Voltage Transducer LV 25-P

For the electronic measurement of voltages : DC, AC, pulsed..., with a galvanic isolation between the primary circuit (high voltage) and the secondary circuit (electronic circuit).

I_{PN} = 10 mA

V_{PN} = 10..500 V

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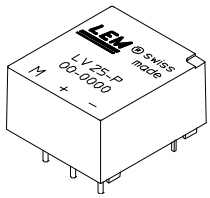

Electrical data

I_{PN}	Primary nominal current rms			10	mA
I_{PM}	Primary current, measuring range			0 .. ± 14	mA
R_M	Measuring resistance			$R_{M\ mini}$ $R_{M\ maxi}$	
	with ± 12 V	@ ± 10 mA $_{maxi}$		30 190	Ω
		@ ± 14 mA $_{maxi}$		30 100	Ω
	with ± 15 V	@ ± 10 mA $_{maxi}$		100 350	Ω
		@ ± 14 mA $_{maxi}$		100 190	Ω
I_{SN}	Secondary nominal current rms			25	mA
K_N	Conversion ratio			2500 : 1000	
V_C	Supply voltage (± 5 %)			± 12 .. 15	V
I_C	Current consumption			10 (@ ±15 V) + I_S	mA

Accuracy - Dynamic performance data

X_G	Overall Accuracy @ I_{PN}, T_A = 25°C	@ ± 12 .. 15 V		± 0.9	%
		@ ± 15 V (± 5 %)		± 0.8	%
ε_L	Linearity error			< 0.2	%
			Typ	Maxi	
I_O	Offset current @ I_P = 0, T_A = 25°C			± 0.15	mA
I_{OT}	Temperature variation of I_O	0°C .. + 25°C	± 0.06	± 0.25	mA
		+ 25°C .. + 70°C	± 0.10	± 0.35	mA
t_r	Response time [1] to 90 % of I_{PN} step		40		µs

General data

T_A	Ambient operating temperature	0 .. + 70	°C
T_S	Ambient storage temperature	- 25 .. + 85	°C
R_P	Primary coil resistance @ T_A = 70°C	250	Ω
R_S	Secondary coil resistance @ T_A = 70°C	110	Ω
m	Mass	22	g
	Standards	EN 50178: 1997	

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

Features

- Closed loop (compensated) voltage transducer using the Hall effect
- Insulated 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 thermal drift
- Low response time
- High 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.

LEM reserves the right to carry out modifications on its transducers, in order to improve them, without prior notice.

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Isolation characteristics

V_d	Rms voltage for AC isolation test, 50 Hz, 1 min	2.5 [2)]	kV
$\hat{V}_w$	Impulse withstand voltage 1.2/50 µs	16	kV
		Mini	
dCp	Creepage distance	19.5	mm
dCl	Clearance distance	19.5	mm
CTI	Comparative Tracking Index (Group IIIa)	175	

Note: [2)] Between primary and secondary.

Application 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
dCp, dCl, $\hat{V}_w$	Rated isolation voltage	Nominal voltage
Single isolation	1600 V	1600 V
Reinforced isolation	800 V	800 V

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 built-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.

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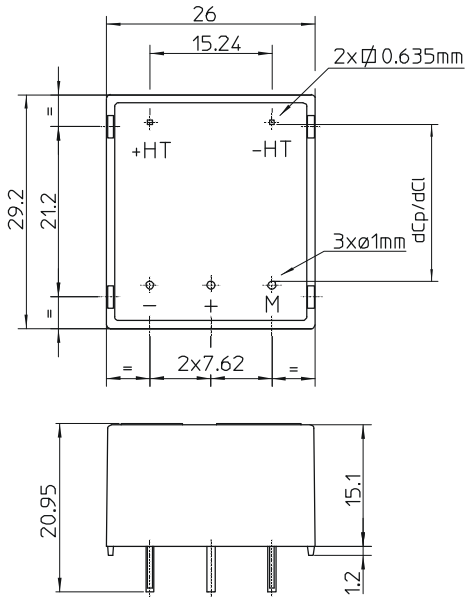
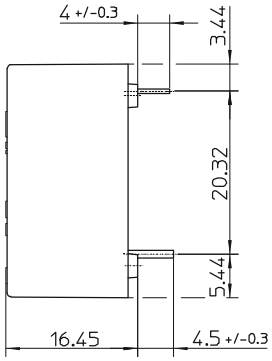
Dimensions LV 25-P (in mm. 1 mm = 0.0394 inch)

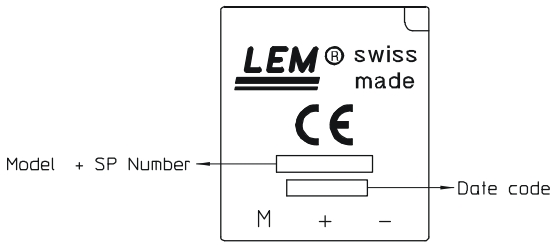
Bottom view



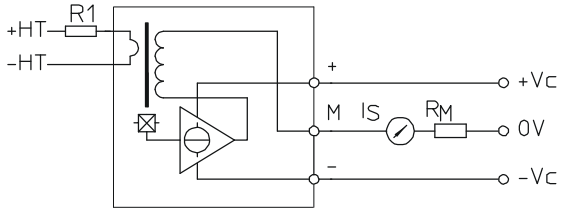
Right view



Top view



Connection



Back view

Mechanical characteristics

• General tolerance	± 0.2 mm
• Fastening & connection of primary	2 pins 0.635 x 0.635 mm
• Fastening & connection of secondary	3 pins ∅ 1 mm
• Recommended PCB hole	1.2 mm

Remarks

- $\mathbf{I}_S$ is positive when $\mathbf{V}_P$ is applied on terminal +HT.
- 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 25-P

Primary resistor $\mathbf{R}_1$: the transducer's optimum accuracy is obtained at the nominal primary current. As far as possible, $\mathbf{R}_1$ should be calculated so that the nominal voltage to be measured corresponds to a primary current of 10 mA.

Example: Voltage to be measured $\mathbf{V}_{PN}$ = 250 V

a) $\mathbf{R}_1$ = 25 kΩ / 2.5 W, $\mathbf{I}_P$ = 10 mA Accuracy = ± 0.8 % of $\mathbf{V}_{PN}$ (@ $\mathbf{T}_A$ = + 25°C)
b) $\mathbf{R}_1$ = 50 kΩ / 1.25 W, $\mathbf{I}_P$ = 5 mA Accuracy = ± 1.6 % of $\mathbf{V}_{PN}$ (@ $\mathbf{T}_A$ = + 25°C)

Operating range (recommended) : taking into account the resistance of the primary windings (which must remain low compared to $\mathbf{R}_1$ in order to keep thermal deviation as low as possible) and the isolation, this transducer is suitable for measuring nominal voltages from 10 to 500 V.

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