Current Transducer HAIS 50 ... 400-P
HAIS 50 ... 150-TP

I_{PN} = 50 ... 400 A

I_{PN} = 50 ... 150 A

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

All data are given with R_L = 10 kΩ

Electrical data

Primary nominal RMS current I_{PN} (A)	Primary current measuring range I_{PM} (A)	Type
50	±150	HAIS 50-P/50-TP [1]
100	±300	HAIS 100-P/100-TP [1]
150	±450	HAIS 150-P/150-TP [1]
200	±600	HAIS 200-P
400	±600	HAIS 400-P

S_N	Nominal sensitivity @ I_{PN}		0.625	V/ I_{PN}
U_{out}	Output voltage (Analog) @ I_P		U_{OE} +(0.625·I_P/ I_{PN})V	
U_{ref}	Reference voltage [2]	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	Load capacitance (±20 %)		4.7	nF
U_C	Supply voltage (±5 %) [3]		5	V
I_C	Current consumption @ U_C = 5 V		< 19	mA

Accuracy - Dynamic performance data

ε	Error [4] @ I_{PN}, T_A = 25 °C		≤ ±1	% of I_{PN}
ε_L	Linearity error 0 ... I_{PM}		≤ ±0.5	% of I_{PN}
TCU_{OE}	Temperature coefficient of U_{OE}		≤ ±0.3	mV/K
TCU_{ref}	Temperature coefficient of U_{ref}	+25 ... +85 °C	≤ ±0.01	%/K
		−40 ... +25 °C	≤ ±0.015	%/K
TCU_{OE}/U_{ref}	Temperature coefficient of U_{OE} / U_{ref}		≤ ±0.2	mV/K
TCS	Temperature coefficient of S		≤ ±0.05	% of reading/K
U_{OE}	Electrical offset voltage @ I_P = 0, T_A = 25 °C		U_{ref} ±0.025	V
U_{OM}	Magnetic offset voltage @ I_P = 0			
	after an overload of I_{PM}	HAIS 50-P/TP	< ±0.5	% of I_{PN}
		HAIS 100-P/TP ... 400-P	< ±0.4	% of I_{PN}
$t_{D\,10}$	Delay time to 10 % of the final output value for I_{PN} step		< 3	µs
$t_{D\,90}$	Delay time to 90 % of the final output value for I_{PN} step [5]		< 5	µs
U_{no}	RMS noise voltage	(DC ... 10 kHz)	< 15	mVpp
		(DC ... 1 MHz)	< 40	mVpp
BW	Frequency bandwidth (−3 dB) [6]		DC ... 50	kHz

Notes:

[1] -TP version is equipped with a primary bus bar; Temperature of primary bus bar should not exceed 100 °C

[2] It is possible to overdrive U_{ref} with an external reference voltage between 1.5 V - 2.8 V providing its ability to sink or source approximately 5 mA

[3] Maximum supply voltage (not operating) <6.5 V

[4] Excluding offset and magnetic offset voltage

[5] Tested with 0 ... 125 A step with slope 100 A/µs

[6] Small signal only to avoid excessive heatings of the magnetic core.

Features

- Hall effect measuring principle
- Galvanic separation between primary and secondary circuit
- Insulation test voltage 2500 V
- Low power consumption
- Single power supply +5 V
- Fixed offset & sensitivity
- Insulating 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
- U_{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
$T_{A\,st}$	Ambient storage temperature	−40 ... +85	°C
m	Mass (in brackets: TP version)	20 (30)	g
	Standards	EN 50178: 1997	

Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	2.5	kV
U_t	Partial discharge RMS test voltage (q_m< 10 pC)		
	HAIS 50 ... 400-P	> 1	kV
	HAIS 50 ... 150-TP	> 1.4	kV
U_{Ni}	Impulse withstand voltage 1.2/50 µs	8	kV
		Min	
d_{Cp}	Creepage distance	> 8	mm
d_{Cl}	Clearance distance	> 8	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	1000 V	1000 V
Reinforced insulation	600 V	300 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 (e.g. 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.

