

AIT1000-10V High-Precision Current Transducer

AIT1000-10V 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





- High Accuracy
- Broad Bandwidth
- Low Zero-drift

Shenzhen Hangzhi Precision Electronics Co., Ltd.

Product Model: AIT1000-10V
Measurement Range: DC $\pm 1000A$
Accuracy: 50PPM

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}	—	—	± 1000	—	Adc
Primary nominal RMS current*	I_{PN_AC}	—	—	707	—	Aac
Primary current, measuring range	I_{PM}	—	—	—	± 1200	Adc
Power supply voltage DC	U_C	—	± 14.2	± 15	± 15.8	V
Current consumption	I_C	Rated primary current	± 40	± 440	± 530	mA
Rated output voltage	U_{PN_DC}	Rated primary voltage (DC)	—	± 10	—	V
Conversion ratio	K_N	—	—	10	—	V/A
Output load current	—	—	—	—	5	mA
Output impedance	R_M	—	—	—	10	m Ω

* refers to AC effective value



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Accuracy Measurement

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Accuracy	X_G	Input direct current, $25\pm 10^{\circ}C$	—	—	50	ppm
Linearity error	ε_L	—	—	—	10	ppm
Offset temperature coefficient	T_C	—	—	—	0.5	ppm/K
Offset stability over time	T_T	—	—	—	0.5	ppm/month
Power supply interference	T_V	—	—	—	1	ppm/V
Step response time to 90% I_{PN_DC}	t_r	$di/dt=1.5/\mu s$	—	—	7	μs
Voltage change rate	dv/dt	—	1.5	—	—	V/ μs
Frequency bandwidth (-3dB)	BW	—	0	—	500	kHz
Zero offset voltage	V_{OT}	Full temperature range	—	—	± 10	μV

Safety Characteristics

Parameter	Symbol	Measuring Conditions	Value	Unit
Insulation voltage / Between primary and secondary	Ud	50Hz, 1min	5	KV
Impulse withstand voltage / Between primary and secondary	Uw	50 μs	10	KV
Creepage distance / Between primary and shield	d_{CP}	—	11	mm
Clearance distance / Between primary and shield	d_{CI}	—	11	mm
Comparative tracking index	CTI	IEC-60112	600	V

General Characteristics

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Ambient operating temperature	T_A	—	-40	—	+85	$^{\circ}C$
Ambient storage temperature	T_S	—	-40	—	+85	$^{\circ}C$
Mass	M	—		1465 ± 100		g



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Safety



Cautions

This specifications documents provide users with relevant precautions for installation, commissioning, operation and maintenance. Please read carefully before installation and use. This manual is provided with the product, please keep it in a proper place for reference during maintenance.

The device must be used according to the manufacturer specifications, otherwise there are risks to damage the device, other equipment connected, and safety risks to operators.

Always inspect the device and its accessories, and confirm they are in good status before energize the device.

If you find any damage to the device housing, fixing, power cord, connecting cables, or connected equipment, immediately disconnect the device from the power source.

If you have concerns about the safe operation of the equipment, you should immediately shut down the equipment and the corresponding accessories, and get in touch with the technical support department of our company as soon as possible to communicate and solve the problem.



Danger

The current sensor is not allowed to be used when the secondary output is open-circuited, that is, when the primary has current or the sensor is powered on, the secondary output terminal is not allowed to be disconnected; only when the bus has no current and the sensor is not powered on, the current output terminal of the sensor can be disconnected . Otherwise, high voltage may be induced and there is a danger of electric shock or equipment damage.

When you need to move the product, please be sure to cut off the power first and unplug all the connecting cables connected to it.

Indicator light description of transducer

◇ Normal status:

The green indicator light is on when the device is running normally:

After the device is powered on, the green indicator light will be on when the device is working normally.

◇ Fault status:

The green light will not 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 voltage and primary currents are not in proportion.

Indicator light instruction of voltage converter box

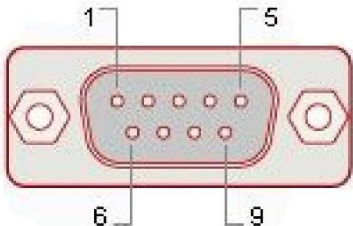
◇ In normal operation, the green light of the voltage converter box is always on:

After the device is powered on, the indicator light of the voltage converter box is always on.


◇ When the power supply is abnormal, the green light will be off.

Connection and Instruction

1. D-Sub9 Connection terminal pin function definition (DB9 Male)

Pin No.	Definition	Instruction	Interface drawing
1	N.C	Disconnected	
2	N.C	Disconnected	
3	N.C	Disconnected	
4	GND	Ground	
5	-15V Supply	Power supply -15V	
6	N.C	Disconnected	
7	N.C	Disconnected	
8	N.C	Disconnected	
9	+15V Supply	Power supply +15V	

2. Phoenix terminal definition

Pin No.	Definition	Instruction	Interface drawing
1	N.C	Disconnected	
2	N.C	Disconnected	
3	N.C	Disconnected	
4	N.C	Disconnected	
5	GND	Output Ground	
6	Vout	Voltage Output	

