User's Manual

Sushi Sensor

XS822
Steam Trap Monitoring Module

IM 01W06G01-01EN

YOKOGAWA

IM 01W06G01-01EN
3rd Edition

CONTENTS

3rd Edition: Mar. 2025

1. Introduction

Thank you for purchasing the XS822 Steam Trap Monitoring Module. To fully utilize all its features and ensure efficient and correct usage, please read this manual thoroughly before use. Make sure to understand the functions and operations, and familiarize yourself with the device.
This manual covers the XS822 Steam Trap Monitoring Module (referred to as XS822). The XS822 operates using the XS110A Wireless Communication Module (referred to as XS110A). The XS822 is powered by the battery within the XS110A. Ensure the XS110A is installed before use.
Table 1.1 lists the documents related to this manual.

Table 1.1 Related Documents

Document Name	Document No.
General Specifications XS822 Steam Trap Monitoring Module	GS 01W06G01-01EN
User's Manual XS110A Wireless Communication Module	IM 01W06D01-01EN
User's Manual Sushi Sensor Series Software Edition	IM 01W06C01-01EN

■ Regarding This Manual

- This manual should be provided to the end user.
- This manual and the identification tag on the packing box are crucial components of the product. Please store them safely for future reference.
- The contents of this manual are subject to change without prior notice.
- All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- Yokogawa provides this manual without any warranty, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose.
- If you have any questions, find errors, or notice missing information in this manual, please contact your nearest Yokogawa sales office.
- The specifications in this manual apply only to the standard type under the specified model number breakdown and do not include custom-made instruments. For products with a suffix code or optional codes containing “Z” and an exclusive document, please read that document in conjunction with this manual.
- Please be aware that changes in specifications, construction, or component parts of the instrument may not be immediately updated in this manual. However, any delay in revisions will not impact the user’s ability to operate the instrument effectively or affect its performance.

■ Safety, Protection, and Modification of this Product

- This product is intended for use by individuals with specialized knowledge.
- To ensure the safety of the operator, the product, and the system it controls, please follow the safety precautions outlined in this manual. We cannot guarantee safety if these instructions are not followed.
- Modifying the product is strictly prohibited.
- Customer repairs or modifications to this instrument can compromise the explosion protection function and create hazardous situations. For any repairs or modifications, please contact the nearest Yokogawa office.

- The following safety symbols are used in this manual:

WARNING

This indicates a potentially dangerous situation that, if not addressed, could lead to death or serious injury.

CAUTION

This indicates a potentially hazardous situation that, if not addressed, could lead to minor or moderate injury or physical damage. It can also serve as a warning against unsafe practices.

IMPORTANT

This indicates that using the hardware or software in this way could cause damage or result in system failure

NOTE

This highlights information crucial for understanding the operation and features.

⏚ : Functional grounding terminal

■ Trademarks

- Sushi Sensor is a registered trademark of Yokogawa Electric Corporation.
- The registered trademarks or trademarks of the respective companies in the text do not bear the mark of ™ or ®.

1.1 Safe Use of the Product

For the operator's safety and to protect the instrument and system, please follow the safety instructions in this manual when handling the instrument. Ignoring these instructions may compromise the instrument's protective features, and Yokogawa cannot guarantee safe operation in such cases. Please pay special attention to the following points:

(a) Installation

WARNING

- Direct exposure to steam, hot water, or hot metal surfaces can cause severe skin burns. Contact with 60°C (140°F) water or metal for just five seconds can result in a second-degree burn. To avoid the risk of burns, always allow hot parts to cool before starting any work.
- The instrument must be installed by a qualified engineer or skilled personnel. The installation procedures described are not intended for operators.
- All installations must comply with local installation requirements and local electrical codes.
- When handling the instrument, avoid exposing it to intense vibration and shock.
- Do not step on the instrument after it has been installed.

(b) Wiring

- The instrument must be installed by an engineer or technician with expert knowledge of it. Operators are not permitted to perform wiring unless they meet this requirement.

(c) Operation

- Do not remove the XS110A from the XS822 in wet or humid conditions. If the cover is opened, the specified enclosure protection will no longer apply.

(d) Maintenance

- Please only perform tasks as described in the maintenance instructions. For any other procedures, contact the nearest YOKOGAWA office.
- Take care to prevent the accumulation of dirt, dust, or other materials on the nameplate. For maintenance, use a soft, dry cloth.

(e) Modification

- Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.

