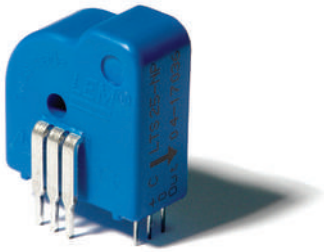
Current Transducer LTS 6-NP

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

I_{PN} = 6 At



Electrical data

I_{PN}	Primary nominal RMS current		6	At
I_{PM}	Primary current, measuring range		0 … ±19.2	At
I_P	Overload capability		250	At
V_{out}	Output voltage (analog) @ I_P		2.5 ±(0.625 × I_P/ I_{PN})	V
	@ I_P = 0		2.5 [1]	V
G	Sensitivity		104.16	mV/A
N_S	Number of secondary turns (±0.1 %)		2000	
R_L	Load resistance		≥ 2	kΩ
R_{IM}	Internal measuring resistance (±0.5 %)		208.33	Ω
TCR_{IM}	Temperature coefficient of R_{IM}		< 50	ppm/K
U_C	Supply voltage (±5 %)		5	V
I_C	Current consumption @ U_C = 5 V	Typical	28 + I_S [2] (V_{out}/R_L)	mA

Accuracy - Dynamic performance data

			Typ	Max	
X	Accuracy @ I_{PN}, T_A = 25 °C		±0.2		%
	Accuracy with R_{IM},@ I_{PN}, T_A = 25 °C		±0.7		%
ε_L	Linearity error		< 0.1		%
TCV_{out}	Temperature coefficient of V_{out} @ I_P = 0	−10 ... +85 °C	80	200	ppm/K
		−40 ... −10 °C		250	ppm/K
TCG	Temperature coefficient of G	−40 ... +85 °C		50 [3]	ppm/K
V_{OM}	Magnetic offset voltage @ I_P = 0,				
	after an overload of 3 × I_{PN}			±0.5	mV
	after an overload of 5 × I_{PN}			±2.0	mV
	after an overload of 10 × I_{PN}			±2.0	mV
t_{ra}	Reaction time @ 10 % of I_{PN}		< 100		ns
t_r	Step response time to 90 % of I_{PN} [4]		< 400		ns
BW	Frequency bandwidth	(0 ... −0.5 dB)	DC … 100		kHz
		(−0.5 ... 1 dB)	DC … 200		kHz

General data

T_A	Ambient operating temperature	−40 … +85	°C
T_S	Ambient storage temperature	−40 … +100	°C
m	Mass	10	g
	Standards	EN 50178: 1997	
		IEC 60950-1: 2001	

Notes: [1] Absolute value @ T_A = 25 °C, 2.475 < V_{out} < 2.525

[2] I_S = I_P/ N_S

[3] Only due to TCR_{IM}

[4] For a di/dt = 15 A/µs.

Features

- Closed loop (compensated) current transducer using the Hall effect
- Unipolar supply voltage
- Insulating plastic case recognized according to UL 94-V0
- Compact design for PCB mounting
- Incorporated measuring resistance
- Extended measuring resistance.

Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift
- Optimized response time
- Wide frequency bandwidth
- No insertion losses
- High immunity to external interference
- Current overload capability.

Applications

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

Application domain

- Industrial.

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
- UL 508 STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT - Edition 17

Ratings

Parameter	Symbol	Unit	Value
Primary involved potential		V AC/DC	600
Max surrounding air temperature	T_A	°C	85
Primary current	I_P	A	According to series primary currents
Output voltage	V_{out}	V	0 to 5

Conditions of acceptability

When installed in the end-use equipment, 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 LTS, LTSR, LTSP Series are intended to be mounted on the printed wiring board of the end-use equipment (with a minimum CTI of 100).
4 - The LTS, LTSR, LTSP Series shall be used in a pollution degree 2 environment.
5 - 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).
6 - The LTS, LTSR, LTSP Series: based on results of temperature tests, in the end-use application, a maximum of 100°C cannot be exceeded at soldering point between primary coil pin and soldering point or on primary bus bar (corrected to the appropriate evaluated max, surrounding air).
7 - For LTS, LTSR, LTSP Series, the secondary sensing circuit was evaluated as the circuit intended to be supplied from a Limited Voltage/Current circuit defined in UL 508 standard.

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.

Current Transducer LTS 6-NP

Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	3	kV
$\hat{U}_W$	Impulse withstand voltage 1.2/50 µs	> 8	kV
U_e	Partial discharge extinction RMS voltage @ 10 pC	1.5 Min	kV
d_{Cp}	Creepage distance [1]	15.5	mm
d_{Cl}	Clearance [2]	6.35	mm
CTI	Comparative tracking index (group IIIa)	175	

Notes: [1] On housing
[2] On PCB with soldering pattern UTEC93-703.

