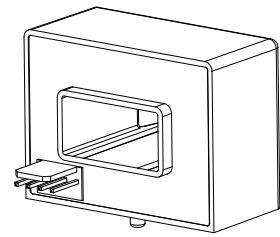


# Current Transducer HAS 200 ... 500-S/SP105

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



$$I_{PN} = 200 \dots 500 \text{ A}$$



## Electrical data

Type	Primary nominal RMS current $I_{PN}$ (A)	Primary current, measuring range $I_{PM}$ (A)		
HAS 200-S/SP105	200	0 ... ±600		
HAS 300-S/SP105	300	0 ... ±900		
HAS 500-S/SP105	500	0 ... ±900		
$U_C$	Supply voltage (±5 %) <sup>1)</sup>		±15	V
$I_C$	Current consumption		±15	mA
$R_{INS}$	Insulation resistance @ 500 V DC		> 1000	MΩ
$U_{out}$	Output voltage (Analog) @ $\pm I_{PN}$ , $R_L = 10 \text{ k}\Omega$ , $T_A = 25 \text{ }^\circ\text{C}$		±4	V
$R_{out}$	Output internal resistance approx		100	Ω
$R_L$	Load resistance <sup>2)</sup>		> 1	kΩ

## Accuracy - Dynamic performance data

$\varepsilon_{tot}$	Total error @ $I_{PN}$ , $T_A = 25 \text{ }^\circ\text{C}$ (excluding offset)	< ±1	%
$\varepsilon_L$	Linearity error <sup>3)</sup> (0 ... ± $I_{PN}$ )	< ±1	% of $I_{PN}$
$U_{OE}$	Electrical offset voltage, $T_A = 25 \text{ }^\circ\text{C}$	< ±20	mV
$U_{OM}$	Magnetic offset voltage @ $I_{PN} = 0$ , after an excursion of $1 \times I_{PN}$	< ±20	mV
$TCU_{OE}$	Temperature coefficient of $U_{OE}$	-40 °C ... +85 °C < ±1 +85 °C ... +105 °C < ±1.5	mV/K mV/K
$TCU_{out}$	Temperature coefficient of $U_{out}$ (% of reading)	< ±0.1	%/K
$t_{D90}$	Delay time to 90 % of $I_{PN}$ <sup>4)</sup>	< 3	μs
$BW$	Frequency bandwidth (-3 dB) <sup>5)</sup>	DC ... 50	kHz

## General data

$T_A$	Ambient operating temperature	-40 ... +105 <sup>6)</sup>	°C
$T_S$	Ambient storage temperature	-40 ... +105	°C
$m$	Mass	approx 60	g
	Standards	UL	UL 508:2010
		EMC	IEC 61000-6-2:2016 IEC 61800-3:2017 <sup>7)</sup>
		Safety	IEC 61010-1:2010
		Environmental	IEC 61477-1:2012 IEC 61800-2:2012

**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> 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

<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> Under small signals condition

<sup>6)</sup> UL conform at 80 °C

<sup>7)</sup> 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 recognized according to UL 94-V0.

## Special features

- Counter bored hole for transducer fastening
- $T_A = -40 \text{ }^\circ\text{C} \dots +105 \text{ }^\circ\text{C}$ .

## Advantages

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

## Applications

- AC variable speed drivers and servo 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.

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### 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 $\mu$ s	> 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).