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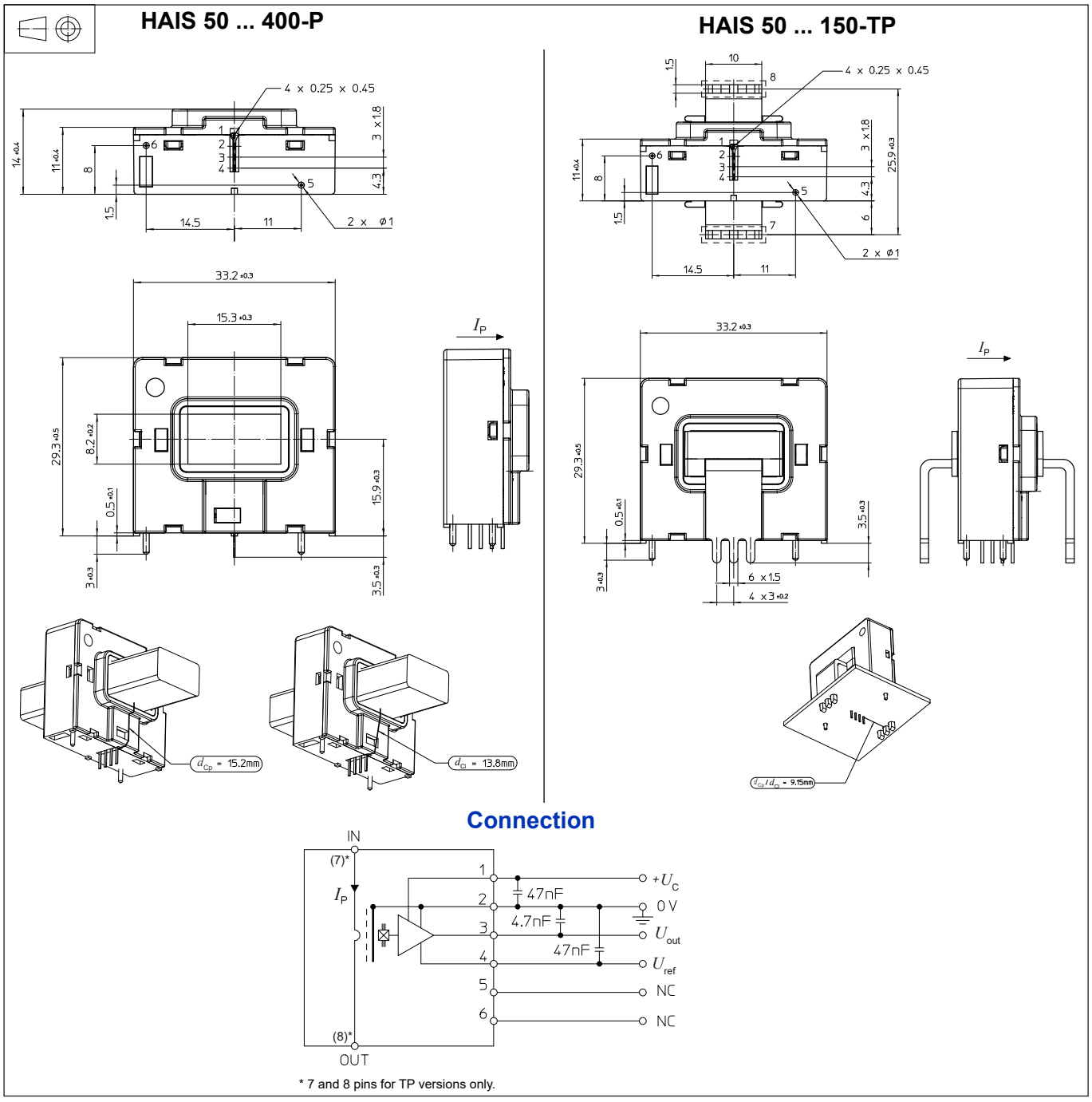
Dimensions HAIS 50 ... 400-P and HAIS 50 ... 150-TP (in mm)



Connection

* 7 and 8 pins for TP versions only.

Mechanical characteristics

- General tolerance ±0.2 mm
- Primary through-hole 15.3 mm x 8.2 mm.

Recommended PCB hole sizes

- Primary bus bar pins 7 and 8 PCB hole 2.3 ±0.1 mm (for TP versions only)
- Secondary pins 1-4 PCB hole 0.7 ±0.1 mm
- Support pins 5 and 6 PCB hole 1.5 ±0.1 mm.

Remarks

- Magnetic core connected internally to 0 V for better dv/dt immunity
- U_{out} is positive when I_P flows in the direction of the arrow
- Temperature of the primary conductor should not exceed 100 °C.

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