General Specifications

XS770A
Wireless Vibration Sensor

Sushi Sensor

GS 01W06E01-01EN

■ GENERAL

The Wireless Vibration Sensor XS770A is a compact battery-powered, measures vibration and temperature,and targets Industrial IoT (IIoT) applications.

With this sensor, you can detect an indication of abnormalities of the assets and the equipment by monitoring long term trends of the vibration and the surface temperature. Visualization of the long term trend achieves condition-based maintenance and effective asset management.

LPWA (Low Power Wide Area) offers long-range reachability to low power devices, allowing wide area coverage and easy installation.

■ FEATURES

- **Battery-powered Compact Wireless Sensor**

The XS770A is compact and has excellent environment resistance characteristics. It can be installed in a plant where wiring is difficult. With a number of sensors, you can collect various data for plant maintenance by early detection and prediction of equipment failure.

- **Installable in Hazardous Location**

This sensor can be installed in Zone 2 areas, such as petrochemical plants, paint plants, drug plants, where flammable gas or vapor may exist.

- **Long-Distance Communication on License-free Bands**

This sensor has adopted LoRaWAN. LoRaWAN has excellent sensitivity reception, good radio interference resistance, and offers a communication distance of 10 km or more in an ideal communication environment. You can install this sensor anywhere you want over vast area.

- **Configuration And Status Monitoring Using Smartphone**

Using an Android-based smartphone with NFC (Near Field Communication) interface makes configuration and status monitoring of sensors simple and intuitive.

■ STANDARD SPECIFICATIONS

☐ WIRELESS SPECIFICATIONS

Communication Protocol:
LoRaWAN class A
EU868, AS923, US915, KR920, AU915

Modulation Method:
LoRa modulation

Data Rate:
250 to 11000 bps*
*: Available data rate vary depending on the country.

Frequency:
[Area code: 2] 863 to 870 MHz*1
[Area code: 3] 902 to 928 MHz*2
[Area code: 4] 919 to 925 MHz*2
[Area code: 5] 915 to 928 MHz
[Area code: 6] 915 to 928 MHz
[Area code: 7] 920.9 to 923.3MHz
*1: This wireless frequency can be used throughout Europe, although there are some restrictions in Sweden and Greece.
*2: Available frequency bands vary depending on the country.

Radio Security:
AES 128 bit encryption

RF Transmitter Power:
Max. 7 dBm

Antenna:
Built-in Omni-directional antenna

☐ POWER SUPPLY SPECIFICATIONS

Battery:
Lithium thionyl chloride battery: 1 unit
(dedicated product)
Rated voltage: 3.6 V
Rated capacity: 2.6 Ah

☐ PERFORMANCE SPECIFICATIONS

Measurement:

Item		Specifications
Vibration	Measurement	Acceleration (peak), Velocity (RMS)
	Axis	X, Y, Z axes and 3-axis composite
	Range *1	Acceleration: 0 to 130 m/s² (0 to 13.26g) Velocity *2: 0 to 20 mm/s
	Frequency range	10 to 1,000 Hz (±3 dB)
	Accuracy (100 Hz)	X, Y, Z axes : ±10 % FS 3-axis composite: ±20 % FS
Temperature	Measurement	Temperature
	Range	-20 °C to 85 °C
	Resolution	0.1 K
	Measurement part	Base

*1: Peak value of the input vibration. For the relation between the measurement frequency band and measurable range, refer to the following figure.
*2: The 20 mm/s pk value is equivalent to 14 mm/s RMS when input is based on a sine wave.

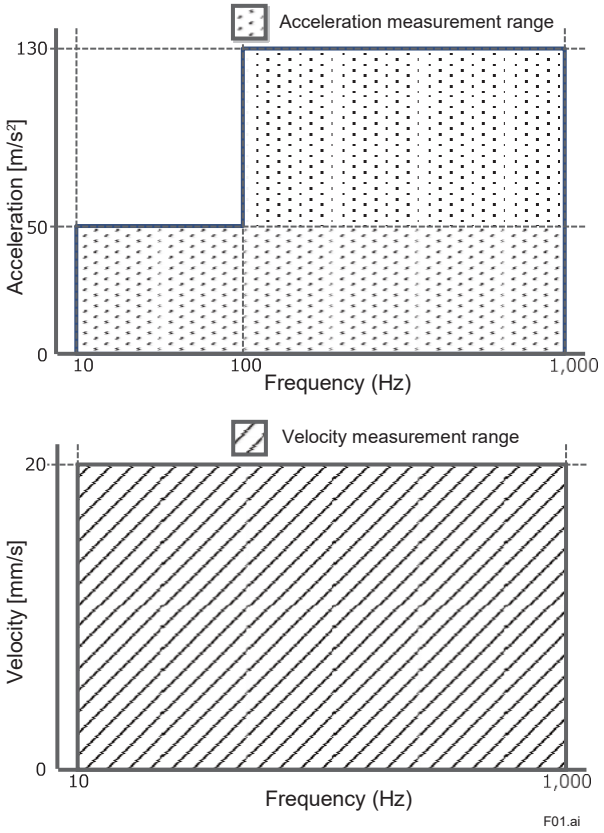


Figure: Measurable Range

Battery Characteristics:
The typical battery life is 4 years in the following conditions*.
- Update period: 1 hour
- Ambient temperature: 23 °C ±2 K

*: Environmental condition such as vibration and the type of the connected device may affect battery life.

