SPECIFICATIONS

Item No.：SCA110T

Description：Voltage Type Single Axis Inclinometer

Version：Ver.08

Production implementation standard reference

- Enterprise quality system standards: ISO9001: 2008 standard (certification number: 128101)
- Tilt sensor production standards: GB / T 191 SJ 20873-2003 inclinometer general specification of Level
- The Academy of metrology and quality inspection Calibrated in accordance to: JJF1119-2004 Electronic Level calibration Specification
- Gyro accelerometer test standard: QJ 2318-92 Gyro accelerometer test methods
- Software development reference standard: GJB 2786A-2009 military software development General requirements
- Product environmental testing standards: GJB150
- Electromagnetic anti-interference test standards: GB / T 17626

SCA110T-Voltage Type Single Axis Inclinometer

General Description

SCA110T is a single axis inclinometer with analog voltage output, the user simply collecting the inclinometer voltage value then can calculate the inclination of the current object. Built-in (MEMS) micro solid pendulum into angle changes by measuring the static gravity field changes, changes in mode output voltage (0-5V). Mainly used to measure the inclination of the object with respect to the horizontal plane.

This product uses non-contact measurement principle, can real-time output current posture inclination, non-contact inductive measuring principle, simple installation. Latest MEMS inclinometer productive technology production, high-precision, small size, strong resistance to external electromagnetic interference ability, the ability to withstand shock and vibration. It is the ideal choice for industrial equipment, platform measuring attitude!

Features

- ●Single-Axis Inclinometer
- ●Accuracy: refer to the technical data
- ●Output interface :0～5V
- ●IP67 protection class
- ●Resolution: 0.0025°
- ●Measuring Range :±1～±180° optional
- ●Wide voltage input: 9～36V
- ●Wide temperature working: -40～+85℃
- ●Highly anti-vibration performance >2000g
- ●Small Volume : 90×40×26mm（customized）

Application:

- ●Engineering vehicles automatic leveling
- ●Aerial platform vehicle,lifter safety & protection
- ●Underground drill posture navigation
- ●Based on the angle direction measurement
- ●Bridge & dam detection
- ●Medical facilities angle control
- ●Shield pipe jacking application
- ●Geological equipment inclined monitoring
- ●Directional satellite communications antenna pitching angle measurement
- ●Mining machinary, oil-well drilling equipment
- ● Equipment level control
- ●Alignment control , curve control

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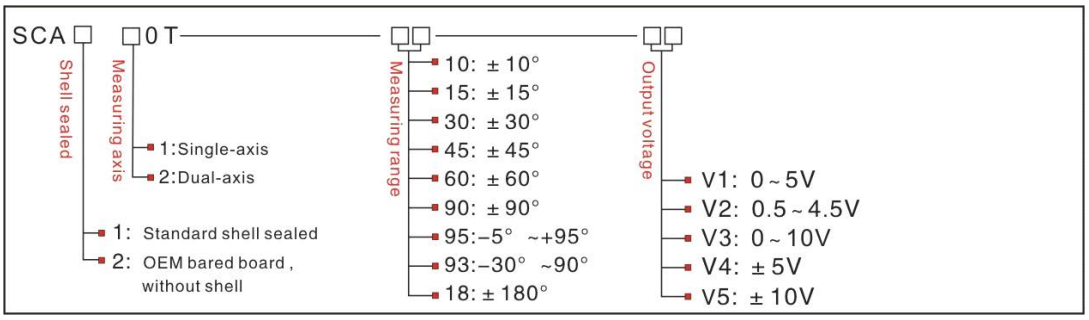


E.g：SCA110T-10-v1：single axis/standard/±10°Measuring range/0V-5V output voltage

Technical Data

Parameters Conditions		SCA110T-10	SCA110T-30	SCA110T-60	SCA110T-90	Unit
Measuring range		±10	±30	±60	±90	°
Measuring axis		X	X	X	X	
Zero output	0° output	2.5	2.5	2.5	2.5	V
Resolution		0.0025	0.0025	0.0025	0.0025	°
Absolute accuracy		0.02	0.05	0.08	0.1	°
Long term stability		0.05	0.05	0.05	0.05	
Zero temperature coefficient	-40～85°	±0.006	±0.006	±0.006	±0.006	°/℃
Sensitivity temperature coefficient	-40～85°	⩽100	⩽100	⩽100	⩽100	ppm/℃
Power on time		0.5	0.5	0.5	0.5	S
Response time		0.05	0.05	0.05	0.05	s
Response frequence		1～20	1～20	1～20	1～20	Hz
Electromagnetic compatibility	According to EN61000 and GBT17626					
MTBF	⩾50000hours/times					
Insulation Resistance	⩾100M					
Shockproof	100g@11ms、3Times/Axis(half sinusoid)					
Anti-vibration	10grms、10～1000Hz					
Protection glass	IP67					
Cables	Standard 1M length、wearproof、grease proofing、wide temperature、Shielded cables4*0.4mm2					
Weight	110g(without cable)					