(f) Explosion Protected Type Instrument

- Users of Intrinsic safety instruments should first refer to section 2.6 (Explosion Protected Instrument) of this manual.
- Only individuals who have received proper training are permitted to use this instrument.

1.2 Warranty

- The warranty period is specified in the quotation provided at the time of purchase. Issues arising during the warranty period will generally be repaired free of charge.
- If any issues arise with this product, please contact the Yokogawa representative from whom it was purchased or the nearest Yokogawa office.
- If any issues occur with this product, please provide details about the nature of the issue and the circumstances under which it developed, including the model specification and serial number. Any diagrams, data, or additional information you can include will also be helpful.
- Yokogawa will determine the party responsible for the cost of fixing the problem after conducting an investigation.

■ The purchaser shall bear the responsibility for repair costs, even during the warranty period, if the malfunction is due to:

- Improper or insufficient maintenance by the purchaser.
- Malfunction or damage resulting from improper handling, use, or storage of this product contrary to the design specifications.
- Use of this product in a location that does not meet Yokogawa's specified standards, or improper maintenance of the installation site.
- Failure or damage resulting from modifications or repairs by anyone other than Yokogawa or an approved Yokogawa representative.
- Malfunction or damage resulting from improper relocation of this product after delivery.
- Causes of force majeure, such as fires, earthquakes, storms, floods, lightning, or other natural disasters, as well as disturbances, riots, warfare, or radioactive contamination.

2. Notes on Handling

The XS822 undergoes comprehensive factory testing prior to shipment. Upon delivery, inspect the unit for any visible damage and ensure all listed components are present. Note that if the XS822 is ordered without waveguides, they will not be included. Additionally, the heat dissipating parts vary based on the steam temperature code designation.
This chapter outlines the necessary precautions for handling this product. Please read this section thoroughly before use. For details on other topics, refer to the relevant sections.

■ Bundled Items

- User's Manual (IM 01W06G01-01EN)
- Waveguide (When Waveguide Code 1 through 5 is specified)

Table 2.1 Waveguide List

Waveguide Code	Waveguide to be included	Packing bag description	Parts number
-1	Waveguide for 1/2" or 3/4" pipe, Lock nut	WAVEGUIDE ASSY 1/2+3/4 SS	F9097GH
-2	Waveguide for 1" pipe, Lock nut	WAVEGUIDE ASSY 1 SS	F9097GJ
-3	Waveguide for 1 1/4" pipe, Lock nut	WAVEGUIDE ASSY 1-1/4B SS	F9097GK
-4	Waveguide for 1 1/2" pipe, Lock nut	WAVEGUIDE ASSY 1-1/2B SS	F9097GL
-5	Waveguide for 2" pipe, Lock nut	WAVEGUIDE ASSY 2 SS	F9097GM

The inch size is marked on the waveguide packing bag.
See the Packing bag description column for details.

- Default key label
- Heat dissipating parts (When Process Temperature Code H or E is specified)

Table 2.2 Heat dissipating Parts List

Process Temperature Code	Heat dissipating parts
M (up to 195°C (383°F))	No heat dissipating parts
H (up to 255°C (491°F))	1 Heat sink
E (up to 440°C (824°F))	2 Heat sinks, 1 Heat sink extension bolt

NOTE

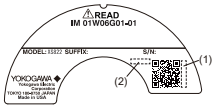
Waveguides, heat sinks, and heat sink extension bolts might exhibit some discoloration or rust. However, this does not impact their quality or performance.

■ Tools required for installation of XS822

- Adjustable wrench
- Phillips head screwdriver (No.2)
- Torque wrench (Applicable size: 1/2" [12.7 mm] Tightening torque: 15.6 N-m)
  Waveguide Code -1,-2, -3
- Torque wrench (Applicable size: 9/16" [14.287 mm] Tightening torque: 27.9 N-m)
  Waveguide Code -4,-5
- Torque wrench (Applicable size: 3/4" [19.05 mm] Tightening torque: 61 N-m)
- Ratchet wrench

2.1 Check the Model and Specifications

The model name and specifications are listed on the nameplate attached to the housing. Ensure that the specifications indicated in the “Model and Suffix Code” in General Specifications “GS 01W06G01-01EN” match those on the order sheet.



(1): Date of manufacture
(2): EUI64 (lower 6 digits* ○○:○○○○)
* The upper 10 digits (0000:64FF:FE) are omitted.

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Figure 2-1 Sample of name plate

2.2 Transportation

To avoid damage during transit, keep the XS822 in its original shipping container until it arrives at the installation site.

