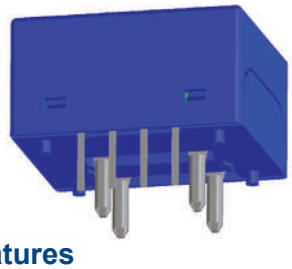
Current Transducer HXS 10-NP/SP3

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

I_{PN} = 10, 20 A
DUAL PHASE



All data are given with R_L = 10 kΩ

Electrical data

I_{PN}	Primary nominal rms current		Serial ±10 | Parallel ±20	A
I_{PM}	Primary current, measuring range		Serial ±30 | Parallel ±60	A
G_{TH}	Theoretical sensitivity		0.625	V/I_{PN}
V_{out}	Output voltage (Analog) @ I_P		V_{OE} ±(0.625 · I_P/I_{PN})V	
V_{ref}	Reference voltage [1]	Output voltage	2.5 ±0.025	V
		Output 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
U_C	Supply voltage (±5 %) [2]		5	V
I_C	Current consumption @ U_C = 5 V		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 × I_{PN}	≤±1	%
TCV_{OE}	Temperature of coefficient of V_{OE}	(+25 .. 85 °C)	≤±0.4	mV/K
		(-40 .. +25 °C)	≤±0.525	mV/K
TCV_{ref}	Temperature of coefficient of V_{ref}	(+25 .. 85 °C)	≤±0.01	%/K
		(-40 .. +25 °C)	≤±0.015	mV/K
TCV_{OE}/V_{ref}	Temperature of coefficient of V_{OE}/V_{ref}		≤±0.15	mV/K
TCG /K	Temperature of coefficient of G		≤±0.05 % of reading	
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 × I_{PN}		±0.7	%
V_{no}	Output voltage noise	(DC .. 10 kHz)	<20	mVpp
		(DC .. 1 MHz)	<40	mVpp
t_{ra}	Reaction time to 10 % of I_{PN} step		<3	µs
t_r	Step response time to 90 % of I_{PN} step		<5	µs
di/dt	di/dt accurately followed		>50	A/µs
BW	Frequency bandwidth (-3 dB) [4]		DC .. 50	kHz

Notes: [1] It is possible to overdrive V_{ref} with an external reference voltage between 1.5 - 2.8 V 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 separation between primary and secondary circuit
- Insulation test voltage 3500 V
- Extremely low profile <11 mm
- Fixed offset & sensitivity
- Low power consumption
- Single power supply +5 V
- Insulating 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
- V_{ref} IN/OUT.

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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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	

Insulation coordination

U_d	Rms voltage for AC insulation test, 50 Hz, 1 min		
	Primary to secondary	3.5	kV
	Primary 1 to primary 2	2.5	kV
		Min	
d_{Cp}	Creepage distance	>5.5	mm
d_{Cl}	Clearance	>5.5	mm
CTI	Comparative Tracking Index (group I)	>600	

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

According to UL 508 standards and following conditions: Maximum voltage 600 V

- Over voltage category OV 3
- Pollution degree PD2

	EN 50178	IEC 61010-1
d_{Cp}, d_{Cl}	Rated insulation voltage	Nominal voltage
Basic insulation	600 V	600 V
Reinforced insulation	300 V	150 V

Safety

This transducer must be used in limited-energy secondary circuits according to IEC 61010-1.



