LUMEL

LOW-VOLTAGES CURRENT TRANSFORMES



GENERAL OVERVIEW OF CURRENT TRANSFORMERS



CURRENT TRANSFORMER is used for measurement of electric alternating currents. When current in a circuit (primary current) is too high to directly applyto measuring instruments, a current transformer produces a reduced current (secondary current) accurately proportional to the current in the circuit, which can be conveniently connected to measuring and recording instruments. A current transformer also isolates the measuring instruments from what may be very high voltage in the monitored circuit. Relationship between primary and secondary currents is called **rated transformation ratio**.

$$I_1 = I_2 \cdot \frac{N_2}{N_1}$$

where: I1 - primary current, I2 - secondary current, N1 - number of turns of primary winding, N2 - number of turns of secondary winding, N2/N1 - rated transformation ratio
Current transformers are used mainly in such a way that the cable from the measured shock or bus current passes through the main hole transformer, which is equivalent to one coil primary winding. In this case, the above equation simplifies to:

$$I_1 = I_2 \cdot N_2$$

The task is to reduce the transformer output current for currents of over 120% of measurement range, to protect against destruction of measuring devices connected to the transformer in case of surges or failures in the primary circuit.

FEATURES:

- Wide range of accuracy classes: 0.2S
- Wide range of supported primary currents, the dimensions of rails, the length of casing and hole diameters.
- Multiple mounting methods, including wall mounting, DIN rail 35mm, the conductor, a current bar.
- Shields designed to seal connections.
- **Marking: Laser engraving.**

GENERAL SPECIFICATION

Applicable standard:	IEC 61869-1/2
Case:	10% glass filled polycarbonate, flame retardant grades classified UL 94V-0
Connection:	Two connection on each side. M4 screws with self lifting clamp strap.
Insulation class	E (120°C max)
Maximum system voltage:	0.72 kV
Operating frequency:	50/60 Hz
Rated primary rating:	100 A…1600 A
Rated secondary output:	5 A or 1 A
Nominal power:	2,5 VA; 5 VA
Accuracy class:	0.2S
Ambient temperature:	-20°C …+45°C
Operating temperature:	-10°C …+55°C
Storage temperature:	-50°C…+80°C
Thermal short circuit current (Ith):	60 x In
Dynamic short circuit current (Idyn):	$2.5xI_{th}$
Instrument security factor (FS):	5

FEATURES:

720 V | Class 0.2S

OUTPUTS:

5 A | 1 A

DEMAND FOR POWER MEASURING DEVICES:

CT users expect these devices fulfill two basic conditions:

- a high degree of accuracy in the nominal current,
- security functions with overloads.

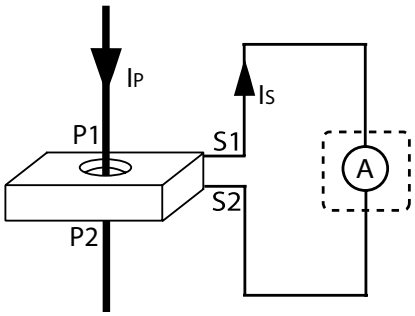
In order to fulfill these stipulations it is necessary for the power of a current transformer offered to fully achieve the actual power requirements of the measurement setup. In ascertaining the actual power requirements, consideration is to be made not only of the loss of power of the appliances to be connected up, but also the losses incurred by the instrument leads.

GENERAL OVERVIEW OF CURRENT TRANSFORMERS

Power requirements for measuring apparatur and relays:

- Analog moving-iron meters 0.7 – 1.5VA
- Rectifier current meters 0.001 – 0.250 VA
- Multi-range current meters 0.005 – 5.000 VA
- Current recorders 0.300-9.000 VA
- Bimmetalic ammeters 2.5 – 3.0 VA
- Power meter 0.2 – 5.0 VA
- Power factor meter 2.0 – 6.0 VA
- Meters 0.4 – 1.0 VA
- Relays 0.2 – 6.0 VA
- Power transducers 0.5 VA
- Energy meters 2.5 VA

CONNECTION DIAGRAMM OF CURRENT TRANSFORMERS



Internal losses of copper wiring:

$$P = \frac{I^2 \times 2L}{q_{CU} \times 56} \text{ [VA]}$$

Where:
I – Secondary nominal current,
L – Distance in [m],
qCU – wire cross-section in [mm^2].

