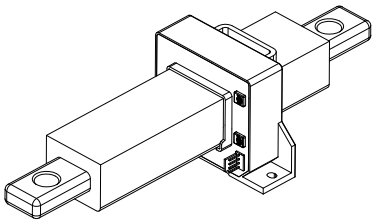
# Current Transducer HAT 163 ... 2184-T/SP17

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

$I_{PN}$ = 163 .. 2184 A

$U_{out}$ = ±4 V



## Electrical data

| Type | Primary nominal RMS current $I_{PN}$ (A) | Primary current, measuring range $I_{PM}$ (A) |
|---|---|---|
| HAT 163-T/SP17 | 163 | ±500 |
| HAT 233-T/SP17 | 233 | ±500 |
| HAT 320-T/SP17 | 320 | ±500 |
| HAT 481-T/SP17 | 481 | ±1000 |
| HAT 728-T/SP17 | 728 | ±1500 |
| HAT 1092-T/SP17 | 1092 | ±2500 |
| HAT 1456-T/SP17 | 1456 | ±2500 |
| HAT 2097-T/SP17 | 2097 | ±2500 |
| HAT 2184-T/SP17 | 2184 | ±2500 |

| | | | |
|---|---|---|---|
| $U_C$ | Supply voltage (±5 %) [1] | ±15 | V |
| $I_C$ | Current consumption | ±20 | mA |
| $R_{INS}$ | Insulation resistance @ 500 V DC | > 1000 | MΩ |
| $U_{out}$ | Output voltage (Analog) @ ± $I_{PN}$, $R_L$ = 10 kΩ, $T_A$ = 25 °C | ±4 | V |
| $R_{out}$ | Output internal resistance | 100 | Ω |
| $R_L$ | Load resistance | > 10 | kΩ |

## Accuracy - Dynamic performance data

| | | | | |
|---|---|---|---|---|
| $\varepsilon$ | Error @ $I_{PN}$, $T_A$ = 25 °C (excluding offset) | | < ±1 | % of $I_{PN}$ |
| $\varepsilon_L$ | Linearity error [2] (0 ... ± $I_{PN}$) | | < ±1 | % of $I_{PN}$ |
| $U_{OE}$ | Electrical offset voltage @ $T_A$ = 25 °C | | < ±20 | mV |
| $U_{OH}$ | Hysteresis offset voltage @ $I_P$ = 0, after an excursion of 1 × $I_{PN}$ | | < ±10 | mV |
| $TCU_{OE}$ | Temperature coefficient of $U_{OE}$ | −40 °C ... +80 °C | < ±1 | mV/K |
| | | +80 °C ... +105 °C | < ±1.5 | mV/K |
| $TCU_{out}$ | Temperature coefficient of $U_{out}$ (% of reading) | | < ±0.1 | %/K |
| $t_{D\,90}$ | Delay time to 90 % of $I_{PN}$ | | < 5 | µs |
| $BW$ | Frequency bandwidth [3] (small signal, −1 dB) | | DC ... 25 | kHz |

## General data

| | | | |
|---|---|---|---|
| $T_A$ | Ambient operating temperature | −40 ... +105 | °C |
| $T_S$ | Ambient storage temperature | −40 ... +105 | °C |
| $m$ | Mass | 300 | g |
| | Standards | EN 50178: 1997 | |
| | | UL 508: 2010 [4] | |

Notes: [1] Operating at ±12 V ≤ $U_C$ < ±15 V will reduce the measuring range

[2] Linearity data exclude the electrical offset

[3] Please refer to derating curves in the technical file to avoid excessive core heating at high frequency

[4] UL conform is only applicable @ $T_A$ = −40 °C ... +85 °C.

## Features

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

## Special feature

- Mounting by base plate 2 holes ⌀ 4.5 mm, distance 80 mm.

## 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

- DC motor drives
- Switched Mode Power Supplies (SMPS)
- AC variable speed drives
- Uninterruptible Power Supplies (UPS)
- Battery supplied applications
- Power supplies for welding applications.

## Application domain

- Industrial.

N° N45736, N° N45737, N° N45738, N° N45739, N° N45740

N° N45741, N° N45742, N° N45743, N° 64.02.69.017.0



30April2019/version 10



LEM International SA
Chemin des Aulx 8
1228 PLAN-LES-OUATES Switzerland
www.lem.com

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### Insulation coordination

| | | | |
|---|---|---|---|
| $U_d$ | RMS voltage for AC insulation test, 50 Hz, 1 min | 4.9 | kV |
| $U_{Ni}$ | Impulse withstand voltage 1.2/50 µs | > 9.9 | kV |
| | | Min | |
| $d_{Cp}$ | Creepage distance | 11 | mm |
| $d_{Cl}$ | Clearance | 11 | mm |
| $CTI$ | Comparative tracking index (group IIIa) | 275 | |

### Applications examples

**According to EN 50178 and IEC 61010-1 standards** and following conditions:

- Over voltage category III
- Pollution degree PD2
- Non-uniform field

| | EN 50178 | IEC 61010-1 |
|---|---|---|
| $d_{Cp}$, $d_{Cl}$, $U_{Ni}$ | Rated insulation voltage | Nominal voltage |
| Basic insulation | 1100 V | 1100 V |
| Reinforced insulation | 500 V | 500 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.







