Multiple Redundant Dynamic Tilt Sensors

DI-3144-R00

Figure 1. Top View of DI-3144-R00

FEATURES

- Dynamic accuracy（Low dynamic scene）: 1°(RMS)
- Interface: CAN/RS232
- Triple redundancy sensor fault detection
- Static accuracy: 0.5°(RMS)
- Size: L70*W80*H27.9（mm）
- Triple redundancy fusion IMU algorithm
- Working temperature:−40°C ~+80°C

APPLICATIONS

- Ships
- Construction machinery
- Platform stability
- Agricultural Machinery
- ROV underwater vehicle navigation
- Driver less
- Robot
- Unmanned Aerial Vehicle

DESCRIPTION

The DI 3144 R00 dynamic inclination sensor is a professional attitude measurement device that can measure the pitch and roll of a moving platform, as well as angular velocity and acceleration of its inertial attitude parameters. The attitude deviation is estimated by the 6-state Kalman filter with appropriate gain, suitable for pitch measurement in motion or vibration state. DI 3144 R00 uses high-quality and reliable MEMS accelerometers and gyroscopes, ensures measurement accuracy through algorithm.

SPECIFICATIONS

Table 1. Electrical

Parameter	Test Conditions	Min.	Typ.	Max.	Unit/Note
Power Supply Voltage		9		36	V
Operating Current	No load	30		60	mA
Operating Temperature Range		−40		+80	°C
Storage Temperature Range		−55		+100	°C

Table 2. Performance IIndex

Parameter	Gyroscope	Accelerometer
Range	±500°/s	±8g, ±4g
Resolution	0.018°/s	0.25mg, 0.13mg
Total Temperature Zero Deviation (−20°C ~ +60°C)	X, Y, Z: 0.1°/s	X, Y, Z: 5mg Z: 40mg
Zero Bias Instability	5°/h(Allan)	0.05mg (Allan)
Pitch/Roll	Dynamic accuracy (low dynamic scenarios)	1°(RMS)
	Static accuracy	0.1°(RMS)
	Resolution	0.01°
	Tilt angle	Pitch±80°, roll±180°
Physical Property	Size	L70×W80×H27.9 (mm)
Characteristics Of Interfaces	Maximum output frequency	200Hz
	CAN	25kbps-1mbps
Emc	Follow GBT17626	
Insulation Resistance	≥100MΩ	
Shock Resistance	2000g, 0.5ms, 3times/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.

ELECTRICAL INTERFACE

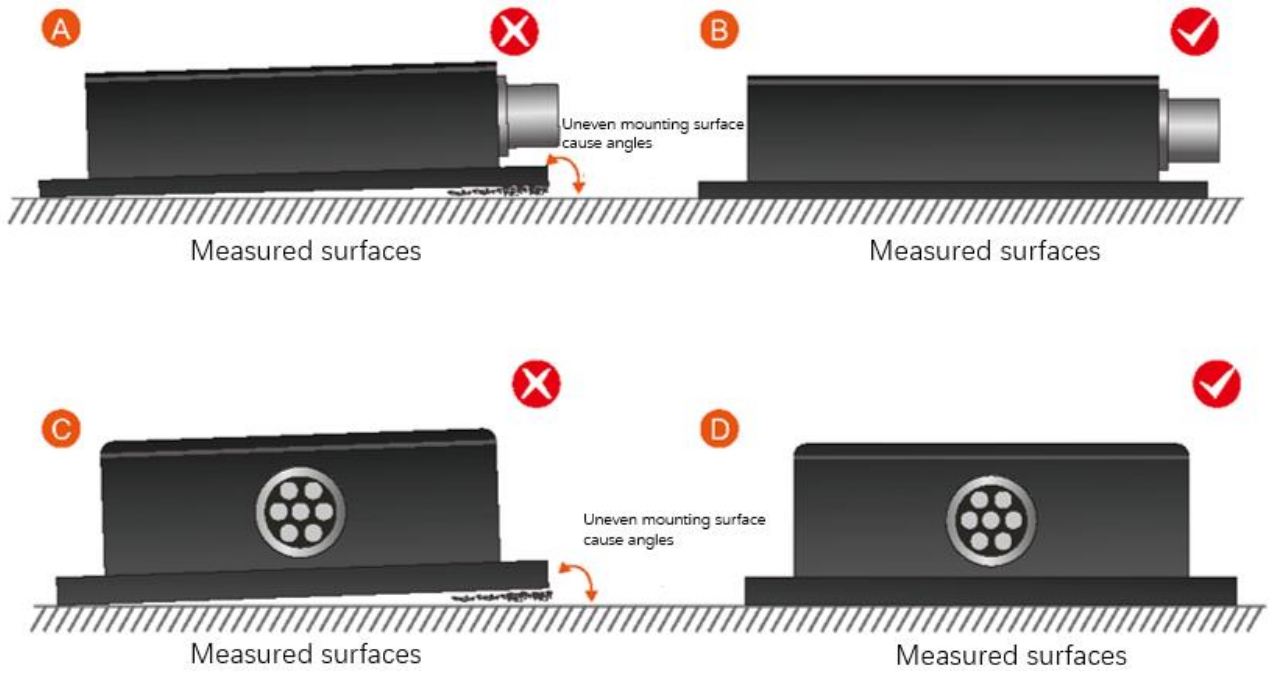
Table 3. Pin Number, Colors and Functions