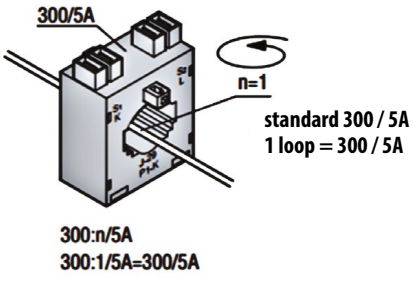
Table for values appertaining to 5 A

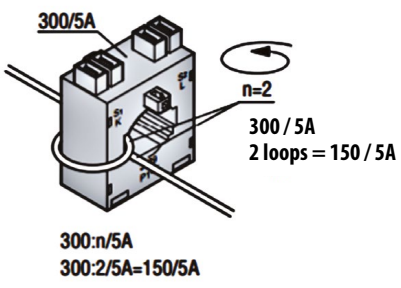
q_{CU}	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m
2.5 mm^2	0.36	0.71	1.07	1.43	1.78	2.14	2.50	2.86	3.21	3.57
4.0 mm^2	0.22	0.45	0.67	0.89	1.12	1.34	1.56	1.79	2.01	2.24
6.0 mm^2	0.15	0.30	0.45	0.60	0.74	0.89	1.04	1.19	1.34	1.49
10.0 mm^2	0.09	0.18	0.27	0.36	0.44	0.54	0.63	0.71	0.80	0.89

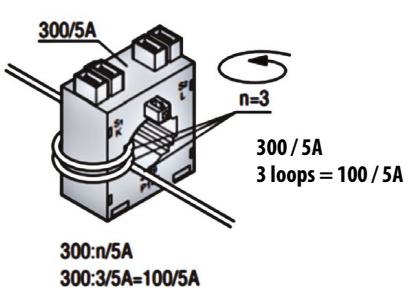
Table for values appertaining to 1 A

q_{CU}	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m
1.0 mm^2	0.36	0.71	1.07	1.43	1.78	2.14	2.50	2.86	3.21	3.57
2.5 mm^2	0.14	0.29	0.43	0.57	0.72	0.86	1.00	1.14	1.29	1.43
4.0 mm^2	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.71	0.80	0.89
6.0 mm^2	0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60
10.0 mm^2	0.04	0.07	0.11	0.14	0.18	0.21	0.25	0.29	0.32	0.36

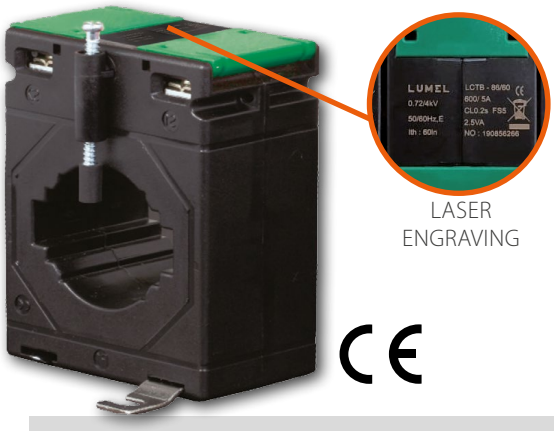
Reducing the transformer ratio.
An example of measuring currents smaller than the rated current of the transformer.