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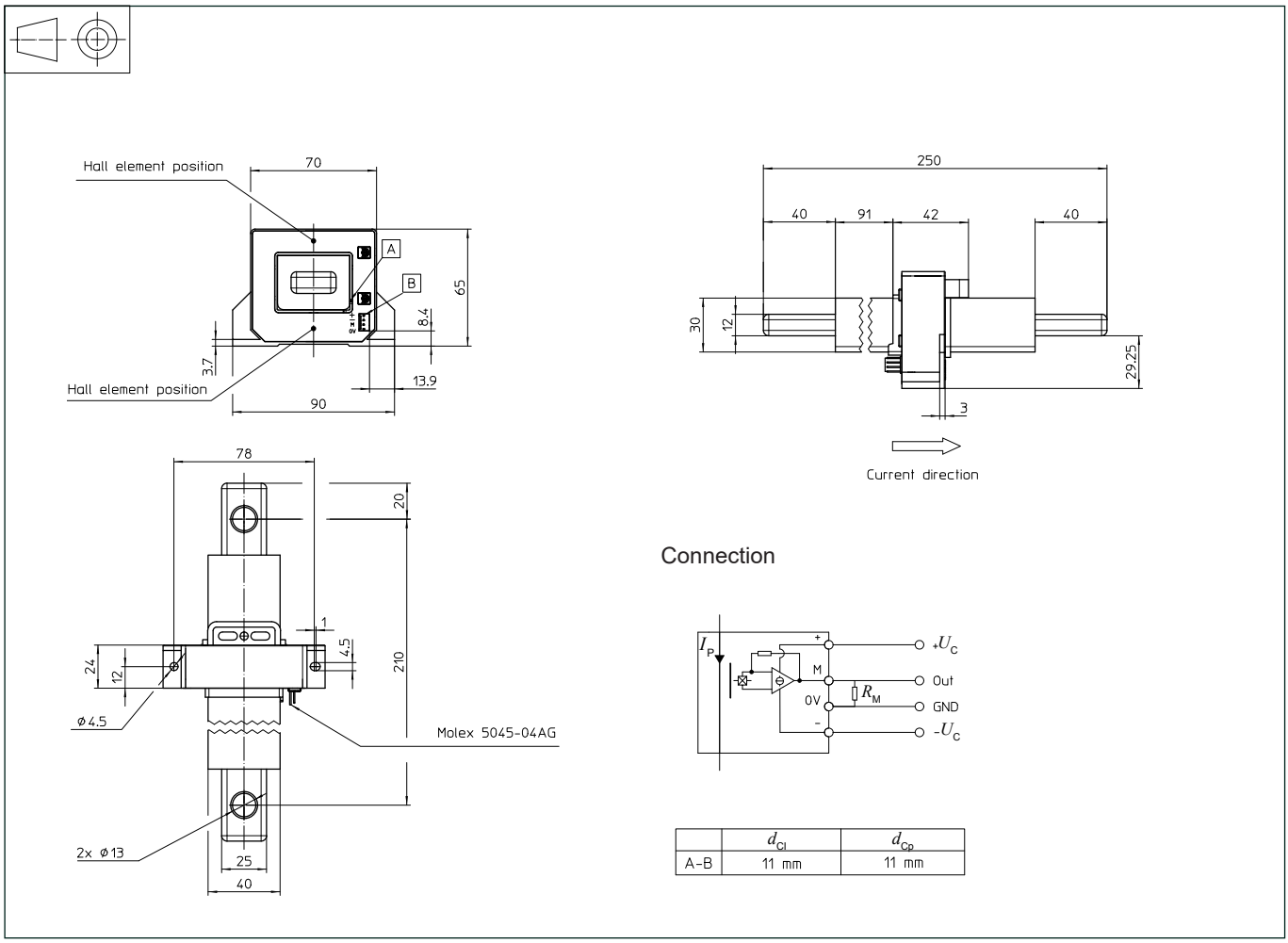
## Dimensions HAT 163 ... 2184-T/SP17 (in mm)




| | $d_{Cl}$ | $d_{Cp}$ |
|---|---|---|
| A–B | 11 mm | 11 mm |

## Mechanical characteristics

- General tolerance ±1 mm
- Transducer fastening By base-plate or on busbar with M4 screws All slots ⌀ 4.5 mm
  Recommended fastening torque 1.2 N·m (±10 %)
- Connection of secondary Molex 5045-04AG

## Remarks

- $U_{out}$ is positive when $I_P$ flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 105 °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/**.







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