

## Current Transducer HXS 20-NP/SP30

For the electronic measurement of currents : DC, AC, pulsed, mixed, with a galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit).



All Data are given with a  $R_L = 10\text{ k}\Omega$

### Electrical data

$I_{PN}$	Primary nominal current rms	$\pm 20$	A
$I_{PM}$	Primary current, measuring range	$\pm 60$	A
$V_{OUT}$	Output voltage (Analog) @ $I_p$	$V_{REF} \pm (0.625 \cdot I_p / I_{PN})$	V
	$I_p = 0$	$V_{REF} \pm 0.0125$	V
$V_{REF}$	Reference voltage <sup>1)</sup> - Output voltage	$2.5 \pm 0.025$	V
	$V_{REF}$ Output impedance	typ. 200	$\Omega$
	$V_{REF}$ Load impedance	$\geq 200$	$\text{k}\Omega$
$R_L$	Load resistance	$\geq 2$	$\text{k}\Omega$
$R_{OUT}$	Output internal resistance	$< 10$	$\Omega$
$C_L$	Capacitive loading	$< 1$	$\mu\text{F}$
$V_C$	Supply voltage ( $\pm 5\%$ )	5	V
$I_C$	Current consumption @ $V_C = 5\text{ V}$	22	mA

### Accuracy - Dynamic performance data

$X$	Accuracy <sup>2)</sup> @ $I_{PN}, T_A = 25^\circ\text{C}$	$\leq \pm 1$	% of $I_{PN}$
$e_L$	Linearity error $0 \dots I_{PN}$	$\leq \pm 0.5$	% of $I_{PN}$
	$\dots 3 \times I_{PN}$	$\leq \pm 1$	% of $I_{PN}$
$TCV_{OE}$	Temperature coefficient of $V_{OE}$ @ $I_p = 0$	$\leq \pm 0.4$	mV/K
$TCV_{REF}$	Temperature coefficient of $V_{REF}$	$\leq \pm 0.01$	%/K
$TCV_{OUT/V_{REF}}$	Temperature coefficient of $V_{OUT} / V_{REF}$ @ $I_p = 0$	$\leq \pm 0.2$	mV/K
$TCV_{OUT}$	Temperature coefficient of $V_{OUT}$	$\leq \pm 0.07\%$ of reading/K	
$V_{OM}$	Magnetic offset voltage @ $I_p = 0$ , after an overload of $3 \times I_{PN}$	$< \pm 1.2$	% of $I_{PN}$
$t_{ra}$	Reaction time @ 10 % of $I_{PN}$	$< 3$	$\mu\text{s}$
$t_r$	Response time to 90 % of $I_{PN}$ step	$< 5$	$\mu\text{s}$
$di/dt$	di/dt accurately followed	$> 50$	A/ $\mu\text{s}$
$V_{no}$	Output voltage noise (DC .. 10 kHz)	$< 20$	mVpp
	(DC .. 1 MHz)	$< 40$	mVpp
<b>BW</b>	Frequency bandwidth (- 3 dB)	DC .. 50	kHz

### General data

$T_A$	Ambient operating temperature	- 40 .. + 85	$^\circ\text{C}$
$T_S$	Ambient storage temperature	- 40 .. + 85	$^\circ\text{C}$
$m$	Mass	10	g
	Standards	EN 50178: 1997	

**Notes :** <sup>1)</sup> It is possible to overdrive  $V_{REF}$  with an external reference voltage between 2 - 2.8 V providing its ability to sink or source approximately 2.5 mA.

<sup>2)</sup> Excluding offset and hysteresis.

$I_{PN} = 5 - 10 - 20\text{ A}$



### Features

- Hall effect measuring principle
- Multirange current transducer through PCB pattern lay-out
- Galvanic isolation between primary and secondary circuit
- Isolation test voltage 3500V
- Low power consumption
- Extremely low profile,  $< 11\text{ mm}$
- Single power supply +5V
- Fixed offset & gain
- Insulated plastic case recognized according to UL 94-V0.

