

Current Transducer LV 100/SP17

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



Electrical data

I_{PN}	Primary nominal RMS current	10	mA
I_{PM}	Primary current, measuring range	0 ... ± 20	mA
R_M	Measuring resistance	$R_{M\min}$	$R_{M\max}$
	with ± 15 V	0	200
		0	70
	with ± 24 V	60	360
		60	150
I_{SN}	Secondary nominal RMS current	50	mA
N_p / N_s	Turns ratio	10000 : 2000	
U_c	Supply voltage (± 5 %)	$\pm 15 \dots 24$	V
I_c	Current consumption	37 (@ ± 24 V) + I_s	mA

Accuracy - Dynamic performance data

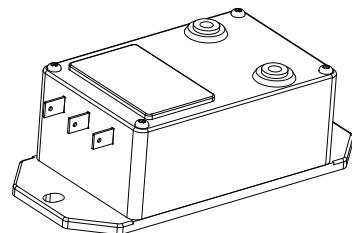
ε_{tot}	Total error @ I_{PN} , $T_A = 25$ °C	± 0.7	%
ε_L	Linearity error	< 0.1	%
I_o	Offset current @ $U_p = 0$, $T_A = 25$ °C	Typ	Max
I_{oT}	Temperature variation of I_o	± 0.2	mA
t_{D90}	Delay time to 90 % of the final output value for U_{PN} step ¹⁾	100	µs

General data

T_A	Ambient operating temperature	-25 ... +70	°C
T_{Ast}	Ambient storage temperature	-40 ... +85	°C
R_p	Resistance of primary winding @ $T_A = 70$ °C	1900	Ω
R_s	Resistance of secondary winding @ $T_A = 70$ °C	60	Ω
m	Mass	460	g
	Standard	EN 50155: 2007	

Note: ¹⁾ $R_1 = 100$ kΩ (L/R constant, produced by the resistance and inductance of the primary circuit).

$I_{PN} = 10$ mA



Features

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

Principle of use

- For voltage measurements, a current proportional to the measured voltage must be collected through an external resistor R_1 which is selected by the user and installed in series with the primary circuit of the transducer.

Special features

- $U_c = \pm 15 \dots 24$ (± 5 %) V
- $T_A = -25$ °C ... +70 °C
- Railway equipment.

Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Optimized delay time
- Wide frequency bandwidth
- High immunity to external interference.

Applications

- Single or three phase inverters
- Propulsion and braking choppers
- Propulsion converters
- Auxiliary converters
- Battery chargers.

Application domain

- Railway (fixed installations and onboard).

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	6 Min	kV
d_{Cp}	Creepage distance	77	mm
d_{Cl}	Clearance	74.1	mm
CTI	Comparative tracking index (group IIIa)	< 249	

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}	Rated insulation voltage	Nominal voltage
Basic insulation	600 V	1000 V
Reinforced insulation	300 V	600 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.



