SA Series Wireless Bolt Loosening Sensors

THETA

The SA series wireless bolt loosening sensors are industrial-grade sensors designed specifically for monitoring the fastening status of critical bolts in industrial equipment. The sensors feature resistance to interference, high accuracy, ultra-low power consumption, and durability, making them suitable for long-term operation in harsh industrial environments.

Each sensor uses MEMS technology to accurately measure the relative rotation angle of the nut to the bolt, thereby monitoring the loosening status of the bolt. Additionally, the sensor is equipped with an attitude sensor to monitor changes in the bolt's movement and potential drops.

SA210 is suitable for monitoring regular bolts, while SA220 features an ultra-thin design suitable for bolts with limited space for end-face installation, such as blade bolts in wind turbines
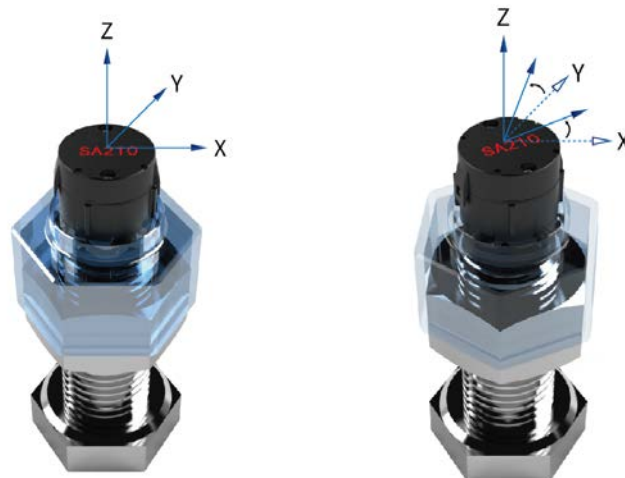
The sensor's data is transmitted through a wireless sensor network to a remote monitoring platform. Users can remotely monitor the loosening rotation angle and receive timely alerts in case of bolt loosening, continuously track the entire process of bolt loosening, ensure the safe operation of equipment, prevent unplanned downtime, and reduce maintenance time and costs.

Features and Advantages

Non-intrusive	⇨	No impact on the structure or strength of the bolt.
Accurate	⇨	Interference resistant and highly accurate, with a precision within ±0.5°.
Easy-to-install	⇨	Cable-less, compact, and lightweight design; mounted with adhesive and twist lock methods.
Wireless	⇨	2.4GHz wireless sensor network; capable of transmitting data reliably.
Low-powered	⇨	Built-in battery with 10 years of life for normal usage.
Ruggedized	⇨	Waterproof, dustproof, shockproof, and corrosion-resistant; suitable for harsh industrial environment.
Accessible	⇨	Remotely accessible anytime, anywhere; automatic alarm; maintenance free.
Convenient	⇨	Bluetooth compatible and connected via mobile APP.

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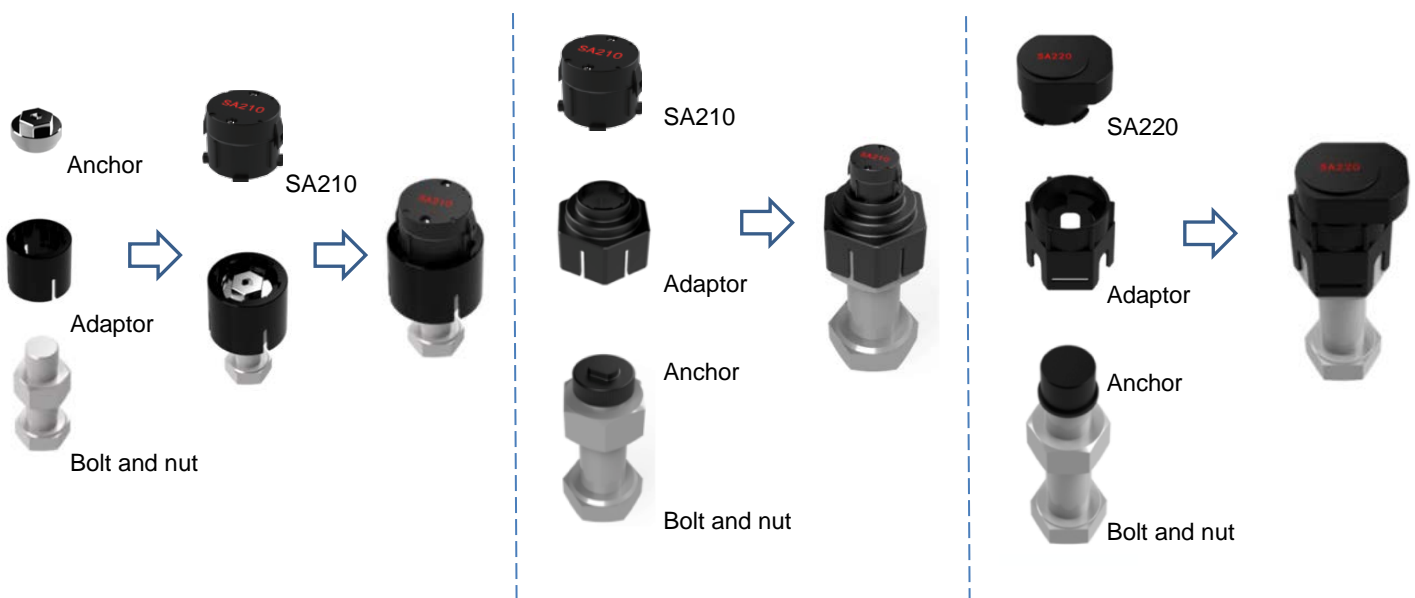
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Specifications

Product Model	SA210	SA220
Mechanical Design	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	2.4GHz Wireless Sensor Network (Bluetooth 5.0), line-of-sight range 300m	
Battery	1200mAh Li/SOCL2; replaceable	
Dimensions	36mm x 28.2mm (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	Polycarbonate	
Explosion Protection	EX ia IIC T4 Ga	
Ingress Protection	IP67	
Mounting	Adhesive and twist lock / welding and twist lock	

SA210

SA220

Mounting

Anchor

Adaptor

Bolt and nut

SA210

SA210 Mounting Method 1

SA210

Adaptor

Anchor

Bolt and nut

SA210 Mounting Method 2

SA220

Adaptor

Anchor

Bolt and nut

SA220 Mounting Method