SAS Series Wireless Bolt Preload Sensors

THETA

The SAS series wireless bolt preload sensors are industrial-grade sensors designed to monitor the health 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.

Using ultrasonic technology, each sensor accurately measures the time of reflective ultrasonic waves. Additionally, the integrated temperature probe measures the surface temperature of the bolt. With a temperature compensation algorithm, the sensor ensures precise and reliable measurement of the bolt's preload (axial tensile force) across varying temperatures.

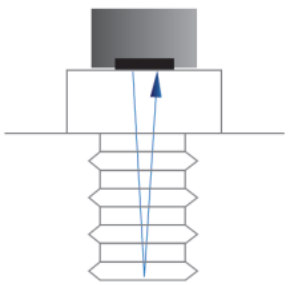
The SAS100 and SAS100A models come in a single integrated enclosure for easy installation. The SAS100 is suited for regular bolts, while the SAS100A is specifically designed for long anchor bolts. The SAS120 features a slim probe design, making it perfect for applications with limited space, such as blade bolts in wind turbines, or bolts with internal hexagonal holes.

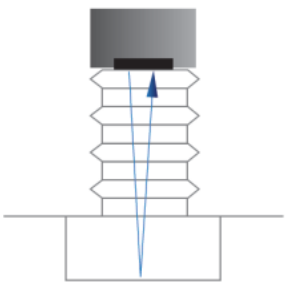
The sensor is transmitted wirelessly to a remote monitoring system, enabling users to remotely monitor the bolt preload and receive timely alerts in case of loosening, fatigue, or fracture. This continuous monitoring ensures safe operation, reduces unplanned downtime, and minimizes maintenance costs.

Features and Advantages

Non-intrusive	⇨	No impact on the structure or strength of the bolt.
Accurate	⇨	Interference resistant and highly accurate, with automatic temperature compensation.
Easy-to-install	⇨	Cable-free; mounted with epoxy, welding, or clamp fixture.
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 environment.
Accessible	⇨	Remotely accessible anytime, with automatic alarm and maintenance-free operation.
Convenient	⇨	Bluetooth compatible and can be connected via mobile app.

The SAS series bolt preload sensor is installed non-intrusively at one end of the bolt. It emits ultrasonic waves into the bolt's interior, and when these waves reach the opposite end or a fracture surface, they are reflected back to the sensor for processing. Using advanced signal processing technology and temperature compensation algorithms, the sensor accurately calculates the preload and evaluates the bolt's condition, detecting issues such as loosening, fatigue, or fracture.





Theta. Sense the Future of Industrial Safety.

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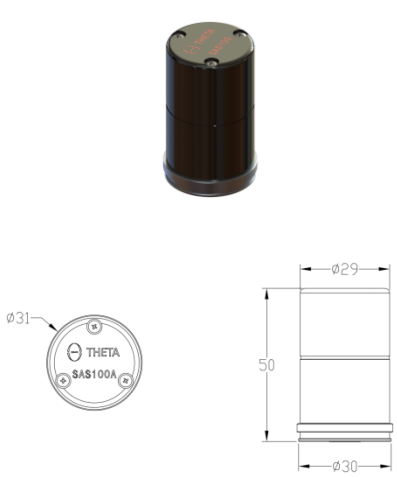
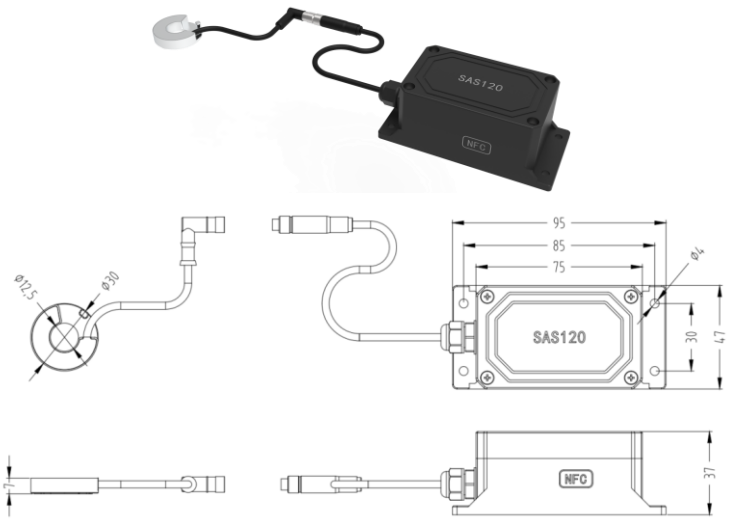
THETA SENSORS CORPORATION

Specifications

Product Model	SAS100/SAS00A	SAS120
Form Factor	Integrated design	Ultra-thin probe design; separate main body and probe
Bolt Range	SAS100: Regular bolts SAS100A: Anchor bolts Installation on threaded end: M36 and above Installation on hexagonal head: M24 and above Total length of bolts: 150-6000mm	Bolts with limited installation space or with hexagonal holes Installation on threaded end: M30 and above Installation on hexagonal head: M20 and above Total length of bolts: 150-6000mm
Preload Accuracy	±1.5%	
Temperature Range	-40~85°C	
Temperature Accuracy	±1°C	
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	1650mAh Li/SOCL2; replaceable	4000mAh Li/SOCL2; replaceable
Dimensions	31mm x 50mm (D x H)	See the diagram below
Weight	35g	70g
Operating Temperature	-40~85°C	
Operating Humidity	10%~90% RH	
Enclosure	Metal and polyamide with fiberglass	
Explosion Protection	EX ia IIC T4 Ga	
Ingress Protection	IP67	
Mounting	Industrial-grade epoxy, optional auxiliary fastening structure	Probe: Industrial-grade epoxy, optional auxiliary fastening structure Main unit: Bracket



SAS100/SAS100A



SAS120

Mounting

- SAS100/SAS100A: The sensor is adhered to the surface of the bolt.
- SAS120: The probe is adhered to the surface of the bolt.
- Durability: Equipped with aerospace-grade epoxy, the sensor can withstand vibrations up to 30g.

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