V1.0

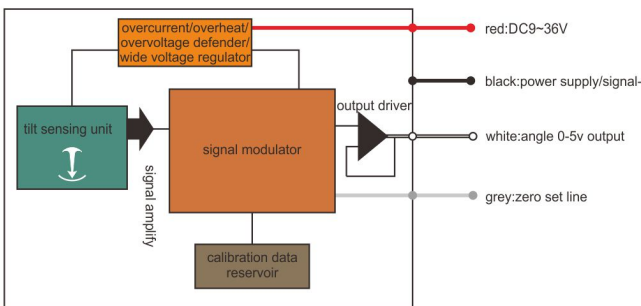## Description

MCA410 inclinometer sensor,developed by RION technology,is a new low cost full posture tilt measurement product,the newest anti-interference design was adopted,new MEMS sensor was integrated.wide working temperature,good performance in anti-shock,long-term reliable work life as long as 10 years.

This product adopts the non-contact measuring principle,can output real-time current attitude angle,simple to use,no need to find the relative variation of the two surface for mounting. It is a ideal choice for Industrial automation control and platform measuring attitude !
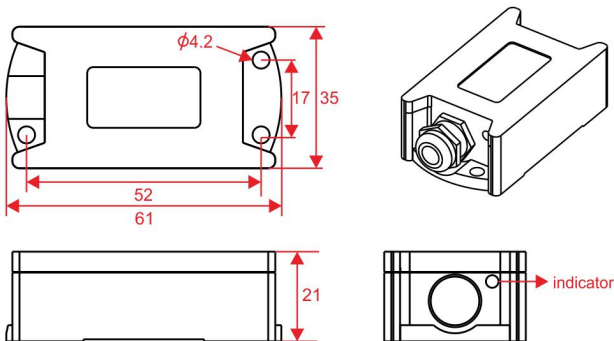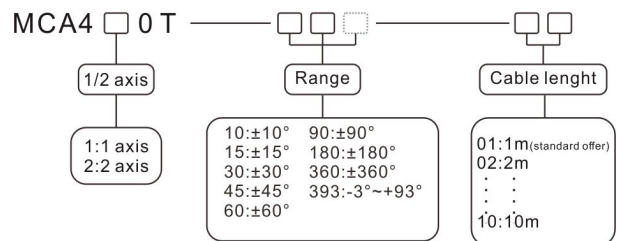
Application

- agricultural machinery
- lifting machinery
- crane
- aerial platform
- solar tracking system
- medical equipment
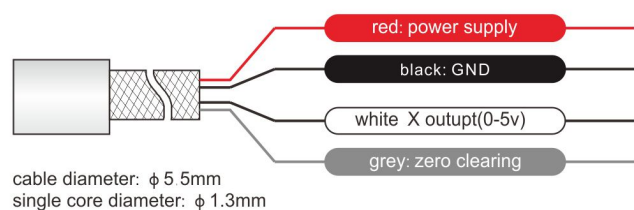- electric vehicle control

Features

- resolution:0.1°
- six installation methods
- zero set function
- IP66
- output: 0~5v
- power supply: 9~36V
- work temperature:40~+85℃
- high anti-shock>3500g

Parameters

Item	Conditions	≤±30°	≤±60°	≤±90°	≤±360°	Unit
output voltage	voltage range	0~5	0~5	0~5	0~5	v
	0°output	2.5±0.1	2.5±0.1	2.5±0.1	2.5±0.1	v
resolution		0.1	0.1	0.1	0.1	°
accuracy	25℃	±0.2	±0.3	±0.5	±0.6	°
response time		0.05	0.05	0.05	0.05	S
temperature drift	-5~55℃	±0.5	±0.5	±0.5	±0.5	°
	-25~70℃	±0.7	±0.7	±0.7	±0.7	°
	-40~85℃	±0.8	±0.8	±0.8	±0.8	°
output load	>500 ohm					
working time	50000 hours/time(no fault)					
insulation resistance	>100 ohm					
anti-shock	10grms,10～1000Hz					
impact resistance	100g@11ms,times/axis（half sinusoid）					
weight	60g					
certificate	CE;FCC;CCC;					
production standard	GB/T 191 SJ 20873-2003 tilt sensor,level sensor general specification					
quality system	ISO9001:2008 standard(certificate No.:128101)					

System diagram

- overcurrent/overheat/ overvoltage defender/ wide voltage regulator
- red:DC9~36V
- black:power supply/signal-
- white:angle 0-5v output
- grey:zero set line
- tilt sensing unit
- signal modulator
- output driver
- signal amplify
- calibration data reservoir

