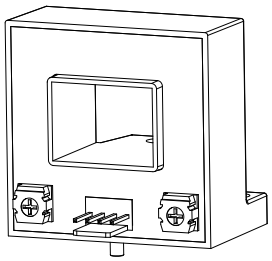
Current Transducer HAL 50 .. 600-S

I_{PN} = 50 .. 600 A

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



Electrical data

	Type	Primary nominal rms current I_{PN} (A)	Primary current, measuring range I_{PM} (A)
	HAL 50-S	50	± 150
	HAL 100-S	100	± 300
	HAL 200-S	200	± 600
	HAL 300-S	300	± 900
	HAL 400-S	400	± 1000
	HAL 500-S	500	± 1000
	HAL 600-S	600	± 1000

$\hat{I}_P$	Overload capability (Ampere Turns)	30000	At
V_{out}	Output voltage (Analog) @ ± I_{PN}	± 4	V
R_L	Load resistance @ T_A = 0 °C .. 70 °C	> 1	kΩ
	@ T_A = - 25 °C .. 85 °C	> 3	kΩ
U_C	Supply voltage (± 5 %)	± 15	V
I_C	Current consumption	< ± 25	mA
R_{IS}	Insulation resistance @ 500 VDC	> 500	MΩ

Accuracy - Dynamic performance data

X	Accuracy @ I_{PN}, T_A = 25 °C, ± 15 V		< ± 1	%
ε_L	Linearity error [1]		< ± 0.5	% of I_{PN}
V_{OE}	Electrical offset voltage @ T_A = 25 °C	HAL 50-S	< ± 20	mV
		HAL 100 .. 600-S	< ± 10	mV
V_{OM}	Magnetic offset voltage @ I_P = 0, after an overload of 3 × I_{PN}			
		HAL 50-S	< ± 30	mV
		HAL 100 .. 200-S	< ± 20	mV
		HAL 300 .. 600-S	< ± 10	mV
TCV_{OE}	Temperature coefficient of V_{OE}	HAL 50-S	< ± 2.0	mV/K
		HAL 100 .. 600-S	< ± 1.0	mV/K
TCV_{out}	Temperature coefficient of V_{out} (% of reading)		< ± 0.05	%/K
t_r	Step response time to 90 % of I_{PN}		≤ 3	µs
BW	Frequency bandwidth (- 3 dB) [2]		DC .. 50	kHz

General data

T_A	Ambient operating temperature	- 25 .. + 85	°C
T_S	Ambient storage temperature	- 25 .. + 85	°C
m	Mass	75	g
	Standards	EN 50178: 1997	
		UL 508: 2010	
	Deviation in output when tested to EN 61000-4-6	< 20	% of I_{PN}
	Deviation in output when tested to EN 61000-4-3	< 20	% of I_{PN}

Notes: [1] Excludes the electrical offset

[2] Derating is needed to avoid excessive core heating at high frequency.

Features

- Hall effect measuring principle
- Insulating plastic case recognized according to UL 94-V0.

Advantages

- Easy installation
- Low power consumption
- Small size and space saving
- Only one design for wide current ratings range
- High immunity to external interference.

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 suppliers for welding applications.

Application domain

- Industrial.

UL 508:Ratings and assumptions of certification HAL 50 .. 600-S

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Standards

- CSA C22.2 NO. 14 - 10 INDUSTRIAL CONTROL EQUIPMENT - Edition 11 - Revision Date 2011/08/01
- UL 508 STANDARD FOR INDUSTRIAL CONTROL EQUIPMENT - Edition 17 - Revision Date 2010/04/15.

Parameter	Symbol	Unit	Value
Primary involved potential		V AC/DC	300
Max surrounding air temperature	T_A	°C	80
Primary current	I_P	A	0 to 1000
Secondary supply voltage	U_C	V DC	0 to ± 42
Output voltage	V_{out}	V	0 to 5

Conditions of acceptability

When installed in the end-use equiment, 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 - 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).

4 - Base on results of temperature tests, int he end use application, a maximum of 100 °C cannot be exceeded at soldering point between primary coil pin and soldering point of on the primary bus bar (corrected to the appropriate evaludated max. surrounding air).

