

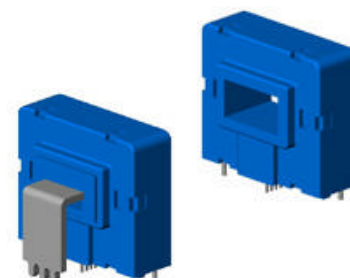
Current Transducer HAIS 50 .. 400-P and HAIS 50 .. 100-TP

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 $R_L = 10 \text{ k}\Omega$

$$I_{PN} = 50 \dots 400 \text{ A}$$



Electrical data

Primary nominal r.m.s. current I_{PN} (A)	Primary current measuring range I_p (A)	Type
50	± 150	HAIS 50-P, HAIS 50-TP ¹⁾
100	± 300	HAIS 100-P, HAIS 100-TP ¹⁾
150	± 450	HAIS 150-P
200	± 600	HAIS 200-P
400	± 600	HAIS 400-P
V_{OUT}	Analog output voltage @ I_p $I_p = 0$	$V_{REF} \pm (0.625 \cdot I_p / I_{PN}) \text{ V}$ $V_{REF} \pm 0.025 \text{ V}$
V_{REF}	Internal Reference ²⁾ - Output voltage	$2.5 \pm 0.025 \text{ V}$
	V_{REF} Output impedance	typ. 200 Ω
	V_{REF} Load impedance	$\geq 200 \text{ k}\Omega$
R_L	Output load resistance	$\geq 2 \text{ k}\Omega$
R_{OUT}	Output impedance	$< 10 \Omega$
C_L	Max. output capacitive load	$< 1 \mu\text{F}$
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 ³⁾ @ I_{PN} , $T_A = 25^\circ\text{C}$	$\leq \pm 1$	% of I_{PN}
e_L	Linearity $0 \dots 3 \times I_{PN}$	$\leq \pm 0.5$	% of I_{PN}
TCV_{OUT}	Thermal drift of V_{OUT} @ $I_p = 0$	$\leq \pm 0.3$	mV/K
TCV_{REF}	Thermal drift of V_{REF}	$\leq \pm 0.01$	%/K
TCV_{OUT}/V_{REF}	Thermal drift of V_{OUT}/V_{REF} @ $I_p = 0$	$\leq \pm 0.2$	mV/K
TCE_G	Thermal drift of the gain	$\leq \pm 0.05\%$	of reading/K
V_{OM}	Residual voltage @ $I_p = 0$, after an overload of $3 \times I_{PN \text{ DC}}$	$\leq \pm 0.4$	% of I_{PN}
t_{ra}	Reaction time @ 10 % of I_{PN}	< 3	μs
t_r	Response time @ 90 % of I_{PN}	< 5	μs
di/dt	di/dt accurately followed	> 100	A/ μs
	Output noise (DC .. 10 kHz)	< 15	mVpp
	(DC .. 1 MHz)	< 40	mVpp
f	Frequency bandwidth (-3 dB) ⁴⁾	DC .. 50	kHz

General data

T_A	Ambient operating temperature	- 40 .. + 85	$^\circ\text{C}$
T_S	Ambient storage temperature	- 40 .. + 85	$^\circ\text{C}$
dCp	Creepage distance	> 8	mm
dCl	Clearance distance	> 8	mm
CTI	Comparative tracking index (Group I)	> 600	V
	UL94 classification	V0	
m	Mass (in brackets : TP version)	20(30)	g
	Standards	EN 50178 (97-10-01)	

Features

- Hall effect measuring principle
- Galvanic isolation between primary and secondary circuit
- Isolation test voltage 2500V
- Low power consumption
- Single power supply +5V
- Fixed offset & gain
- Bus bar version available for 50A and 100A ratings.

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
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications.

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Insulation category

V_b	Nominal Voltage with IEC 61010-1 standards and following conditions - Single insulation - Over voltage category III - Pollution degree 2 - Heterogeneous field	300	V r.m.s.
V_b	Nominal Voltage with EN 50178 standards and following conditions - Reinforced insulation - Over voltage category III - Pollution degree 2 - Heterogeneous field	600	V r.m.s.
V_d	R.m.s. voltage for AC isolation test, 50/60 Hz, 1 mn	2.5	kV
V_e	R.m.s. voltage for partial discharge extinction @ 10pC		
	HAIS 50..400-P	> 1	kV
	HAIS 50..100-TP	> 1.4	kV
V_w	Impulse withstand voltage 1.2/50µs	8	kV

If insulated cable is used for the primary circuit, the voltage category could be improved with the following table :

Cable insulation (primary)	Category
HAR 03	450V CAT III
HAR 05	550V CAT III
HAR 07	650V CAT III

Notes : ¹⁾ -TP version is equipped with a primary bus bar.