LCTB - BUSBAR SERIES



LASER ENGRAVING

INPUT:

100A ... 1600A

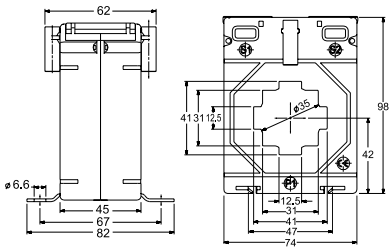
OUTPUTS:

5 A **1 A**

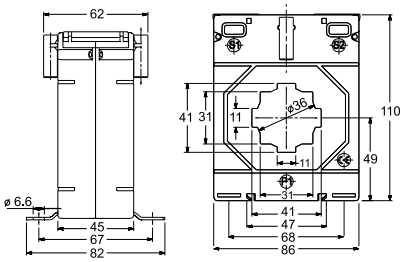
	LCTB 74/40 (45)	LCTB 86/40 (45)	LCTB 86/60 (45)
Hole diameter	∅35 mm	∅ 36 mm	∅ 51 mm
Busbar	40x12 mm 2x30 x15 mm	40 x 10 mm, 2x30x15mm	60 x 12 mm, 2 x 50 x 15 mm
Depth	45 mm	45 mm	45 mm
Width	74 mm	86 mm	86 mm
Primary current	200 A...1000 A	100 A...1000 A	300 A...1600 A
Secondary current	1 A, 5 A		
Accuracy class	0.2S		

DIMENSIONS

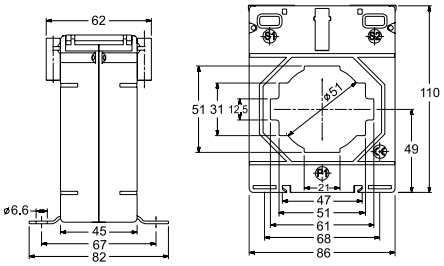
LCTB 74/40 (45)



LCTB 86/40 (45)



LCTB 86/60 (45)



ORDERING CODES

Transformer type	LCTB 74/40 (45)	
Accuracy class	0.2S	
Rated primary current	Transformer burden	Ordering code *
200 A	2.5 VA	LH000-0904-130-805
250 A	2.5 VA	LH000-0904-130-789
	5 VA	LH000-0904-130-835
300 A	2.5 VA	*
	5 VA	*
400 A	2.5 VA	*
	5 VA	*
500 A	2.5 VA	*
	5 VA	*
600 A	2.5 VA	LH000-0904-130-836
	5 VA	LH000-0904-130-837
750 A	2.5 VA	*
	5 VA	*
800 A	2.5 VA	*
	5 VA	*
1000	2.5 VA	*
	5 VA	*

Transformer type	LCTB 86/40 (45)	
Accuracy class	0,2S	
Rated primary current	Transformer burden	Ordering code *
150 A	2.5 VA	LH000-0904-130-807
	5 VA	LH000-0904-130-833
200 A	2.5 VA	*
	5 VA	LH000-0904-130-806
250 A	2.5 VA	*
	5 VA	LH000-0904-130-788
300 A	2.5 VA	*
	5 VA	*
400 A	2.5 VA	*
	5 VA	*
500 A	2.5 VA	*
	5 VA	*
600 A	2.5 VA	*
	5 VA	*
750 A	2.5 VA	*
	5 VA	*
800 A	2.5 VA	*
	5 VA	*
1000 A	2.5 VA	*
	5 VA	*

