



BWL325S Series

CAN Bus Dual Axis Inclinator

Technical Manual



Introduction

BWL325S is a low-cost dual-axis inclinometer with CAN output developed and produced by BWSensing. It uses a mature industrial-grade MEMS accelerometer, with a measuring range of $\pm 180^\circ$, the highest accuracy of 0.1° , and an operating temperature of -40°C to $+85^\circ\text{C}$. This product is small in size and light in weight, which can meet the application requirements with limited space. It converts the change of the static gravity field into the change of the inclination angle, and directly outputs the horizontal inclination angle value through the voltage mode. It has the advantages of low cost, small temperature drift, simple use, and strong anti-interference ability. It is photovoltaic power generation, pan-tilt control, tower ideal for inclination measurement in industries such as rod monitoring!

Main Feature

- Dual axis tilt measurement
- Resolution: 0.01°
- Power supply: 9-36V
- Volume: L55*W37*H24 (mm)
- Highest accuracy: 0.1°
- Range: $\pm 90^\circ$
- Output : CAN
- IP67 protection level

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



Electrical index

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



Performance Index

Measurement Range (°)	Condition	±10	±30	±60	±90
Measurement axis		X-Y	X-Y	X-Y	X-Y
Accuracy (°)	Room temperature	0.1	0.1	0.1	0.2
Resolution (°)	Completely still	0.01	0.01	0.01	0.01
Zero bias (°/°C)	-40~85°C	±0.02	±0.02	±0.02	±0.02
Cross axis error (°)	-40~85°C	0.1	0.1	0.1	0.2
Start-up time		< 50ms	< 50ms	< 50ms	< 50ms
Output frequency (Hz)	5-100Hz adjustable	Up to 100	Up to 100	Up to 100	Up to 100
Mean time between failures MTBF	≥90000 h				
Electromagnetic	According to GBT17626				
Insulation resistance	≥100 MΩ				
Impact resistance	2000g , 0.5ms, 3 times/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.



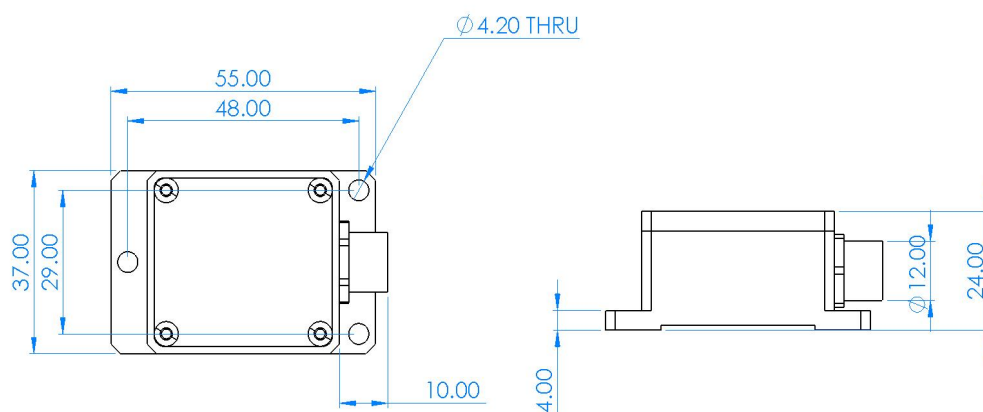
Mechanical Index

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



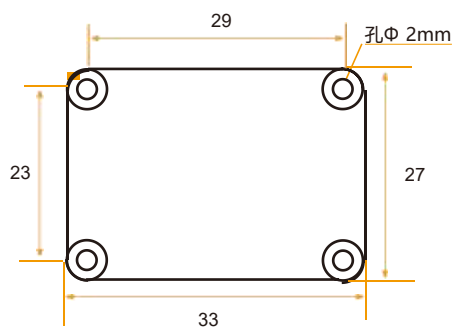
Package product size

Product size: L55*W37*H24 (mm)