2.3 Storage

When an extended storage period is expected, observe the following precautions.

(1) Choose a storage location that satisfies the following requirements.
- A location protected from rain or water exposure.
- A location with minimal vibration or impact.
- Recommended temperature and humidity range:
  Temperature: –40 to 85°C (–40 to 185°F)
  Humidity: 0 to 100% RH (non-condensation)

(2) When storing the XS822, carefully repack it in its original shipping packaging. In humid environments, ensure it is stored in the same condition as when it was shipped from our company.

NOTE

For long-term storage, it is advisable to set the instrument to OFF Mode to conserve battery life. For instructions on how to switch to OFF Mode, please refer to “IM 01W06C01-01EN”

2.4 Selecting the Installation Location

This product is built to endure harsh environmental conditions. However, to guarantee years of stable and accurate performance, consider the following precautions when choosing the installation location.

■ Wireless Communication

- Install the product in an area free from obstacles like walls or pipes that could interfere with radio waves.
- Avoid extended use in environments with unstable wireless communication.

■ Ambient Temperature

- Avoid locations with wide temperature variations or significant temperature gradients. If the area is exposed to radiant heat from plant equipment, ensure proper thermal insulation and/or ventilation.
- Steer clear of locations where high temperature and humidity will persist for extended periods.

■ Ambient Atmospheric

- Avoid installing the product in corrosive environments. If unavoidable, ensure proper ventilation.
- Ensure that gases, liquids, or solids containing organic solvents, or acidic or alkaline chemicals do not come into contact with the product.

■ Shock and Vibration

- This product is built to withstand shock and vibration. However, it is advisable to install it in an area with minimal impact and vibration.
- Avoid stepping on the instrument after installation.

■ Orientation

The installation orientation is limited by the process temperature. See chapter 4.2.4 for details.

2.5 Restrictions on Use of Radio Transceivers

IMPORTANT

While this product is designed to minimize high frequency noise, interference may still occur if a transceiver is used near the product and its wiring. Therefore, it's important to test the transceiver's effect beforehand and ensure it is used at a distance where no issues.

2.6 Explosion Protected Instrument

2.6.1 ATEX Intrinsic Safety

Technical data:

- Certificate number: DEKRA 23ATEX0082X
- Application standards: EN IEC 60079-0:2018, EN 60079-11:2012
- Ex marking: Ⓔx II 2 G Ex ib IIC T4 Gb
- Ambient temperature: -40 °C to 70 °C (-40 to 158°F)

Electrical parameters:

Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 8.9 µF, Li = 2.82 µH

Enclosure: IP20

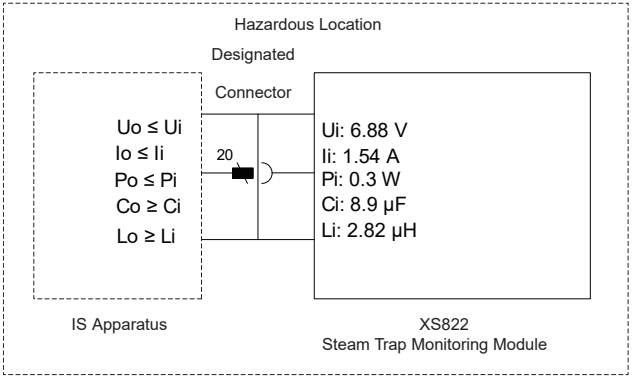
Explosion protection is certified as IP20, but IP66/IP67 in accordance with only EN 60529 is applied when combined with XS110A.

Certification information

WARNING

A modification of the equipment would no longer comply with the construction described in the certificate documentation.

Control drawing:



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Note:

1. If earthing of the Case (metallic part of the enclosure) is not ensured by installation, apply conductive connection between the Case and the earth point (or the equipotential bonding system).

Specific conditions of use:

- When the maximum process temperature allowed is 160 °C or less, no mounting accessories are required, no angular orientation limitations.
- When the maximum process temperature allowed is 195°C or less, no mounting accessories are required, orient up to 45° above the horizon or below.
- When the maximum process temperature allowed is 255 °C or less, a single heat sink is required, orient up to 45° above the horizon or below.
- When the maximum process temperature allowed is 440°C or less, dual heat sinks and an extension bolt are required, orient up to 45° above the horizon or below.
- The heat sink, the waveguide, and the extension bolt shall be used specified by manufacturer.
- The ambient temperature range is −40 °C to +70 °C.

