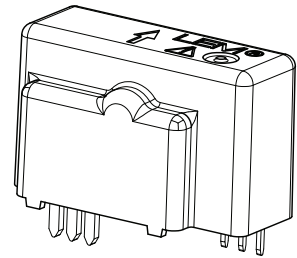


# Current Transducer LAH 50-P/SP1

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 <sup>1)</sup>	0 ... ±90	A	
$R_M$	Measuring resistance @ <sup>2)</sup>	$T_A = 70 \text{ °C}$		
		$T_A = 85 \text{ °C}$		
	with ±12 V	@ $I_{PN}$ [±A DC]	$R_{M \min}$ $R_{M \max}$	0 107   10 103 Ω
		@ $I_{PN}$ [A RMS] <sup>2)</sup>		0 53   10 49 Ω
with ±15 V	@ $I_{PN}$ [±A DC]		22 163   58 159 Ω	
	@ $I_{PN}$ [A RMS] <sup>2)</sup>		22 93   58 89 Ω	
$I_{SN}$	Secondary nominal RMS current	50	mA	
$N_P/N_S$	Turns ratio	1 : 1000		
$U_C$	Supply voltage (±5 %)	±12 ... 15	V	
$I_C$	Current consumption	10 (@ ±15V) + $I_S$	mA	

## Accuracy - Dynamic performance data

$\epsilon_{\text{tot}}$	Total error <sup>3)</sup> @ $I_{PN}$ , $T_A = 25 \text{ °C}$	±0.25	%
$\epsilon_L$	Linearity error	< 0.15	%
$I_O$	Offset current referred to primary @ $I_p = 0$ , $T_A = 25 \text{ °C}$	Typ	Max
			±300
$I_O$	Offset current referred to secondary @ $I_p = 0$ , $T_A = 25 \text{ °C}$	±0.3	mA
$I_{OM}$	Magnetic offset current @ $I_p = 0$ , referred to secondary and specified $R_M$ , after an overload of $5 \times I_{PN}$	±0.2 ±0.3	mA
$I_{OT}$	Temperature variation of $I_O$ , referred to secondary		
		0 °C ... +70 °C	±0.2 ±0.6
		-25 °C ... +85 °C	±0.2 ±0.8
$t_{D10}$	Delay time to 10 % of the final output value for $I_{PN}$ step	< 200	ns
$t_{D90}$	Delay time to 90 % of the final output value for $I_{PN}$ step <sup>4)</sup>	< 500	ns
$di/dt$	$di/dt$ accurately followed	> 200	A/μs
$BW$	Frequency bandwidth (-1 dB)	DC ... 200	kHz

## General data

$T_A$	Ambient operating temperature	-25 ... +85	°C
$T_{Ast}$	Ambient storage temperature	-40 ... +90	°C
$R_S$	Resistance of secondary winding @ $T_A = 70 \text{ °C}$	72	Ω
		@ $T_A = 85 \text{ °C}$	76
$m$	Mass	22	g
	Standards	EN 50178: 1997	

- Notes:**
- <sup>1)</sup> For 10 s, with  $R_M \leq 53 \text{ Ω}$
  - <sup>2)</sup> The measuring resistance  $R_{M \min}$  may be lower (see "LAH Technical Information" leaflet of the "LAH Application Note")
  - <sup>3)</sup> Without  $I_O$  &  $I_{OM}$
  - <sup>4)</sup> For a  $di/dt = 100 \text{ A/μs}$ .

## Features

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

## Special features

- $I_{PM} = 0 \text{ ... } \pm 90 \text{ A}$
- $N_P/N_S = 1 : 1000$ .

## Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Optimized delay 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	5	kV
$U_{Ni}$	Impulse withstand voltage 1.2/50 $\mu$ s	12	kV
$U_t$	Partial discharge RMS test voltage ( $q_m < 10$ pC)	> 2	kV
		Min	
$d_{Cp}$	Creepage distance <sup>1)</sup>	11.75	mm
$d_{Cl}$	Clearance <sup>1)</sup>	11.75	mm
$CTI$	Comparative tracking index (group IIIa)	175	

Note: <sup>1)</sup> On PCB with soldering pattern UTEC93-703.

### 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	1000 V	1000 V
Reinforced insulation	500 V	500 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.



