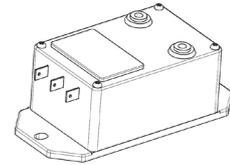


# Current Transducer LV 100/SP41

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

$$I_{PN} = 10 \text{ mA}$$



## Electrical data

$I_{PN}$	Primary nominal RMS current	10	mA
$I_{PM}$	Primary current, measuring range	0 ... $\pm 20$	mA
$R_M$	Measuring resistance with $\pm 15 \text{ V}$	@ $\pm 10 \text{ mA}_{\text{max}}$	$R_{M \text{ min}}$ 0 $R_{M \text{ max}}$ 200 $\Omega$
		@ $\pm 20 \text{ mA}_{\text{max}}$	0 70 $\Omega$
	with $\pm 24 \text{ V}$	@ $\pm 10 \text{ mA}_{\text{max}}$	60 360 $\Omega$
		@ $\pm 20 \text{ mA}_{\text{max}}$	60 150 $\Omega$
$I_{SN}$	Secondary nominal RMS current	50	mA
$N_p / N_s$	Turns ratio	10000 : 2000	
$S$	Sensitivity	5	mA/mA
$U_C$	Supply voltage ( $\pm 5 \%$ )	$\pm 15 \dots 24$	V
$I_C$	Current consumption	$25 (@ \pm 24 \text{ V}) + I_S$	mA

## Accuracy - Dynamic performance data

$\epsilon_{\text{tot}}$	Total error @ $I_{PN}, T_A = 25 \text{ }^\circ\text{C}$	$\pm 0.7$	%
$\epsilon_L$	Linearity error	$< 0.1$	%
$I_O$	Offset current @ $U_p = 0, T_A = 25 \text{ }^\circ\text{C}$	Typ	$\pm 0.3$ mA
		Max	$\pm 0.3$ mA
$I_{OT}$	Temperature variation of $I_O$	$-25 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$	$\pm 0.4 \pm 0.6$ mA
$t_{D90}$	Delay time to 90 % of the final output value for $U_{PN}$ step <sup>1)</sup>	$< 100$	$\mu\text{s}$

## Test circuit

$N_T$	Number of turns	100	
$R_T$	Resistance of test winding @ $T_A = 70 \text{ }^\circ\text{C}$	4	$\Omega$
$I_T$	Test current <sup>2)</sup>	0.1	A

## General data

$T_A$	Ambient operating temperature	$-25 \dots +70$	$^\circ\text{C}$
$T_{Ast}$	Ambient storage temperature	$-40 \dots +85$	$^\circ\text{C}$
$R_p$	Resistance of primary winding @ $T_A = 70 \text{ }^\circ\text{C}$	1900	$\Omega$
$R_s$	Resistance of secondary winding @ $T_A = 70 \text{ }^\circ\text{C}$	60	$\Omega$
$m$	Mass	450	g
	Standard <sup>3)</sup>	EN 50155: 2017	

Notes: <sup>1)</sup>  $R_1 = 100 \text{ k}\Omega$  ( $L/R$  constant, produced by the resistance and inductance of the primary circuit)

<sup>2)</sup> Test current 0.5 A RMS can be applied for maximum 10 s within 2 hours @  $T_A = 25 \text{ }^\circ\text{C}$

<sup>3)</sup> Additional information available on request.

## 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  $R_i$ , which is selected by the user and installed in series with the primary circuit of the transducer.

## Special features

- $U_C = \pm 15 \dots 24 (\pm 5 \%) \text{ V}$
- $I_T = 0.1 \text{ A}$
- $N_T = 100$  turns
- Completely potted
- Faston on primary winding
- CCQ or CECC components and high-reliability components for transistors, zener diodes and operational amplifiers.

## Advantages

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

## Applications

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

## Application domain

- Railway (fixed installations and onboard).

## Current Transducer LV 100/SP41

### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	6 <sup>4)</sup>	kV
$CTI$	Comparative tracking index (group IIIa)	< 249	

Note: <sup>4)</sup> Between primary and secondary + test winding.

