

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



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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}	—	—	±1000	—	Adc
Primary nominal alternating current*	I_{PN}	—	—	707	—	Aac
Primary overload current	I_{PM}	1 Minute	—	—	±1200	Adc
Operating Voltage	V_C	—	±14.2	±15	±15.8	V
Power consumption current	I_{PWR}	Rated primary current	±40	±440	±530	mA
Rated output voltage	U_{PN_DC}	Rated primary voltage (DC)	—	±10	—	V
Conversion ratio	K_N	—	—	10	—	mV/A
Output load current	—	—	—	—	5	mA
Output impedance	R_M	—	—	—	10	mΩ

* 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, $25\pm 10^\circ\text{C}$	—	—	20	ppm
Linearity	ϵ_L	—	—	—	2	ppm
Temperature stability	T_C	—	—	—	0.5	ppm/K
Time stability	T_T	—	—	—	0.5	ppm/month
Power supply interference	T_V	—	—	—	1	ppm/V
Dynamic response time	t_r	$di/dt=1.5/\mu\text{s}$, rised to 90% I_{PN}	—	—	7	μs
Voltage change rate	dv/dt	—	1.5	—	—	V/ μs
Frequency bandwidth (-3dB)	F	—	0	—	500	kHz
Zero offset voltage	V_{OT}	Full temperature range	—	—	± 5	μV

Safety Characteristics

Parameter	Symbol	Measuring Conditions	Value	Unit
Insulation voltage / Between primary and secondary sides	Vd	50Hz, 1min	5	KV
Transient isolation withstand voltage / Between primary and secondary sides	Vw	50 μs	10	KV
Creepage distance / Between the primary and the outer shell	dCp	—	11	mm
Clearance distance / Between the primary and the outer shell	dCi	—	11	mm
Comparative tracking index	CTI	IEC-60112	600	V

General Characteristics

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
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Ambient operating temperature	T _A	—	-40	—	+85	°C
Ambient storage temperature	T _S	—	-40	—	+85	°C
Mass	M	—		1465±100		g

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 and the connection between pin 3 & 8 of the DB9 interface will be off.

Indicator light instruction of voltage converter box

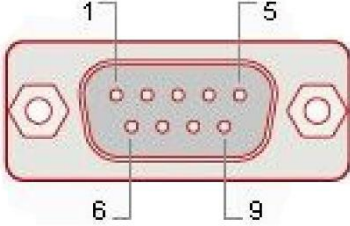
◇ In normal operation, the green light of the voltage converter box is always on:

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 $\pm 15\text{VDC}$ 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.

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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 Ω , 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 $\pm 15\text{VDC} \pm 1\%$, and the current is at least $\pm 1.0\text{A}$.

Dimensions

Unit: mm

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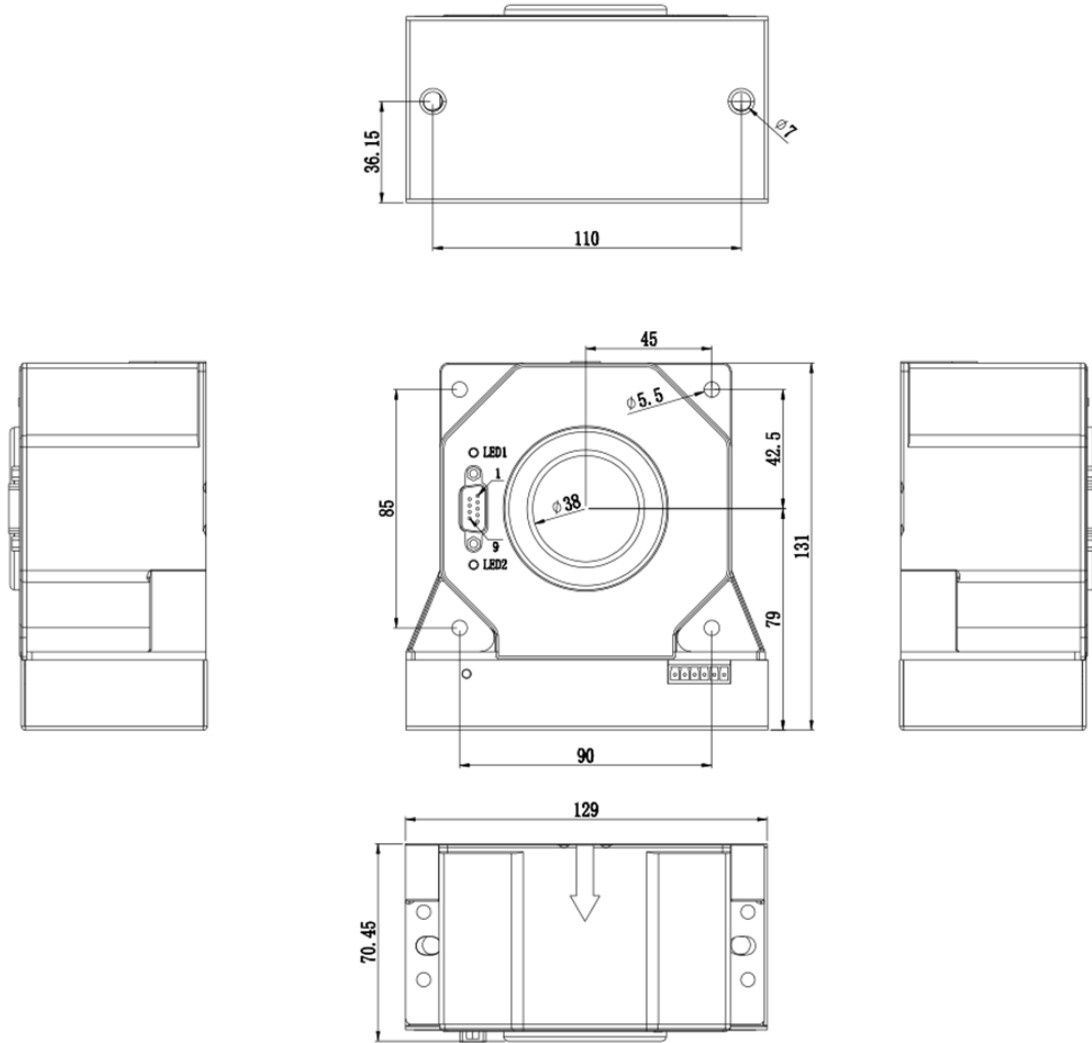
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