

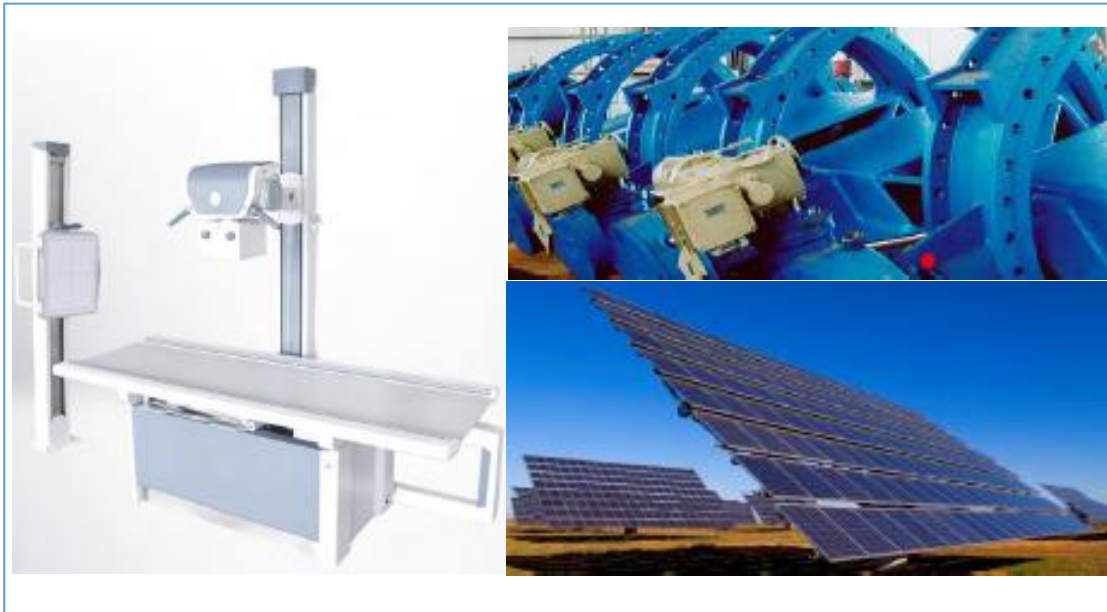


BWK315S Series

Low Cost Single Axis CAN
Output Inclinator

Technical Manual

V3.0



Introduction

The BWL315S is a low-cost, single-axis, CAN-output inclinometer designed by BWSENSING Technology LLC, utilizing the latest industrial-grade MEMS accelerometers. With a measurement range of $\pm 180^\circ$, maximum accuracy of 0.1° , and an operating temperature of -40°C to $+85^\circ\text{C}$, the BWL315S is small and lightweight enough to meet the requirements of space-constrained applications.

The product converts static gravity field changes into angle changes and directly outputs horizontal angle values digitally, which has the advantages of low cost, small temperature drift, simple use and strong resistance to external interference. It is ideal for attitude measurement in industries such as photovoltaic (PV), gimbal control, and tower turbines.

Main Feature

- Single-axis inclinometer measurement
- Resolution: 0.01°
- Voltage input: 9~36VDC
- Product size: L55*W37*H24(mm)
- Accuracy: 0.1°
- Measuring range: $\pm 180^\circ$
- Output mode: CAN
- IP67 protection

Application

- Industrial automatic leveling
- Medical instruments
- Photovoltaic automatic tracking
- Tower tilt monitoring
- Special valve
- Oil drilling equipment
- Industrial converter
- Lifting equipment inclination control

Product Feature



Technical Index

Parameter	Condition	Minimum	Typical value	Maximum	Units
Power voltage(V)		9	12	36	v
Operating current(mA)	No load	20	30	40	mA
Operating temperature(°C)		-40		+85	°C
Storage temperature(°C)		-55		+100	°C



Performance Index

Measurement Range (°)	Condition	0~±180
Measurement axis		X
Accuracy(°)	Room temperature	0.1
Resolution(°)	Completely still	0.01
Zero temperature drift(°/°C)	-40~+85°C	±0.01
Power on time		< 3s
Frequency response (Hz)		100
Mean time between failures MTBF	≥ 100000 h/times	
Electromagnetic compatibility	According to GBT17626	
Insulation resistance	≥100 MΩ	
Impact resistance	2000g, 0.5ms, 3times/ axis	
Weight (g)	210 (Without outer packaging)	

Resolution: The smallest change value of the measured value that the sensor can detect and distinguish within the measurement range.

Accuracy: The root mean square error of the actual angle and the sensor measuring angle for multiple (≥16 times) measurements.



