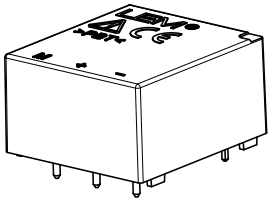
Voltage Transducer LV 25-P/SP5

I_{PN} = 10 mA

V_{PN} = 10 .. 1500 V

For the electronic measurement of voltage: 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 .. ± 14	mA
R_M	Measuring resistance			$R_{M\,min}$ $R_{M\,max}$	
	with ± 15 V	@ ± 10 mA $_{max}$		100 340	Ω
		@ ± 14 mA $_{max}$		100 180	Ω
I_{SN}	Secondary nominal rms current			25	mA
K_N	Conversion ratio			2500 : 1000	
U_C	Supply voltage (± 5 %)			± 15	V
I_C	Current consumption			10 + I_S	mA

Accuracy - Dynamic performance data

X_G	Overall accuracy @ I_{PN}, T_A = 25 °C			± 0.8	%
ε_L	Linearity error			< 0.2	%
				Typ Max	
I_O	Offset current @ I_P = 0, T_A = 25 °C			± 0.15	mA
I_{OT}	Temperature variation of I_O	- 25 °C .. + 85 °C		± 0.25 ± 0.50	mA
		- 40 °C .. + 85 °C		± 0.30 ± 0.80	mA
t_r	Step response time [1] to 90 % of V_{PN}			25	µs

General data

T_A	Ambient operating temperature			- 40 .. + 85	°C
T_S	Ambient storage temperature			- 50 .. + 90	°C
R_P	Resistance of primary winding @ T_A = 85 °C			300	Ω
R_S	Resistance of secondary winding @ T_A = 85 °C			117	Ω
m	Mass			22	g
	Standards			EN 50155: 2007	
				UL 508: 2010	

Note: [1] R_1 = 25 kΩ (L/R constant, produced by the resistance and inductance of of the primary circuit).

Features

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

Special features

- T_A = - 40 °C .. + 85 °C
- U_d = 4.2 kV (4 kV DC / 5 min).

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.

Applications

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

Application Domain

- Traction.

Voltage Transducer LV 25-P/SP5

Insulation coordination

U_d	Rms voltage for AC insulation test, 50 Hz, 1 min	4.2	kV
$\hat{U}_W$	Impulse withstand voltage 1.2/50 µs	16	kV
		Min	
d_{Cp}	Creepage distance	19.5	mm
d_{Cl}	Clearance	19.5	mm
CTI	Comparative tracking index (group IIIa)	175	

Safety

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 (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.

UL 508:Ratings and assumptions of certification

File # E189713 Volume: 2 Section: 1

Standards

- CSA C22.2 NO. 14 - 10 INDUSTRIAL CONTROL EQUIPMENT - Edition 11 - Revision Date 2011/08/01
- UL 508 STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT - Edition 17 - Revision Date 2010/04/15.

Parameter	Symbol	Unit	Value
Primary involved potential		V AC/DC	600
Max surrounding air temperature	T_A	°C	85
Primary current	I_P	mA	0 to 10
Secondary supply voltage	U_C	V DC	0 to ±15
Secondary nominal rms current	I_{SN}	mA	25

Conditions of acceptability

When installed in the end-use equiment, consideration shall be given to the following:

1 - These devices must be mounted in a suitable end-use enclosure.

2 - The terminals have not been evaluated for field wiring.

3 - The LV 25-P series are intended to be mounted on the printed wiring board of the end-use equipment (with a minimum CTI of 100).

4 - The LV 25-P series shall be used in a pollution degree 2 environment when the Printed Wiring Board has not been coated.

5 - The LV 25-P series shall be mounted on the load side of line filters.

