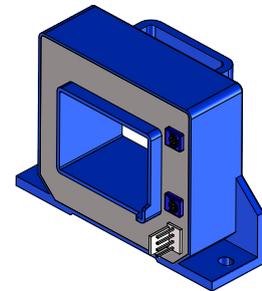


# Current Transducer HAT 163 ... 2184-S/SP6

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

$$I_{PN} = 163 \dots 2184 \text{ A}$$

$$U_{out} = \pm 4 \text{ V}$$



## Electrical data

Type	Primary nominal RMS current $I_{PN}$ (A)	Primary current, measuring range $I_{PM}$ (A)	RoHS since date code
HAT 163-S/SP6	163	$\pm 500$	46170
HAT 233-S/SP6	233	$\pm 500$	46170
HAT 320-S/SP6	320	$\pm 500$	46129
HAT 481-S/SP6	481	$\pm 1000$	46170
HAT 728-S/SP6	728	$\pm 1500$	46186
HAT 1092-S/SP6	1092	$\pm 2500$	46191
HAT 1456-S/SP6	1456	$\pm 2500$	77304
HAT 2184-S/SP6	2184	$\pm 2500$	78178

$U_C$	Supply voltage ( $\pm 5\%$ ) <sup>1)</sup>	$\pm 15$	V
$I_C$	Current consumption	$\pm 20$	mA
$R_{INS}$	Insulation resistance @ 500 V DC	> 1000	M $\Omega$
$U_{out}$	Output voltage (Analog) @ $\pm I_{PN}$ , $R_L = 10 \text{ k}\Omega$ , $T_A = 25^\circ\text{C}$	$\pm 4$	V
$R_{out}$	Output internal resistance	100	$\Omega$
$R_L$	Load resistance	> 10	k $\Omega$

## Accuracy - Dynamic performance data

$\epsilon$	Error @ $I_{PN}$ , $T_A = 25^\circ\text{C}$ (excluding offset)	< $\pm 1$	% of $I_{PN}$
$\epsilon_L$	Linearity error <sup>2)</sup> ( $0 \dots \pm I_{PN}$ )	< $\pm 1$	% of $I_{PN}$
$U_{OE}$	Electrical offset voltage @ $T_A = 25^\circ\text{C}$	< $\pm 20$	mV
$U_{OH}$	Hysteresis offset voltage @ $I_p = 0$ , after an excursion of $1 \times I_{PN}$	< $\pm 10$	mV
$TCU_{OE}$	Temperature coefficient of $U_{OE}$	-40 $^\circ\text{C}$ ... +80 $^\circ\text{C}$ < $\pm 1$ +80 $^\circ\text{C}$ ... +105 $^\circ\text{C}$ < $\pm 1.5$	mV/K mV/K
$TCU_{out}$	Temperature coefficient of $U_{out}$ (% of reading)	< $\pm 0.1$	%/K
$t_{D90}$	Delay time to 90 % of $I_{PN}$	< 5	$\mu\text{s}$
$BW$	Frequency bandwidth <sup>3)</sup> (small signal -1 dB)	DC ... 25	kHz

## General data

$T_A$	Ambient operating temperature	-40 ... +105	$^\circ\text{C}$
$T_S$	Ambient storage temperature	-40 ... +105	$^\circ\text{C}$
$m$	Mass	300	g
	Standards	EN 50178: 1997 UL 508: 2010 <sup>4)</sup>	

**Notes:** <sup>1)</sup> Operating at  $\pm 12 \text{ V} \leq U_C < \pm 15 \text{ V}$  will reduce the measuring range

<sup>2)</sup> Linearity data exclude the electrical offset

<sup>3)</sup> Please refer to derating curves in the technical file to avoid excessive core heating at high frequency

<sup>4)</sup> UL conform is only applicable @  $T_A = -40^\circ\text{C} \dots +85^\circ\text{C}$ .

## Features

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

## Special feature

- Secondary connection on Molex 5045-04AG.

## 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.

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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 $\mu$ s	> 9.9	kV
		Min	
$d_{cp}$	Creepage distance	11	mm
$d_{ci}$	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
$d_{cp}, d_{ci}, U_{Ni}$	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).