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	600 V	600 V
Reinforced insulation	300 V	300 V

Safety

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



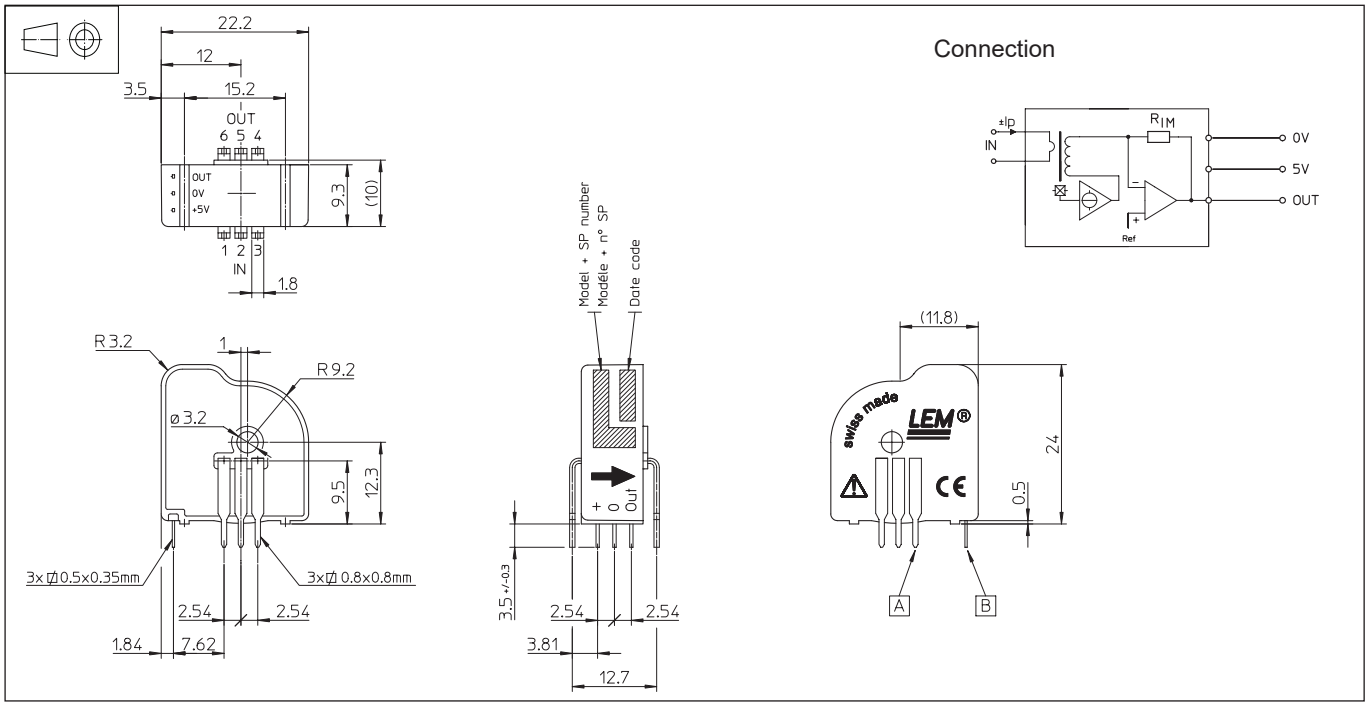
This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.



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 LTS 6-NP (in mm)



Number of primary turns	Primary nominal RMS current	Nominal output voltage V_{out}	Primary resistance R_P [mΩ]	Primary insertion inductance L_P [µH]	Recommended connections
1	±6	2.5 ±0.625	0.18	0.013	6 5 4 OUT IN 1 2 3
2	±3	2.5 ±0.625	0.81	0.05	6 5 4 OUT IN 1 2 3
3	±2	2.5 ±0.625	1.62	0.12	6 5 4 OUT IN 1 2 3

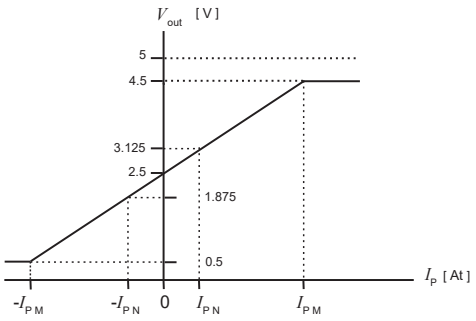
Mechanical characteristics

- General tolerance ±0.2 mm
- Transducer fastening of primary 6 pins 0.8 × 0.8 mm
  Recommended PCB hole 1.3 mm
- Transducer fastening of secondary 3 pins 0.5 × 0.35 mm
  Recommended PCB hole 0.8 mm
- Primary through-hole ⌀ 3.2 mm

Remarks

- V_{out} swings above 2.5 V when I_P flows from terminals 1, 2, 3 to terminals 6, 5, 4 (with the arrow).
- 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.**
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.

Output voltage - Primary current



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