SA Series Wireless Bolt Loosening Sensors

The SA series wireless bolt loosening sensors are industrial-grade sensors designed to monitor the fastening status of critical bolts in industrial equipment. Built for harsh environments, these sensors offer exceptional resistance to interference, high accuracy, ultra-low power consumption, and long-lasting durability for continuous operation.

Utilizing MEMS technology, each sensor accurately measures the relative rotation angle between the nut and bolt, effectively tracking bolt loosening. Additionally, the integrated attitude sensor detects movement and potential drops, providing enhanced monitoring capabilities.

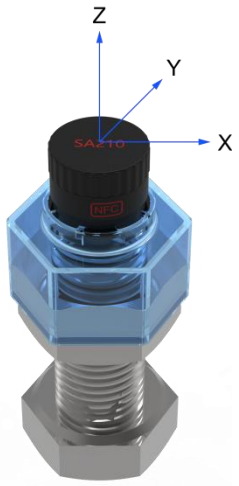
The SA210 model is ideal for standard bolt applications, while the SA220 features an ultra-thin design, perfect for installations in confined spaces such as blade bolts in wind turbines.

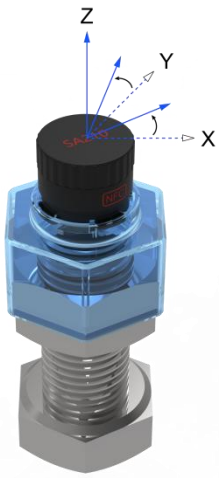
The sensor data is transmitted wirelessly to a remote monitoring system, enabling users to monitor loosening angles, receive timely alerts, and track the entire loosening process. This ensures safe equipment operation, minimizes unplanned downtime, and reduces maintenance time and costs.

Features and Advantages

Non-intrusive	⇨	No impact on the structure or strength of the bolt.
Accurate	⇨	Interference resistant with high precision, within ±0.5°.
Easy-to-install	⇨	Cable-free, compact, and lightweight; mounted with adhesive or twist lock methods.
Wireless	⇨	Reliable data transmission via Bluetooth.
Low-powered	⇨	Built-in battery with 10 years of life for normal usage.
Ruggedized	⇨	Waterproof, dustproof, shockproof, corrosion-resistant, and intrinsically safe; suitable for harsh industrial environments.
Accessible	⇨	Remotely accessible anytime, with automatic alarm and maintenance-free operation.
Convenient	⇨	Bluetooth compatible and can be connected via mobile app.

The SA series bolt loosening sensor is installed non-intrusively on the nut. Using advanced signal processing technology and algorithms, it rapidly and precisely measures the nut's loosening rotation angle relative to the bolt, providing an accurate assessment of the bolt's fastening status.



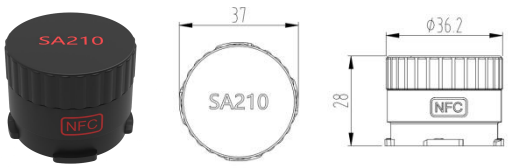


SA Series Wireless Bolt Loosening Sensors

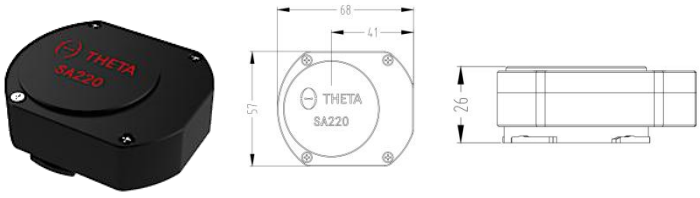
THETA SENSORS CORPORATION

Specifications

Product Model	SA210	SA220
Form Factor	Compact design	Ultra-thin design
Application Scenarios	Regular bolts	Bolts with limited installation space
Loosening Angle Precision	±0.5°	
Feature Data	Loosening angle, measurement index, motion index, attitude index, temperature	
Data Acquisition Period	1/2/5/10/15/20/30/60/120/240/360/480/720/1440 minutes	
Communication	Bluetooth 5.0, line-of-sight range 300m	
Battery	1200mAh Li/SOCL2; replaceable	
Dimensions	36.2mm x 28mm (D x H)	57mm x 68mm x 26mm (L x W x H)
Weight	26g	60g
Operating Temperature	-40~85°C	
Operating Humidity	10%~90% RH	
Enclosure	Polyamide with fiberglass	
Explosion Protection	EX ia IIC T4 Ga	
Ingress Protection	IP67	
Mounting	Adhesive and twist lock / welding and twist lock	

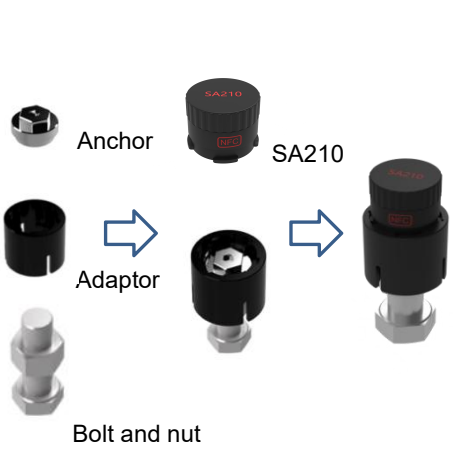


SA210



SA220

Mounting



SA210 Mounting Method 1

SA210 Mounting Method 2

SA220 Mounting Method

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