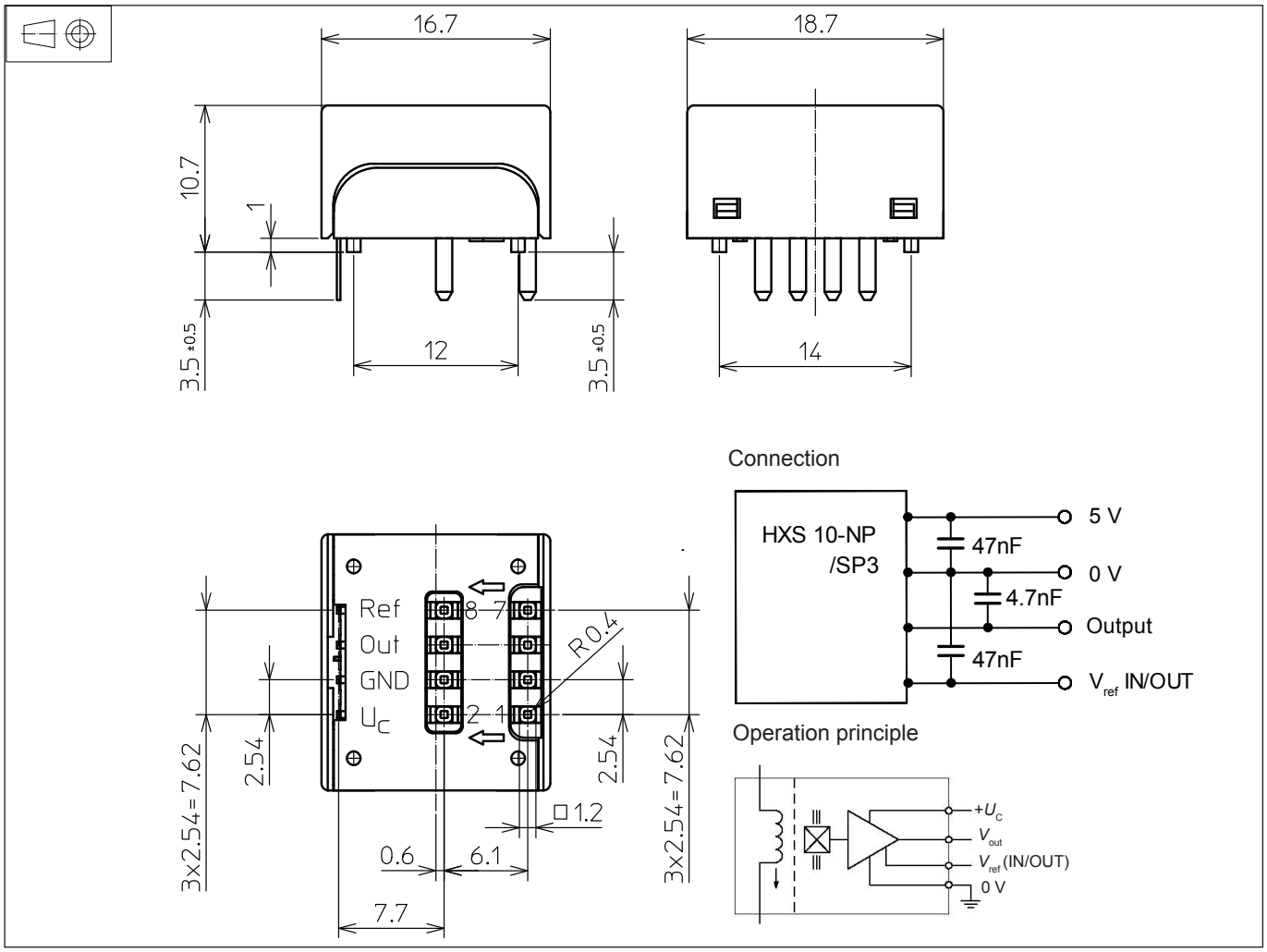
This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.



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 HXS 10-NP/SP3 (in mm)



Primary connections	Primary current		Primary resistance	Primary insertion inductance	Recommended PCB connections
	nominal I_{PN} [A]	maximum I_{PN} [A]	R_P [mΩ]	L_P [µH]	
Serial	10	30	0.2	0.1	IN 1 7 / 2 8 OUT
Parallel	20	60	0.05	0.025	IN 1 7 / 2 8 OUT

Mechanical characteristics

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

Recommended PCB hole

- Primary PCB hole ⌀ 1.5 mm
- Secondary PCB hole ⌀ 0.7 mm

Remarks

- V_{out} is positive when I_P flows from terminals 1,7 (IN) to terminals 2,8 (OUT).
- Temperature of the primary conductor should not exceed 100 °C.