Made by LEM Danfysik

High Performance Current Transducer ITN 12-P ULTRASTAB

I_{PM} = 0 .. 12.5 A

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

Electrical data

I_{PN}	Primary nominal current DC	12.5	A
I_{PN}	Primary nominal current rms	8.8	A
I_{PM}	Primary current, measuring range	0 .. ± 12.5	A
$\hat{I}_P$	Max overload capability 100 ms [1]	± 62.5	A
R_M	Measuring resistance	$R_{M\,min}$ $R_{M\,max}$	
	Over operating current, temperature and supply voltage range	0 31	Ω
I_S	Secondary current	0 .. ± 50	mA
I_{SN}	Secondary nominal current rms	35	mA
K_N	Conversion ratio	1 : 250	
V_C	Supply voltage (± 5 %)	± 15	V
I_C	Current consumption ± 15 V	≤ 60 + I_S	mA

Accuracy - Dynamic performance data

ε_L	Linearity error [2]	≤ 4	ppm
I_{OE}	Electrical offset current + self magnetization + effect of earth magnetic field @ T_A = 25°C [2]	< 500	ppm
ΔI_{OE}	Offset stability (no load) [2]	< 5	ppm/month
TCI_{OE}	Temperature coefficient of I_{OE} (10°C .. 45°C) [2]	< 2	ppm/K
	Offset vs. power supply stability @ T_A = 25°C [2] @ V_C = ± 15 V ± 5 %	< 1	ppm/% of V_C = ± 15 V

General data

T_A	Ambient operating temperature	10 .. + 45	°C
	Humidity (non condensing)	20 - 80 %	RH
T_S	Ambient storage temperature	- 20 .. + 85	°C
	Humidity (non condensing)	20 - 80 %	RH
R_S	Secondary coil resistance @ T_A = 25°C	90	Ω
m	Mass	0.35	kg

Notes: [1] Single pulse only, not AC.
Overload conditions of use as described page 4.
[2] All ppm figures refer to secondary measuring range 50 mA.

Features

- Closed loop (compensated) current transducer using an extremely accurate zero flux detector
- Mountable on to a PCB
- Metal housing for high immunity against external interference.

Advantages

- Very high accuracy
- Excellent linearity
- Extremely low temperature drift
- Wide frequency bandwidth
- High immunity to external electrostatic and magnetic fields interference
- High resolution
- Low noise on output signal
- Low noise feedback to main conductor.

Applications

- Feed back element in precision current regulated devices (power supplies...)
- Calibration unit
- Precise and high stability inverters
- Energy measurement
- Medical equipment.

Application domain

- Industrial and Medical.

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Isolation characteristics

Between primary and secondary

V_b	Rated isolation voltage rms, reinforced isolation	150	V
	Rated isolation voltage rms, single isolation	300	V
	with IEC 61010-1 standards and following conditions		
	- Over voltage category III		
	- Pollution degree 2		
V_d	Rms voltage for AC isolation test, 50/60 Hz, 1 min	2.4 [1)]	kV
$\hat{V}_w$	Impulse withstand voltage 1.2/50 µs	4.3	kV
V_b	Rated isolation voltage rms, reinforced isolation	150	V
	Rated isolation voltage rms, single isolation	300	V
	with EN 50178 standards and following conditions		
	- Over voltage category III		
	- Pollution degree 2		
dCp	Creepage distance	4.7	mm
dCl	Clearance distance	3.3	mm
CTI	Comparative Tracking Index (Group IIIb)	175	V

Note: [1)] Between primary and secondary + shield.

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.

Output noise figures: @ 25°C

Random Noise ppm (rms):

0 – 10 Hz	0 – 100 Hz	0 – 1 kHz	0 – 10 kHz	0 – 100 kHz
< 0.4	< 0.5	< 0.7	< 5	< 10

Re-injected noise measured on primary cable (DC - 50 kHz)		< 5	μV_{RMS}

Dynamic performance data

BW	Frequency bandwidth for small signal 0.5 %, of I_{PN} (DC)		
	(± 1 dB)	DC .. 100	kHz
	(± 3 dB)	DC .. > 500	kHz
di/dt	di/dt accurately followed	> 20	A/µs
t_r	Response time [1)] to 90 % of I_{PN} step	< 1	µs

Note: [1)] ITN 12-P is measured with input having di/dt of 20 A/µs.