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 HAL 50 .. 600-S

Insulation coordination

U_d	Rms voltage for AC insulation test, 50 Hz, 1 min	3	kV
U_b	Rated insulation rms voltage, reinforced or basic insulation	500	V
$\hat{U}_W$	Impluse withstand voltage 1.2/50 µs	> 8	kV
		Min	
d_{Cp}	Creepage distance	12.1	mm
d_{Cl}	Clearance	9.8	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

	EN 50178	IEC 61010-1
d_{Cp}, d_{Cl}, $\hat{U}_W$	Rated insulation voltage	Nominal voltage
Basic insulation	1000 V	1000 V
Reinforced insulation	300 V	300 V

Safety

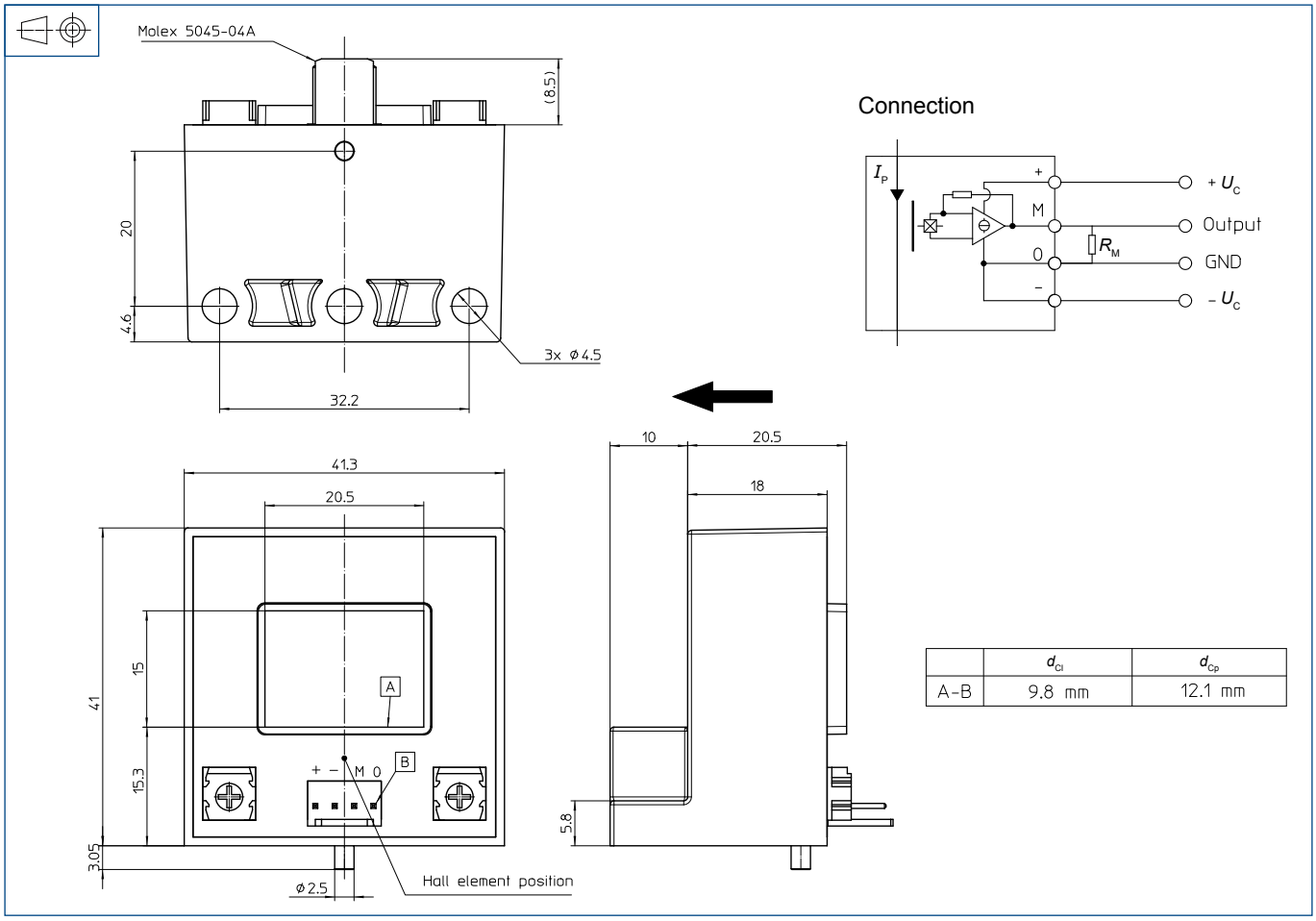
This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.

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 (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 HAL 50 .. 600-S (in mm)



	d_{Cl}	d_{Cp}
A-B	9.8 mm	12.1 mm

Mechanical characteristics

- General tolerance ± 0.5 mm
- Transducer fastening 3 holes ⌀ 4.5
  3 M4 steel screws
  Recommended fastening torque 1.2 N·m (± 10 %)
- Primary through-hole 20.5 × 15 mm
- Connection of secondary Molex 5045-04A

Remarks

- V_{out} is positive when I_P flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 90 °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**.
- Dynamic performances (d*i*/d*t* and response time) are best with a single bar completely filling the primary hole.
- This is a standard model. For different versions (supply voltages, turns ratios, unidirectional measurements...), please contact us.