*This Technical data only list ± 10 ° , ± 30 ° , ± 60 ° , + 90 ° series for reference, other measuring range please refer to the adjacent parameters

Electronic Characteristics

Parameters	Conditions	Min	Standard	Max	Unit
Power supply	Standard	9	12、24	36	V
	Optional		5		V
Working current			30		mA
Output overload	Resistive	10			kΩ
	Capacitive			20	nF
Working temperature		-40		+85	℃
Store temperature		-55		+125	℃

Key words：

Resolution：Refers to the sensor in measuring range to detect and identify the smallest changed value.

Absolute accuracy：Refers to in the normal temperature circumstances,the sensor absolute linearity, repeatability, hysteresis, zero deviation, and transverse error comprehensive error.

Long term stability : Refers to the sensors in normal temperature conditions, the deviation between the maximum and minimum values after a year's long time work.

Response time：Refers to the sensor in an angle change, the sensor output value reached the standard time required.

Mechanical Parameters

○ Connectors：1m lead cable（customized）

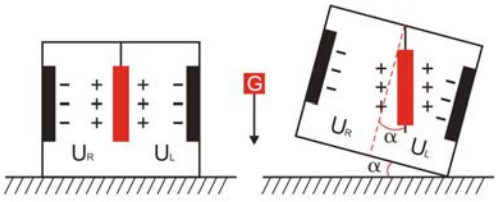
○ Protection glass：IP67

○ Enclosure material ：Aluminum Oxide

○ Installation ：4*M6 screws

Working Principle

Adopt the European import of core control unit, using the capacitive micro pendulum principle and the earth gravity principle, when the the inclination unit is tilted, the Earth's gravity on the corresponding pendulum will produce a component of gravity, corresponding to the electric capacity will change, , by enlarge the amount of electric capacity , filtering and after conversion then get the inclination.



U_R, U_LRespectively is the pendulum left plate and the right plate corresponding to their respective voltage between theelectrodes, when the tilt sensor is tilted, U_R, U_L Will change according to certain rules, so $f(U_R, U_L)$ On the inclination of α function:

$$\alpha = (U_R, U_L)$$

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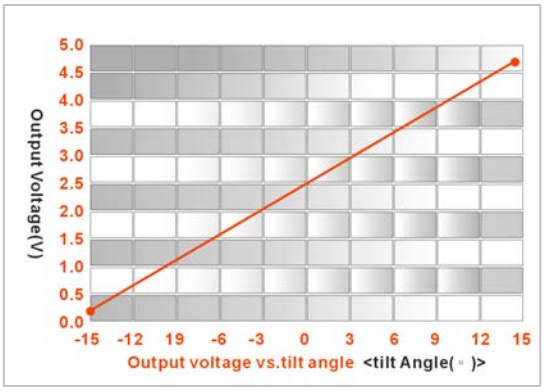
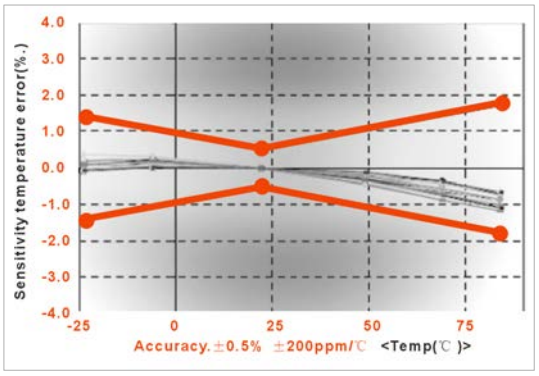
Typical performance diagram