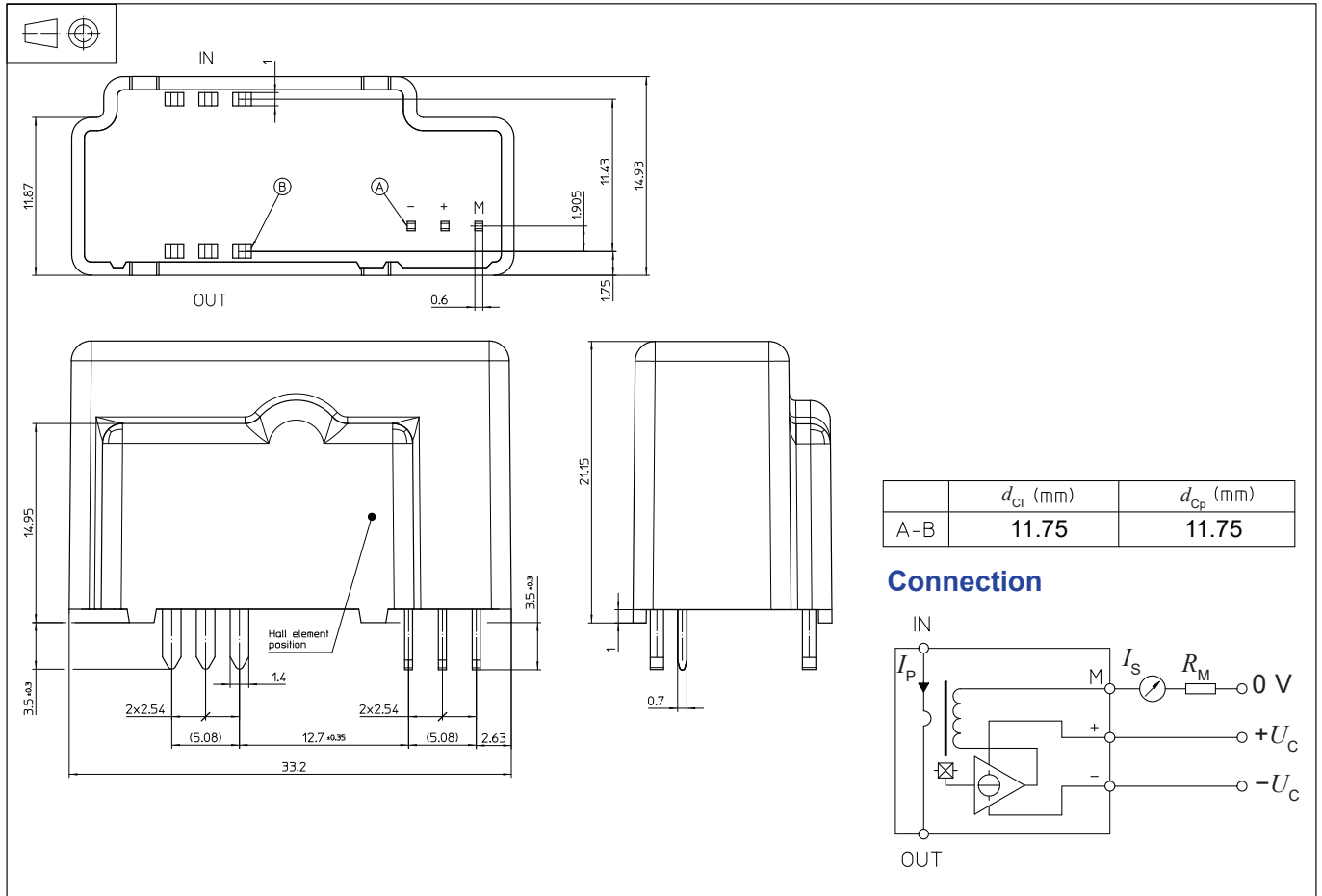
Caution, risk of electrical shock

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 LAH 50-P/SP1 (in mm)



Number of primary turns	Primary current		Nominal output current $I_{SN}$ [mA]	Turns ratio $N_p/N_s$	Primary resistance $R_p$ [mΩ]	Primary insertion inductance $L_p$ [μH]
	Nominal $I_{PN}$ [A]	Maximum $I_p$ [A]				
1	50	90	50	1 : 1000	0.12	0.008

### Mechanical characteristics

- General tolerance  $\pm 0.2$  mm
- Fastening & connection of primary 6 pins 1.4 mm × 1 mm  
Recommended PCB hole 2 mm
- Fastening & connection of secondary 3 pins 0.7 mm × 0.6 mm  
Recommended PCB hole 1.2 mm

### Remarks

- $I_S$  is positive when  $I_p$  flows from terminals IN to terminals OUT.
- The jumper temperature and PCB should not exceed 100 °C.