Order guide

MCA4 □ 0 T — □□□ — □□

1/2 axis
- 1:1 axis
- 2:2 axis

Range
- 10:±10°   90:±90°
- 15:±15°   180:±180°
- 30:±30°   360:±360°
- 45:±45°   393:-3°~+93°
- 60:±60°

Cable lenght
- 01:1m(standard offer)
- 02:2m
- ⋮
- 10:10m

Dimension

φ4.2

17 35

52

61

21

indicator

size:61*35*21mm

Connection

- red: power supply
- black: GND
- white X out>ut(0-5v)
- grey: zero clearing

cable diameter: φ5 5mm
single core diameter: φ1.3mm

Installation way

<level up install>

< level down install >
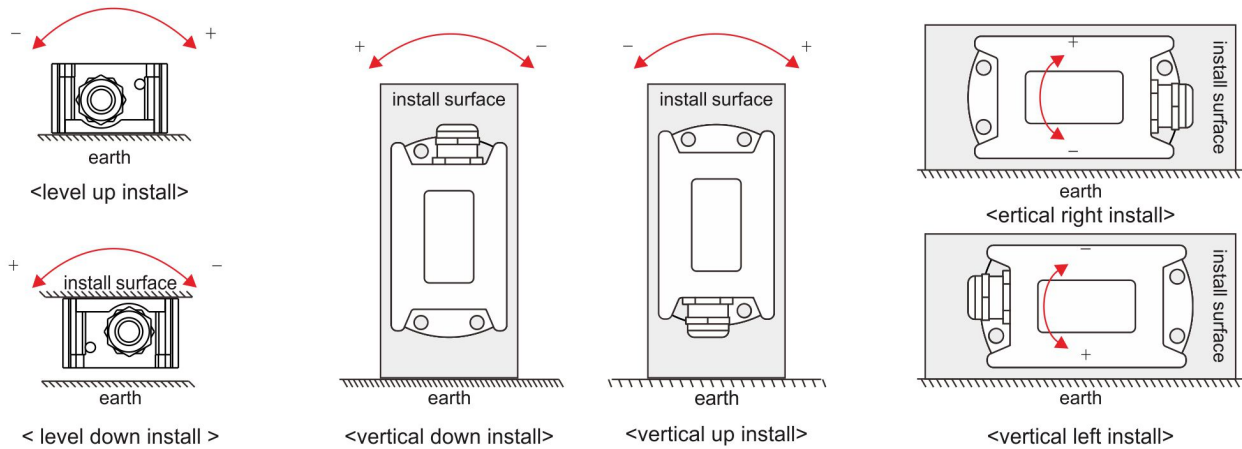
<vertical down install>

<vertical up install>

<ertical right install>

<vertical left install>

Note:factory default intallation is level up,if other installation needed,please refer to clause 2 to set.

Usage

1、the working principle is sensing gravity of earth, when installation, the sensing axis of the sensor should be parallel with the tilt axis of measured object to achieve the best accuracy. the install surface of the measured object must be flat, stable, contact close, error may be caused if the installation surface is not even.

2、any side of the six sides of the sensor could be as the installation side. After installation, set current position as zero position by the zero set function, (at the same time, the installation way is set as well, the set value is stored in reservoir of the sensor. After zero set, the sensor will work and regard the current position as zero position). set steps as below:

short circuit set line(grey) and GND(black) for 3 second above, the power indicator will shut off at the same time, unbind set line after power indicator flicker again, zero set finished, indicator will back to normally on status.

3、the protection class is Ip66, rain or water spray would not affect its proper work, please do not soak it under water for long time in case inner circuit would be damaged, damage caused by which is beyond warranty service

4、after installation, please do not short-circuit signal wire and power+ in case of damaging output circuit. the signal- and power- is shared by the same wire, so please connect acquisition signal- end to the power-.

Output features

the output of the sensor is 0~5v,corresponding to the max and min measuring range,angle value could be calculated by ratio,for example:

MCA410T-30-01: indicate the measuring range is±30 deg, output current is 0~5v,by ratio,0 deg output 2.5v,sensitivity is 0.08333 v/deg.

MCA410T-0393-01: indicate the measuring range is -3 deg to +93deg,output current is 0~5mA,by ratio,0 deg output 0.156v,sensitivity is 0.52v/deg.

diagram on the right is the output feature curve:

note:

a=(max range-min range)/2