

Current Transducer LAH 25-NP/SP5

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



Electrical data

I_{PN}	Primary nominal RMS current	25	A
I_{PM}	Primary current, measuring range ¹⁾	0 ... 55	A
R_M	Measuring resistance @ ²⁾	$T_A = 70\text{ }^{\circ}\text{C}$	$T_A = 85\text{ }^{\circ}\text{C}$
		$R_{M\text{ min}}$ $R_{M\text{ max}}$	$R_{M\text{ min}}$ $R_{M\text{ max}}$
	with $\pm 12\text{ V}$	@ I_{PN} [$\pm$ At DC]	0 284 0 280 Ω
		@ I_{PN} [At RMS] ³⁾	0 182 0 178 Ω
	with $\pm 15\text{ V}$	@ I_{PN} [$\pm$ At DC]	67 398 70 394 Ω
		@ I_{PN} [At RMS] ³⁾	67 263 70 259 Ω
		@ $I_P < I_{PN}$ ⁴⁾	
I_{SN}	Secondary nominal RMS current	25	mA
N_P/N_S	Turns ratio	1-2-3 : 1000	
U_C	Supply voltage ($\pm 5\text{ }\%$)	$\pm 12 \dots 15$	V
I_C	Current consumption	10 (@ $\pm 15\text{ V}$) + I_S	mA

Accuracy - Dynamic performance data

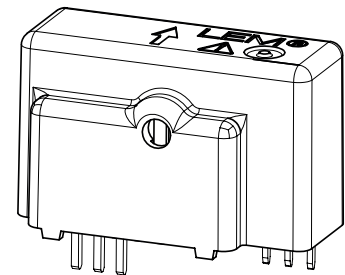
ε_{tot}	Total error ⁵⁾ @ I_{PN} , $T_A = 25^\circ\text{C}$	± 0.3	%
ε_L	Linearity error	< 0.2	%
I_O	Offset current referred to primary @ $I_P = 0$, $T_A = 25^\circ\text{C}$	Typ ± 50	mA
I_O	Offset current referred to secondary @ $I_P = 0$, $T_A = 25^\circ\text{C}$	Max ± 0.05	mA
I_{OM}	Magnetic offset current @ $I_P = 0$, referred to secondary and specified R_M , after an overload of $5 \times I_{PN}$	± 0.20 ± 0.25	mA
I_{OT}	Temperature variation of I_O , referred to secondary		
	0 $^\circ\text{C} \dots +70^\circ\text{C}$	± 0.10 ± 0.60	mA
	$-25^\circ\text{C} \dots +85^\circ\text{C}$	± 0.10 ± 0.70	mA
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 ⁶⁾	< 500	ns
BW	Frequency bandwidth (-1 dB)	DC ... 200	kHz

General data

T_A	Ambient operating temperature	$-25 \dots +85$	$^\circ\text{C}$
T_{Ast}	Ambient storage temperature	$-40 \dots +90$	$^\circ\text{C}$
R_S	Resistance of secondary winding @ $T_A = 70^\circ\text{C}$	72	Ω
	@ $T_A = 85^\circ\text{C}$	76	Ω
m	Mass	20	g
	Standards	EN 50178: 1997	

Notes: ¹⁾ During 10 s, with $R_M \leq 109\ \Omega$ ($U_C = \pm 15\text{ V}$)
²⁾ Calculation of $R_{M\min}$ with the maximum power of the transistors = 0.307 W @ 70°C and the maximum power of the transistors = 0.302 W @ 85°C
³⁾ Sinusoidal wave 50 Hz
⁴⁾ The measuring resistance R_M may be lower (see "LAH technical information" leaflet)
⁵⁾ Without I_O & I_{OM}
⁶⁾ For a $di/dt = 200\text{ A}/\mu\text{s}$.

$$I_{PN} = 8-12-25\text{ A}$$



Features

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

Special feature

- $I_O = \pm 0.050\text{ mA}$ max.

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 μ s	12	kV
U_t	Partial discharge RMS test voltage ($q_m < 10$ pC)	> 2	kV
		Min	
d_{cp}	Creepage distance ¹⁾	12	mm
d_{cl}	Clearance ¹⁾	12	mm
CTI	Comparative tracking index (group I)	175	