On-site assembling:

- The pipe (steam) application temperature determines the allowable range of mounting positions (or orientation) and any required mounting accessories (heat sink and extension bolt).
- The allowable range of angular orientation, relative to the pipe, and required mounting accessories based on process temperature for horizontally running pipe are in accordance with specific conditions of use.
- There are no mounting restrictions (angular orientation) on a vertically running pipe. However, process temperature determines the required mounting accessories.
- The process temperature specified by the model code may be changed by the combination of the mounting accessories applied to the equipment.

Installation:

- The equipment must be installed in accordance with EN 60079-14, local requirements, and the control drawing.
- XS822 must be used in conjunction with battery powered approved equipment (e.g., Wireless Communication Module, type XS110A).
- The user must ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces of XS110A.

Maintenance and repair:

WARNING

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

Nameplate:

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2.6.2 IECEx Intrinsic Safety

Technical data:

- Certificate number: IECEx DEK 23.0058X
- Application standards: IEC 60079-0:Ed.7.0 (2017), IEC 60079-11:Ed.6.0 (2011)
- Ex marking: Ex ib IIC T4 Gb
- Ambient temperature: -40 °C to 70 °C (-40 to 158°F)

Electrical parameters:

Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 8.9 µF, Li = 2.82 µH

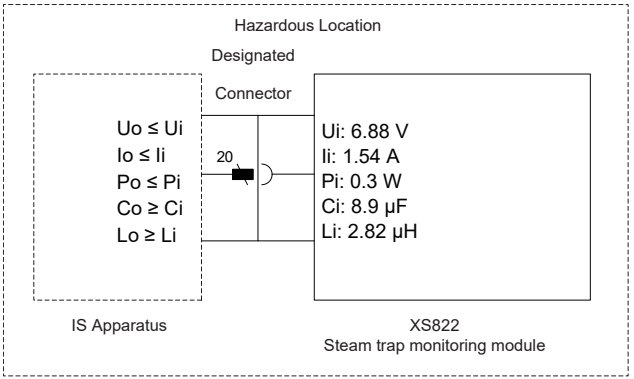
Enclosure: IP20

Explosion protection is certified as IP20, but IP66/IP67 in accordance with only IEC 60529 is applied when combined with XS110A.

Certification information

WARNING

A modification of the equipment would no longer comply with the construction described in the certificate documentation.



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Note:

1. If earthing of the Case (metallic part of the enclosure) is not ensured by installation, apply conductive connection between the Case and the earth point (or the equipotential bonding system).

Specific conditions of use:

- When the maximum process temperature allowed is 160 °C or less, no mounting accessories are required, no angular orientation limitations.
- When the maximum process temperature allowed is 195°C or less, no mounting accessories are required, orient up to 45° above the horizon or below.
- When the maximum process temperature allowed is 255 °C or less, a single heat sink is required, orient up to 45° above the horizon or below.
- When the maximum process temperature allowed is 440°C or less, dual heat sinks and an extension bolt are required, orient up to 45° above the horizon or below.
- The heat sink, the waveguide, and the extension bolt shall be used specified by manufacturer.

On-site assembling:

- The pipe (steam) application temperature determines the allowable range of mounting positions (or orientation) and any required mounting accessories (heat sink and extension bolt).
- The allowable range of angular orientation, relative to the pipe, and required mounting accessories based on process temperature for horizontally running pipe are in accordance with specific conditions of use.
- There are no mounting restrictions (angular orientation) on a vertically running pipe. However, process temperature determines the required mounting accessories.
- The process temperature specified by the model code may be changed by the combination of the mounting accessories applied to the equipment.

Installation:

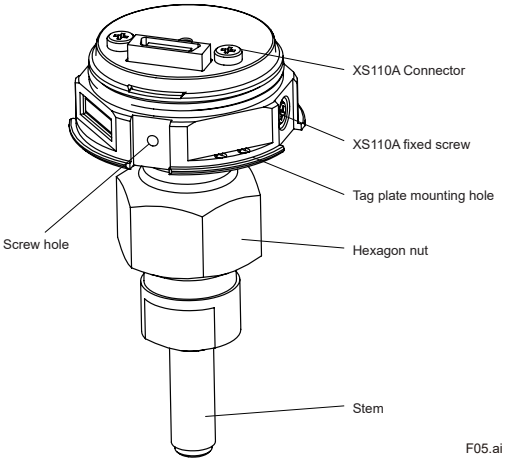
- The equipment must be installed in accordance with IEC 60079-14, local requirements, and the control drawing.
- XS822 must be used in conjunction with battery powered approved equipment (e.g., Wireless Communication Module, type XS110A).
- The user must ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on nonconducting surfaces of XS110A.