### 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).

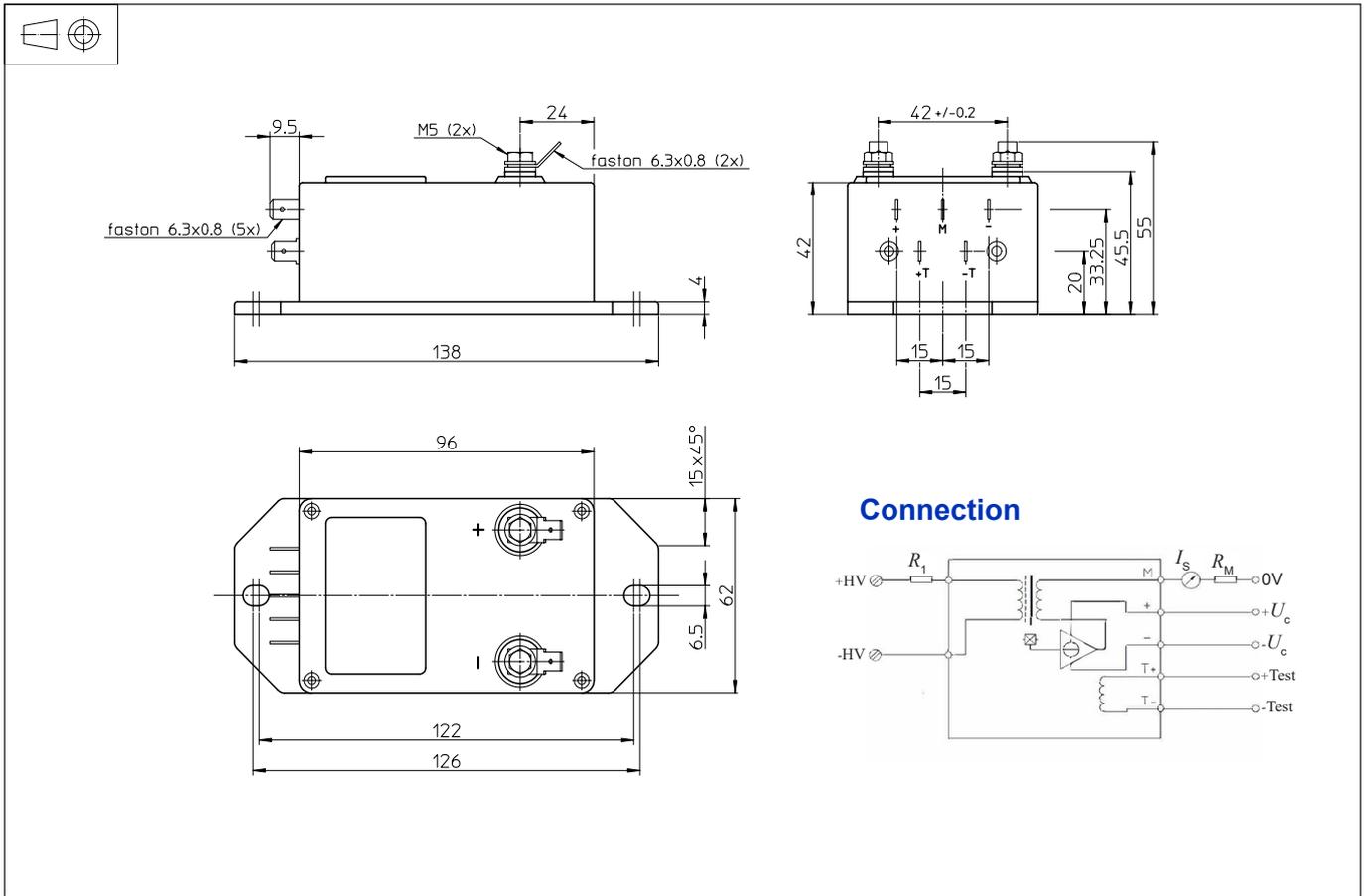
Ignoring this warning can lead to injury and/or cause serious damage.

