



# **BWN425 Series**

## **CAN Bus Dual Axis Inclinator**

# **Technical Manual**

V3.0



## Introduction

BWN425 is a cost-effective dual-axis inclinometer developed and produced by Bewis Sensing. It adopts MEMS technology and CAN output. The measurement range is  $\pm 90^\circ$ , the highest accuracy is  $0.02^\circ$ , and the working temperature is  $-40^\circ\text{C}$ - $+85^\circ\text{C}$ . The product uses a high-precision MEMS accelerometer and a high-resolution differential digital-to-analog converter, with built-in automatic compensation and filtering algorithms, which largely eliminates errors caused by environmental changes. Convert the change of the static gravity field into the inclination change, and directly output the horizontal inclination value through the voltage method. This product has high long-term stability, low temperature drift, simple use, and strong ability to resist external interference. It is a recommended choice to be used for surveying and mapping, industrial automation and other industries.

## Features

- Dual axis inclination measurement
- Resolution:  $0.001^\circ$
- Power supply: 9-35V
- Dimension: L90\*W40.5\*H26 (mm)
- Highest accuracy:  $0.02^\circ$
- Range:  $\pm 90^\circ$
- Output mode: CAN
- IP67 Protection level

## Application

- Industrial automatic leveling
- Medical instruments
- Photovoltaic automatic tracking
- Tower tilt monitoring
- Lifting equipment inclination control
- Structural deformation monitoring
- Surveying and Mapping Instruments
- Equipment automation

## Product Feature



### Electrical index

Parameter	Condition	Minimum	Typical	Maximum
Power voltage(V)		9	12	35
Working Current (mA)	No load	20	30	40
Operating Temperature (°C)		-40	25	85
Storage Temperature (°C)		-55	25	100



### Performance index

Measurement Range (°)	Condition	±90
Measurement axis		X-Y
Accuracy (°)	Highest	0.02
Resolution (°)	Completely still	0.001
Zero bias (°/°C)	-40~85°C	±0.008
Start-up time		< 3s
Output frequency (Hz)	5-100Hz adjustable	Up to 100
Mean time between failures MTBF	≥90000 h	
Electromagnetic compatibility	According to GBT17626	
Insulation resistance	≥100 MΩ	
Impact resistance	2000g, 0.5ms, 3 times/axis	

**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.



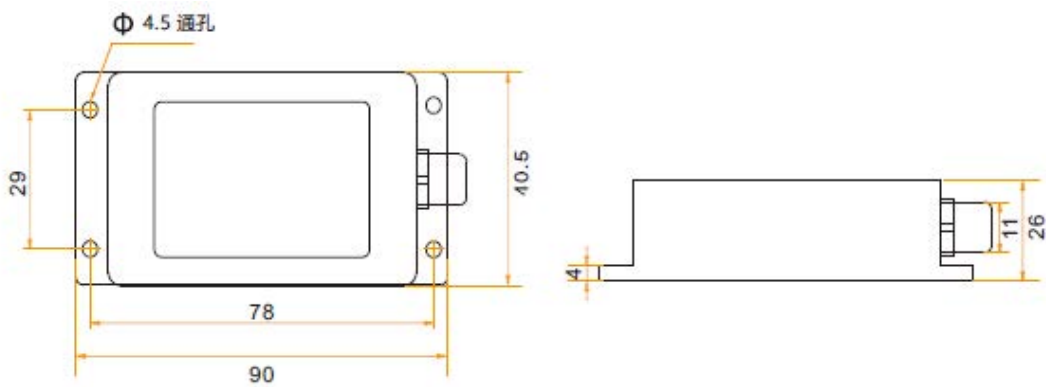
### Mechanical Index

Connector	Metal Joint (Cable 1.5m)
Protection level	IP67
Shell material	Magnesium aluminum alloy oxidation
Installation	Four M4 screws



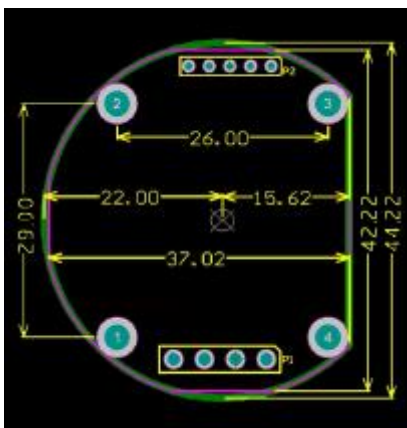
### Package product size

Product size: L90\*W40.5\*H26 (mm)



