

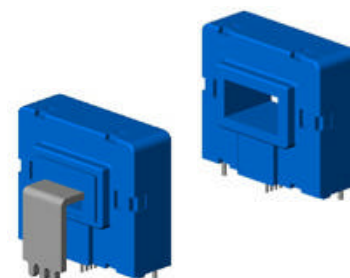
Current Transducer HAIS 50 .. 400-P and HAIS 50 .. 100-TP

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

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



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 $I_p = 0$ | $V_{REF} \pm (0.625 \cdot I_p / I_{PN})$ V $V_{REF} \pm 0.025$ V |
| V_{REF} | Internal Reference ²⁾ - Output voltage | 2.5 ± 0.025 V |
| | V_{REF} Output impedance | typ. 200 Ω |
| | V_{REF} Load impedance | ≥ 200 k Ω |
| R_L | Output load resistance | ≥ 2 k Ω |
| R_{OUT} | Output impedance | < 10 Ω |
| C_L | Max. output capacitive load | < 1 μ F |
| V_C | Supply voltage ($\pm 5 \%$) | 5 V |
| I_C | Current consumption @ $V_C = 5$ V | 22 mA |

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.

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 $3 \times I_{PNDC}$ | $\leq \pm 0.4$ | % of I_{PN} |
| t_{ra} | Reaction time @ 10 % of I_{PN} | < 3 | μ s |
| t_r | Response time @ 90 % of I_{PN} | < 5 | μ s |
| di/dt | di/dt accurately followed | > 100 | A/ μ s |
| | 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 | EN50178 (97-10-01) | |

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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 1.2/50 μ s | 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

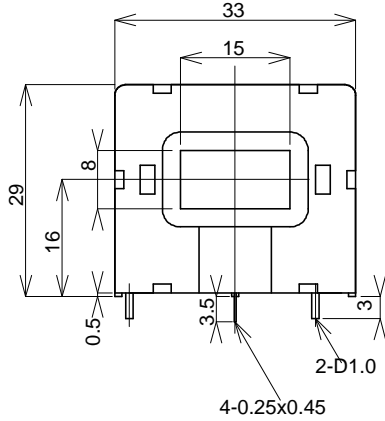


Caution, risk of electrical shock

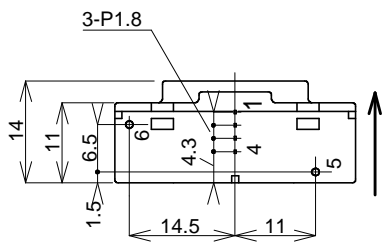
This transducer shall be used in accordance with manufacturer instruction. The temperature of the primary conductor shall not exceed 100°C. Power supply shall be a low voltage source and shall have an efficient protective system against over current. Power supply must incorporate a circuit breaker. This 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

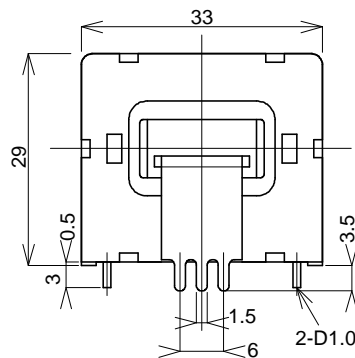
- Pin 1-4 : $0.7 \pm 0.1\text{mm}$
- Pin 5-6 : $1.5 \pm 0.1\text{mm}$
- Primary bus bar : $2.3 \pm 0.1\text{mm}$

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

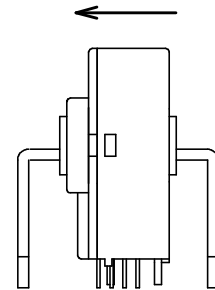
Unit : mm

HAIS 50..100-TP

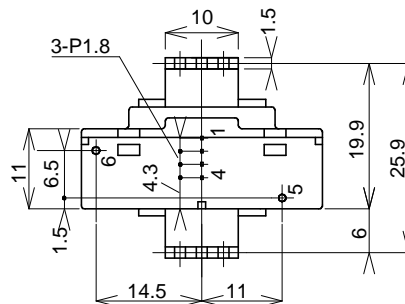
Front view



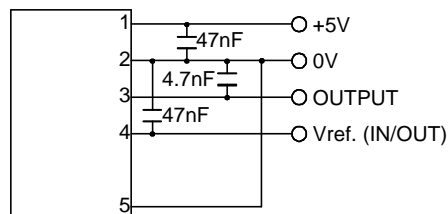
Right view



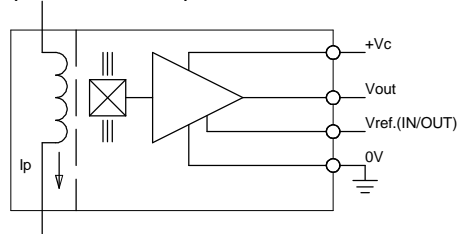
Bottom view



Required Connection Circuit



Operation Principle



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