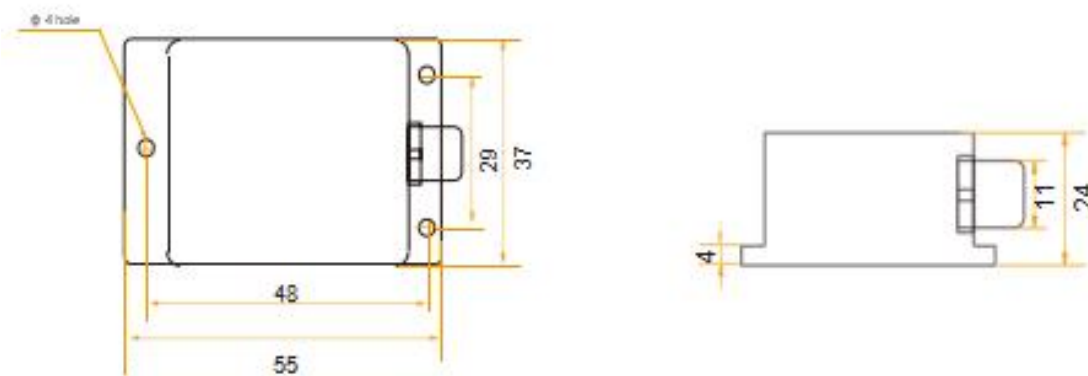
Mechanical Index

Connector	Metal connector
Protection level	IP67
Shell material	Magnesium alloysanding oxidation
Installation	Three M4 screws



Package product size

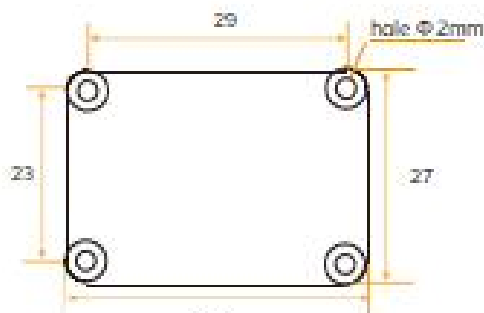
Product size: L55*W37*H24 (mm)



Bare board product size

Product size: L33*W27*H6(mm)

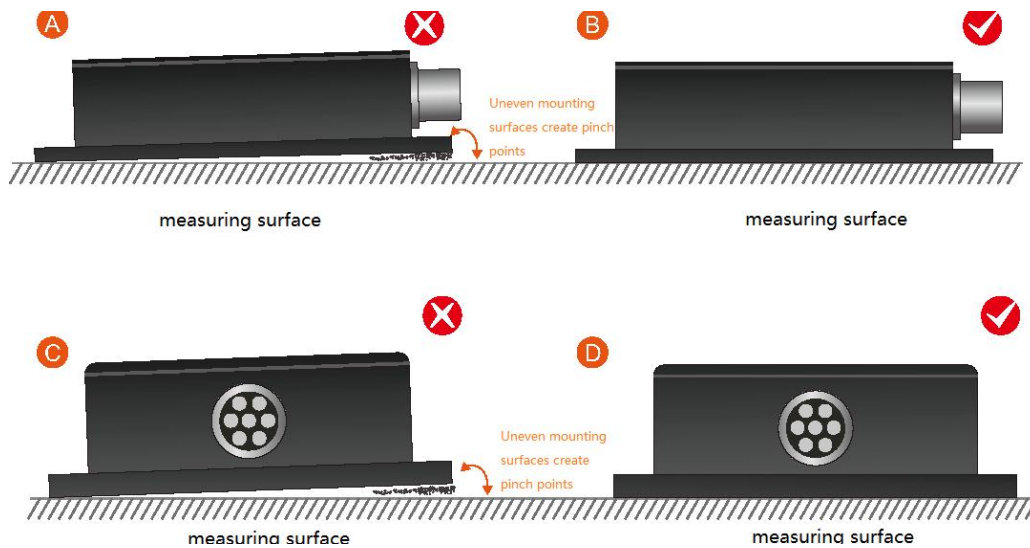
The length and width may have an error of ± 1 mm, please refer to the actual product



