

# Current Transducer HXS 10-NP/SP3

**$I_{PN} = 10 \text{ A}$**

**DUAL PHASE**

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

Primary nominal current rms $I_{PN}$ (A)	Primary current, measuring range $I_{PM}$ (A)	Type
Serial	Parallel	Serial
$\pm 10$	$\pm 20$	$\pm 30$
		$\pm 60$
		<b>HXS 10-NP/SP3</b>
$V_{OUT}$	Output voltage (Analog) @ $I_p$ $I_p = 0$	$V_{REF} \pm (0.625 \cdot I_p / I_{PN})$ V
$V_{REF}$	Reference voltage <sup>1)</sup> - Output voltage $V_{REF}$ Output impedance $V_{REF}$ Load impedance	$V_{REF} \pm 0.0125$ V $2.5 \pm 0.025$ V typ. 200 $\Omega$ $\geq 200$ k $\Omega$
$R_L$	Load resistance	$\geq 2$ 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 @ $V_C = 5$ 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 $0 \dots I_{PN}$ $\dots 3 \times I_{PN}$	$\leq \pm 0.5$	% 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 $V_{OUT}$	$\leq \pm 0.05\%$ of reading/K	
$V_{OM}$	Magnetic offset voltage @ $I_p = 0$ , after an overload of $3 \times I_{PN}$	$< \pm 0.7$	% 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) (DC .. 1 MHz)	$< 20$	mVpp
$BW$	Frequency bandwidth (-3 dB) <sup>3)</sup>	$< 40$	mVpp
		DC .. 50	kHz

## General data

$T_A$	Ambient operating temperature	- 40 .. + 85	°C
$T_s$	Ambient storage temperature	- 40 .. + 85	°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.

<sup>3)</sup> Small signal only to avoid excessive heatings of the magnetic core.

## 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, < 11mm
- Single power supply +5V
- Fixed offset & gain
- Insulated plastic case recognized according to UL 94-V0.

## Special Feature

- Two separate primary windings for dual phase measurement

## 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.

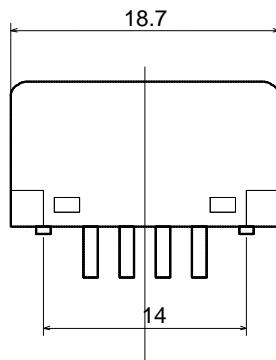
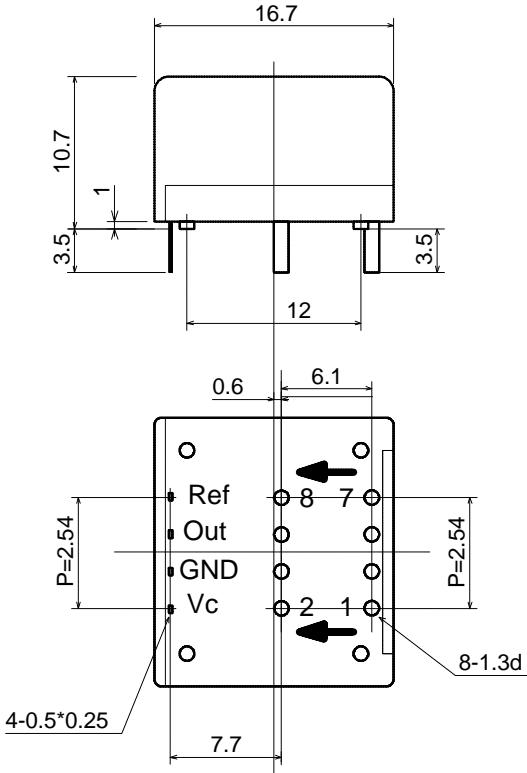
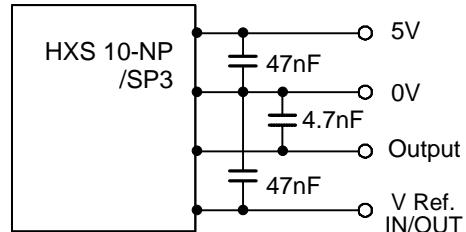
## Application Domain

- Industrial

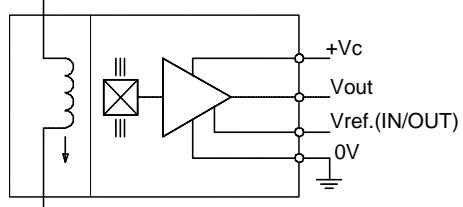
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### Isolation characteristics

$V_b$	Rated isolation voltage rms with IEC 61010-1 standards and following conditions	150	V rms
	- Single insulation		
	- Over voltage category III		
	- Pollution degree 2		
	- Heterogeneous field		
$V_b$	Rated isolation voltage rms with EN 50178 standards and following conditions	300	V rms
	- Reinforced insulation		
	- Over voltage category III		
	- Pollution degree 2		
	- Heterogeneous field		
$V_d$	Rms voltage for AC isolation test, 50 Hz, 1 min		
	Primary to secondary	3.5	kV
	Primary 1 to Primary 2	2.5	kV
$d_{Cp}$	Creepage distance	> 5.5	mm
$d_{Cl}$	Clearance distance	> 5.5	mm
$CTI$	Comparative tracking index (Group I)	> 600	

**Dimensions HXS 10-NP/SP3 (in mm. 1 mm = 0.0394 inch)**

**Required connection circuit**


Primary connections	Primary current		Primary resistance $R_p$ [m ohm]	Primary insertion inductance $L_p$ [ $\mu$ H]	Recommended PCB connections
	nominal $I_{PN}$ [A]	maximum $I_p$ [A]			
Serial	10	30	0.5	0.025	IN 1 2 7 8 OUT
Parallel	20	60	0.15	0.01	IN 1 2 7 8 OUT

**Operation Principle**

**Mechanical characteristics**

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

**Remarks**

- $V_{OUT}$  is positive when  $I_p$  flows from terminals 1, 7 (IN) to terminals 2, 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.