Current Transducer HASS 50 ... 600-S

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

5 YEAR WARRANTY by LEM CE UKCA c $\mathbf{\mathcal{A}}$ us RoHS

All data are given with R_L = 10 kΩ

I_{PN} = 50 ... 600 A

Electrical data

Primary nominal RMS current I_{PN} (A)	Primary current measuring range I_{PM} (A)	Type
50	±150	**HASS 50-S**
100	±300	**HASS 100-S**
200	±600	**HASS 200-S**
300	±900	**HASS 300-S**
400	±1100	**HASS 400-S**
500	±1100	**HASS 500-S**
600	±1100	**HASS 600-S**

S_{Th}	External detection threshold sensitivity @ I_{PN}		0.625	V/ I_{PN}
U_{out}	Analog output voltage @ I_P		$U_{OE} \pm (0.625 \cdot I_P / I_{PN})$	V
U_{ref}	Reference voltage [1]	Output voltage	2.5 ± 0.025	V
		Output impedance	typ. 200	Ω
		Load impedance	≥ 200	Ω
R_L	Load resistance		≥ 2	kΩ
R_{out}	Output internal resistance		< 5	Ω
C_L	Load capacitance (±20 %)		= 4.7	nF
U_C	Supply voltage (±5 %) [2]		5	V
I_C	Current consumption @ U_C = 5 V		19 (typ)	mA
			25 (max)	mA

Accuracy - Dynamic performance data

ε_{tot}	Total error [3] @ I_{PN}, T_A = 25° C		≤ ±1	%
ε_L	Linearity error	0 ... I_{PN}	≤ ±0.5	%
		0 ... I_{PM}	≤ ±1	%
TCU_{OE}	Temperature coefficient of U_{OE} ($U_{out} - U_{ref}$ @ I_P = 0)		≤ ±0.1	mV/K
TCU_{ref}	Temperature coefficient of U_{ref}		≤ ±190	ppm/K
TCS	Temperature coefficient of S		≤ ±250	ppm/K
U_{OE}	Electrical offset voltage @ I_P = 0, T_A = 25 °C		U_{ref} ±0.015	V
U_{OM}	Magnetic offset voltage @ I_P = 0 after an overload of I_{PM}		< ±0.4	%
t_{D10}	Delay time to 10 % of the final output value for I_{PN} step [4]		< 3	µs
t_{D90}	Delay time to 90 % of the final output value for I_{PN} step			
	HASS 50-S		< 4	µs
	others		< 3.5	µs
U_{no}	RMS noise voltage referred to primary (DC ... 20 MHz)		< 40	mVpp
BW	Frequency bandwidth (–3 dB) [5]		DC ... 240	kHz
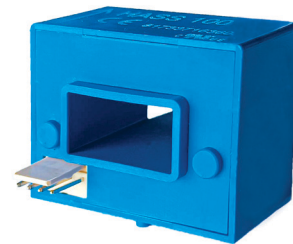
Features

- Hall effect measuring principle
- Galvanic separation between primary and secondary circuit
- Insulation test voltage 3300 V
- Low power consumption
- Single power supply +5 V
- Fixed offset & sensitivity
- Insulating plastic case recognized according to UL 94-V0.

Advantages

- Easy installation
- Small size and space saving
- Only one design for wide current ratings range
- High immunity to external interference
- Internal & external reference.

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.

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General data

T_A	Ambient operating temperature	–40 ... +105	°C
T_{Ast}	Ambient storage temperature	–40 ... +105	°C
m	Mass	55	g
	Standard	EN 50178: 1997	

Notes:
[1] It is possible to overdrive U_{ref} with an external reference voltage between 0.5 - 2.65 V providing its ability to sink or source approximately 5 mA

[2] Maximum supply voltage (not operating) < 6.5 V

[3] Excluding offset and magnetic offset voltage

[4] For a di/dt = 100 A/µs

[5] Small signal only to avoid excessive heatings of the magnetic core.

Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	3.3	kV
U_t	Partial discharge RMS test voltage (q_m< 10 pC)	> 1	kV
U_{Ni}	Impulse withstand voltage 1.2/50 µs	6	kV
		Min	
d_{Cp}	Creepage distance	6.9	mm
d_{Cl}	Clearance distance	4.4	mm
CTI	Comparative Tracking Index (group I)	> 600	

