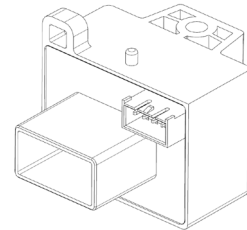


## Current Transducer HAS 500-S/SP59

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



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



### Electrical data

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

### Accuracy - Dynamic performance data

$\varepsilon$	Error @ $I_{PN}$ , $T_A = 25^\circ\text{C}$ (excluding offset)	< $\pm 1$	%
$\varepsilon_L$	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
$U_{OM}$	Magnetic offset voltage @ $I_{PN} = 0$ , after an excursion of $1 \times I_{PN}$	< $\pm 20$	mV
$TCU_{OE}$	Temperature coefficient of $U_{OE}$	-40 $^\circ\text{C}$ ... +85 $^\circ\text{C}$ < $\pm 1$ +85 $^\circ\text{C}$ ... +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 the final output value for $I_{PN}$ step <sup>4)</sup>	< 3	$\mu\text{s}$
$BW$	Frequency bandwidth (-3 dB) <sup>5)</sup>	DC ... 50	kHz

### General data

$T_A$	Ambient operating temperature	-40 ... +105	$^\circ\text{C}$
$T_{Ast}$	Ambient storage temperature	-40 ... +105	$^\circ\text{C}$
$m$	Mass approx	60	g
	Standards	UL 508:2010 <sup>6)</sup>	
		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 k $\Omega$  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 k $\Omega$   
<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>6)</sup> UL conform at +80  $^\circ\text{C}$   
<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
- $T_A = -40^\circ\text{C} \dots +105^\circ\text{C}$
- Molex 35312-0460.

### 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.

## Current Transducer HAS 500-S/SP59

### Insulation coordination

$U_d$	RMS voltage for AC insulation test, 50 Hz, 1 min	6.7	kV
$U_{Ni}$	Impulse withstand voltage 1.2/50 $\mu$ s	10.3	kV
		Min	
$d_{Cp}$	Creepage distance	14.5	mm
$d_{Ci}$	Clearance	14.3	mm
$CTI$	Comparative tracking index (group I)	600	

### Applications examples

According to IEC 61800-5-1 standard and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field
- Altitude(m) 2000

	IEC 61800-5-1
$d_{Cp}, d_{Ci}, U_{Ni}$	Nominal voltage
Basic insulation	1500 V
Reinforced insulation	600 V

### Safety

This transducer must be used in limited-energy secondary circuits according to IEC 61800-5-1.



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).

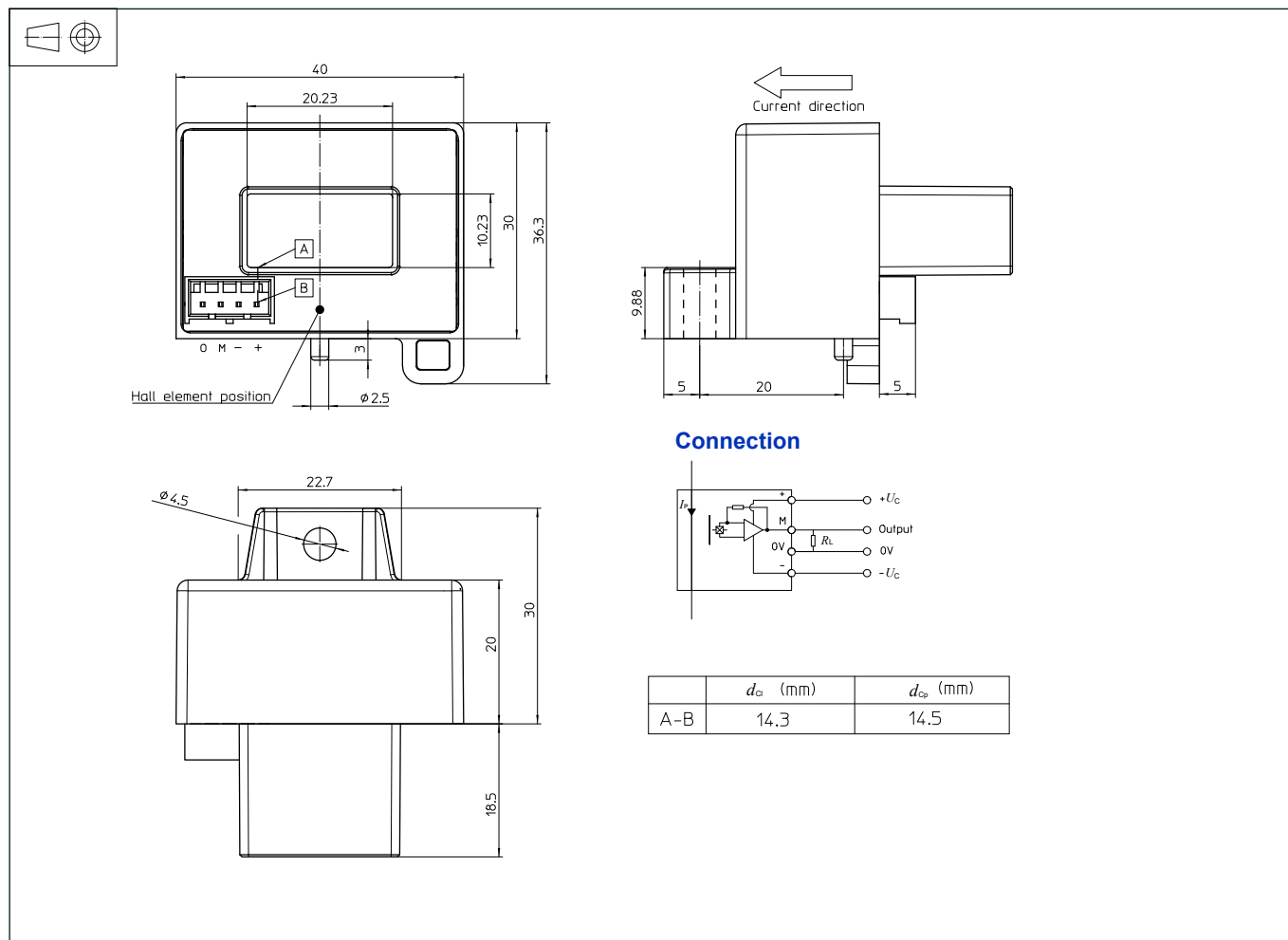
Ignoring this warning can lead to injury and/or cause serious damage.

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 500-S/SP59 (in mm)



## Mechanical characteristics

- General tolerance  $\pm 0.5$  mm
- Transducer fastening
  - 1 hole  $\varnothing 4.5$  mm
  - 1 M4 steel screw
  - Recommended fastening torque 0.75 N·m ( $\pm 10$  %)
- Connection of secondary Molex 35312-0460

## Remarks

- $I_s$  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.