Update Time:
1 minute to 3 days

☐ FUNCTIONAL SPECIFICATIONS

Output:
LoRaWAN
(EU868:EU, AS923: Southeast Asia and New Zealand, US915: North America, KR920: Korea, AU915: Australia)

NFC Interface:
NFC Forum Type 2 Tag

Diagnostic Function:
Battery alarm, internal temperature, wireless communication failures, sensor over-range, sensor failures, memory failures

Software Download Function:
Allows the user to update the software of the sensor via the NFC interface.

☐ INSTALLATION ENVIRONMENT

Ambient Temperature Limits:
Operating: -20 °C to 85 °C

Ambient Humidity Limits:
Operating: 0 % rH to 100 % rH (non-condensation)

Altitude:
Up to 3000 m

Shock Resistance:
100 G

☐ REGULATORY COMPLIANCE STATEMENTS

This device satisfies the following standards.
*: Please confirm that an installation region fullfills an applicable standard. If additional regulatory information and approvals are required, contact a Bax Engineering representative.

Telecommunication Compliance:
RE Directive (EEA and EFTA Countries),
FCC Approval (United States),
ISED Approval (Canada),
KC Marking (Korea)
RCM (Australia and New Zealand)

CE Conformity:
RoHS Directive:
EN50581
RE Directive:
Safety: EN61010-1 (Indoor/Outdoor use), EN62479
EMC: EN 301 489-1, EN 301 489-3,
EN61326-1 Class A Table 2, EN61326-2-3,
EN55011 Class A Group 1
Radio Spectrum: EN 300 220-2 (Band h1.3 in the table 1 of CEPT ERC Rec. 70-03),
EN 300 330
ATEX Intrinsically safe declaration:
Applicable standard: EN 60079-0:2012+A11:2013
EN 60079-11:2012
II 3 G Ex ic IIB T4 Gc
Enclosure: IP66/IP67 in accordance with EN 60529
Ambient temperature: –20 °C to 80 °C

Canadian Safety Standards:
CAN/CSA-C22.2 No.61010-1
CSA-C22.2 No.94.2
IEC 60529

Degrees of Protection:
[Housing material Code: 1] IP66/IP67
[Housing material Code: 2] IP66/IP67 and Type 4X

KC Marking
Trade Name: Bax Engineering GmbH
Equipment Name: Wireless Vibration Sensor
Manufacturer: Yokogawa Electric Corp.

IECEx Intrinsically safe Approval
Application Standard: IEC 60079-0:2017,
IEC 60079-11:2011,
Certificate: IECEx DEK 19.0072
Ex ic IIB T4 Gc
Ambient temperature: –20 °C to 80 °C

FM Nonincendive Approval (United States)
Applicable Standards: FM 3600:2018, FM 3611:2018,
FM 3810:2018, ANSI/UL 121201 Ed.9 (2017),
ANSI/UL 61010-1 Ed.3 (2012), NEMA 250:1991
Certificate No: FM19US0205
Nonincendive for Class I, Division 2, Groups A, B, C,
D; Class II, Division 2, Groups F, G;
Class III, Division 1; Class I, Zone 2, Group IIC
Temperature Class: T4
Ambient temperature: –20 °C to +85 °C
Enclosure: Type 4X

☐ PHYSICAL SPECIFICATIONS

Housing Material:
For detail, refer to “MODEL AND SUFFIX CODES.”

Weight:
260 g (0.57 lb)

Mounting:
Mounting on the measurement target using the screw*
*: Can also mount using the magnetic holder supplied as an accessory. Note that, when using the magnetic holder, the vibration measurement frequency band drops.

■ SOFTWARE SPECIFICATIONS

☐ SUSHI SENSOR APP

This software is used to perform the setting and status check of this product via the NFC interface.