²⁾ 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.

³⁾ Excluding offset and hysteresis.

⁴⁾ Small signal only to avoid excessive heatings of the magnetic core.

Safety :



Caution, risk of danger

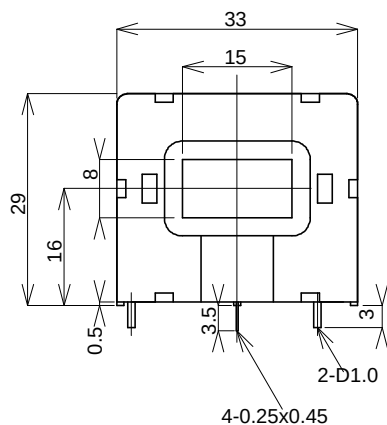


Caution, risk of electrical shock

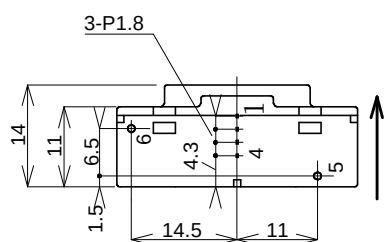
This transducer shall be used in accordance with manufacturer instruction. The temperature of the primary conductor shall not exceed 100°C. Power supply shall be a low voltage source and shall have an efficient protective system against over current. Power supply must incorporate a circuit breaker. This transducer shall be used in an electric/electronic equipment in respect of standards rules and applicable safety requirements. Primary bar and output terminals can provide hazardous voltage. This transducer is a built in device, of which conducting parts must be inaccessible by installation. Protective envelope or additional shield must be used.

HAIS 50..400-P

Front view



Bottom view



Terminal Pin Identification

- 1...+5V
- 2...0V
- 3...OUTPUT
- 4...Vref. (IN/OUT)
- 5...Core Earth (*)
- 6...NC.

Recommended PCB hole

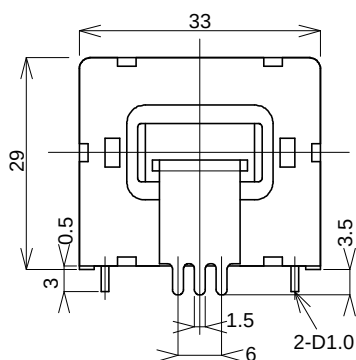
- Pin 1-4 : $0.7 \pm 0.1\text{mm}$
- Pin 5-6 : $1.5 \pm 0.1\text{mm}$
- Primary bus bar : $2.3 \pm 0.1\text{mm}$

General tolerance : $\pm 0.2\text{mm}$

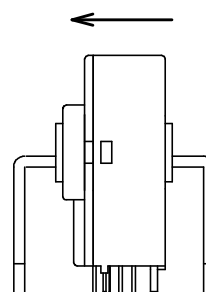
Unit : mm

HAIS 50..100-TP

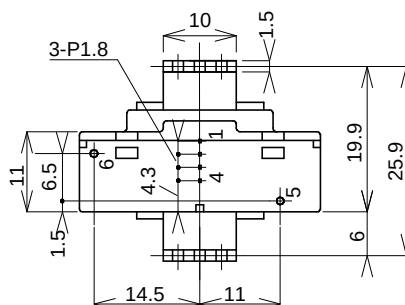
Front view



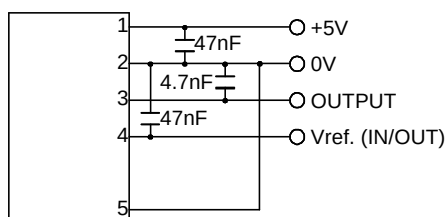
Right view



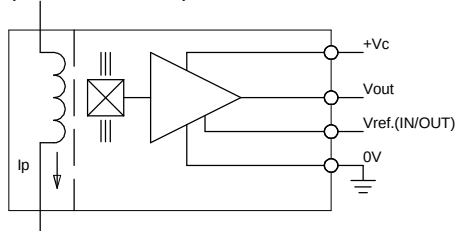
Bottom view



Required Connection Circuit



Operation Principle



(*) should be connected to 0V of Power Supply for better dv/dt immunity.
Arrow indicates positive current direction.