

## Voltage Transducer LV 100

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



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

$$U_{PN} = 100 \dots 2500 \text{ V}$$



### 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 $\pm 15 \text{ V}$	$R_{M \min}$	$R_{M \max}$
		@ $\pm 10 \text{ mA}_{\max}$	0    150 $\Omega$
	@ $\pm 20 \text{ mA}_{\max}$	0    50 $\Omega$	
$I_{SN}$	Secondary nominal RMS current	50	mA
$N_P/N_S$	Turns ratio	10000 : 2000	
$U_C$	Supply voltage ( $\pm 5 \%$ )	$\pm 15$	V
$I_C$	Current consumption	$31 + I_S$	mA

### Accuracy - Dynamic performance data

$\varepsilon_{\text{tot}}$	Total error @ $I_P, T_A = 25 \text{ }^\circ\text{C}$	$\pm 0.7$	%
$\varepsilon_L$	Linearity error	$< 0.1$	%
$I_O$	Offset current @ $I_P = 0, T_A = 25 \text{ }^\circ\text{C}$	Typ	Max
			$\pm 0.2$ mA
$I_{OT}$	Temperature variation of $I_O$ $0 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$	$\pm 0.2$ $\pm 0.3$	mA
$t_{D90}$	Delay time to 90 % of $I_{PN}$ <sup>1)</sup>	$< 20 \dots 100$	$\mu\text{s}$

### General data

$T_A$	Ambient operating temperature	$0 \dots +70$	$^\circ\text{C}$
$T_S$	Ambient storage temperature	$-25 \dots +85$	$^\circ\text{C}$
$R_P$	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	460	g
	Standard	EN 50178: 1997	

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

### Features

- Closed loop (compensated) voltage 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 passed through an external resistor  $R_1$  which is selected by the user and installed in series with the primary circuit of the transducer.

### Advantages

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

### Applications

- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Power supplies for welding applications.

### Application domain

- Industrial.

## Voltage Transducer LV 100

### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	6	kV
		Min	
$d_{cp}$	Creepage distance	77	mm
$d_{ci}$	Clearance	74.1	mm
$CTI$	Comparative tracking index (group IIIa)	225	

### 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
$d_{cp}, d_{ci}, U_{Ni}$	Rated insulation voltage	Nominal voltage
Basic insulation	6 kV	6 kV
Reinforced insulation	3 kV	3 kV

## 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.



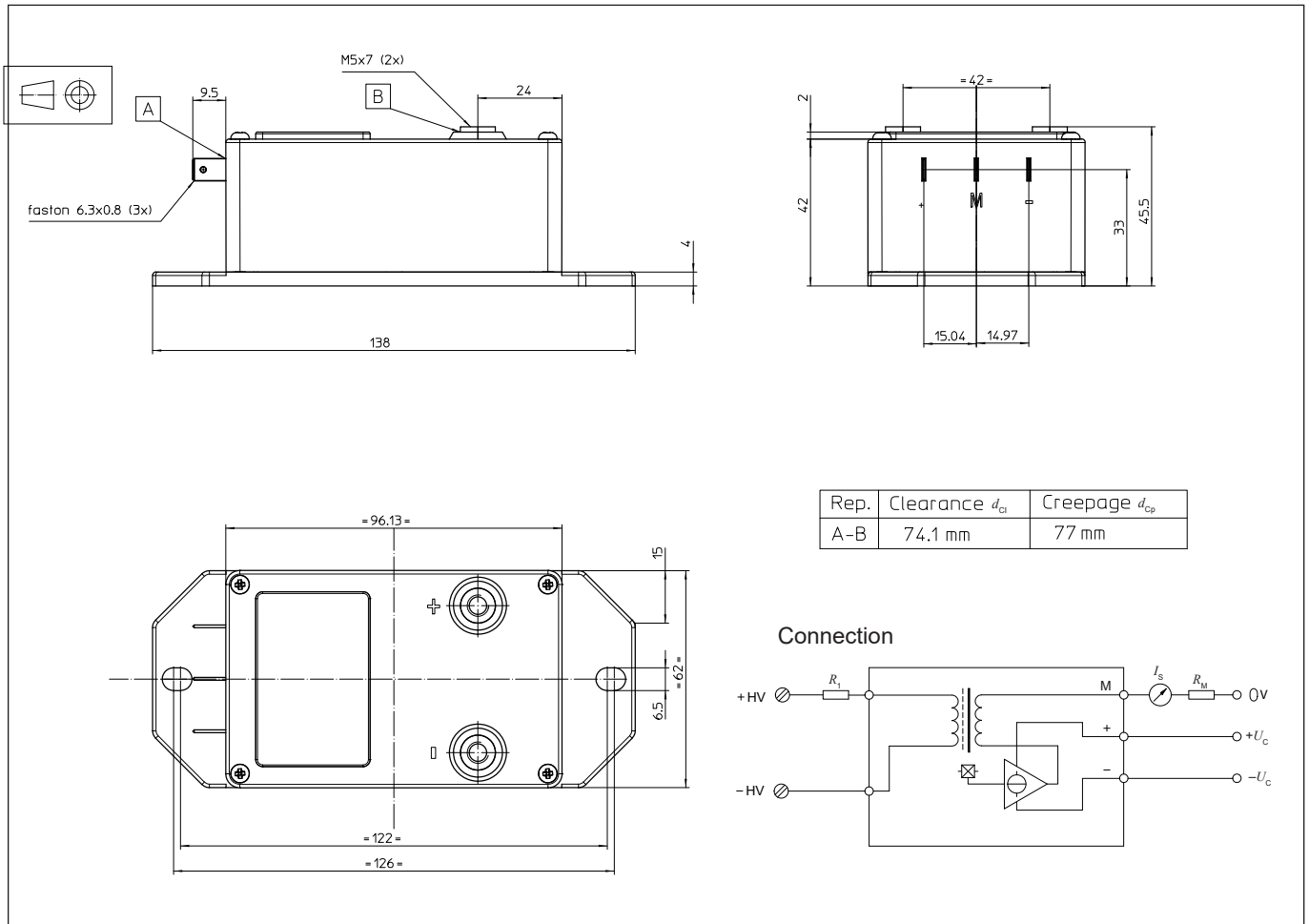
Caution, risk of electrical shock

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 (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  $\times$  m
- Connection of primary
  - M5 steel screws
  - Recommended fastening torque 2.2 N  $\times$  m
- Connection of secondary
  - Faston 6.3  $\times$  0.8 mm

### Remarks

- $I_S$  is positive when  $U_p$  is applied on terminal +HV.
- 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>.
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.

### Instructions for use of the voltage transducer model LV 100

Primary resistor  $R_1$ : the transducer's optimum accuracy 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 Accuracy =  $\pm 0.7$  % of  $U_{PN}$  (@  $T_A = +25$  °C)

b)  $R_1 = 400$  k $\Omega$ /5 W,  $I_p = 2.5$  mA Accuracy =  $\pm 2.5$  % 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 2500 V.