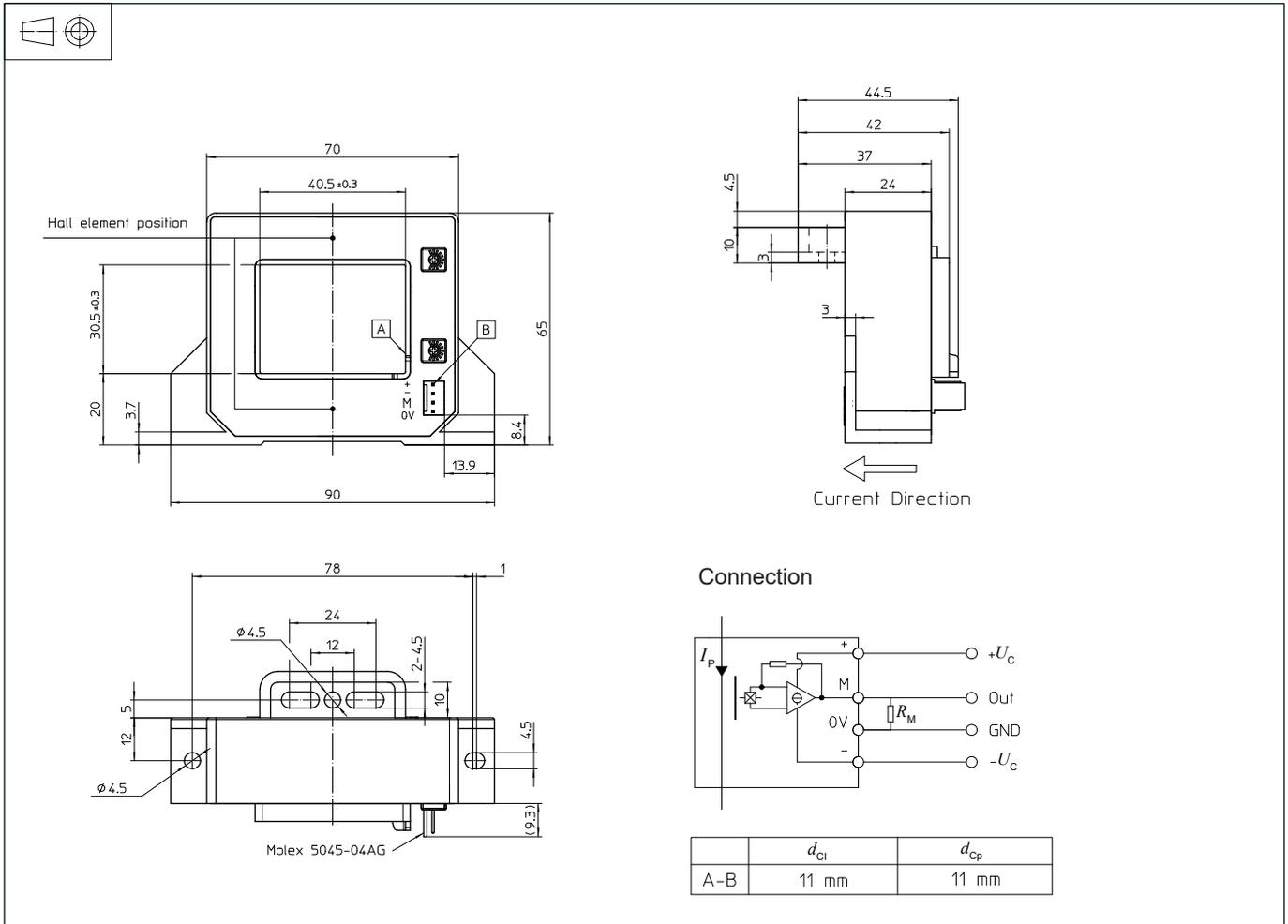
Ignoring this warning can lead to injury and/or cause serious damage.

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.

## Dimensions HAT 163 ... 2184-S/SP6 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Transducer fastening By base-plate or on busbar with M4 screws  
All holes  $\varnothing 4.5$  mm
- Recommended fastening torque 0.75 N·m  $\pm 20\%$
- 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 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/>.