### Special Feature

- Designed to avoid heating

### Advantages

- Small size and space saving
- Only one design for wide current ratings range
- High immunity to external interference.
- Internal & external reference

### Applications

- AC variable speed 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

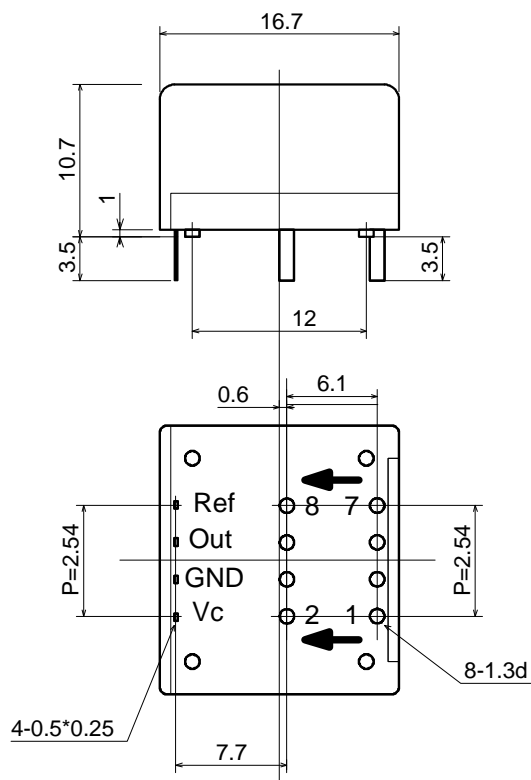
- Industrial

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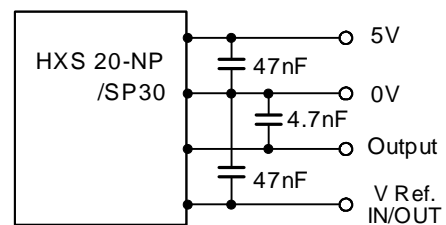
### Isolation characteristics

<b>V<sub>b</sub></b>	Rated isolation voltage rms with IEC 61010-1 standards and following conditions	150	V rms
	<ul style="list-style-type: none"> <li>- Single insulation</li> <li>- Over voltage category III</li> <li>- Pollution degree 2</li> <li>- Heterogeneous field</li> </ul>		
<b>V<sub>b</sub></b>	Rated isolation voltage rms with EN 50178 standards and following conditions	300	V rms
	<ul style="list-style-type: none"> <li>- Reinforced insulation</li> <li>- Over voltage category III</li> <li>- Pollution degree 2</li> <li>- Heterogeneous field</li> </ul>		
<b>V<sub>d</sub></b>	Rms voltage for AC isolation test, 50 Hz, 1 min	3.5	kV
<b>dCp</b>	Creepage distance	> 5.5	mm
<b>dCl</b>	Clearance distance	> 5.5	mm
<b>CTI</b>	Comparative tracking index (Group I)	> 600	

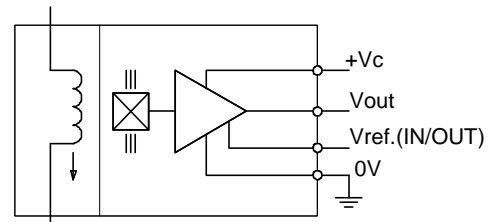
## Dimensions HXS 20-NP/SP30 (in mm. 1 mm = 0.0394 inch)



### Required connection circuit



### Operation Principle



Number of primary turns	Primary current		Primary resistance $R_p$ [m ohm]	Primary insertion inductance $L_p$ [μH]	Recommended PCB connections
	nominal $I_{PN}$ [A]	maximum $I_p$ [A]			
1	20	60	0.05	0.029	IN 1 3 5 7 2 4 6 8 OUT
2	10	30	0.2	0.12	IN 1 3 5 7 2 4 6 8 OUT
4	5	15	1	0.46	IN 1 3 5 7 2 4 6 8 OUT

## Mechanical characteristics

- General tolerance  $\pm 0.2$  mm
- Fastening & connection of primary jumper 8 pins  $\varnothing 1.3$  mm  
Recommended PCB hole  $\varnothing 1.5$  mm
- Fastening & connection of secondary 4 pins  $0.5 \times 0.25$   
Recommended PCB hole  $\varnothing 0.7$  mm

## Remarks

- $V_{OUT}$  is positive when  $I_p$  flows from terminals 1, 3, 5, 7 (IN) to terminals 2, 4, 6, 8 (OUT).
- Temperature of the primary conductors should not exceed 100°C.

## Safety



This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following 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 built-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.