

# Current Transducer HAX 500 ... 2500-S

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

$$I_{PN} = 500 \dots 2500 \text{ A}$$



## Electrical data

Type	Primary nominal RMS current $I_{PN}$ (A)	Primary current, measuring range <sup>1)</sup> $I_{PM}$ (A)	
HAX 500-S	500	$\pm 1500$	
HAX 600-S	600	$\pm 1800$	
HAX 850-S	850	$\pm 2550$	
HAX 1000-S	1000	$\pm 3000$	
HAX 1500-S	1500	$\pm 4500$	
HAX 2000-S	2000	$\pm 5500$	
HAX 2500-S	2500	$\pm 5500$	
$U_C$	Supply voltage ( $\pm 5\%$ ) <sup>1)</sup>	$\pm 15$	V
$I_C$	Current consumption	$< +20/-15$	mA
$\hat{I}_P$	Overload capability	30000	At
$R_{INS}$	Insulation resistance @ 500 V DC	$> 1000$	MΩ
$U_{out}$	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	appr. 100	Ω
$R_L$	Load resistance	$> 1$	kΩ

## Accuracy - Dynamic performance data

$\varepsilon$	Error @ $I_{PN}$ , $T_A = 25^\circ\text{C}$ (excluding offset) <sup>2)</sup>	$< \pm 1$	% of $I_{PN}$
$\varepsilon_L$	Linearity error <sup>3)</sup> (0 ... $\pm I_{PN}$ )	$< \pm 1$	% 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 $1 \times I_{PN}$	$< \pm 30$	mV
$TCU_{OE}$	Temperature coefficient of $U_{OE}$	$< \pm 1$	mV/K
$TCU_{out}$	Temperature coefficient of $U_{out}$ (% of reading)	$< \pm 0.1$	%/K
$t_{D90}$	Delay time to 90 % of $I_{PN}$ <sup>4)</sup>	$< 5$	μs
$BW$	Frequency bandwidth ( $-3 \text{ dB}$ ) <sup>5)</sup>	DC ... 25	kHz

## General data

$T_A$	Ambient operating temperature	$-40 \dots +85$	°C
$T_S$	Ambient storage temperature	$-40 \dots +85$	°C
$m$	Mass	appr. 450	g
	Standards	UL 508: 2013	

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

<sup>2)</sup> The primary busbar fixed in the center of aperture is recommended. The position of busbar has impact on the accuracy of transducer

<sup>3)</sup> Linearity data exclude the electrical offset

<sup>4)</sup> For a  $di/dt = 50 \text{ A}/\mu\text{s}$

<sup>5)</sup> Please refer to derating curves in the technical file to avoid excessive core heating at high frequency.

<sup>5)</sup> Variation of the offset during the test IEC 61000-4-3 between 100 to 200 MHz: 8 % of  $I_{SN}$ .

## Features

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

## Advantages

- Low insertion losses
- 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 drivers
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power suppliers for welding applications.

## Application domain

- Industrial.

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### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	5	kV
$U_{Ni}$	Impulse withstand voltage 1.2/50 $\mu$ s	8.3	kV
$U_e$	Partial discharge extinction RMS voltage @ 10 pC	> 660	V
		Min	
$d_{Cp}$	Creepage distance	15.7	mm
$d_{Cl}$	Clearance	12.7	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 OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
$d_{Cp}, d_{Cl}, U_{Ni}$	Rated insulation voltage	Nominal voltage
Basic insulation	1500 V	1000 V
Reinforced insulation	600 V	600 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).

