AIT300-SI High Precision Digital Current Transducer

The multi-point zero-flux technology system applied in this high-precision DC transducer combines closed-loop excitation flux control technology, self-excited flux gate technology, and multiple closed loop control technology. The combination of technologies enables zero-flux closed-loop control of excitation flux, DC flux and AC flux, and can detect high-frequency ripple by constructing a high-frequency ripple sensing channel, so that the transducer can achieve high gains and measuring accuracy over the full bandwidth.

Product photo

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Key Technologies

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

Features

◇ Advanced zero-flux closed-loop transducer
◇ Insulation measurement at 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

◇ Industry Control
◇ Railway
◇ Test instrumentation
◇ Medical Equipment
◇ Power and power grid
◇ New Energy

Electrical Performance

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Primary nominal direct current	I_{PN_DC}	—	—	±300	—	Adc
Primary nominal alternating current*	I_{PN}	—	—	212	—	Aac
Primary overload current	I_{PM}	1 Minute	—	—	±450	Aac
Operating Voltage	V_C	—	±14.2	±15	±15.8	V
Power consumption current	I_{PWR}	Rated primary current	±20	±170	±250	mA
Current ratio	K_N	Input : Output	2000:1	2000:1	2000:1	—
Rated output current	I_{SN}	Rated Primary current	—	±0.15	—	A
Measuring resistance	R_M	See Fig. 1	0	10	25	Ω

* refers to AC effective value

Accuracy Measurement

Parameter	Symbol	Measuring Conditions	Min	Typ	Max	Unit
Accuracy	X_G	Input direct current, full temperature range	—	—	10	ppm
Linearity	ε_L	Full range	—	—	20	ppm
Zero offset current	I_O	@25ºC	—	—	±5	uA
Zero offset current	I_{OT}	Full temperature range	—	—	±10	uA
Response time	t_r	di/dt=100A/us, rised to 90%I_{PN}	—	—	1	us
Current change rate	di/dt	—	200	—	—	A/us
Frequency bandwidth (-3dB)	F	—	0	—	100	kHz

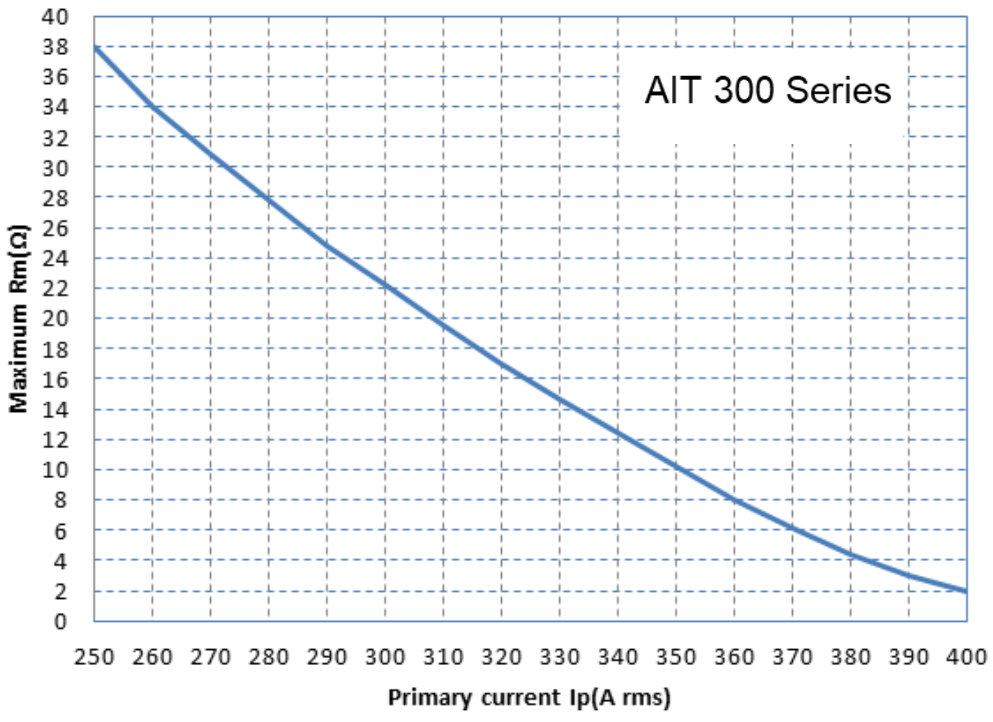
Safety Characteristics

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	50us	10	KV
Creepage distance / Between the primary and the outer shell	dCp	—	—	mm
Clearance distance / Between the primary and the outer shell	dCi	—	—	mm
Comparative tracking index	CTI	IEC-60112	275	V

General Characteristics

Parameter	Symbol	Measuring Condition	Min	Typ	Max	Unit
Ambient operating temperature	T_A	—	-40	—	+85	ºC
Ambient storage temperature	T_S	—	-55	—	+90	ºC
Secondary winding internal resistance	R_S	@25℃		—		—
Mass	M	—	130±10	130±10	130±10	g

Load Resistor Instructions



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Operating Status Instructions

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

After the device is powered on, the green indicator is on when the device is running normally, and the 3rd pin and 8th pin of D-Sub9 interface are connected together.