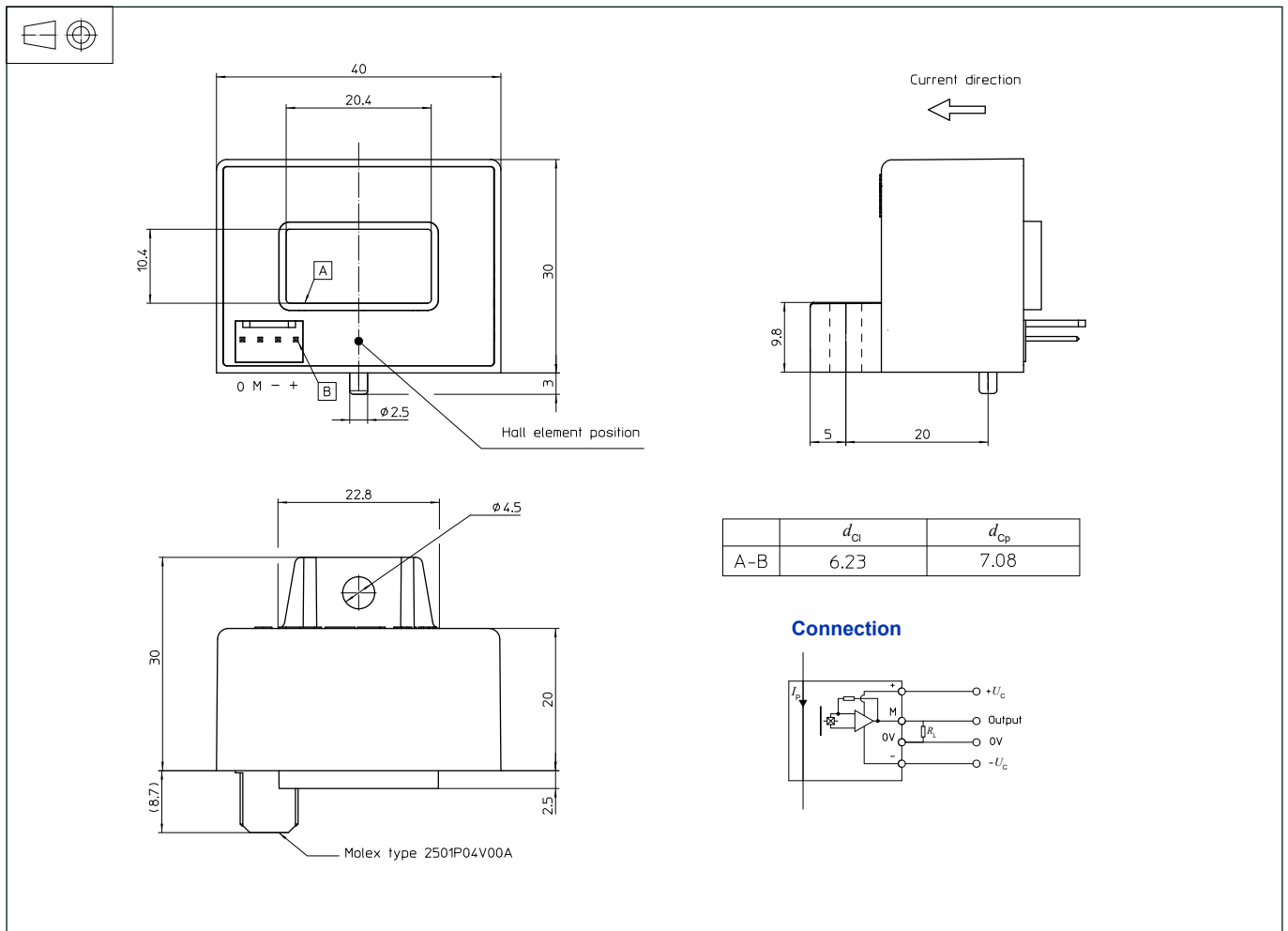
Ignoring this warning can lead to injury and/or cause serious damage.

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.

## Dimensions HAS 200 ... 500-S/SP105 (in mm)



### Mechanical characteristics

- General tolerance  $\pm 0.5$  mm
- Transducer fastening
  - 1 hole  $\phi 4.5$  mm
  - 1 M4 steel screw
  - Recommended fastening torque 0.75 N·m ( $\pm 10$  %)
- Connection of secondary Molex type 2501P04V00A <sup>1)</sup>

**Note:** <sup>1)</sup> 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 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/>.
- Dynamic performances ( $di/dt$  and delay time) are best with a single bar completely filling the primary hole.