No.	Color		Functions
1		Red	VCC: DC 9V ~ 36V
2		Black	Ground
3		Green	CAN L
4		Yellow	CAN H
5		Purple	Receive RXD
6		White	Send TXD

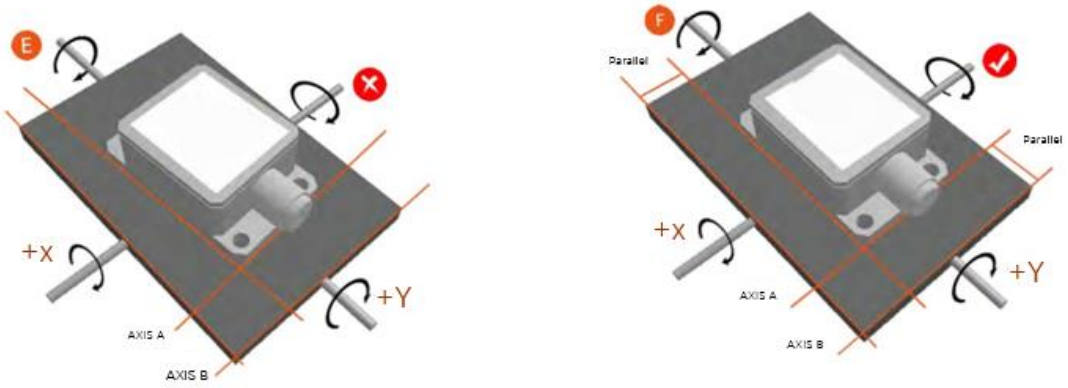
INSTALLATION

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 edge line of the sensor and the axis of the measured object cannot have an angle as shown in figure E, and the installation should keep the bottom edge line of the sensor parallel or perpendicular to the rotating axis of the measured object. This product can be installed horizontally or vertically (vertical installation requires customized), and the correct installation method is shown in figure F.