Note: ¹⁾ 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



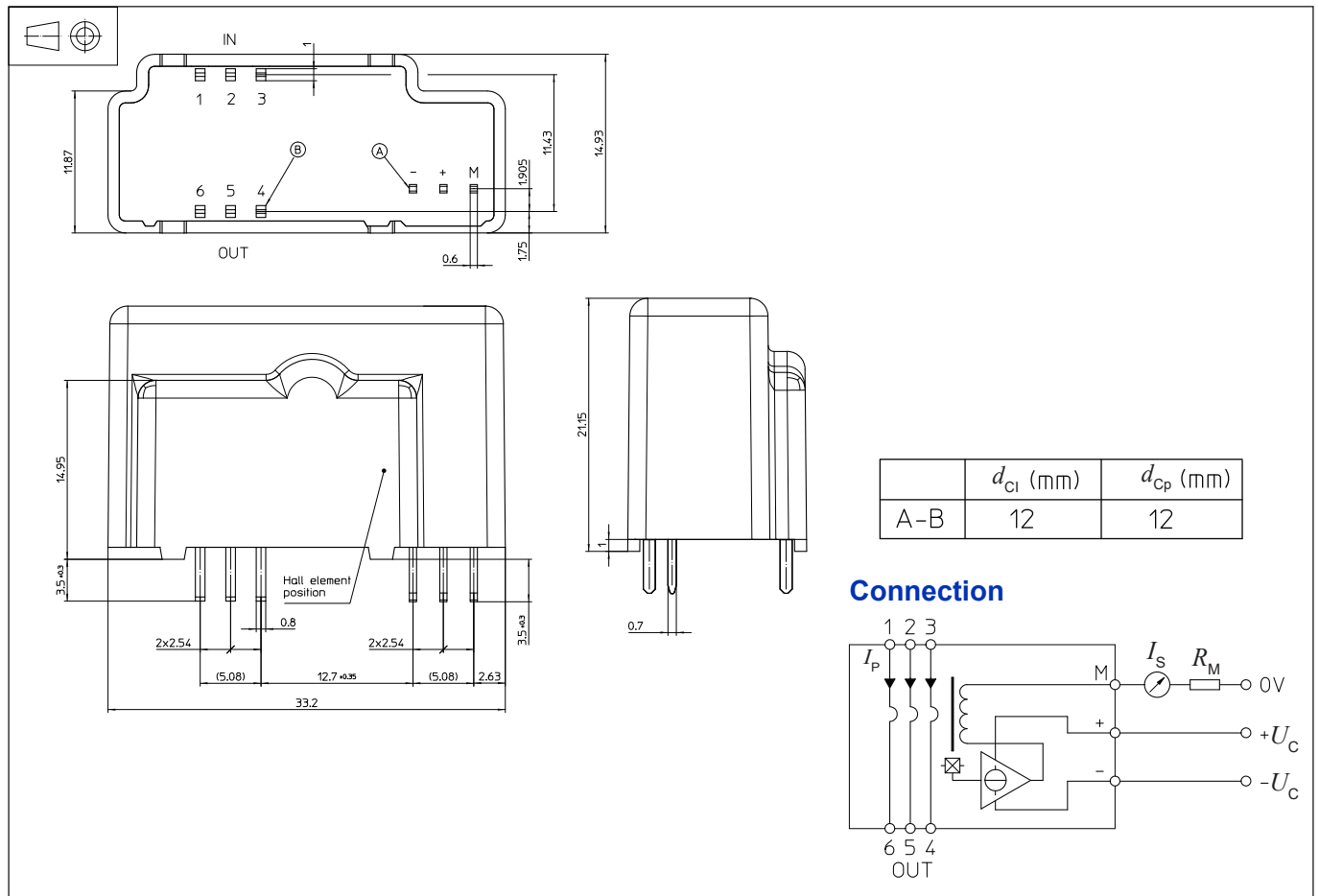
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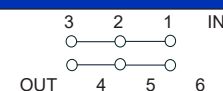
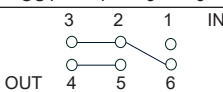
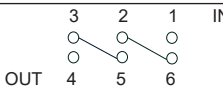
When operating the transducer, certain parts of the module can carry hazardous voltage (eg. primary busbar, power supply). Ignoring this warning can lead to injury and/or cause serious damage.

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 25-NP/SP5 (in mm)



Number of primary turns	Primary current nominal I_{PN} [A]	Primary current maximum I_P [A]	Nominal output current I_{SN} [mA]	Turns ratio N_P/N_S	Primary resistance R_P [mW]	Primary insertion inductance L_P [μH]	Recommended PCB connections
1	25	55	25	1 : 1000	0.18	0.012	
2	12	27	24	2 : 1000	0.81	0.054	
3	8	18	24	3 : 1000	1.62	0.110	

Mechanical characteristics

- General tolerance ± 0.2 mm
- Fastening & connection of primary 6 pins 1×0.8 mm
- Recommended PCB hole 1.5 mm
- Fastening & connection of secondary 3 pins 0.7×0.6 mm
- Recommended PCB hole 1.2 mm

Remarks

- I_S is positive when I_P flows from terminals 1, 2, 3 (IN) to terminals 6, 5, 4 (OUT).
- The jumper temperature and PCB should not exceed 100 °C.

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