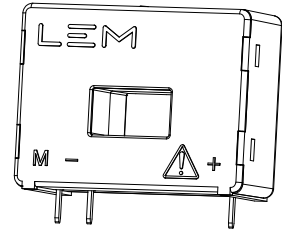


# Current Transducer LA 55-P/SP23

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

$$I_{PN} = 50 \text{ A}$$



## Electrical data

$I_{PN}$	Primary nominal RMS current	50	A					
$I_{PM}$	Primary current, measuring range	0 ... $\pm 70$	A					
$R_M$	Measuring resistance	@ $T_A = 70^\circ\text{C}$   $T_A = 85^\circ\text{C}$						
		$R_{M \min}$	$R_{M \max}$	$R_{M \min}$	$R_{M \max}$			
		with $\pm 12 \text{ V}$	@ $\pm 50 \text{ A}_{\max}$	10	100	60	95	$\Omega$
		with $\pm 15 \text{ V}$	@ $\pm 70 \text{ A}_{\max}$	10	50	60 <sup>1)</sup>	60 <sup>1)</sup>	$\Omega$
		@ $\pm 50 \text{ A}_{\max}$		50	160	135	155	$\Omega$
		@ $\pm 70 \text{ A}_{\max}$		50	90	135 <sup>2)</sup>	135 <sup>2)</sup>	$\Omega$
$I_{SN}$	Secondary nominal RMS current	50	mA					
$N_P/N_S$	Turns ratio	1 : 1000						
$U_C$	Supply voltage ( $\pm 5\%$ )	$\pm 12 \dots 15$	V					
$I_C$	Current consumption ( $\pm 2$ )	10 (@ $\pm 15 \text{ V}$ ) + $I_S$	mA					

## Accuracy - Dynamic performance data

$\varepsilon$	Error @ $I_{PN}, T_A = 25^\circ\text{C}$	@ $\pm 15 \text{ V}$ ( $\pm 5\%$ )	$\pm 0.45$	%	
		@ $\pm 12 \dots 15 \text{ V}$ ( $\pm 5\%$ )	$\pm 0.70$	%	
$\varepsilon_L$	Linearity error		< 0.15	%	
$I_{OE}$	Electrical offset current @ $I_P = 0, T_A = 25^\circ\text{C}$	Typ			
		Max	$\pm 0.10$	mA	
$I_{OM}$	Magnetic offset current <sup>3)</sup> @ $I_P = 0$ and specified $R_M$ , after an overload of $3 \times I_{PN}$		$\pm 0.30$	mA	
$I_{OT}$	Temperature variation of $I_O$	0 $^\circ\text{C}$ ... +70 $^\circ\text{C}$	$\pm 0.1$	$\pm 0.25$	mA
		-25 $^\circ\text{C}$ ... +85 $^\circ\text{C}$	$\pm 0.1$	$\pm 0.60$	mA
		-40 $^\circ\text{C}$ ... -25 $^\circ\text{C}$	$\pm 0.2$	$\pm 1.0$	mA
$t_{D10}$	Delay time to 10 % of the final output value for $I_{PN}$ step		< 500	ns	
$t_{D90}$	Delay time to 90 % of the final output value for $I_{PN}$ step <sup>4)</sup>		< 1	$\mu\text{s}$	
$BW$	Frequency bandwidth (-1 dB)		DC ... 200	kHz	

## General data

$T_A$	Ambient operating temperature	-40 ... +85	$^\circ\text{C}$	
$T_{A \text{ st}}$	Ambient storage temperature	-40 ... +90	$^\circ\text{C}$	
$R_S$	Resistance of secondary winding	@ $T_A = 70^\circ\text{C}$	80	$\Omega$
		@ $T_A = 85^\circ\text{C}$	85	$\Omega$
$m$	Mass	18	g	
	Standards	EN 50178: 1997 UL 508: 2010		

**Notes:** 1) Measuring range limited to  $\pm 60 \text{ A}_{\max}$   
 2) Measuring range limited to  $\pm 55 \text{ A}_{\max}$   
 3) Result of the coercive field of the magnetic circuit  
 4) For a  $di/dt = 200 \text{ A}/\mu\text{s}$ .

## Features

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

## Special features

- $\varepsilon = \pm 0.45\%$  @  $\pm 15 \text{ V}$  ( $\pm 5\%$ )
- $I_O = \pm 0.1 \text{ mA}$
- $I_{OT} = \pm 0.25 \text{ mA max}$  (0  $^\circ\text{C}$  ... +70  $^\circ\text{C}$ ).

## 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
$U_{Ni}$	Impulse withstand voltage 1.2/50 $\mu$ s	5.7	kV
		Min	
$d_{Cp}$	Creepage distance	5	mm
$d_{Cl}$	Clearance	5	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

	EN 50178	IEC 61010-1
$d_{Cp}, d_{Cl}, U_{Ni}$	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).