Maintenance and repair:

WARNING

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

3. Component Names



4. Installation

4.1 Precautions

Before installing this product, please review the cautionary notes in subsection 2.4, “Selecting the Installation Location.” For more details on the permissible ambient conditions at the installation site, refer to section 8, “General Specifications.”

WARNING

Steam piping and plumbing joints can become extremely hot. To prevent severe skin burns, either shut off the vapor flow and allow the steam piping to cool before installation, or use appropriate personal protective equipment (PPE) and take additional precautions to avoid burns.

CAUTION

When installing in a hazardous location, ensure both the XS110A and XS822 are used with explosion protected products.

IMPORTANT

Ambient environment

When connecting or disconnecting modules to the XS110A terminal, ensure the surrounding environment is free of dust and that the interior of the main unit is protected from water droplets and other contaminants.

Connector Protection

To safeguard the connector, use a protective cap (Part Number: F9097ND) when replacing batteries or installing without the XS110A. This cap temporarily shields the XS822 connector when the XS110A is removed during battery replacement or other tasks. Note that waterproof and dustproof performance cannot be ensured when the XS110A is removed, so reinstall the XS110A on the XS822 as soon as possible after completing the work.

Installation Work

Please carefully review the installation precautions in section 2.4, “Selecting the Installation Location,” to ensure proper installation.

Mounting with XS110A

After installing the XS110A, ensure that the head of the XS110A fixing screw on the XS822 is flush with the surface of the XS110A and that the monitoring module fixing screw on the XS110A is securely tightened.

Welding work

When welding piping, such as during steam trap replacement, ensure that the welding current does not pass through the XS822.

4.2 Mounting

This product is connected to the steam piping using a waveguide. The XS110A is shipped without batteries, so please ensure the batteries are installed before proceeding with the installation. For detailed instructions on installing the batteries, refer to the XS110A User's Manual (IM01W06D01-01EN). Additionally, consult Section 4.2.1, "Mounting the XS110A," before mounting with the XS110, and Section 4.2.3, "Mounting to the Waveguide," before mounting on the waveguide.

4.2.1 Mounting the XS110A

Refer to Section 4.1 "Precautions" before mounting with XS110A.

(1) Align and insert the XS110A and XS822 connectors.
(2) Fit the XS110A into the XS822.
(3) Turn each XS110A fixing screw on the XS822 to the left, pull them out, and then turn them 1/4 turn to the left from the point of contact to tighten. Ensure that the head of each XS110A fixing screw is flush with the surface of the XS110A.
(4) Turn the XS110A measuring module fixing screw to the right. At this time, tighten the screws with a torque of 1.4 N·m.

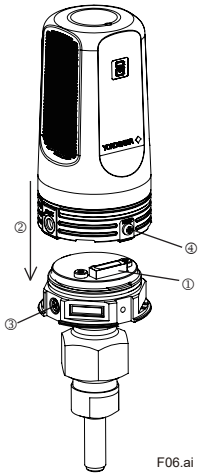


Figure 4-1 Mounting with XS110A

After installing the XS110A, you can configure the settings using the Sushi Sensor App. Ensure that the Sushi Sensor has the latest firmware. To remove the XS110A, follow the reverse order as for mounting. If it's difficult to separate the XS110A and XS822 by hand, you can easily do so by inserting a flat blade screwdriver between the grooves of the XS110A and XS822 and gently prying them apart.

4.2.2 Mounting the heat dissipating parts

When process temperature code H or E is specified, or used at steam temperatures higher than 195°C (383°F), mount heat dissipating parts.

(1) When process temperature code H is specified, or when used at steam temperatures higher than 195°C (383°F) and 255°C (491°F), or less thread a heat sink to the XS822.

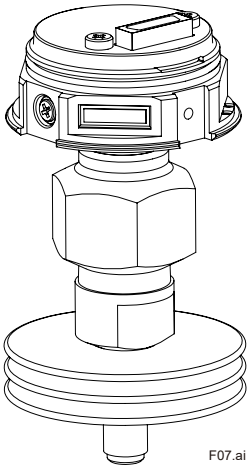


Figure 4-2 With one heat sink mounting

(2) When process temperature code E is specified or when used at steam temperatures higher than 255°C (491°F) and 440°C (824°F), or less thread the extension bolt for the heat sink under step (1) with a tightening torque of 61 N·m and then fasten the second heat sink.