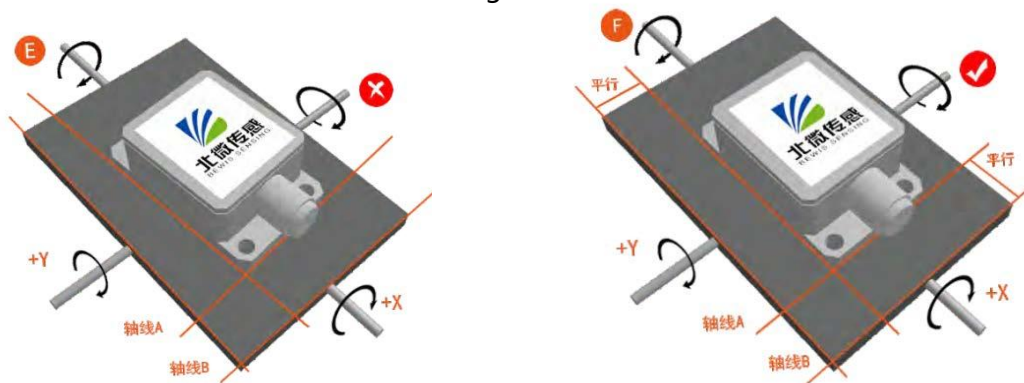
Installation

The correct installation method can avoid measurement errors. When installing the sensor, please do the following:

First of all, make sure that the sensor mounting surface is completely close to the measured surface, and the measured surface should be as level as possible. There should be no included angles as shown in Figure A and Figure C. The correct installation method is shown in Figure B and Figure D.



Secondly, the bottom line of the sensor and the axis of the measured object cannot have an angle as shown in Figure E, and the bottom line of the sensor should be kept parallel or orthogonal to the axis of rotation of the measured object during installation. This product can be installed horizontally or vertically (vertical installation needs to be customized), and the correct installation method is shown in Figure F.

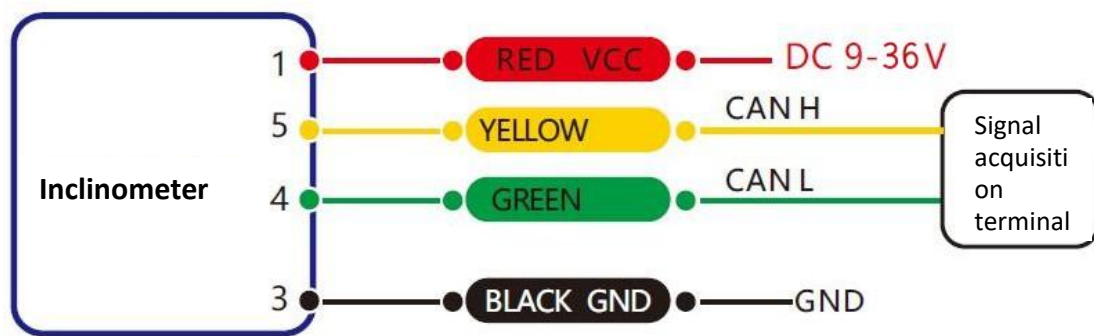


Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth in contact, and stable in rotation, and measurement errors due to acceleration and vibration must be avoided.

Electrical Interface

Wiring definition

	RED	BLUE	BLACK	GREEN	YELLOW
Color Wiring	1	2	3	4	5
Function	VCC DC 9-36V	NC	GND Place	CAN L	CAN H



CAN BUS Wiring Diagram

Order information

Model	Communication mode	Package situation
BWK315S-180-CAN	CAN	IP67 Package/Metal joint

Executive standard

- Enterprise Quality System Standard: ISO9001:2015 Standard (Certificate No.23919Q10455R0S)
- CE certification (certificate number: M.2019.103. U Y1151)
- ROHS (certificate Number: G 190930099)
- GB/T 191 SJ 20873-2003 General specification for inclinometer and level
- GBT 18459-2001 The calculation method of the main static performance index of the sensor
- JJF 1059-1999 Evaluation and expression of measurement uncertainty
- GBT 14412-2005 Mechanical vibration and shock Mechanical installation of accelerometer
- GJB 450A-2004 General requirements for equipment reliability
- GJB 909A Quality control of key parts and important parts
- GJB899 Reliability appraisal and acceptance test
- GJB150-3A High temperature test
- GJB150-4A Low temperature test
- GJB150-8A Rain test
- GJB150-12A Sand and dust experiment
- GJB150-16A Vibration test
- GJB150-18A Impact test
- GJB150-23A Tilt and rock test
- GB/T 17626-3A Radio frequency electromagnetic field radiation immunity test
- GB/T 17626-5A Surge (impact) immunity test
- GB/T 17626-8A Power frequency magnetic field immunity test
- GB/T 17626-11A Immunity to voltage dips, short-term interruptions and voltage changes
- GB/T 2423.22-2012 Environment test
The Second Part : Test Method Test N : Temperature change (IEC60068-2-14:2009,IDT)
- GB/T 10125-2012 Artificial atmosphere corrosion test Salt spray test (ISO 9227:2006,IDT)

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Output Inclinometer**

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