SPECIFICATIONS

Item No.：HCA518T

Description: High Accuracy Current Type Single-axis Inclinometer

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
- 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
- Version:Ver.10
- Date:2015.8.28

HCA518T-High Accuracy Current Type Single-axis Inclinometer

General Description

HCA518T is a high accuracy single-axis inclinometer, output adopt the standard industry electronic interface 4 ~ 20mA, can be long-distance transmission of up to 2000 meters. The product uses the latest MEMS high technology for production, made precise compensation and correction to temperature error and nonlinearity error, small measuring range the highest accurate up to 0.003 ° (bigger measuring range index, please refer to product technical data),

HCA518T inclinometer use the dynamic zero test compensation technology to ensure product Quick Launch, high resolution ,stable data, good capacity to bear shock & vibration, built-in anti-RF, adopts anti-electromagnetic interference circuit to ensure that the output signal to a higher anti-interference ,in addition to this product is better than the similar market product on software technical data, on the reliability and stability the product is also using the high-end application-level MCU,three-proofing PCB board, imported cable, wide temperature shielded metal enclosure and other measures to improve product industrial level,to ensure the product can be long-term & safety extraordinary operation in harsh environments.

Features

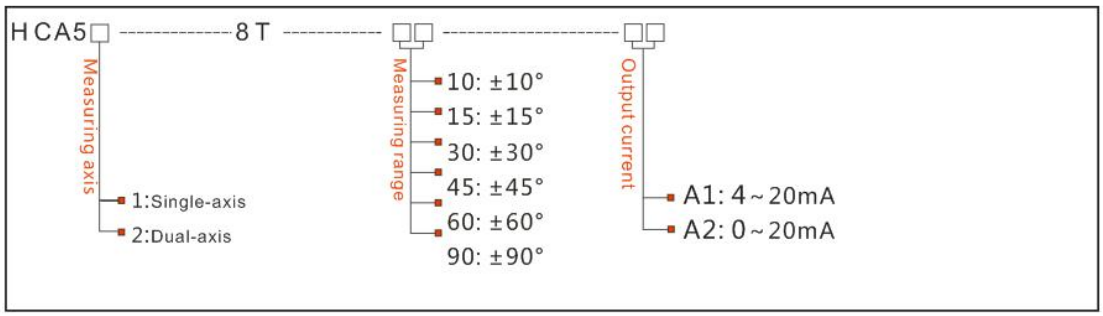
- ●Single-Axis Inclinometer
- ●Accuracy: refer to the technical data
- ●Output interface : 4-20mA
- ●IP67 protection class
- ●Resolution: 0.001°
- ●Measuring Range :±1～±90° optional
- ●Wide voltage input: 9～36V
- ●Wide temperature working: -40～+85℃
- ●Highly anti-vibration performance >2000g
- ●Small Volume : 90×50×33mm（customized）

Application:

- ●Engineering vehicles automatic leveling
- ●Aerial platform vehicle,lifter safety & protection
- ●Underground drill posture navigation
- ●Mining machinary, oil-well drilling equipment
- ●Directional satellite communications antenna pitching angle measurement
- ●Bridge & dam detection
- ●Medical facilities angle control
- ● Railway gauging rule , gauge equipment leveling
- ●Geological equipment inclined monitoring

T 0755-29657137 E sales@rion-tech.net
F 0755-29123494 W www.rion-tech.net

Ordering information:



E.g：HCA518T-10-A1：Single-axis /Standard/±10°Measuring range /4-20mA output current

Technical Data

Parameters	Conditions	HCA518T-10	HCA518T-30	HCA518T-60	HCA518T-90	unit
Measuring range		±10	±30	±60	±90	°
Measuring axis		X	X	X	X	
Zero output	0°Output	12	12	12	12	M A
Resolution		0.001	0.001	0.001	0.001	°
Absolute accuracy		0.005	0.01	0.02	0.05	°
Long term stability		0.01	0.02	0.05	0.08	
Zero temperature coefficient	-40～85°	±0.002	±0.002	±0.002	±0.002	°/℃
Sensitivity temperature coefficient	-40～85°	≤50	≤50	≤50	≤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 frequency		1～20	1～20	1～20	1～20	Hz
Electromagnetic compatibility	According to EN61000 and GBT17626					
MTBF	≥50000 hours/times					
Insulation Resistance	≥100M					
Shockproof	100g@11ms、3Times/Axis(half sinusoid)					
Anti-vibration	10grms、10～1000Hz					
Protection glass	IP67					
Cables	Standard 1M length、wearproof、wide temperature、Shielded cables4*0.4mm2 air-plug connector					
Weight	150g(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
Working current	No-load		40		mA
Output overload	Resistive		400	1000	kΩ
Working temperature		-40		+85	℃
Store temperature		-55		+100	℃