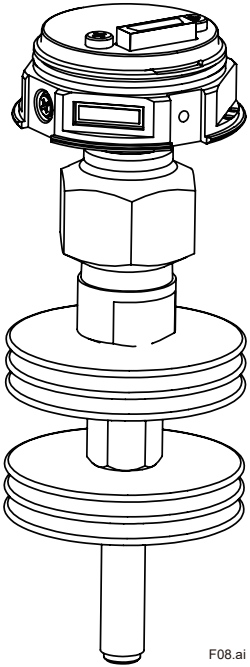


Figure 4-3 With two heat sinks mounting.

NOTE

When installing the heat sink, ensure that the cup side faces the XS110A. Attach one heat sink to the top of the stem and the other to the top of the extension bolt.

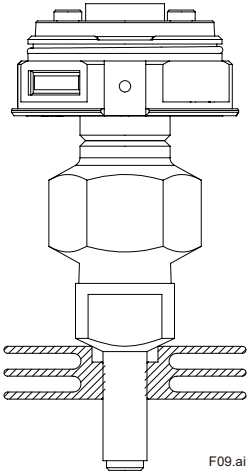


Figure 4-4 Orientation of heat sink

4.2.3 Mounting to the waveguide

WARNING

Piping and fittings can become hot. To avoid contact burns, use appropriate personal protective equipment (PPE) and take extreme care to avoid burns.

NOTE

When the installation location is wrapped with insulation material, be extremely careful and remove the insulation material in advance.

(1) Mount a waveguide within 15 cm (6 inches) from the steam trap inlet according to the pipe diameter.
(2) Thread the bolt and washer through the wave guide.
(3) Thread the washer and nut through the end of the bolt. When the waveguide is 2" or smaller, use a tightening torque of 15.6 N.m. and when a waveguide larger than 2" is used, use a tightening torque of 27.9 N.m.

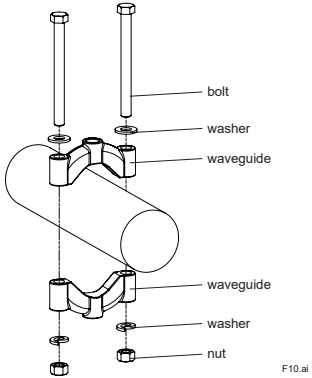


Figure 4-5 Waveguide installation

(4) Thread the lock nut and lock the XS822 to the waveguide. The tightening torque should be 61 N.m. when heatdissipating parts are installed, lock nut is not used.

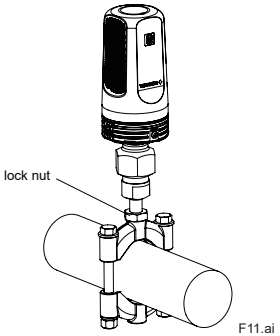


Figure 4-6 Mounting on waveguide (without heat sink)

NOTE

When installing heat insulation materials after mounting this module, ensure there is an opening of at least 3 cm (1.2 in) in front of and behind the product. If a heat sink is used, maintain a gap of at least 3 cm (1.2 in) between the heat sink and the insulation materials.

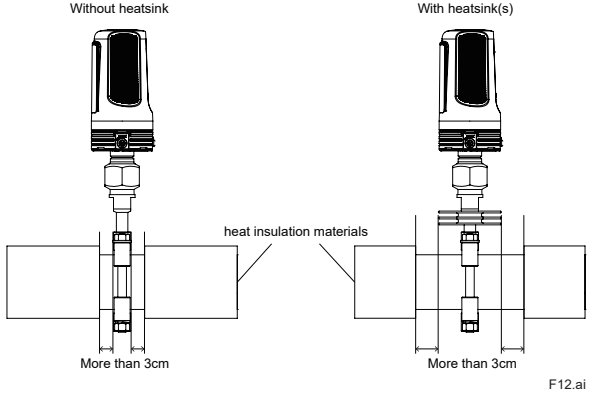


Figure 4-7 Installation of insulation

4.2.4 Mounting Angle

The mounting angle of the XS822 varies depending on Process Temperature.

■ Process Temperature 160°C (320°F) or less

Installation is restricted to within ±135° from the vertical upward direction.