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

d_{Cp}, d_{Cl}, U_{Ni}	EN 50178	IEC 61010-1
	Rated insulation voltage	Nominal voltage
Basic insulation	600 V	600 V
Reinforced insulation	300 V	150 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.
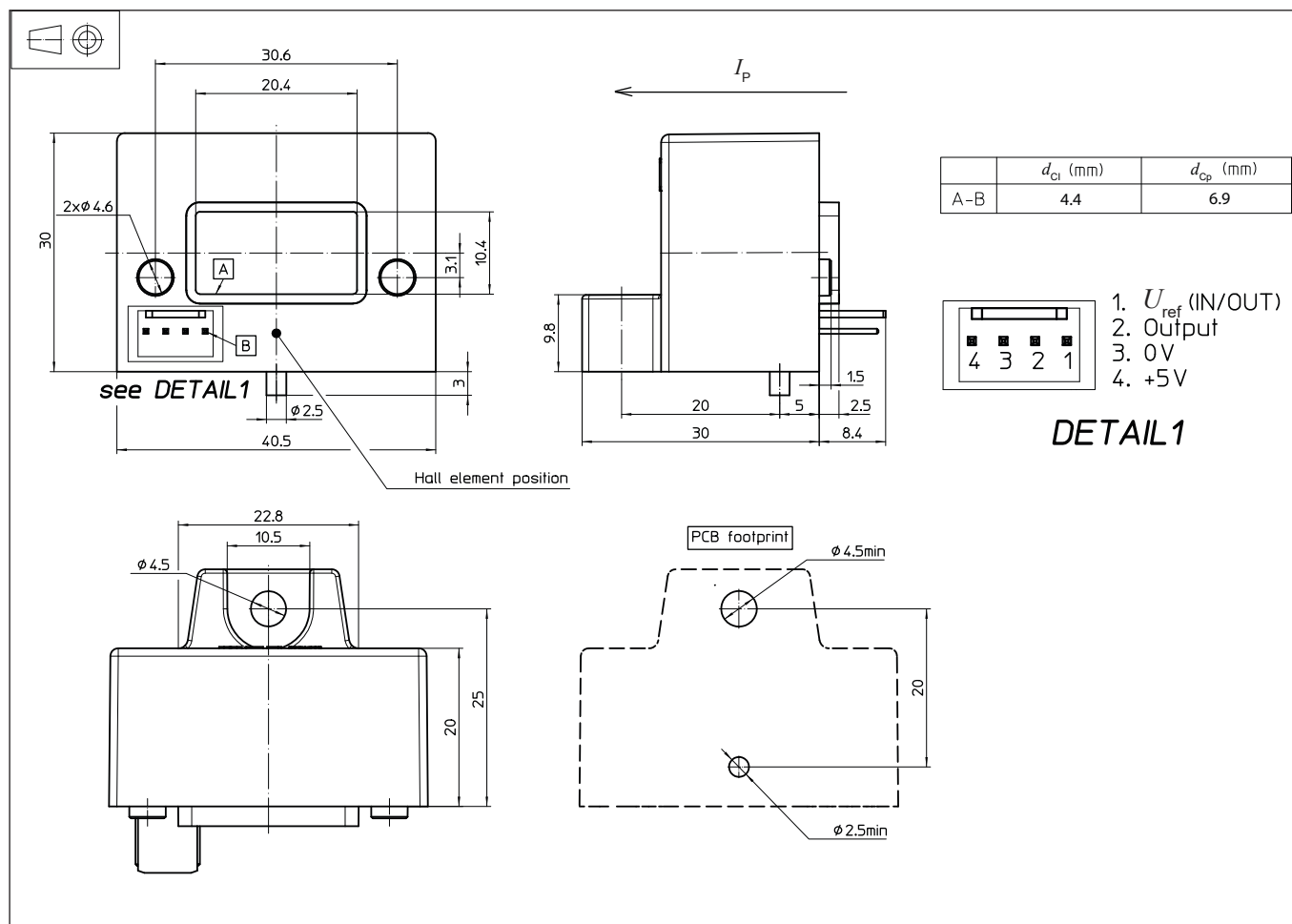
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Caution, risk of electrical shock

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.
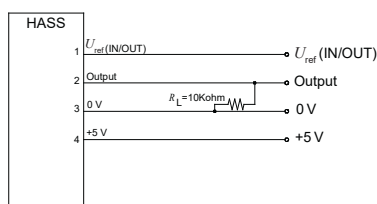This transducer is a build-in device, whose conducting parts must be inaccessible after installation.A protective housing or additional shield could be used.
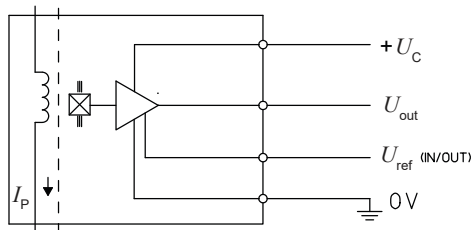Main supply must be able to be disconnected.

Dimensions HASS 50 ... 600-S (in mm)

	d_{CI} (mm)	d_{Cp} (mm)
A–B	4.4	6.9

DETAIL1

1. U_{ref} (IN/OUT)
2. Output
3. 0 V
4. +5 V

Hall element position

see DETAIL1

PCB footprint

Required connection circuit

Operation principle

Mechanical characteristics

- General tolerance — ±0.5 mm
- Aperture for primary conductor — 20.4 × 10.4 × 0.5 mm
- Transducer fastening — M4
- Recommended fastening torque — < 1.5 N·m
- Connection of secondary — Molex 2501P04V00A

Remarks

- I_S is positive when I_P flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 120 °C.
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.
- 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: **https://www.lem.com/en/file/3137/download/.**