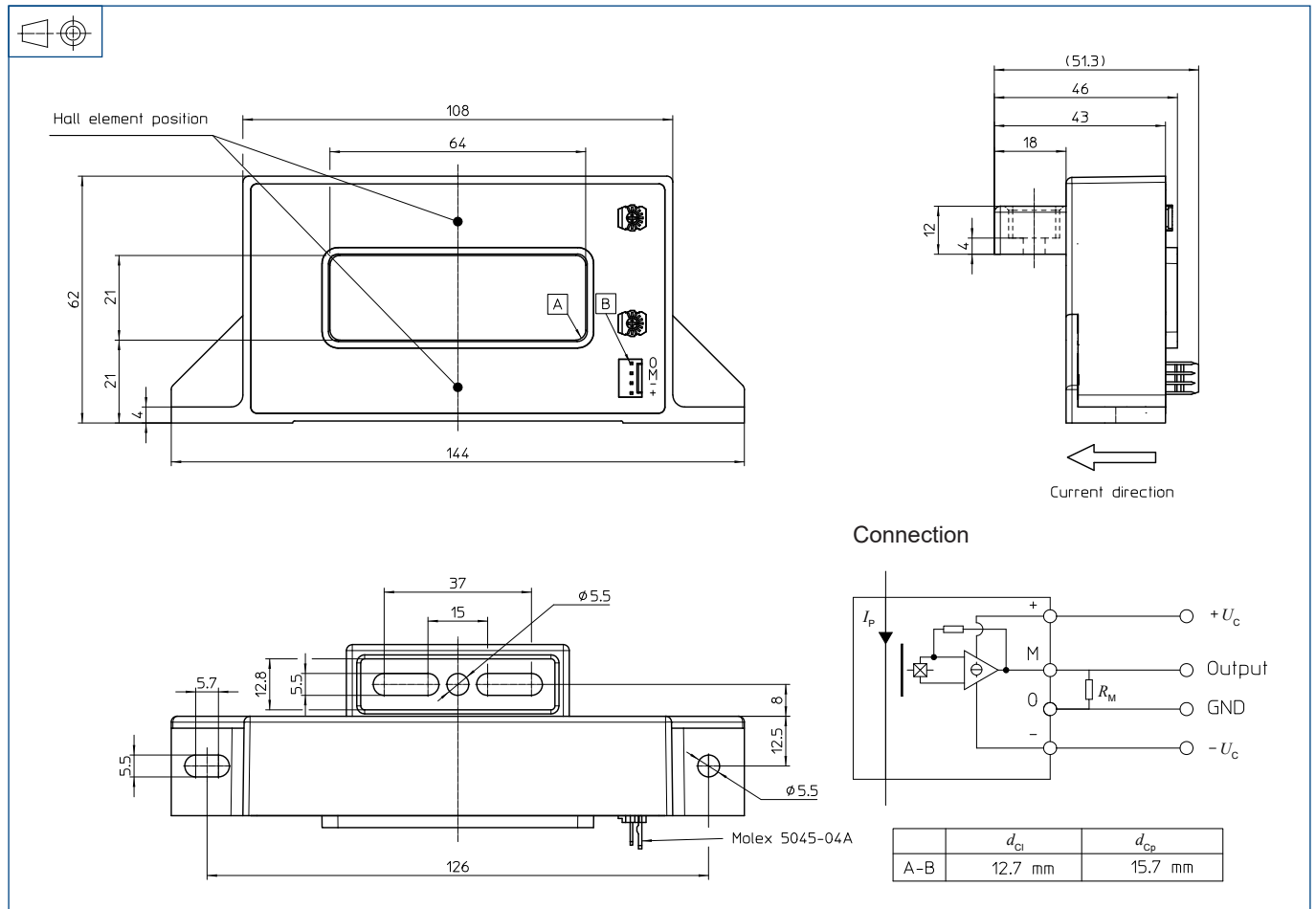
Ignoring this warning can lead to injury and/or cause serious damage.

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 HAX 500 ... 2500-S (in mm)



### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Transducer fastening
  - 1 hole and 1 notch  $\phi 5.5$  mm
  - 2 M5 steel screws
- Recommended fastening torque 1.5 N·m
- or
  - 1 hole and 2 notches  $\phi 5.5$  mm
  - 3 M5 steel screws
- Recommended fastening torque 1.5 N·m
- Primary through-hole 64 × 21 mm
- Connection of secondary Molex 5045-04A

### 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.