# Current Transducer HAS 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 [1] $I_{PM}$ (A) |
|---|---|---|
| HAS 50-S | 50 | ±150 |
| HAS 100-S | 100 | ±300 |
| HAS 200-S | 200 | ±600 |
| HAS 300-S | 300 | ±900 |
| HAS 400-S | 400 | ±900 |
| HAS 500-S | 500 | ±900 |
| HAS 600-S | 600 | ±900 |

| | | | | |
|---|---|---|---|---|
| $U_C$ | Supply voltage (±5 %) [1] | | ±15 | V |
| $I_C$ | Current consumption | | ±15 | mA |
| $R_{INS}$ | Insulation resistance @ 500 V DC | | > 1000 | MΩ |
| $U_{out}$ | Output voltage (Analog) @ $\pm I_{PN}$, $R_L$ = 10 kΩ, $T_A$ = 25 °C | | ±4 | V |
| $R_{out}$ | Output internal resistance | approx | 100 | Ω |
| $R_L$ | Load resistance [2] | | > 1 | kΩ |

## Accuracy - Dynamic performance data

| | | | | |
|---|---|---|---|---|
| $\varepsilon_{tot}$ | Total error @ $I_{PN}$, $T_A$ = 25 °C (excluding offset) | | < ±1 | % of $I_{PN}$ |
| $\varepsilon_L$ | Linearity error [3] (0 ... $\pm I_{PN}$) | | < ±1 | % of $I_{PN}$ |
| $U_{OE}$ | Electrical offset voltage, $T_A$ = 25 °C | HAS 50-S | < ±40 | mV |
| | | HAS 100 ... 600-S | < ±20 | mV |
| $U_{OM}$ | Hysteresis offset voltage @ $I_P$ = 0, after an excursion of 1 × $I_{PN}$ | | < ±20 | mV |
| $TCU_{OE}$ | Temperature coefficient of $U_{OE}$ | HAS 50-S | < ±2 | mV/K |
| | | HAS 100 ... 600-S | < ±1 | mV/K |
| $TCU_{out}$ | Temperature coefficient of $U_{out}$ (% of reading) | | < ±0.1 | %/K |
| $t_{D\,90}$ | Delay time to 90 % of the final output value for $I_{PN}$ step [4] | | < 3 | µs |
| $BW$ | Frequency bandwidth (−3 dB) [5] | | DC ... 50 | kHz |

## General data

| | | | | |
|---|---|---|---|---|
| $T_A$ | Ambient operating temperature | | −10 ... +80 | °C |
| $T_{Ast}$ | Ambient storage temperature | | −25 ... +80 | °C |
| $m$ | Mass | approx | 60 | g |
| | Standards | UL | UL 508:2010 | |
| | | EMC | IEC 61000-6-2:2016 | |
| | | | IEC 61800-3:2017 [6] | |
| | | Safety | IEC 61010-1:2010 | |
| | | Environmental | IEC 61477-1:2012 | |
| | | | IEC 61800-2:2012 | |

Notes:
[1] Operating at ±12 V ≤ $U_C$ < ±15 V will reduce the measuring range
[2] If the customer uses 1 kΩ of the load resistor, the primary current has to be limited as the nominal. To measure the full defined measuring range, the load resistor should be at minimum 10 kΩ
[3] Linearity data exclude the electrical offset
[4] For a $di/dt$ = 50 A/µs
[5] Under small signals condition
[6] Regarding compliance towards IEC 61000-4-3 (IEC 61800-3:2017): variation of the offset between 390 MHz and 400 MHz with a field intensity of 10 [V/m].

## Features

- Hall effect measuring principle
- Insulating plastic case made of polycarbonate PBT recognized according to UL 94-V0.

## Advantages

- Easy mounting
- 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
- 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.



22September2022/Version 16

LEM reserves the right to carry out modifications on its transducers, in order to improve them.

LEM International SA
Route du Nant-d'Avril, 152
1217 Meyrin
www.lem.com

## Current Transducer HAS 50 ... 600-S

### Insulation coordination

| | | | |
|---|---|---|---|
| $U_d$ | RMS voltage for AC insulation test, 50 Hz, 1 min | 3.6 | kV |
| $U_{Ni}$ | Impulse withstand voltage 1.2/50 µs | > 6.6 | kV |
| | | Min | |
| $d_{Cp}$ | Creepage distance | 7.08 | mm |
| $d_{Cl}$ | Clearance | 6.23 | mm |
| $CTI$ | Comparative tracking index (group IIIa) | 275 | |

### Applications examples

**According to IEC 61010-1 standard** and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

| | IEC 61010-1 |
|---|---|
| $d_{Cp}$, $d_{Cl}$, $U_{Ni}$ | Nominal voltage |
| Basic insulation | 600 V |
| Reinforced insulation | 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.