Usage

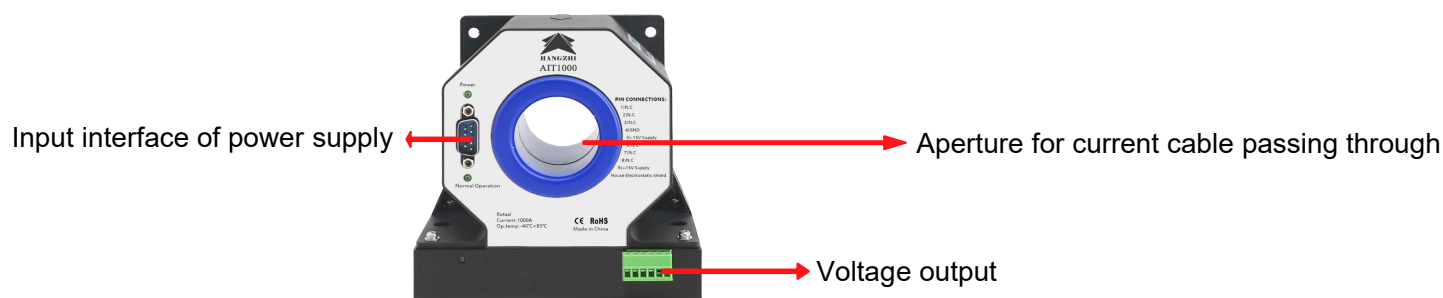
Use the following steps, and refer to the figure below.

Step 1: Provide $\pm 15VDC$ power supply, and connect to the input interface of the power supply.

Step 2: The indicator light of transducer should be on, and the indicator light of power supply should be on.

Step 3: Pass the current cable through the transducer aperture, and pay attention to the current direction.

Step 4: The voltage output interface is connected to the voltage measuring instrument or AD sampling circuit, and pay attention that the load current should not be too large.



Attention in usage

1. Voltage output port load should be more than $3k\Omega$, and load current is less than 5mA.
2. The positive and negative terminals of the voltage output ports shall not be short-circuited.
3. The power input is $\pm 15VDC \pm 1\%$, and the current is at least $\pm 1.0A$



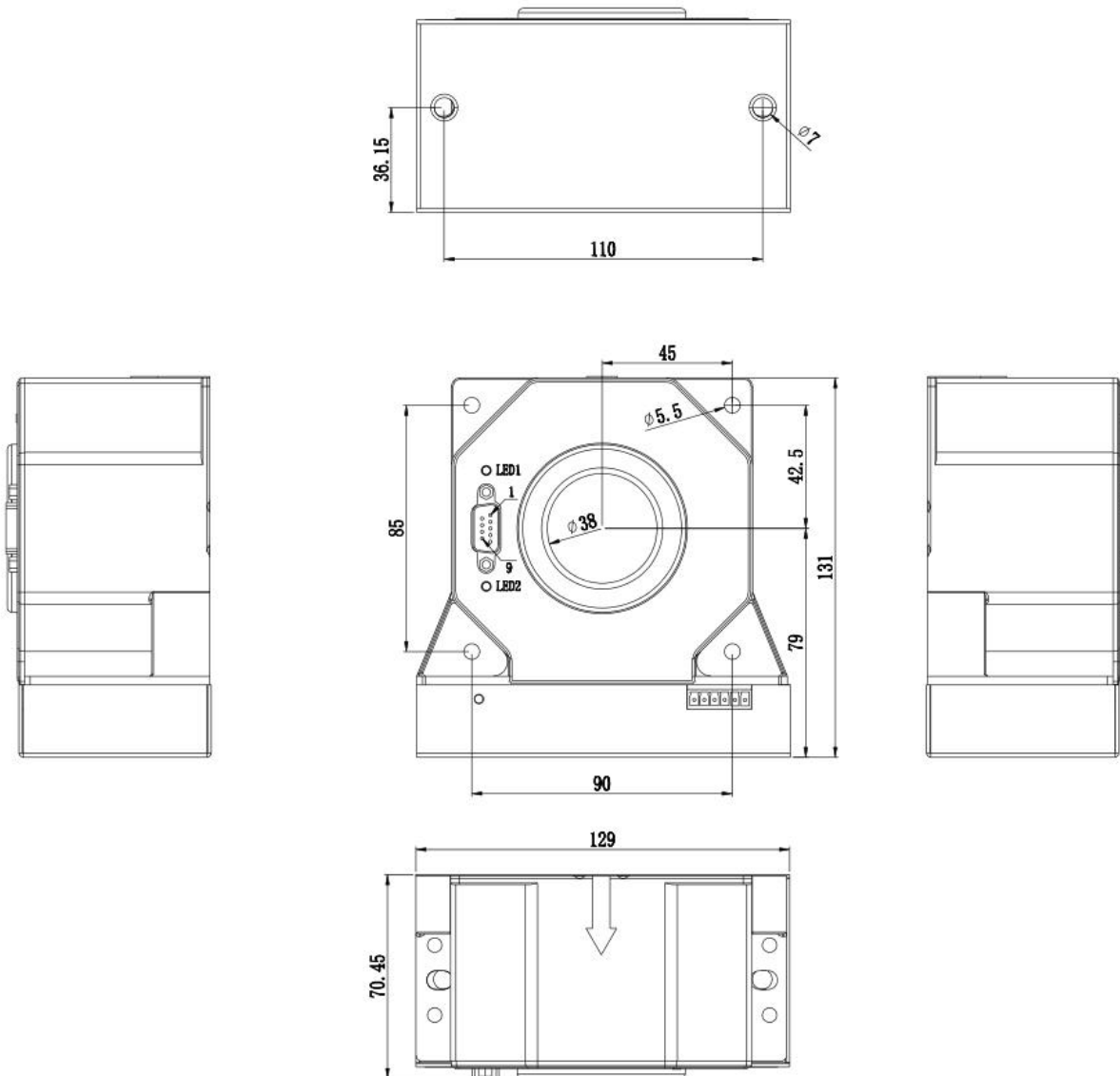
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Dimensions

Unit: mm



Packing List & Dimensions

Package dimensions (L x W x H): 170mm x 155mm x 100mm

Item	Description	Quantity	Comments
AIT1000-10V	Current Transducer	1	/