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

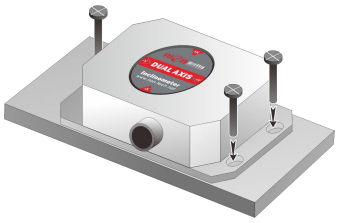
○ Connectors：1m cable with air-plug connector（customized）

○ Protection glass：IP67

○ Enclosure material ： Aluminum Oxide

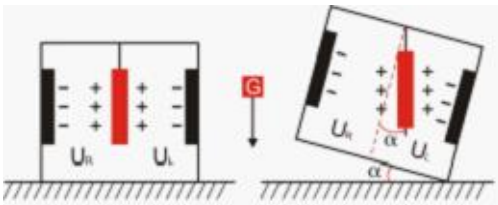
○ Installation ： 3*M4 screws

Installation



Working Principle

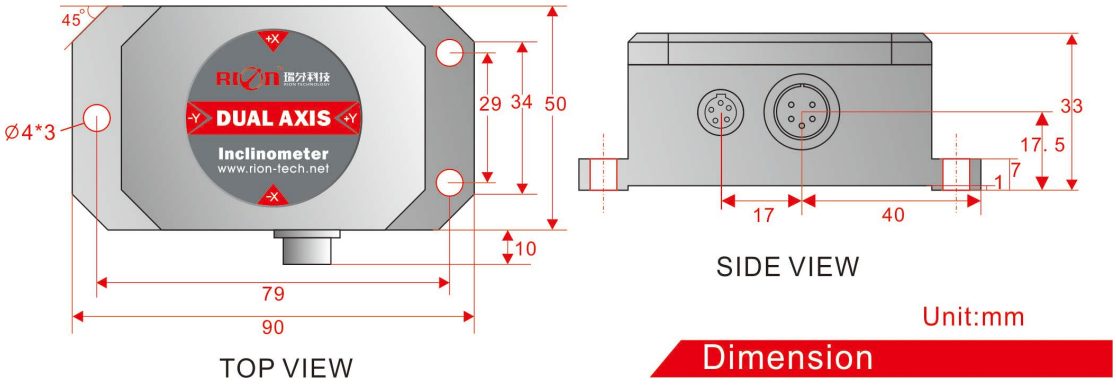
Adopt the European import of core control unit, using the capacitive micro pendulum principle and the earth gravity principle, when the the inclination unit is tilted, the Earth's gravity on the corresponding pendulum will produce a component of gravity, corresponding to the electric capacity will change, 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:

$\alpha = (U_R, U_L)$

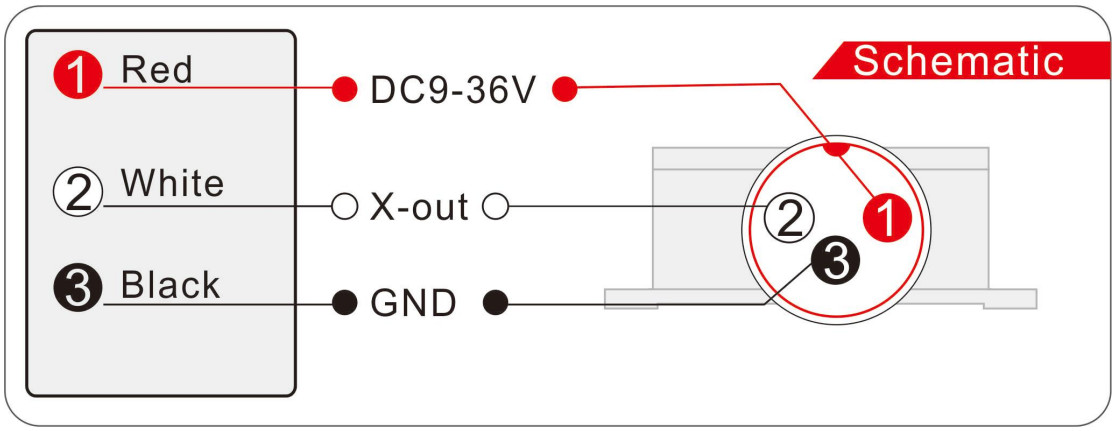
Dimension



Size：L90×W50×H33mm

Electrical Connection

Line color function	BLACK	WHITE	RED	GREEN
	GND Power Negative	Out X X Axis output current	Vcc power supply positive	NC