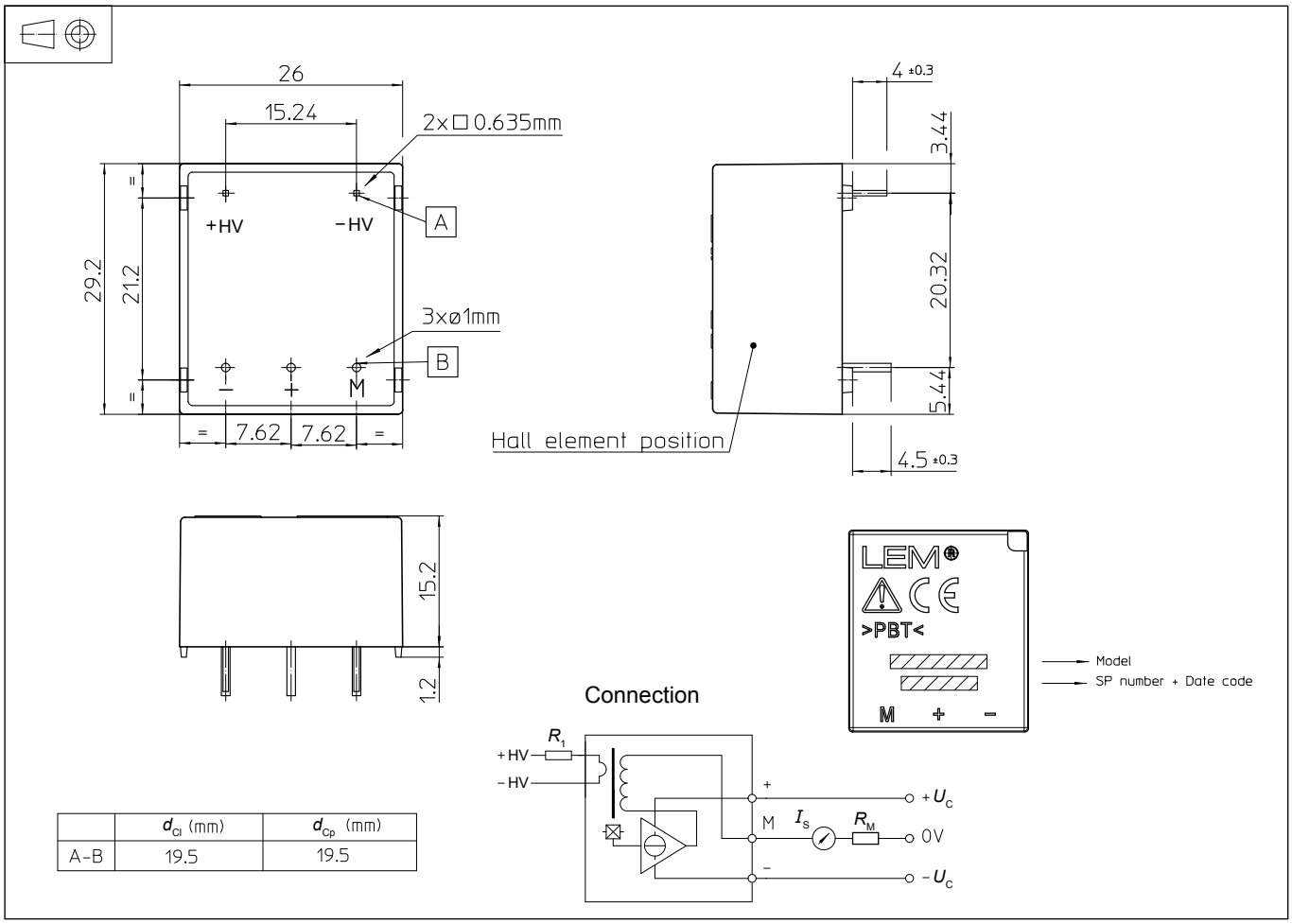
6 - Low voltage circuits are intended to be powered by a circuit derived from an isolating source (such as a transformer,optical isolator,limiting impedance or electro-mechanical relay) and having no direct connection back to the primary circuit (other than through the grounding means).

7 - Base on results of temperature tests, int he end use application, a maximum of 100 °C cannot be exceeded at soldering point between primary coil pin and soldering point of on the primary bus bar (corrected to the appropriate evaludated max. surrounding air).

Marking

Only those products bearing the UL or UR Mark should be considered to be Listed or Recognized and covered under UL's Follow-Up Service.Always look for the Mark on the product.

Dimensions LV 25-P/SP5 (in mm)



	d_{Cl} (mm)	d_{Cp} (mm)
A-B	19.5	19.5

Mechanical characteristics

- General tolerance ± 0.2 mm
- Fastening & connection of primary 2 pins
  0.635 × 0.635 mm
- Fastening & connection of secondary 3 pins ⌀ 1 mm
  Recommended PCB hole ⌀ 1.2 mm

Remarks

- I_S is positive when V_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: **Products/Product Documentation**.

Instructions for use of the voltage transducer model LV 25-P/SP5

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 V_{PN} = 250 V
a) R_1 = 25 kΩ / 2.5 W, I_P = 10 mA Accuracy = ± 0.8 % of V_{PN} (@ T_A = + 25 °C)
b) R_1 = 50 kΩ / 1.25 W, I_P = 5 mA Accuracy = ± 1.6 % 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_1, in order to keep thermal deviation as low as possible) and the isolation, this transducer is suitable for measuring nominal voltages from 10 to 1500 V.

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