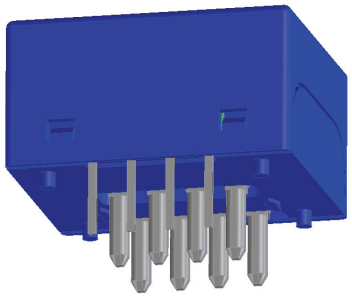
Current Transducer HXS 20-NP

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

All Data are given with a R_L = 10 kΩ

I_{PN} = 5-10-20 A



Electrical data

I_{PN}	Primary nominal current rms		± 20	A
I_{PM}	Primary current, measuring range		± 60	A
V_{OUT}	Analog Output voltage @ I_P		V_{OE} ± (0.625. I_P/ I_{PN})	V
G_{TH}	Theoretical sensitivity		0.625	V/ I_{PN}
V_{REF}	Reference voltage [1]	Ouput voltage	2.5 ± 0.025	V
		Ouput impedance	typ. 200	Ω
		Load impedance	≥ 200	kΩ
R_L	Load resistance		≥ 2	kΩ
R_{OUT}	Output internal resistance		< 5	Ω
C_L	Capacitive loading (± 20 %)		= 4.7	nF
V_C	Supply voltage (± 5 %) [2]		5	V
I_C	Current consumption @ V_C = 5V		19	mA

Accuracy - Dynamic performance data

X	Accuracy [3] @ I_{PN} , T_A = 25°C		≤ ± 1	%
ε_L	Linearity error	0 .. I_{PN}	≤ ± 0.5	%
		0 .. 3 x I_{PN}	≤ ± 1	%
TCV_{OE}	Temperature coefficient of V_{OE}	(+25.. 105°C)	≤ ± 0.4	mV/K
		(-40.. +25°C)	≤ ± 0.525	mV/K
TCV_{REF}	Temperature coefficient of V_{REF}	(+25.. 105°C)	≤ ± 0.01	%/K
		(-40.. +25°C)	≤ ± 0.015	%/K
TCV_{OE}/V_{REF}	Temperature coefficient of V_{OE} /V_{REF}		≤ ± 0.15	mV/K
TCG	Temperature coefficient of **G**		≤ ±0.05% of reading//K	
V_{OE}	Electrical offset voltage @ I_P = 0, T_A = 25°C		V_{REF} ± 0.0125	V
V_{OM}	Magnetic offset voltage @ I_P = 0 after an overload of 3 x I_{PN}		< ± 0.7	%
t_{ra}	Reaction time to 10 % of I_{PN} step		< 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) [4]		DC .. 50	kHz

General data

T_A	Ambient operating temperature	- 40 .. + 105	°C
T_S	Ambient storage temperature	- 40 .. + 105	°C
m	Mass	10	g
	Standards	EN 50178: 1997	

Notes:
[1] It is possible to overdrive V_{REF} with an external reference voltage between 1.5V - 2.8V providing its ability to sink or source approximately 5 mA.
[2] Maximum supply voltage (not operating) < 6.5 V
[3] Excluding Offset and Magnetic offset voltage
[4] 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 3500 V
- Low power consumption
- Extremely low profile < 11 mm
- Single power supply + 5 V
- Fixed offset & sensitivity
- Isolated 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 and servo motor 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

$\mathbf{V_d}$	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	V

Applications examples

According to EN 50178 and IEC 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
Single isolation	600 V	600 V
Reinforced isolation	300 V	150 V

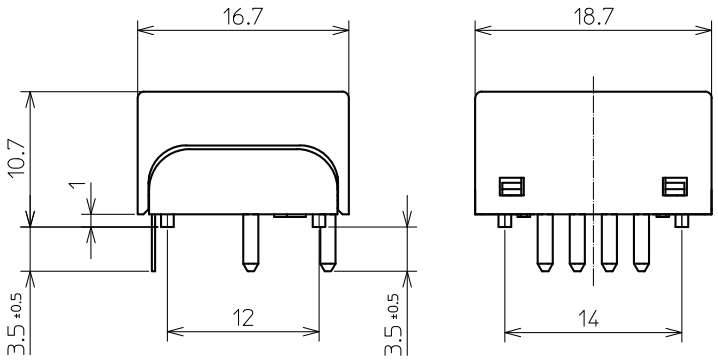
Safety

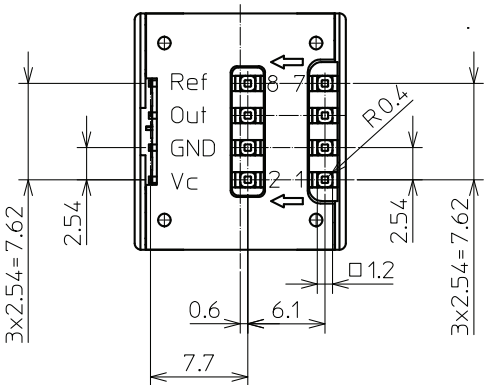
This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.

Caution, risk of electrical shock

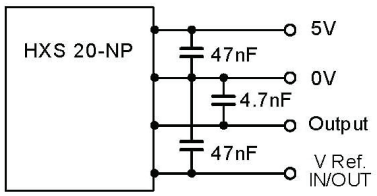
When operating the transducer, certain parts of the module can carry hazardous voltage (eg. primary busbar, power supply).
Ignoring this warning can lead to injury and/or cause serious damage.
This transducer is a build-in device, whose conducting parts must be inaccessible after installation.
A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

Dimensions HXS 20-NP (in mm)

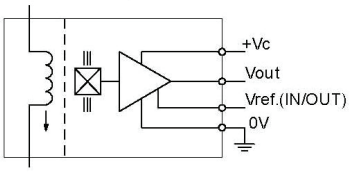




Recommended connection circuit



Operation Principle



Number of primary turns	Primary current		Primary resistance	Primary insertion inductance	Recommended PCB connections
	nominal I_{PN} [A]	maximum I_P [A]	R_P [mΩ]	L_P [µH]	
1	20	60	0.05	0.025	IN 1 3 5 7 / 2 4 6 8 OUT
2	10	30	0.2	0.1	IN 1 3 5 7 / 2 4 6 8 OUT
4	5	15	1	0.4	IN 1 3 5 7 / 2 4 6 8 OUT

Mechanical characteristics

- General tolerance ± 0.2 mm
- Transducer fastening & connection of primary jumper 8 pins □ 1.2 mm (corner R 0.4mm)
- Transducer fastening & connection of secondary 4 pins 0.5 x 0.25 mm

Recommended PCB hole

- Primary PCB hole Ø 1.5 mm
- Secondary PCB hole Ø 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 conductor should not exceed 120°C.