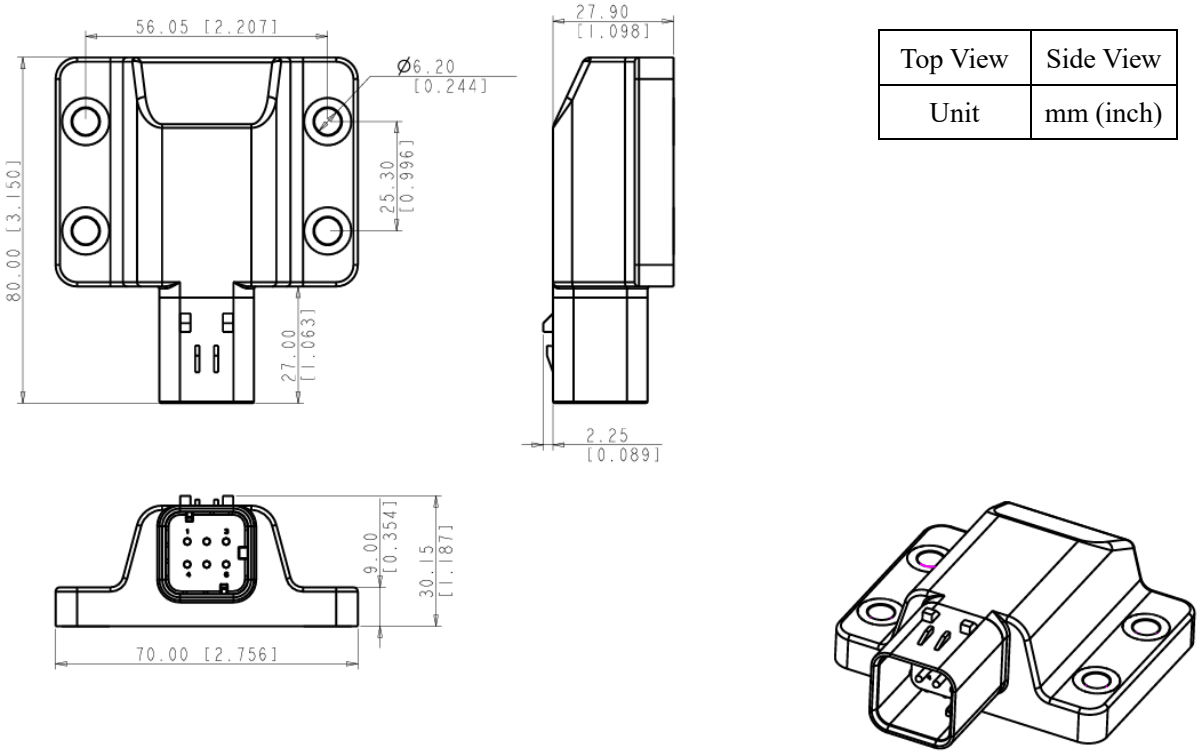


Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth contact, and stable in rotation, and measurement errors due to acceleration and vibration.

DIMENSIONS

Outline Dimensions: L70*W80*H27.9（mm）

Note: The appearance of the cover product is a rendering, not the final object.



Top View	Side View
Unit	mm (inch)

Figure 2. Outline Dimensions

Table 4. Mechanical Index

Connector	AMPSEAL 16: male 776434-1, female776433-1
Protection level	IP67
Shell material	Molding in one body
Installation	Four M6 screws

STANDARD

- Enterprise quality system standard: ISO9001:2015 standard (Certificate number: 064-21-Q-3290-R0-S)
- GB/T 191 SJ 20873-2003 General specification for inclinometer and level
- GBT 18459-2001 Main static performance indicators of sensors
- JJF10591-2012 Measurement uncertainty evaluation and expression
- GBT 14412-2005 Mechanical installation of mechanical vibration and shock accelerometers
- GJB 450A-2004 General requirements for equipment reliability

ORDERING INFORMATION

Part Number	Buy Now	Output	Installation
DI-3144-R00-H1	* *	CAN/RS232	Dual axle horizontal, mounted on the body
DI-3144-R00-V1	* *	CAN/RS232	Double shaft vertical, mounted in bucket
DI-3144-R00-V2	* *	CAN/RS232	Double shaft vertical, mounted in the lower arm

*: both and are our online store icons. Our products can be ordered from either one of them with the same pricing and delivery time.

NOTICE

1. It is important to carefully read and follow the warnings, cautions, and product-specific notes provided with electronic components. These instructions are designed to ensure the safe and proper use of the component and to prevent damage to the component or surrounding equipment. Failure to follow these instructions could result in malfunction or failure of the component, damage to surrounding equipment, or even injury or harm to individuals. Always take the necessary precautions and seek professional assistance if unsure about proper use or handling of electronic components.
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