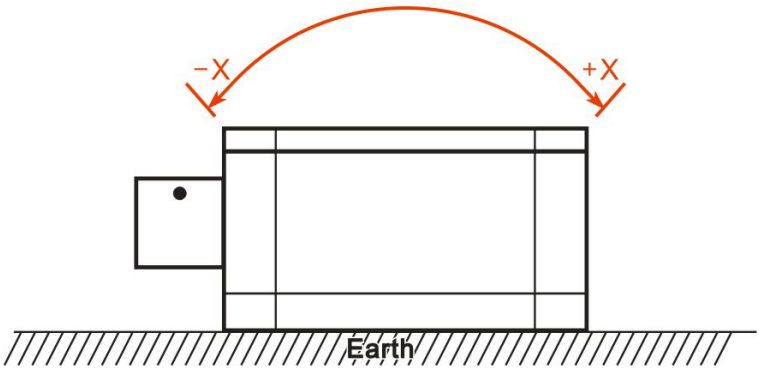
Angle output computational formula

Angle = (Output current—ZERO position current)÷ Angle sensitivity

Angle sensitivity= Output current range÷ Angle measuring range
E.g：HCA518T-30-A1 (±30° Measuring range 16mA Output current range)
Angle sensitivity= 16÷60=0.266666 mA/°

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.

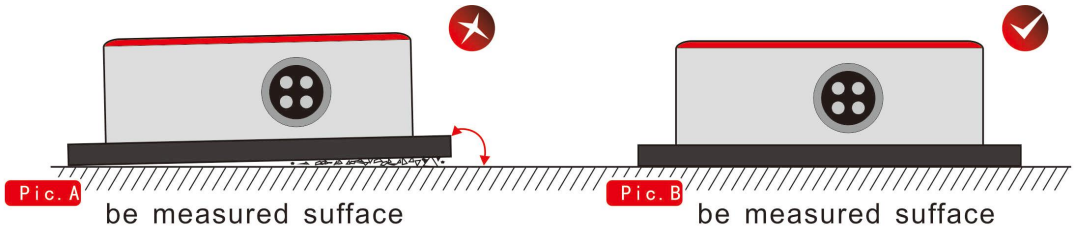


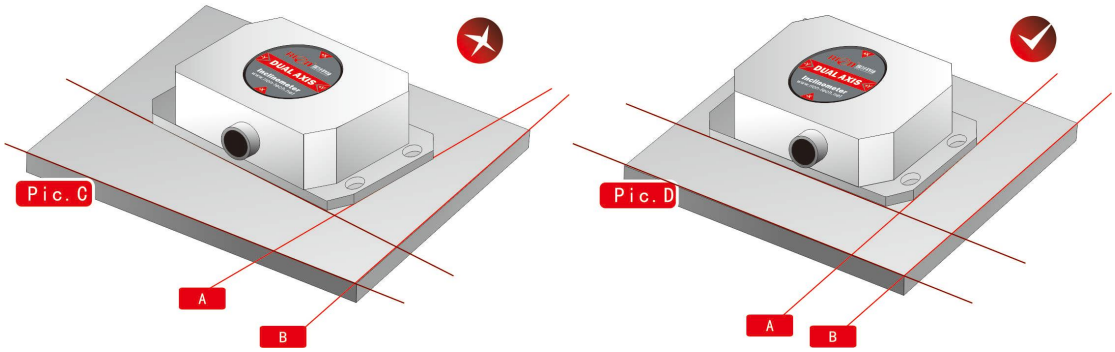
Production installation notes :

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





※More information please visit Rion's company website: www.rion-tech.net

深圳市瑞芬科技有限公司

CHINA SHENZHEN RION TECHNOLOGY CO.,LTD.

•INCLINOMETER •TILT SWITCH •ACCESSORIES •NORTH FINDER •TURNTABLE
•ELECTRONIC COMPASS •DIGITAL INCLINOMETER •ACCELEROMETER
•ATTITUDE AND HEADING REFERENCE SYSTEM •ELECTRONIC GYROSCOPE

T : (86) 755-29657137 F : (86) 755-29123494
W : www.riontech.cn E : sales@rion-tech.net
A : Block 1, COFCO(FUAN) Robotics Industrial Park , Da Yang Road 90,
Fuyong Distict, Shenzhen City, China

Attitude Solution Provider
姿态方案解决专家!