

Current Transducer HXS 50-NP

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	± 50	A
I_{PM}	Primary current, measuring range	± 150	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 ¹⁾ - Output voltage	2.5 ± 0.025	V
	V_{REF} Output impedance	typ. 200	Ω
	V_{REF} Load impedance	≥ 200	$k\Omega$
R_L	Load resistance	≥ 2	$k\Omega$
R_{OUT}	Output internal resistance	< 10	Ω
C_L	Capacitive loading	< 1	μF
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 ²⁾ @ I_{PN} , $T_A = 25^\circ C$	$\leq \pm 1$	% of I_{PN}
e_L	Linearity error 0 .. I_{PN}	$\leq \pm 0.5$	% of I_{PN}
	.. $3 \times I_{PN}$	$\leq \pm 1$	% 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}	$\leq \pm 0.05\%$	of reading/K
V_{OM}	Magnetic offset voltage @ $I_p = 0$, after an overload of $3 \times I_{PN}$	$< \pm 1$	% of I_{PN}
t_{ra}	Reaction time @ 10 % of I_{PN}	< 3	μs
t_r	Response time to 90 % of I_{PN} step	< 5	μs
di/dt	di/dt accurately followed	> 50	A/ μs
V_{no}	Output voltage noise (DC .. 10 kHz)	< 20	mVpp
	(DC .. 1 MHz)	< 40	mVpp
BW	Frequency bandwidth (-3 dB) ³⁾	DC .. 50	kHz

General data

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

$$I_{PN} = 12.5 - 25 - 50\text{ A}$$



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.

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

Notes : ¹⁾ 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.

²⁾ Excluding offset and hysteresis.

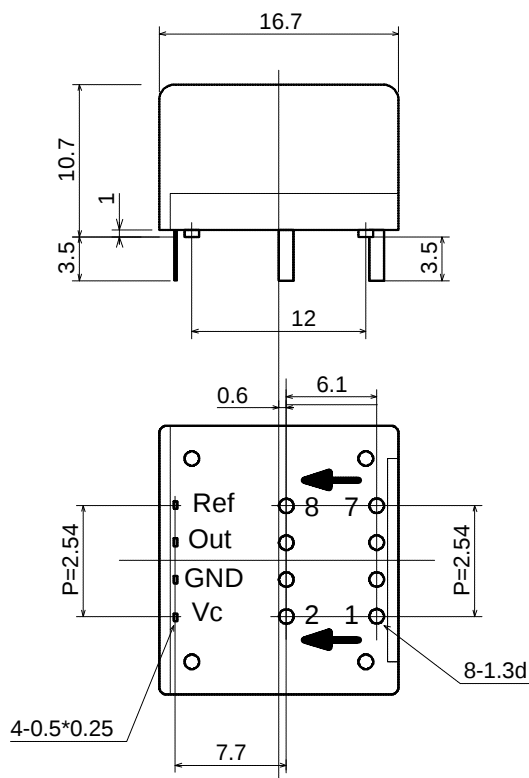
³⁾ Small signal only to avoid excessive heatings of the magnetic core.

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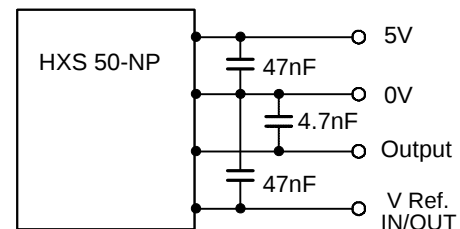
Isolation characteristics

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

Dimensions HXS 50-NP (in mm. 1 mm = 0.0394 inch)

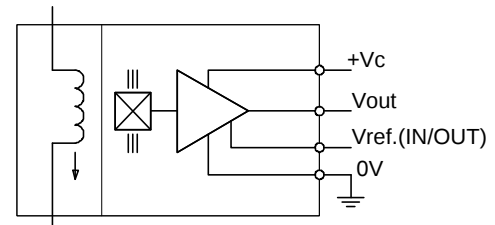


Required connection circuit



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	50	150	0.05	0.025	IN 1 3 5 7 OUT 2 4 6 8
2	25	75	0.2	0.1	IN 1 3 5 7 OUT 2 4 6 8
4	12.5	37.5	1	0.4	IN 1 3 5 7 OUT 2 4 6 8

Operation Principle



Mechanical characteristics

- General tolerance: ± 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 0.5×0.25
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.