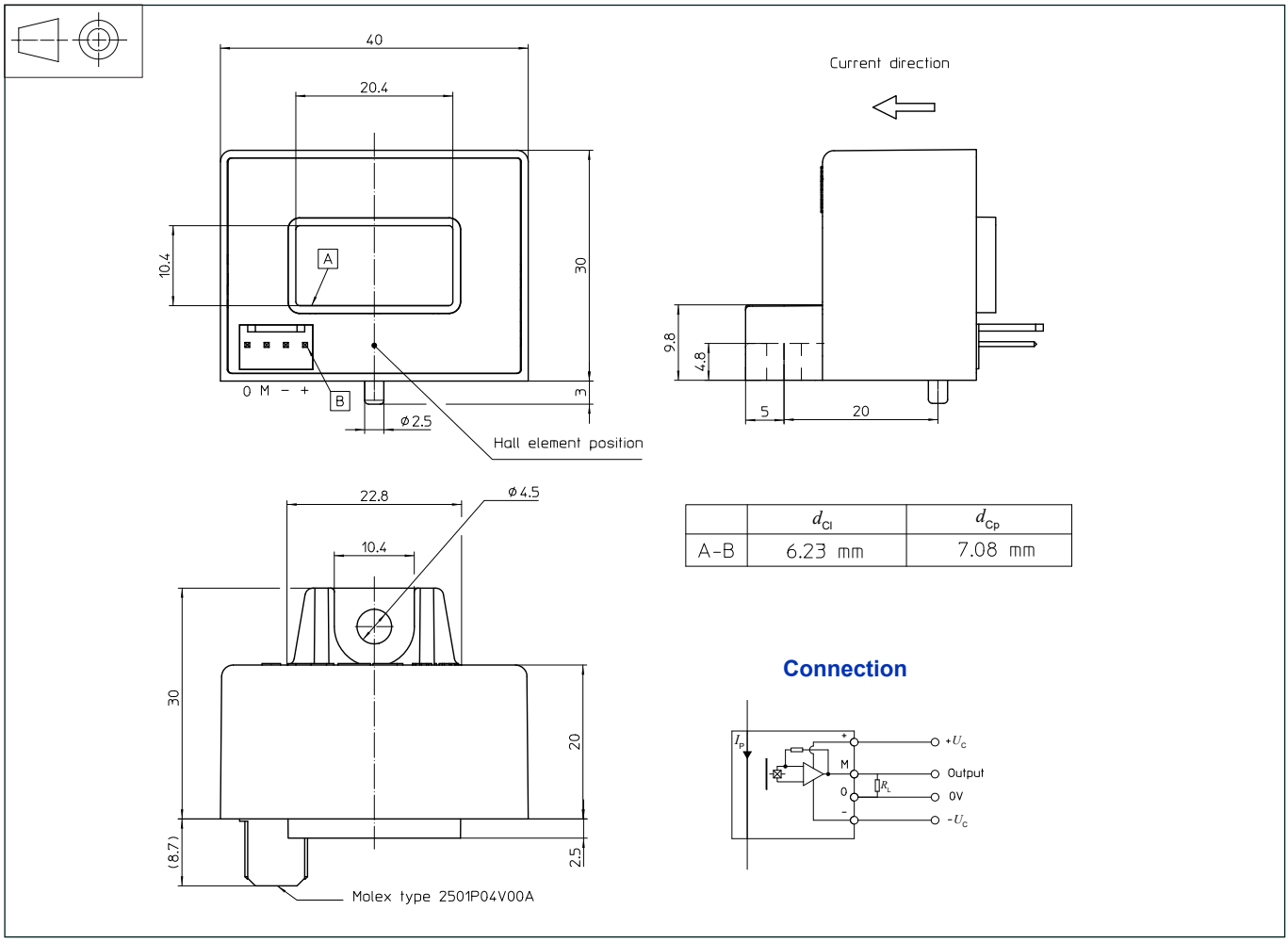


22September2022/Version 16

LEM reserves the right to carry out modifications on its transducers, in order to improve them.

LEM International SA
Route du Nant-d'Avril, 152
1217 Meyrin
www.lem.com

## Dimensions HAS 50 ... 600-S (in mm)




| | $d_{Cl}$ | $d_{Cp}$ |
|---|---|---|
| A-B | 6.23 mm | 7.08 mm |

### Connection




## Mechanical characteristics

- General tolerance ±0.5 mm
- Transducer fastening 1 hole Ø 4.5 mm
  1 M4 steel screw
  Recommended fastening torque 0.75 N·m (±10 %)
- Connection of secondary Molex type 2501P04V00A [1)]

Note: [1)] Recommended mating connector: Molex 511910400 (housing) and 508029101 (contact).

## Remarks

- $U_{out}$ is positive when $I_P$ flows in the direction of 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: **https://www.lem.com/en/file/3137/download/.**
- Dynamic performances ($di/dt$ and delay 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.



22September2022/Version 16

LEM reserves the right to carry out modifications on its transducers, in order to improve them.

LEM International SA
Route du Nant-d'Avril, 152
1217 Meyrin
www.lem.com