Operating Environment:

Item	Recommended System Requirements
OS	Android 5.1.1 or higher
CPU	Snapdragon 800 or equivalent or higher
Resolution	1280 x 720 dots or more
NFC	Reader, writer
GPS	Optional

Note of Available Android Device:
When using Sushi Sensor APP to intrinsically safe explosion devices, the Android device must comply with the following.
- When using an NFC link in a non-hazardous area, the maximum magnetic field strength generated by the Android device is 18 A/m (r.m.s.) or less (Compliant with ISO / IEC 14443).
- When using an NFC link in a hazardous area, only an Android device confirmed by Bax Engineering GmbH can be used.
- If additional information and approvals for Android devices are required, contact a Bax Engineering representative.

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
XS770A		Wireless Vibration Sensor *1
---	**-A**	Always A
Area	**2**	Europe EU868
	3	North America US915*2
	4	Southeast Asia AS923
	5	Australia AU915
	6	New Zealand AS923
	7	Korea KR920*9
Type	**00**	General Purpose*4
	K2	ATEX Intrinsic safety*3
	S2	IECEx Intrinsic safety*6
	F1	FM Nonincendive*7
---	**-A**	Always A
Housing material	**1**	Plastic (PBT), Stainless steel*8
	2	Plastic (PC), Stainless steel*5
Power source	**C**	Battery powered (battery included)
---	**A**	Always A

*1: A hexagon socket set screw is attached.
*2: Conversion screw is included when area code is 3.
*3: Applicable when area code is 2 or 4.
*4: Applicable when area code is 2 or 3.
*5: Applicable when area code is 3,5,6, or 7.
*6: Applicable when area code is 4,5 or 6.
*7: Applicable when area code is 3 and sales country is United States.
*8: Applicable when area code is 2 or 4.
*9: Please contact a Bax Engineering representative for available Type Code.

■ OPTIONAL ACCESSORIES

Item	Parts Number	Description
Magnetic holder	F9096DA	Magnet for mounting (M6 female screw)
Hexagon socket set screw	B1137BS	Screw for mounting (M6)
Conversion screw	F9096CM	Screw for mounting (M6 to 1/4-28UNF)*1

*1: Conversion screw is attached when area code is 3.

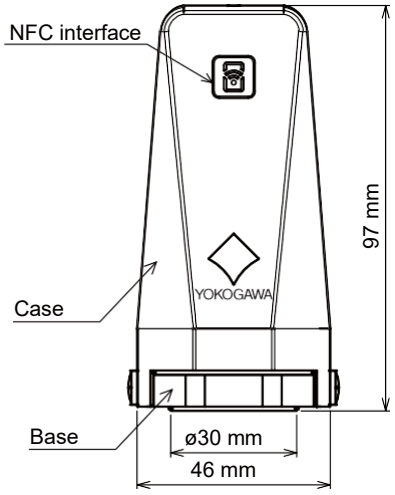
Model	Suffix Codes	Description
XS70BT		Lithium battery*1
Battery type	**-A**	Dedicated battery for XS770A
---	**-A**	Always A
Number of Unit	**-C004**	4 units
	-C012	12 units

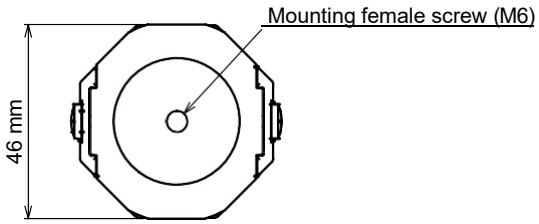
*1: The XS70BT is a dedicated product (model: LS14500 C5SY) with a battery connector incorporated to SAFT battery

■ DIMENSIONS

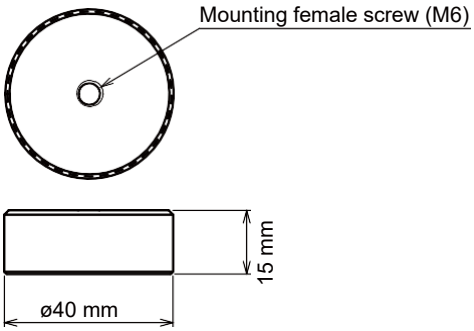
- **Main unit**

Unit: Millimeters

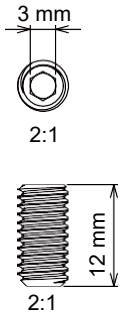




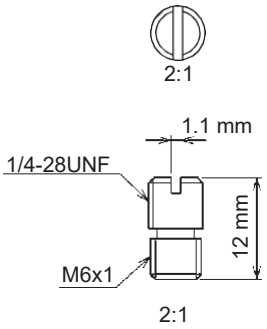
- **Magnetic holder**
  Parts No: F9096DA



- **Hexagon socket set screw (M6)**
  Parts No: B1137BS



- **Conversion screw*1 (M6 to 1/4-28UNF)**
  Parts No: F9096CM



*1: Conversion screw is attached when area code is 3

<Ordering Information>

1. Model, suffix codes, and option code

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