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/SP41 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 0.3$  mm
- Transducer fastening 2 holes  $\varnothing 6.5$  mm  
M6 steel screws  
Recommended fastening torque 5 N·m
- Connection of primary Faston  $6.3 \times 0.8$  mm
- 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/SP41

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)  $R_1 = 100$  k $\Omega$  / 40 W,  $I_p = 10$  mA      Total error =  $\pm 0.7$  % of  $U_{PN}$  (@  $T_A = +25$  °C)  
 b)  $R_1 = 400$  k $\Omega$  / 5 W,  $I_p = 2.5$  mA      Total error =  $\pm 3$  % of  $U_{PN}$  (@  $T_A = +25$  °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 4000 V.

## IMPORTANT NOTICE

The information in this document is considered accurate and reliable. However, LEM International SA and any company directly or indirectly controlled by LEM Holding SA ("LEM") do not provide any guarantee or warranty, expressed or implied, regarding the accuracy or completeness of this information and are not liable for any consequences resulting from its use. LEM shall not be responsible for any indirect, incidental, punitive, special, or consequential damages (including, but not limited to, lost profits, lost savings, business interruption, costs related to the removal or replacement of products, or rework charges) regardless of whether such damages arise from tort (including negligence), warranty, breach of contract, or any other legal theory.

LEM reserves the right to update the information in this document, including specifications and product descriptions, at any time without prior notice. Information in this document replaces any previous versions of this document. No license to any intellectual property is granted by LEM through this document, either explicitly or implicitly. Any Information and product described herein is subject to export control regulations.

LEM products may possess either unidentified or documented vulnerabilities. It is the sole responsibility of the purchaser to design and operate their applications and products in a manner that mitigates the impact of these vulnerabilities. LEM disclaims any liability for such vulnerabilities. Customers must select products with security features that best comply with applicable rules, regulations, and standards for their intended use. The purchaser is responsible for making final design decisions regarding its products and for ensuring compliance with all legal, regulatory, and security-related requirements, irrespective of any information or support provided by LEM.

LEM products are not intended, authorized, or warranted for use in life support, life-critical, or safety-critical systems or equipment, nor in applications where failure or malfunction of an LEM product could result in personal injury, death, or significant property or environmental damage. LEM and its suppliers do not assume liability for the inclusion and/or use of LEM products in such equipment or applications; thus, this inclusion and/or use is at the purchaser's own and sole risk. Unless explicitly stated that a specific LEM product is automotive qualified, it should not be used in automotive applications. LEM does not accept liability for the inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

Applications that are described herein are for illustrative purposes only. LEM makes no representation or warranty that LEM products will be suitable for a particular purpose, a specified use or application. The purchaser is solely responsible for the design and operation of its applications and devices using LEM products, and LEM accepts no liability for any assistance with any application or purchaser product design. It is purchaser's sole responsibility to determine whether the LEM product is suitable and fit for the purchaser's applications and products planned, as well as for the planned application and use of purchaser's third-party customer(s).

Stressing and using LEM products at or above limiting values will cause permanent damage to the LEM product and potentially to any device embedding or operating with LEM product. Limiting values are stress ratings only and operation of the LEM product at or above conditions and limits given in this document is not warranted. Continuous or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the LEM product.

LEM products are sold subject to the general terms and conditions of commercial sale, as published at [www.lem.com](http://www.lem.com) unless otherwise agreed in a specific written agreement. LEM hereby expressly rejects the purchaser's general terms and conditions for purchasing LEM products by purchaser. Any terms and conditions contained in any document issued by the purchaser either before or after issuance of any document by LEM containing or referring to the general terms and conditions of sale are explicitly rejected and disregarded by LEM, and the document issued by the purchaser is wholly inapplicable to any sale or licensing made by LEM and is not binding in any way on LEM.

**© 2025 LEM INTERNATIONAL SA – All rights reserved**