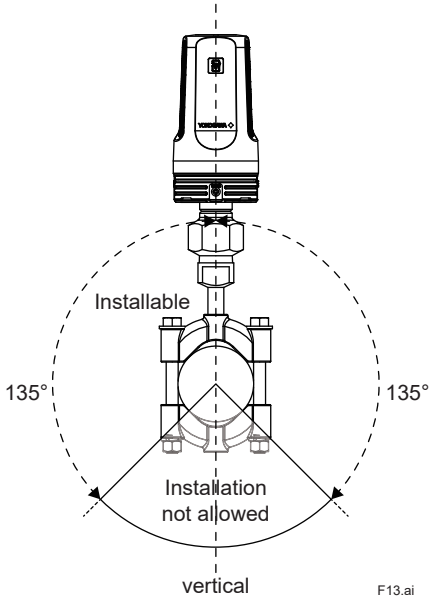


Figure 4-8 Mounting angle of process temperature 160°C (320°F) or less.

■ Process Temperature higher than 160°C (320°F)

Installation is restricted to within ±45° from the vertical upward direction.

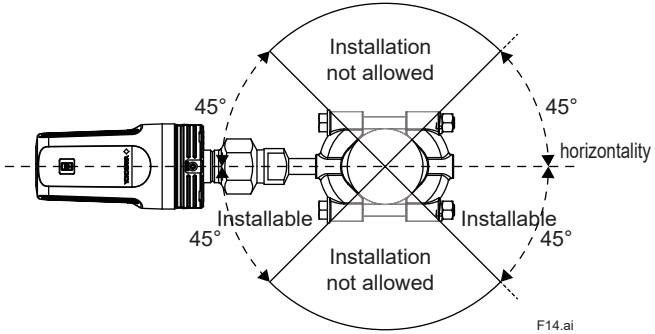


Figure 4-9 Mounting angle of process temperature higher than 160°C (320°F)

4.3 Grounding

Ensure continuity (resistance less than 0.2 MΩ) between the ground terminal of the XS822 and the ground pole. A grounding resistance of 100 Ω or less is recommended. If continuity between the ground terminal and the ground electrode cannot be achieved, use the specified cables. Do not share the ground wiring of the XS822 with other devices.

■ Applicable Cables

Insulated cables for industrial equipment such as;

- 600 V polyvinyl chloride insulated wires (IV): JIS C3307
- Polyvinyl chloride insulated wires for electrical apparatus (KIV): JIS C3316
- 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV): JIS C3317
- Heatproof vinyl insulated wires VW-1 (UL 1015/UL 1007)

Wire size

- Core: AWG 14 to 13 (2 to 2.6 mm2)

Termination

- Use a round crimp terminal for M4 terminals with an insulation sleeve.

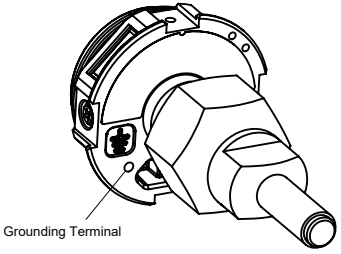


Figure 4-10 Ground terminal of XS822

WARNING

Grounding is required for safe operation.

5. Operation

5.1 Preparation for Starting Operation

NOTE

Install the XS110A before using the product. For detailed instructions on mounting the XS110A, refer to section 4.2.1, “Mounting with XS110A.”

(1) Confirmation of installation

This product complies with the specifications outlined in Chapter 4, “Installation.” Ensure it is properly attached.

(2) Checking the Firmware

Ensure the Sushi Sensor has the latest firmware. For instructions on checking and updating the firmware, refer to “IM01W06C01-01EN.”

5.2 Cold Detection Temperature Setting

Once the preparation for starting operation is complete, set the cold detection temperature. For detailed instructions on how to set it, refer to “IM01W06C01-01EN.”

5.3 Start of operation

Confirm that installation, wiring, network settings and operation of the product are correct before starting operation.

5.4 Shutting down

To stop operation, either remove the XS110A or set the XS822 to OFF mode.

NOTE

- To stop operation for an extended period, remove the XS822 from the process line.
- Refer to “IM01W06D01-01EN” for instructions on removing the battery.
- When storing the XS110A with the battery installed, it is recommended to set the product to OFF mode to prevent battery depletion. For instructions on switching to OFF mode, refer to “IM01W06C01-01EN.”

6. Maintenance

6.1 Overview

This chapter outlines the necessary maintenance procedures for the product. Please read the explanations of the following items carefully and handle them correctly. When replacing the equipment, ensure you thoroughly understand and properly follow the instructions for each item.

6.2 Replacing the XS110A

When replacing the XS110A, follow these steps. The XS110A can be replaced while the XS822 remains mounted on the piping:

(1) Remove the XS110A from the XS822 (Refer to Chapter 4).
(2) Attach the battery to the new XS110A.
(3) Mount the new XS110A on the XS822 (Refer to Chapter 4).

