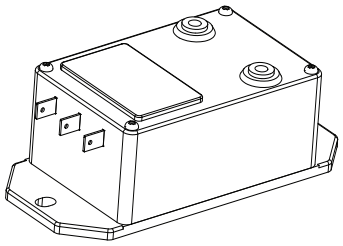
Voltage Transducer LV 100/SP47

I_{PN} = 10 mA

V_{PN} = 100 ... 2500 V

For the electronic measurement of voltages: 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 ±12 V	@ ±10 mA $_{max}$	0	140	Ω
		@ ±20 mA $_{max}$	0	40	Ω
	with ±18 V	@ ±10 mA $_{max}$	80	250	Ω
		@ ±20 mA $_{max}$	80	90	Ω
I_{SN}	Secondary nominal RMS current		50		mA
K_N	Conversion ratio		10000 : 2000		
U_C	Supply voltage (±5 %)		±12 … 18		V
I_C	Current consumption		25 (@ ±18 V) + I_S		mA

Accuracy - Dynamic performance data

X	Accuracy @ I_{PN}, T_A = 25 °C		±0.7		%
ε_L	Linearity error		< 0.1		%
			Typ	Max	
I_O	Offset current @ V_P = 0, T_A = 25 °C			±0.3	mA
I_{OT}	Temperature variation of I_O	−40 °C … +85 °C	±0.6	±1.0	mA
		−25 °C … +70 °C	±0.4	±0.6	mA
t_r	Step response time to 90 % of V_{PN} [1]		20 ... 100		µs

General data

T_A	Ambient operating temperature	−40 … +85	°C
T_S	Ambient storage temperature	−45 … +90	°C
R_P	Resistance of primary winding @ T_A = 85 °C	2000	Ω
R_S	Resistance of secondary winding @ T_A = 85 °C	63	Ω
m	Mass	460	g
	Standard	EN 50155: 1995	

Note: [1] R_P = 100 kΩ (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 collected through an external resistor R_P which is selected by the user and installed in series with the primary circuit of the transducer.

Special features

- U_C = ±12 … 18 (±5 %) V
- U_d = 9 kV
- T_A = −40 °C… +85 °C
- Railway equipment.

Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Low 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

- Traction.

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	9 Min	kV
d_{Cp}	Creepage distance	77	mm
d_{Cl}	Clearance	74.1	mm
CTI	Comparative tracking index (group I)	600	

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}, $\hat{U}_W$	Rated insulation voltage	Nominal voltage
Basic insulation	1000 V	1000 V
Reinforced insulation	600 V	600 V

Safety

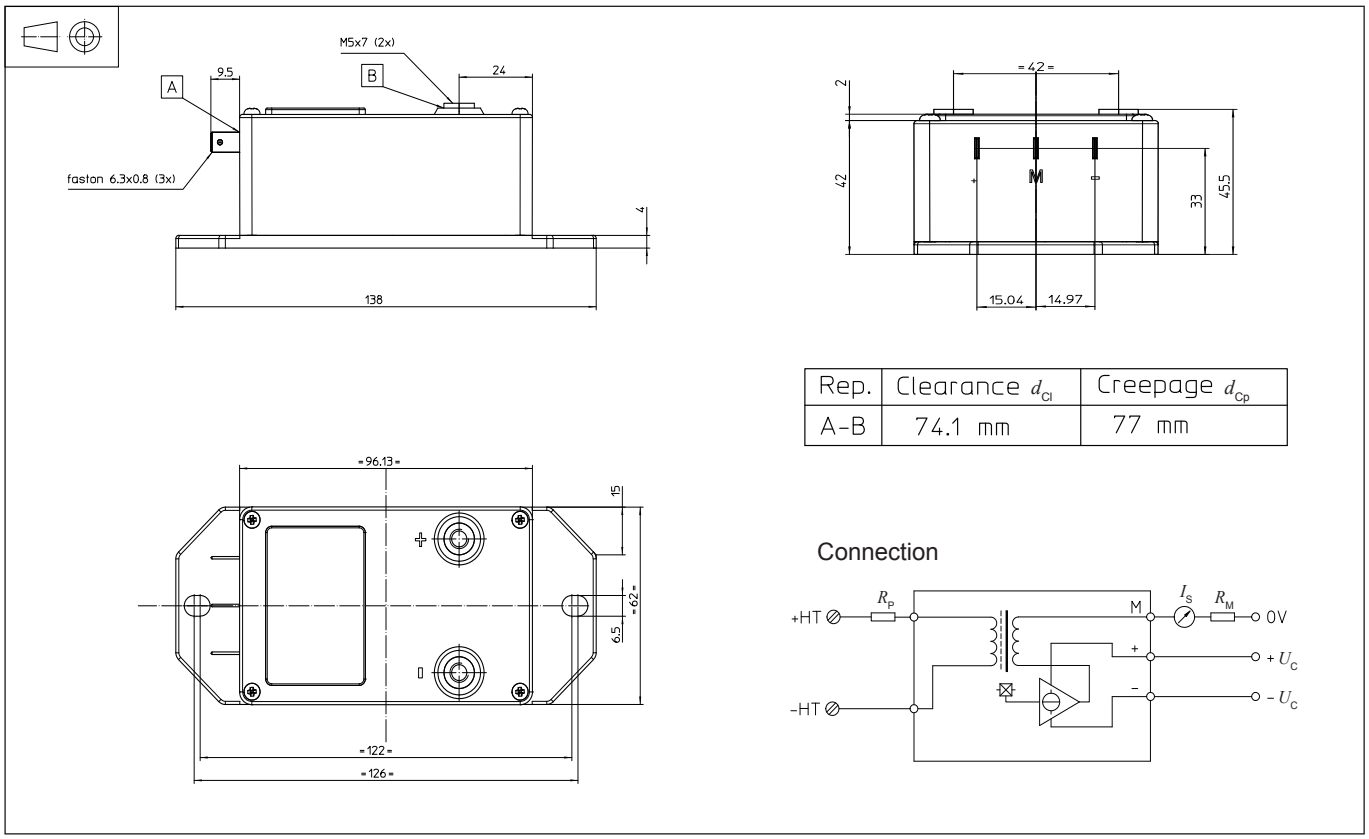
This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.

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/SP47 (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 ⌀ 6.5 mm
  2 M6 steel screws
  Recommended fastening torque 5 N·m
- Connection of primary M5 screw terminals
  Recommended fastening torque 2.2 N·m
- Connection of secondary Faston 6.3 × 0.8 mm

Remarks

- I_S is positive when V_P is applied on terminal +HT.
- Temperature of the primary conductor should not exceed 100 °C.
- 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: **Products/Product Documentation.**

Instructions for use of the voltage transducer model LV 100/SP47

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

Example: Voltage to be measured V_{PN} = 1000 V
a) R_P = 100 kΩ / 40 W, I_P = 10 mA Accuracy = ±0.7 % of V_{PN} (@ T_A = +25 °C)
b) R_P = 400 kΩ/ 5 W, I_P = 2.5 mA Accuracy = ±2.5 % of V_{PN} (@ T_A = +25 °C)

Operating range (recommended): taking into account the resistance of the primary windings (which must remain low compared to R_P 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.