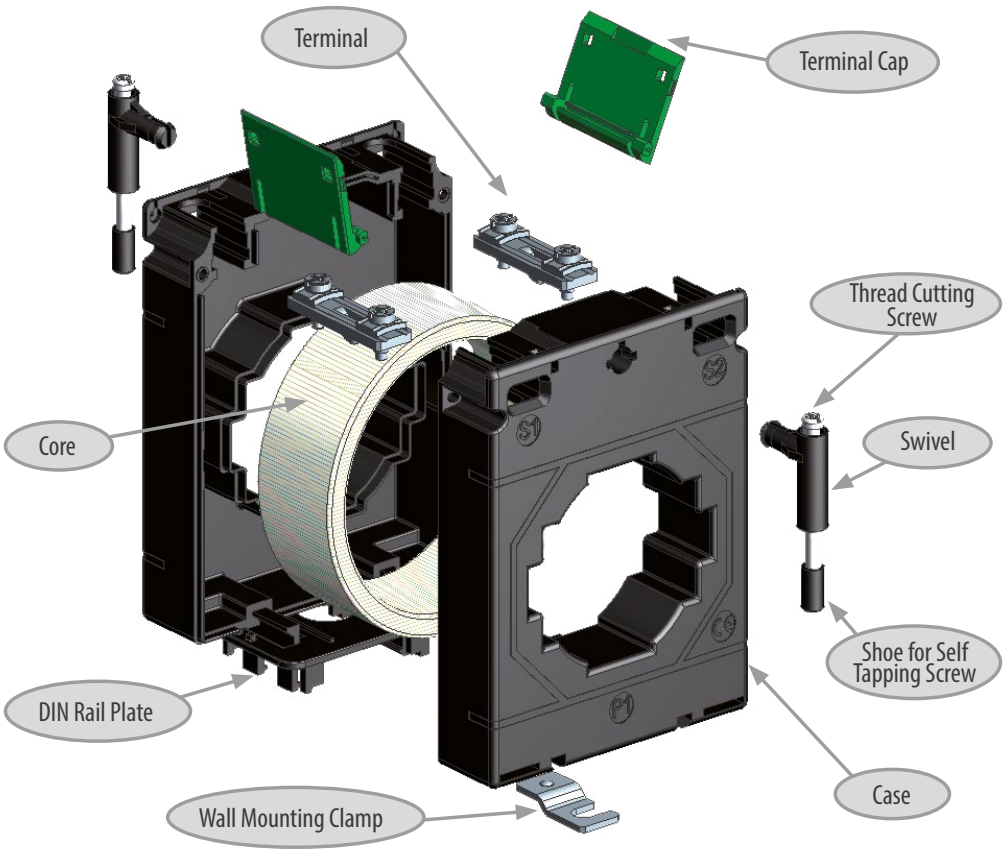
Transformer type	LCTB 86/60 (45)	
Accuracy class	0.2S	
Rated primary current	Transformer burden	Ordering code *
300 A	2.5 VA	*
400 A	2.5 VA	*
500 A	2.5 VA	*
	5 VA	*
600 A	2.5 VA	LH000-0904-130-787
	5 VA	LH000-0904-130-808
750 A	2.5 VA	*
	5 VA	*
800 A	2.5 VA	*
	5 VA	*
1000 A	2.5 VA	LH000-0904-130-809
	5 VA	LH000-0904-130-810
1200 A	2.5 VA	*
	5 VA	*
1250	2.5 VA	*
	5 VA	*
1500 A	2.5 VA	*
	5 VA	*
1600 A	2.5 VA	*
	5 VA	*

* Other order codes after agreement with the producer

Ordering example: Order code LH000-0904-130-789 means the transformer LCTB 74/40(45) 250/5A meeting the requirements of the class 0.2S and with transformer burden 2.5VA, FS5

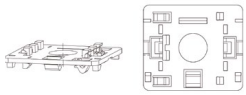
ACCESSORIES:
DIN rail mounting base
ordering code: LH000-0904-130-124

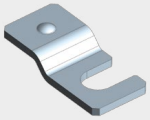
ACCESSORIES



DIN rail mounting base:

(additional accessories - have to be order separatly)

Order code	Transformer type	View
LH000-0904-130-124	LCTB 74, LCTB 86	
LH000-0904-130-128 (for vertical or horizontal mounting)	LCTB 74, LCTB 86	

Accessories	
Description	**View**
Thread cutting screw 4 x 45mm	
Wall mounting clamp	
Swivel	
Shoe for self tapping M4 screw	

Busbar mounting kit:

(delivered with each current transformer)

Kit order code	Description	No of pcs.	Transformer type
LH000-0904-130-142	Thread cutting screw 4 x 45mm	2	LCTB 74, LCTB 86
	Wall mounting clamp	2	
	Swivel	2	
	Shoe for self tapping M4 screw	2	