



- High Accuracy
- Broad Bandwidth
- Low Zero-drift

Shenzhen Hangzhi Precision Electronics Co. Ltd.

## AIT4000-SG High-Precision Current Transducer

AIT4000-SG has a high gain and measurement accuracy in the full bandwidth range, due to the application of the multi-point zero-flux technology system and high-frequency ripple sensing channel on top of currently existing DC sensor technology.

The multi-point zero-flux technology system secures the high accuracy by utilizing the technology combination of exciting magnetic flux closed-loop control, self-excited magnetic flux gate and multi-closed-loop control that realizes the closed-loop control between excitation magnetic flux and AC/DC magnetic flux generated by primary current, while the high-frequency ripple sensing channel allows the sensor to have the high performance over the full bandwidth range.

### Product photo





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## Key Technologies

- ◇ Excitation closed-loop control technology
- ◇ Self-excitation demagnetization technology
- ◇ Multi-point zero-flux technology
- ◇ Temperature control compensation technology
- ◇ Multi-range automatic switching technology

## Features

- ◇ Insulated measurement between primary and secondary side
- ◇ Excellent linearity and accuracy
- ◇ Extremely low temperature drift
- ◇ Extremely low zero drift
- ◇ Broad band and low response time
- ◇ Strong anti-electromagnetic interference

## Application Domain

- ◇ Medical Equipment: Scanner, MRI
- ◇ Power industry: Converter, Inverter □
- ◇ Renewable Energy: Photovoltaic, Wind energy
- ◇ Testing Instrument: Power analyzer, High-precision power supply
- ◇ Smart Power Grid: Power generation and battery monitoring, Medium low voltage substation
- ◇ Industry Control: Industrial motor drive, UPS, Welding, Robot, Hoist, Elevator, Ski lift
- ◇ Rail Transit: EMU, Metro, Trolley car □
- ◇ Ship: Electric driven ship
- ◇ Car: Electric car

## Electrical Performance

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Primary nominal direct current	$I_{PN\_DC}$	—	—	±4000	4400	Adc
Primary nominal RMS current*	$I_{PN\_AC}$	—	—	2828	3111	Aac
Power supply voltage AC	$U_C$	—	—	220	—	Vac
Current consumption	$I_C$	Rated primary current	—	—	210	mA
Conversion ratio	$K_N$	Primary/secondary	1:4000	1:4000	1:4000	—
Secondary nominal RMS current	$I_{SN}$	Rated Primary current	—	±1.0	—	A
Secondary burden resistance	$R_M$		0	1	1.5	Ω

\* refers to AC effective value

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## Accuracy Measurement

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Accuracy	X <sub>G</sub>	Input direct current, 25±20°C	—	—	50	ppm
Linearity error	ε <sub>L</sub>	—	—	—	30	ppm
Offset temperature coefficient	T <sub>C</sub>	—	—	—	0.1	ppm/K
Offset stability over time	T <sub>T</sub>	—	—	—	0.2	ppm/month
Power supply interference	T <sub>V</sub>	—	—	—	1	ppm/V
Zero offset current	I <sub>O</sub>	@25°C	—	—	1 (can be adjusted to zero by users)	ppm
Ripple current	I <sub>N</sub>	DC-10Hz	—	—	0.5	ppm
Step response time to 90%I <sub>PN_DC</sub>	t <sub>r</sub>	di/dt of 100A/μs	—	—	1	μs
di/dt accurately followed	di/dt	—	100	—	—	A/μs
Frequency bandwidth (-3dB)	BW	—	0	—	300	kHz
Zero offset current	I <sub>OT</sub>	Full temperature range	—	—	±5	μA

## Safety Characteristics

Parameter	Symbol	Measuring Conditions	Value	Unit
Insulation voltage / Between primary and secondary	U <sub>d</sub>	50Hz, 1min	5	KV
Impulse withstand voltage / Between primary and secondary	U <sub>w</sub>	50μs	10	KV
Creepage distance / Between primary and shield	d <sub>CP</sub>	—	11	mm
Clearance distance / Between primary and shield	d <sub>CI</sub>	—	11	mm
Comparative tracking index	CTI	IEC-60112	600	V

## General Characteristics

Parameter	Symbol	Measuring Condition	Min	Typ	Max	Unit
Ambient operating temperature	T <sub>A</sub>	—	-40	—	+85	°C
Ambient storage temperature	T <sub>S</sub>	—	-40	—	+85	°C
Relative humidity	RH	—	20	—	80	%
Mass	M	—	—	13000±200	—	g



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## Operating Status Instructions

### ◇ Normal status:

The green indicator is on when the device is running normally.

### ◇ Fault status:

The green light will be off when the transducer is in fault mode.

Trouble-shooting:

- a) When the green light is off, the power supply should be checked as the first step;
- b) If the power supply is normal, then the primary current is over the specified measurement range and the transducers will be in overload mode.

In this mode, the transducers will be working in non-zero flux mode, that the secondary current remains at specified maximum output, the secondary and primary currents are not in proportional. When the measuring current returns to the specified measurement range, the output current will return to normal and the green light will be on.

## Instructions

The steps are as follows:

Step 1: Connect the transducer and the control box through a dedicated connection line.

Step 2: Insert the AC 220V power plug into the control box and turn on the power supply switch

Step 3: Pass the current cable to be tested through the transducer and pay attention to the current direction.

Step 4: The current output interface is connected to the current measuring instrument or current sampling circuit. Note that the sampling resistance value cannot exceed the maximum limit value.

## Connection System

### 1. Control box power supply wiring:

The power interface of the control box is directly connected to the 220V power supply;

Red terminal: the positive side of the secondary current output;

Black terminal: the negative side of the secondary current output;

### 2. Connection of control box and winding coil

Insert the D-Sub9 male connector on the winding coil directly into the D-Sub9 female connector of the control box and fix it with screws.

### 3. Test description:

By measuring the test current  $I_s$  flowing through  $R_M$ , or the voltage  $U_R$  across  $R_M$ ,

The primary current  $I_P$  can be obtained:

$$I_P = K_N * I_S = K_N * (U_R / R_M)$$

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## Dimensions

Unit: mm