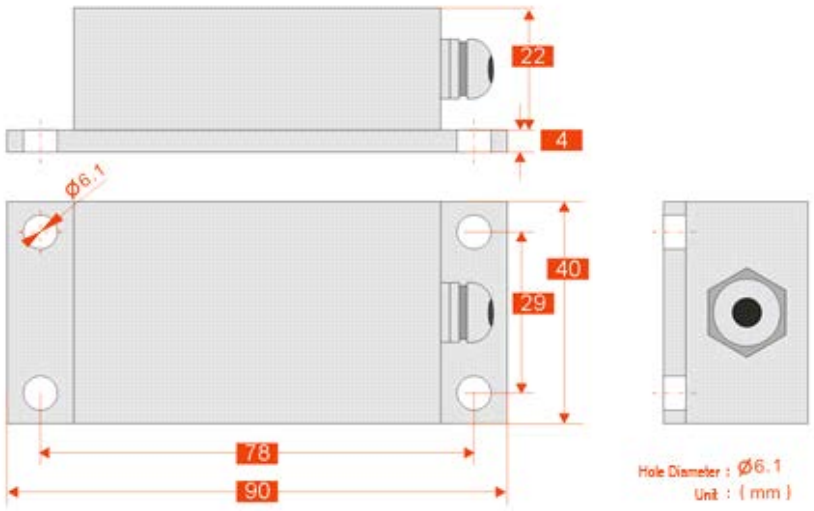
1： Input and Output characteristics：



2：Temperature characteristic chart：



Dimension



Size：L90×W40×H26mm

Electrical Connection

Line color function	BLACK	WHITE	RED	GREEN
	GND Power Negative	Out X- Output voltage	DC 9-36V	NC

Angle output calculation formula

Angle=(output voltage－Zero position voltage)÷Angle sensitivity

Angle sensitivity=output voltage range÷ Angle measuring range

E.g：SCA110T-30-V1 (±30° Measuring range 0～5V output voltage range)
Angle sensitivity= 5÷60=0.83333 V/°

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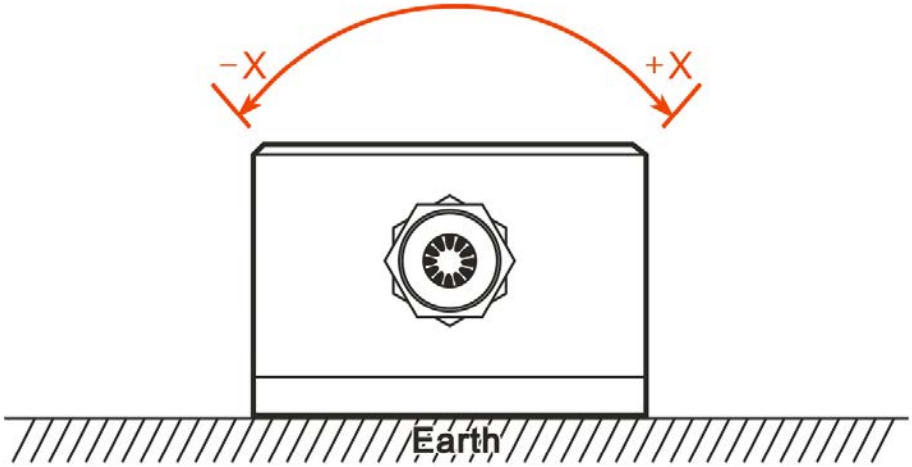
Measuring Directions&Fix

The installation must guarantee the product bottom is parallel to measured face，and reduce the influence of dynamic and acceleration to the sensor. This product can be installed horizontally or mounted vertically (mounted vertically selection is only applicable to the single axis), for installation please refer to the following scheme.

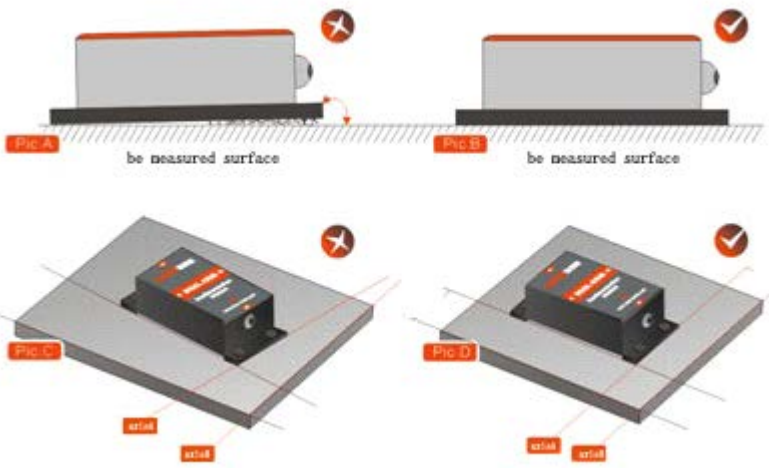


Production installation notes :

Please follow the correct way to install tilt sensor, incorrect installation can cause measurement errors, with particular attention to the "surface", "line"：:

1）The Sensor mounting surface and the measured surface must be fixed closely, smoothly, stability,if mounting surface uneven likely to cause the sensor to measure the angle error. See Figure Pic.AB

2) The sensor axis and the measured axis must be parallel ,the two axes do not produce the angle as much as possible. See Figure Pic.CD



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