### Bara board product size

The front device is 3.85mm, the back is 2.5mm, and the board thickness is 2.0mm

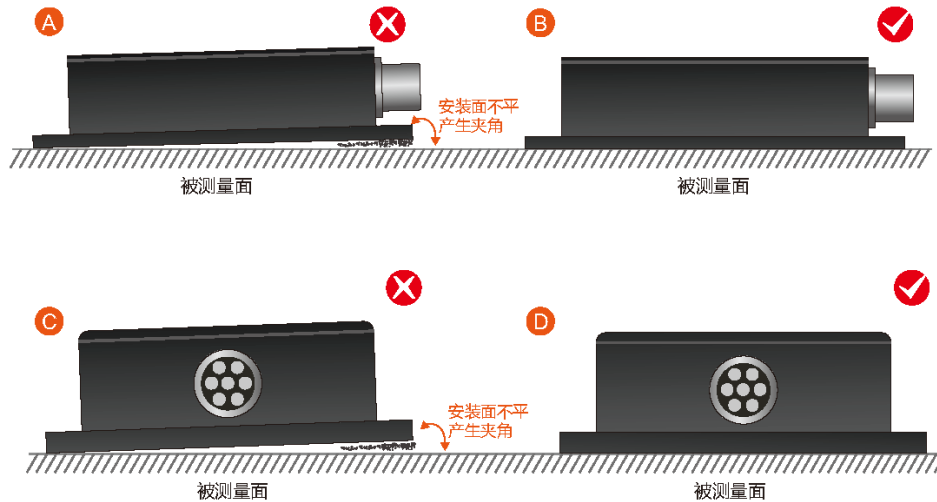




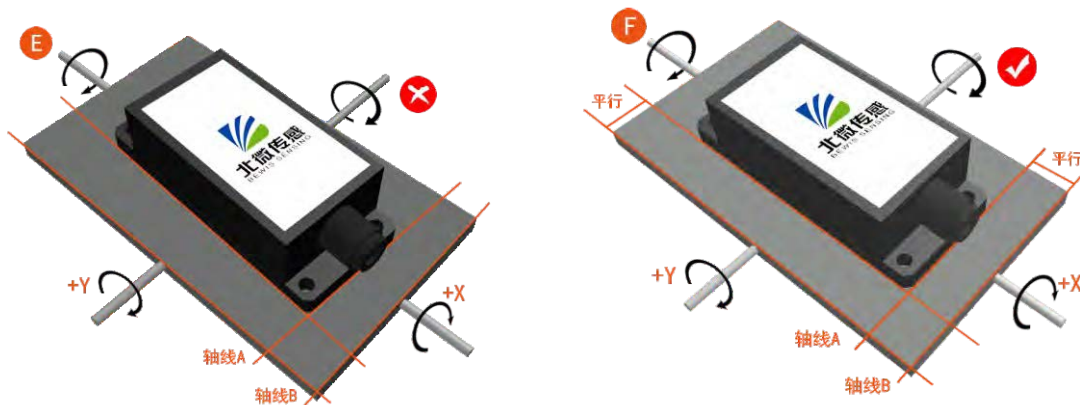
## Installation

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, and 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.

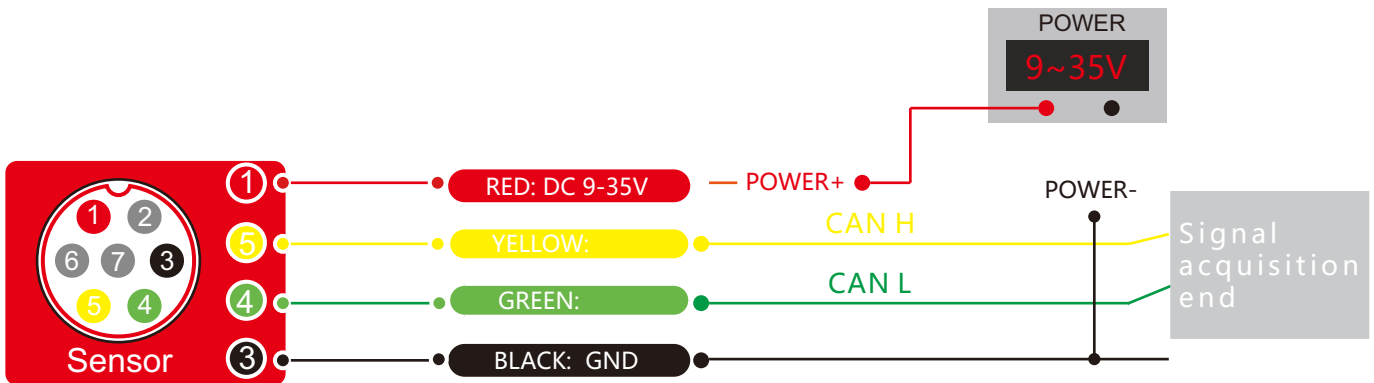


Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth in contact, and stable in rotation, and measurement errors due to acceleration and vibration must be avoided.

## Electrical Interface

RS232 wiring definition

	RED	BLUE	BLACK	GREEN	YELLOW
Wire color	1	2	3	4	5
function	VCC DC 9-35V	NC	GND	CAN L	CAN H





## Order information

Model	Communication mode	Package situation
BWN425-90-CAN	CAN	IP67 Package/Metal joint

## Executive standard

- Enterprise Quality System Standard: ISO9001:2015 Standard (Certificate No.064-21-Q-3290-RO-S)
- 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 1059.1-2012 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

# **BWN425 Series**

## **CAN Bus Dual Axis Inclinometer**

### **Wuxi Bewis Sensing Technology LLC**

Add: Building 30, NO. 58, Xiuxi Road, Binhu District,  
Wuxi City, Jiangsu Province, China

Tel: +86 18921292620

Mail: [sales@bwsensing.com](mailto:sales@bwsensing.com)

Web: [www.bwsensing.com](http://www.bwsensing.com)