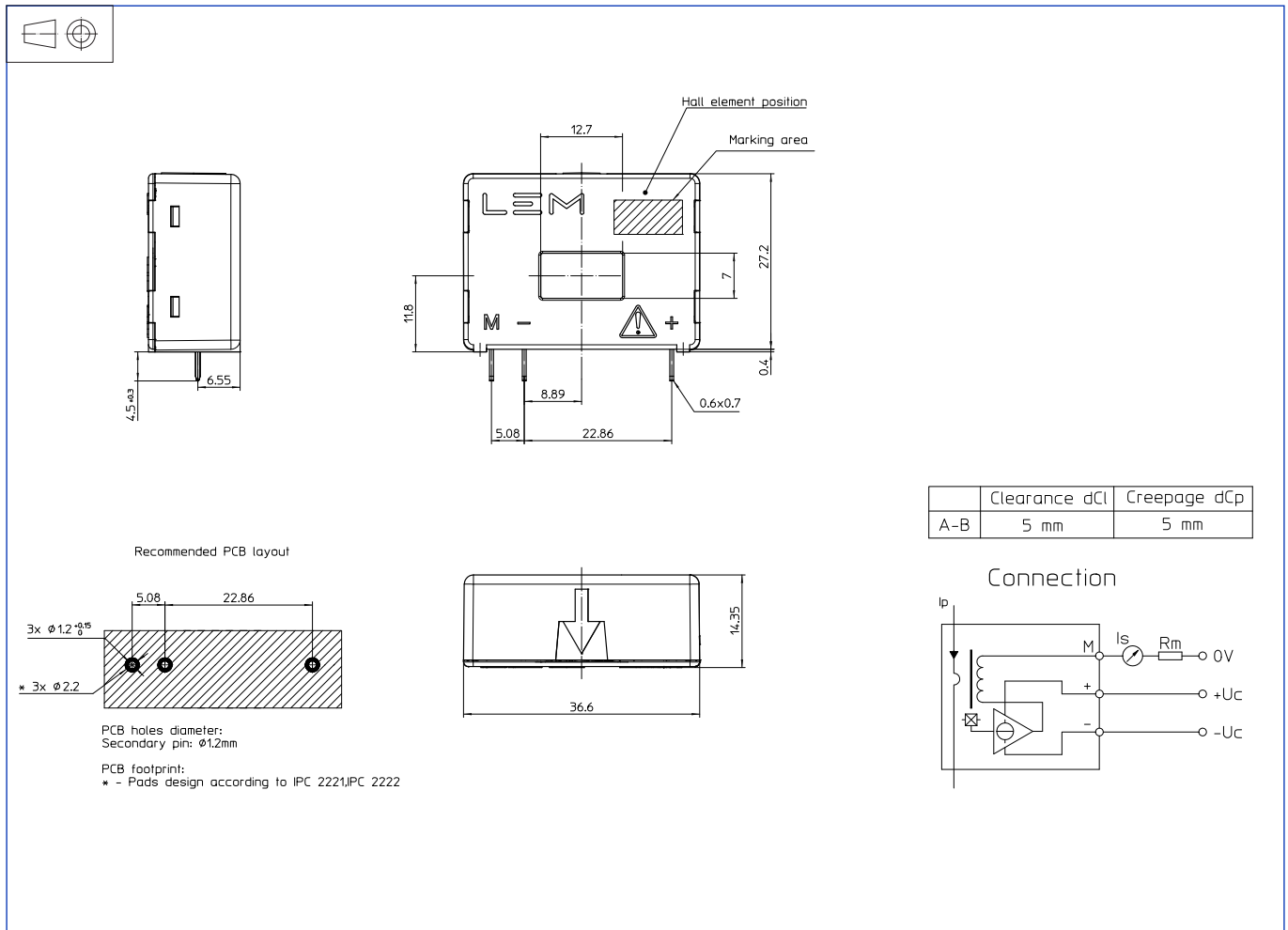
Ignoring this warning can lead to injury and/or cause serious damage.

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 55-P/SP23 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 0.2$  mm
- Primary through-hole  $12.7 \times 7$  mm
- Fastening & connection of secondary 3 pins
- Recommended PCB hole  $0.6 \times 0.7$  mm
- Recommended PCB hole  $\varnothing 1.2$  mm

### Remarks

- $I_s$  is positive when  $I_p$  flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed  $90^\circ\text{C}$ .
- 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: <https://www.lem.com/en/file/3137/download/>.
- Dynamic performances ( $di/dt$  and delay time) are best with a single bar completely filling the primary hole.
- In order to achieve the best magnetic coupling, the primary windings have to be wound over the top edge of the device.

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