Bare board product size

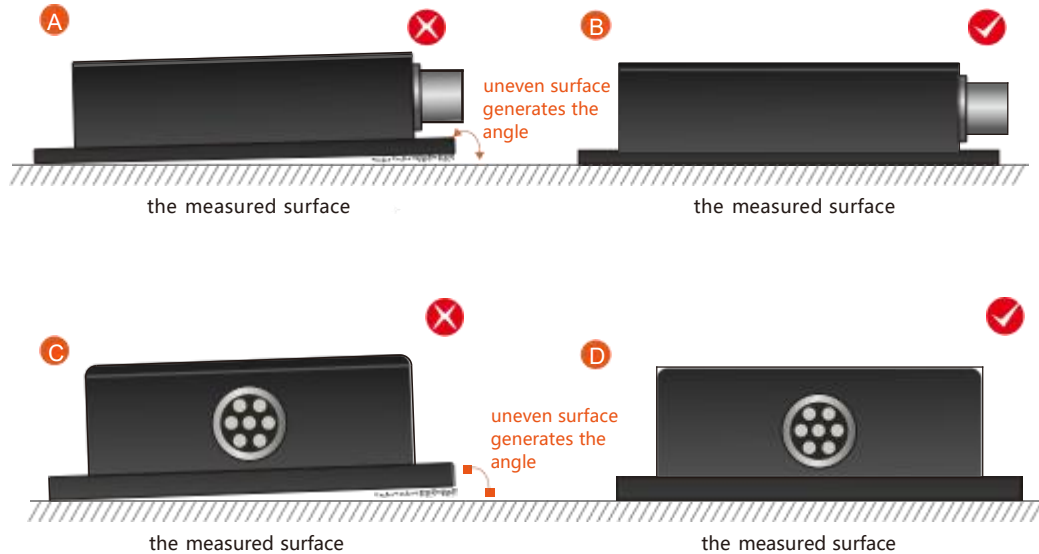
Product size: L33*W27*H6 (mm) The length and width may have an error of ± 1 mm, please refer to the actual product



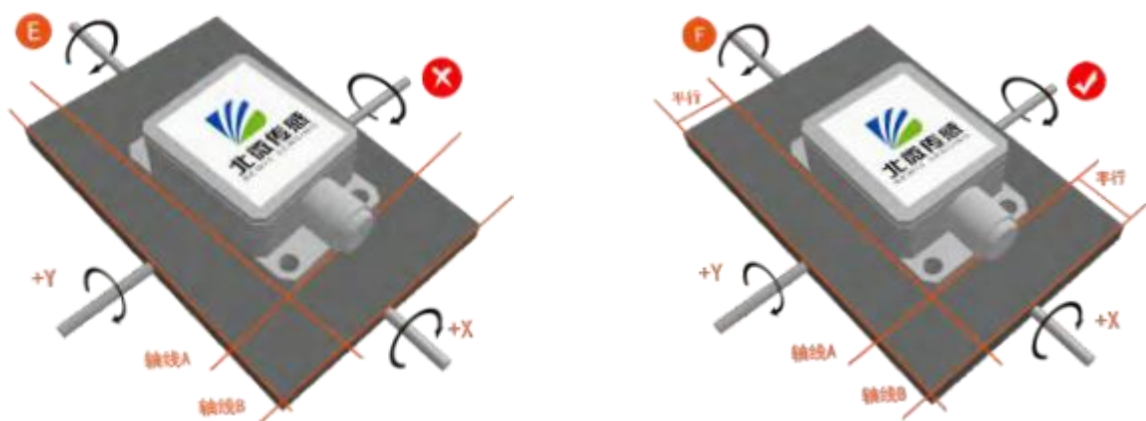
Installation

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.

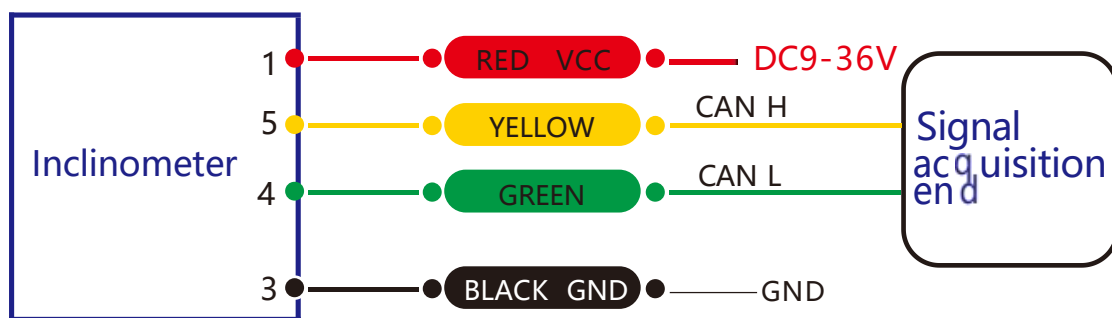


Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth in contact, and stable in rotation, and measurement errors due to acceleration and vibration must be avoided.

Electrical Interface

Electrical interfaces

Cable color & function	RED	BLUE	BLACK	GREEN	YELLOW
	1	2	3	4	5
	VCC DC 9-36V	NC	GND	CAN L	CAN H



CAN BUS wiring diagram

Order information

Model	Communication mode	Package situation
BWL325S-90-CAN	CAN	IP67 Package/Metal joint

Executive standard

- National Standard (Draft) for Static Calibration of Dual Axis Inclinometer Sensors
- GB/T 191 SJ 20873-2003 General Specification for Tiltmeters and Levelling Devices

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Wuxi Bewis Sensing Technology LLC

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

Tel: +89 18921292620

Mail : sales@bwsensing.com

Web: www.bwsensing.com