◇ The green light is off when the current overload or power supply is abnormal:

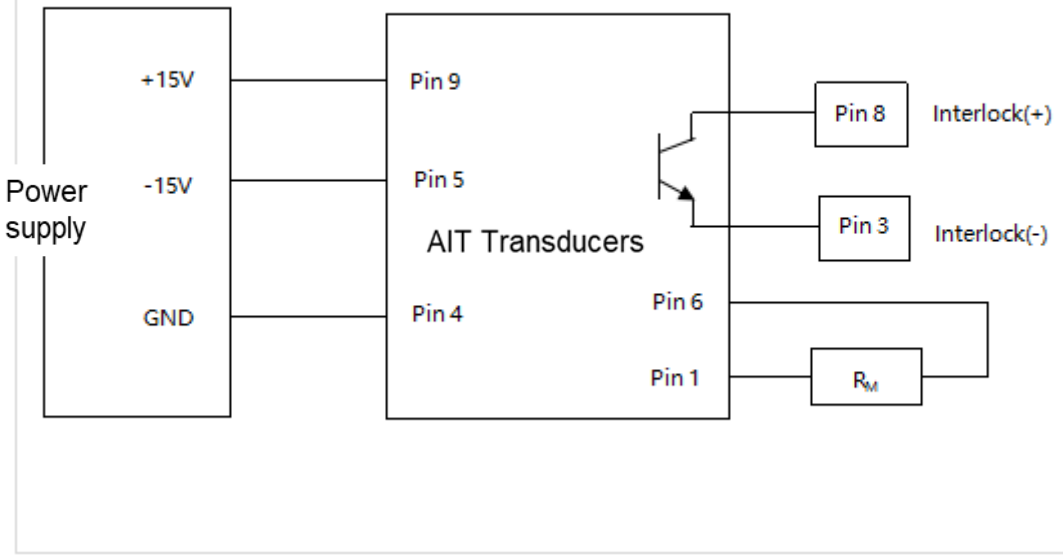
When the green light is off, you should check whether the power supply of the transducer is normal. When the power supply is normal, if the green light is off, the current transducer is in a non-zero flux state. At this time, the input current amplitude of the bus exceeds the specified range, and the transducer enters the scanning state. The output current is no longer proportional to the input current signal. In overload mode, the output current of the transducer remains at the maximum output state and the green indicator light goes out. When the input current recovers within the specified current range, the transducer output current will return to normal and the green indicator will light up.

◇ In overload mode, pins 3 and 8 of the D-Sub9 interface are disconnected.

Connection system

1. D-Sub9 Connection terminal pin function definition

Pin No.	1	2、7	3	4	5	6	8	9
Definition	**I_Output return**	**N.C**	**Interlock(-)**	**GND**	**-15V Supply**	**I_Output**	**Interlock(+)**	**+15V Supply**



Test instruction:

The primary current I_P can be obtained by measuring the test current I_s flowing through R_M or the voltage U_R across R_M:

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

2. Interlock Port connection description:

There are two types of Interlock Port connection based on users' actual application shown as Fig A and Fig B:

