

Current Transducer HX 05 ... 15-NP series

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



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

Electrical data

Primary nominal current RMS		Primary current measuring range		Primary conductor diameter \times turns (mm)	Type
I_{PN} (A)		I_{PM} (A)			
Serial	Parallel	Serial	Parallel		
± 5	± 10	± 15	± 30	$0.8d \times (6T + 6T)$	HX 05-NP
± 10	± 20	± 30	± 60	$1.0d \times (3T + 3T)$	HX 10-NP
± 15	± 30	± 45	± 90	$1.2d \times (2T + 2T)$	HX 15-NP
U_{out}	Output voltage (Analog) @ $\pm I_{PN}$, $R_L = 10 \text{ k}\Omega$, $T_A = 25 \text{ }^\circ\text{C}$			± 4	V
R_{out}	Output internal resistance			< 50	Ω
R_L	Load resistance			≥ 10	$\text{k}\Omega$
U_C	Supply voltage ($\pm 5 \%$) ¹⁾			± 15	V
I_C	Current consumption			$< \pm 15$	mA

Accuracy - Dynamic performance data

ϵ	Error @ I_{PN} , $T_A = 25 \text{ }^\circ\text{C}$ (excluding offset)	$\leq \pm 1$	% of I_{PN}
ϵ_L	Linearity error $0 \dots \pm I_{PN}$	$\leq \pm 1$	% of I_{PN}
U_{OE}	Electrical offset voltage, @ $I_P = 0$, $T_A = 25 \text{ }^\circ\text{C}$	$< \pm 40$	mV
U_{OM}	Magnetic offset voltage @ $I_P = 0$ after an excursion of $1 \times I_{PN}$	$< \pm 15$	mV
TCU_{OE}	Temperature of coefficient of U_{OE}	$< \pm 1.5$	mV/K
TCU_{out}	Temperature of coefficient of U_{out} (% of reading)	± 0.1	%/K
t_{D90}	Delay time to 90 % of the output value for I_{PN} step ²⁾	≤ 3	μs
BW	Frequency bandwidth (-3 dB) ³⁾	50	kHz

General data

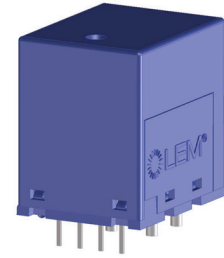
T_A	Ambient operating temperature	$-25 \dots +85$	$^\circ\text{C}$
T_{Ast}	Ambient storage temperature	$-25 \dots +85$	$^\circ\text{C}$
m	Mass	8	g
	Standard	EN 50178: 1997	

Notes: ¹⁾ Also operate at $\pm 12 \text{ V}$ power supplies, measuring range reduced to $\pm 2.5 \times I_{PN}$

²⁾ For a $di/dt = 50 \text{ A}/\mu\text{s}$

³⁾ Small signal only to avoid excessive heating of the magnetic cores.

$$I_{PN} = 5 \dots 15 \text{ A}$$



Features

- Hall effect measuring principle
- Galvanic separation between primary and secondary circuit
- Insulation voltage 3000 V
- 2 insulated primary windings
- Low power consumption
- Extended measuring range ($3 \times I_{PN}$)
- Power supply from $\pm 12 \text{ V}$ to $\pm 15 \text{ V}$
- Insulating plastic case recognized according to UL 94-V0.

Advantages

- Low insertion losses
- Easy mount with automatic handling system
- Only one design for wide current ratings range
- Small size and space savings
- High immunity to external interference.

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)
- Electrical appliances.

Application domain

- Industrial.

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	Primary to secondary	> 3	kV
		Primary 1 to primary 2	> 1	kV
U_t	Partial discharge RMS test voltage ($q_m < 10$ pC)		≥ 1	kV
U_{Ni}	Impulse withstand voltage 1.2/50 μs		≥ 6	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

	EN 50178	IEC 61010-1
d_{Cp}, d_{Cl}, U_{Ni}	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 HX 05 ... 15-NP series (in mm)

Terminal Pin (Identification)

1	-15 V
2	0 V
3	+15 V
4	Output
5	Primary i1 input Current (-)
7	Primary 1 input Current (+)
6	Primary 2 input Current (-)
8	Primary 2 input Current (+)

Primary conductor diameter

HX	HX 05-NP	HX 10-NP	HX 15-NP
d	0.8	1.0	1.2

Secondary Pin dimension: 0.5 × 0.25 mm

Marking view

Mechanical characteristic

- General tolerance ± 0.5 mm

Remarks

- U_{out} is positive when I_p flows in the direction of the arrow.
- Temperature of the primary conductor should not exceed 100 °C.