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Over current protection - Electrical specification - Status

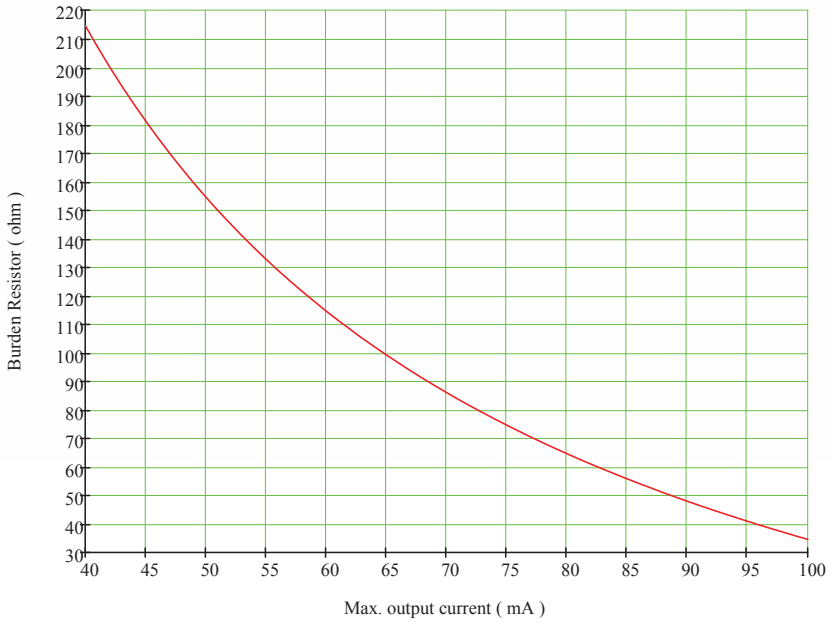
As soon as electrical saturation appears, the transducer switches from normal operation to over current mode.
This electrical saturation appears in any case beyond twice the measuring range. The primary current corresponding to this trip level is related to the temperature inside the transducer.

Under this condition:

- Fault level I_P > 200 % of I_{PN} DC
- Primary current must not exceed 25 A
- If the primary current has exceeded the max. I_P = 25 A or the device has been powered up with primary current flowing; it will enter the overload state. In this situation the output current will remain higher than ± 100 mA (max ± 150 mA with 20 ohm burden resistor), independent of the primary current.
- Action in case of overload:
  1. Make sure the primary current is switched off.
  2. Power down the device for one second.
  3. Power up the device
  4. Reestablish the primary current.

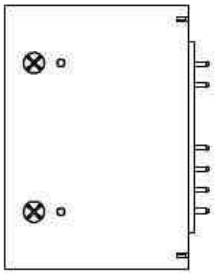
Max secondary current versus measuring resistor

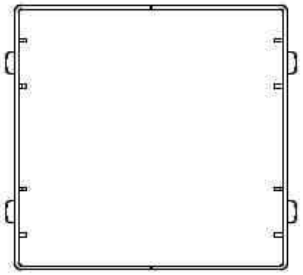
The graph shows the maximum allowable burden resistor versus output current

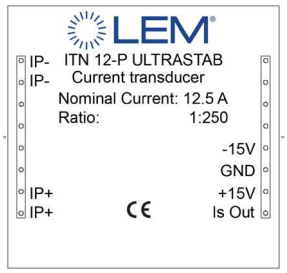


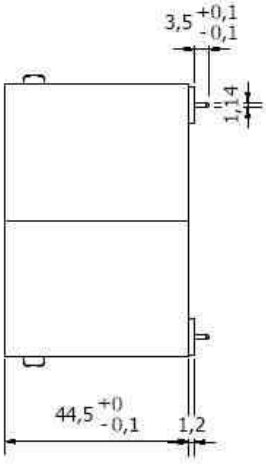
Notes: a) Continous output current must not exceed 50mA
b) Specifications has been verified with burden resistors equal to or less than 31 ohm

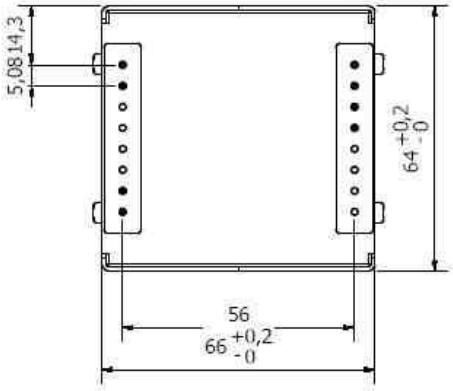
Dimensions ITN 12-P ULTRASTAB (in mm)



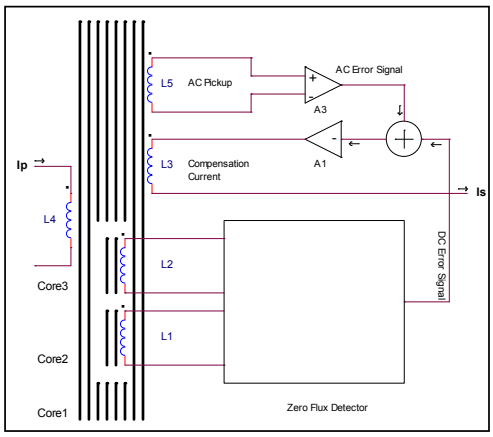








Connection



Mechanical characteristics

• General tolerance	± 0.3 mm
• Fastening and connection of primary	4 pins 1 x 1 mm
• Fastening and connection of secondary	4 pins 1 x 1 mm
• Recommended PCB hole	1.6 mm

Remarks

- I_S is positive when I_P flows from terminals I_P+ to terminals I_P-.
- Temperature of the primary conductor should not exceed 65°C.
- Do not apply primary current to unpowered device.