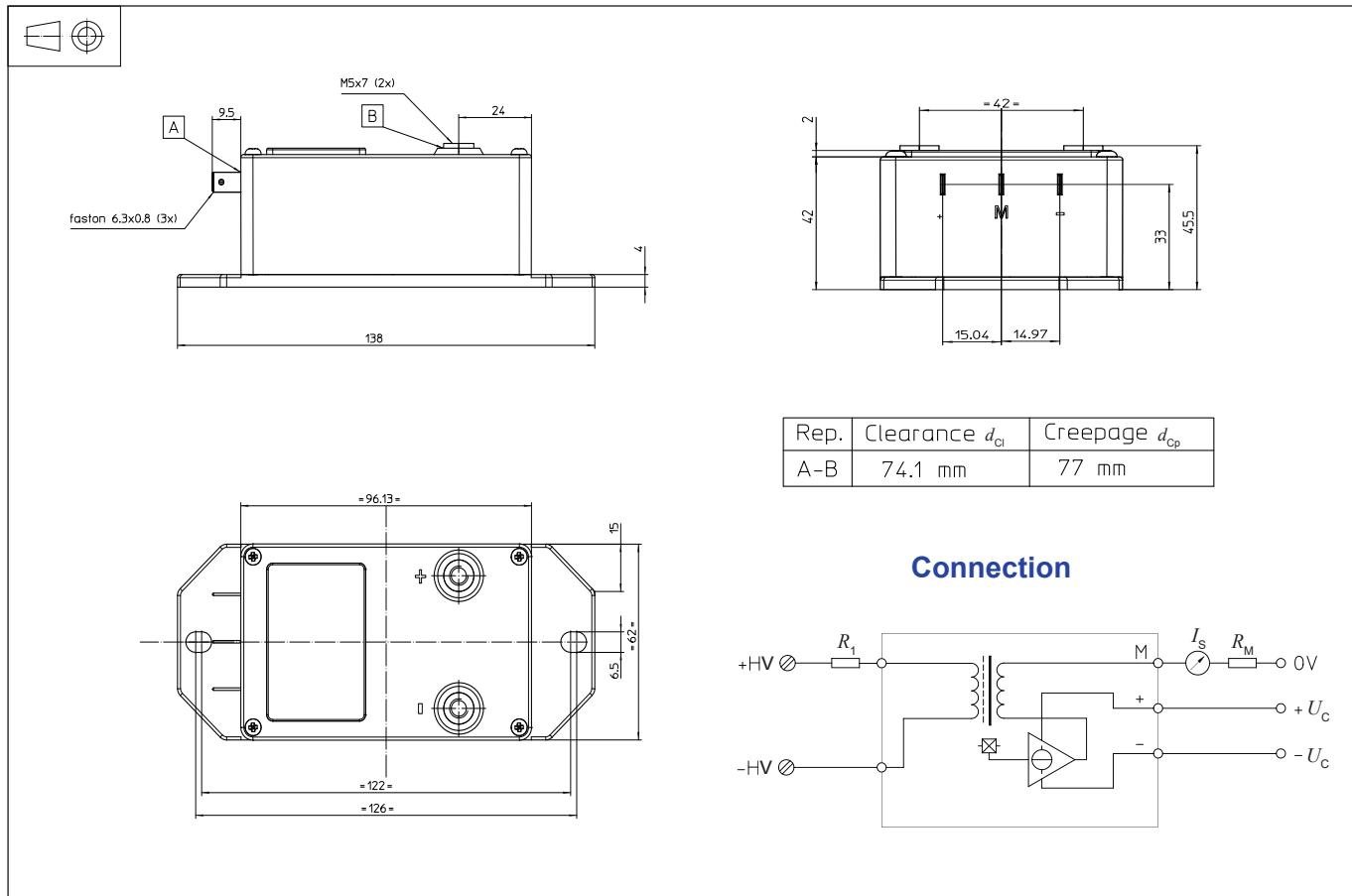
Caution, risk of electrical shock

When operating the transducer, certain parts of the module can carry hazardous voltage (e.g. 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.

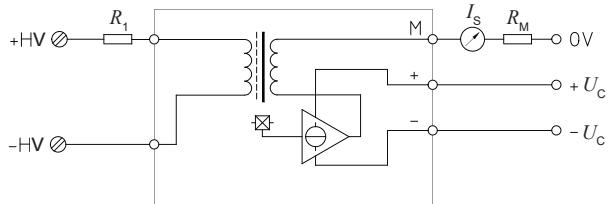
Main supply must be able to be disconnected.

Dimensions LV 100/SP17 (in mm)



Rep.	Clearance d_{Cl}	Creepage d_{Cp}
A-B	74.1 mm	77 mm

Connection



Mechanical characteristics

- General tolerance ± 0.3 mm
- Transducer fastening 2 holes $\varnothing 6.5$ mm
M6 steel screws
- Recommended fastening torque 5 N·m
- Connection of primary M5 threaded studs
- Recommended fastening torque 2.2 N·m
- Connection of secondary Faston 6.3 \times 0.8 mm

Remarks

- I_s is positive when U_p is applied on terminal +HV.
- The primary circuit of the transducer must be linked to the connections where the voltage has to be measured.
- 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/>.

Instructions for use of the current transducer model LV 100/SP17

Primary resistor R_1 : the transducer's optimum total error is obtained at the nominal primary current. As far as possible, R_1 should be calculated so that the nominal voltage to be measured corresponds to a primary current of 10 mA.

Example: Voltage to be measured $U_{pN} = 1000$ V

a) $R_1 = 100 \text{ k}\Omega / 40 \text{ W}$, $I_p = 10 \text{ mA}$ Total error = $\pm 0.7\%$ of U_{pN} (@ $T_A = +25^\circ\text{C}$)
b) $R_1 = 400 \text{ k}\Omega / 5 \text{ W}$, $I_p = 2.5 \text{ mA}$ Total error = $\pm 2.5\%$ of U_{pN} (@ $T_A = +25^\circ\text{C}$)

Operating range (recommended): taking into account the resistance of the primary windings (which must remain low compared to R_1 in order to keep thermal deviation as low as possible) and the insulation, this transducer is suitable for measuring nominal voltages from 100 to 2500 V.