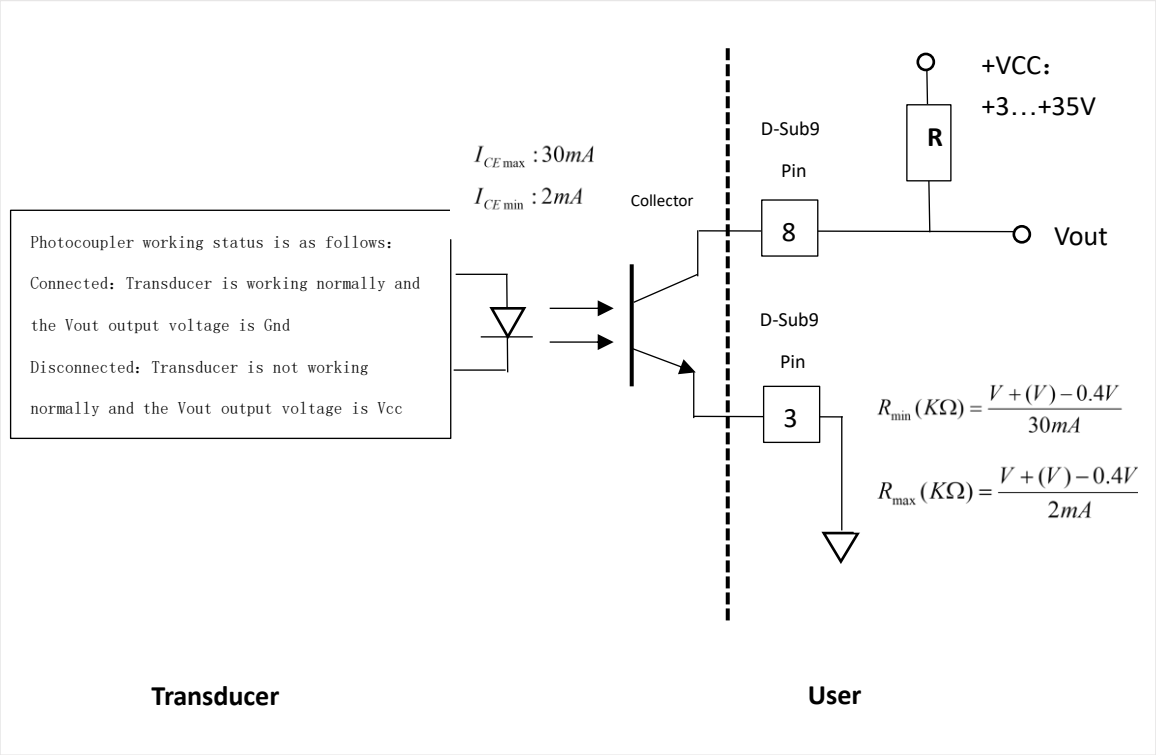


Fig A: Low level output when the transducer is operating normally

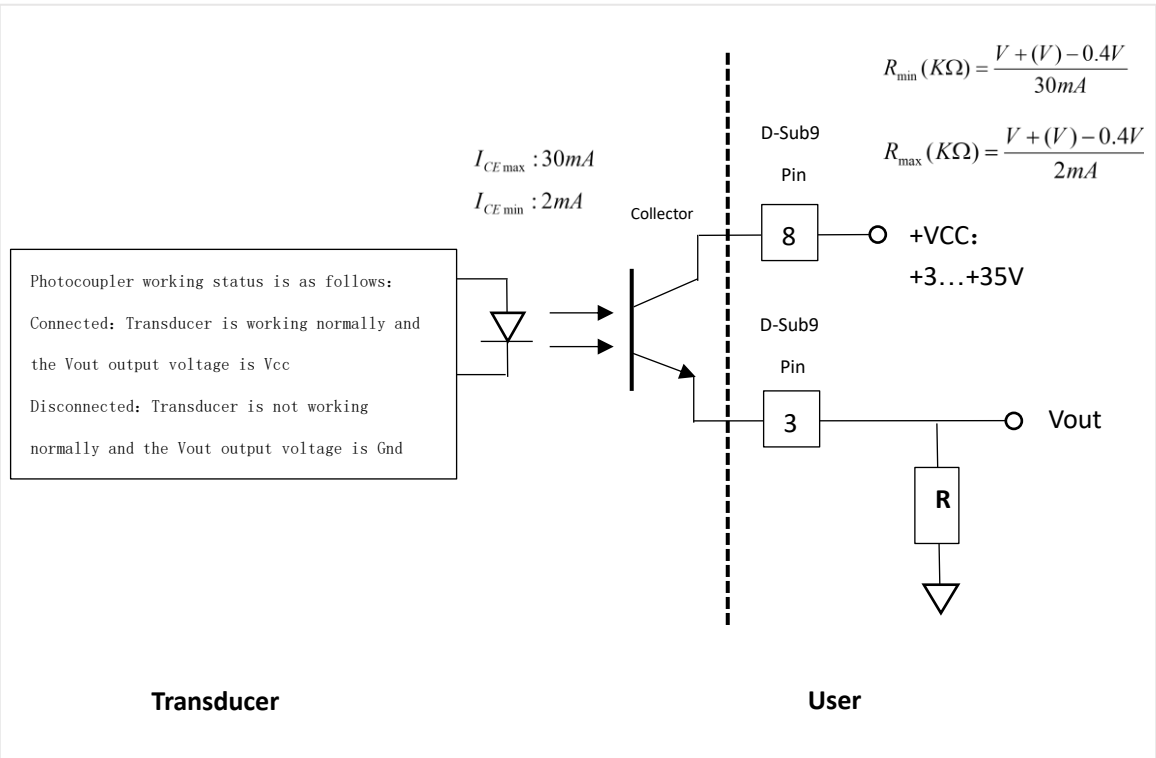


Fig B: High output when the transducer is operating normally

3. The output of the pin Vout in the optocoupler is related to the user-designed circuit, as shown in the following table.

Parameter	Vout	Description
Fig A	<0.2V	The transducer is working normally.
	Vcc	The transducer is working abnormally, i.e., in overload mode or abnormal power supply
Fig B	<0.2V	The transducer is working abnormally, i.e., in overload mode or abnormal power supply
	Vcc	The transducer is working normally.

Dimensions

Unit：mm