For detailed instructions on mounting and removing the XS110A, refer to "IM01W06D01-01EN."

6.3 Replacing the XS822

When replacing the XS822, follow these steps:

(1) Import the XS822 setting using the Sushi Sensor App.
(2) Remove the installed XS822. If heat dissipating parts are installed, remove them as well. (Refer to Chapter 4).
(3) Detach the XS110A from the old XS822 and attach it to the new XS822 (Refer to Chapter 4).
(4) Export the settings acquired in step (1) to the new XS822.
(5) Configure the network settings for the new XS822.
(6) Install the new XS822 at the location (Refer to Chapter 4).

For detailed instructions on setting up the XS822 and using the Sushi Sensor App, refer to "IM01W06C01-01EN."

7. Action after condition detection

After the XS822 detects the steam trap condition, use the table below to inspect the steam trap and surrounding facilities.

For instructions on checking the steam trap condition with the Sushi Sensor App and the communication format of the data, refer to “IM 01W06C01-01JA.”

Table 7.1 Action List After Condition Detection

Steam trap condition	Possible causes	Action
Good	-	None
Cold	Strainer or piping is clogged with debris.	Clean or replace strainer or piping.
	Outlet oriphice is clogged with debris.	Disassemble and clean or replace the steam trap.
	Back pressure (outlet side pressure) is high and the steam trap is not operating at the Maximum Allowable Operating Pressure Differential.	Lower the back pressure or replace the steam trap.
	The steam trap has exceeded its service life and is deteriorating over time.	Replace the steam trap.
	Valve in front of steam trap is closed.	None
	Boiler not in use	None
Blow through	Debris is entrapped in the valve.	Disassemble and clean the steam trap.
	More condensate is flowing into the steam trap than the steam trap allows.	Ensure that the product of the condensate amount and the safety factor does not surpass the steam trap’s discharge capacity*. * Steam trap discharge capacity (kg/h) > Condensate generation amount (kg/h) x safety factor
	The steam trap has exceeded its service life and is deteriorating over time.	Replace the steam trap.

8. General Specifications

Refer to GS 01W06G01-01EN for the latest information.

8.1 Standard Specifications

■ Measurement Range

Maximum Steam Temperature:

440°C (824°F)*

* The combination of heat dissipating parts varies with the steam temperature.

Minimum Steam Pressure:

100 kPa (14.5 psi)

■ PERFORMANCE SPECIFICATIONS

Temperature Sensor:

Measuring range: -40 to +200°C (–40 to 392°F)

Resolution: 1°C

Update Period:

1 minute to 3 days*

* This refers to the wireless transmission cycle. For the measurement cycle, please refer to the "Steam trap condition detection function".

Battery Characteristics:

Battery life is 10 years under the following conditions*

- Ambient temperature: 23 ± 2°C (73.4±3.6°F)
- Update Period: 1 hour

* Environmental condition such as vibration may affect the battery life.

■ FUNCTIONAL SPECIFICATIONS

Steam trap condition detection function:

Detects the conditions of steam traps (Good, Cold, Blow through) every hour.

Output:

Steam trap condition (Good, Cold, Blow through), Temperature

Diagnostic Function:

sensor failure, temperature sensor over-range, memory failure

■ INSTALLATION EMVIRONMENT

Ambient Temperature Limits:

Operating: –40 to 70°C (–40 to 158°F)

Storage: –40 to 85°C (–40 to 185°F)

Ambient Humidity Limits:

0 to 100%RH (non-condensation)

Altitude:

[Type Code: 00] Up to 3,000 m

[Type Code: K2, S2] Up to 2,000 m* (80 kPa to 110 kPa)

*: Ta : over 10°C

Vibration Resistance:

0.07 mmP-P(10 to 60 Hz)

1 G (60 Hz to 2 kHz)

Shock Resistance:

50 G 11 ms

■ PHYSICAL SPECIFICAITONS

Housing Material:

Stainless Steel

Weight:

630 g (Waveguide and heat dissipating parts not included)

Mounting:

Refer to “MODEL AND SUFFIX CODES.”

8.2 MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
XS822		Steam Trap Monitoring Module
Inter-module communication	-A	Digital communication for XS-series
Area	2	Europe EU868
	3	North America US915
	4	Malaysia, Singapore, Thailand AS923-1
	H	Saudi Arabia EU868
Type	00	General Purpose*1
	K2	ATEX intrinsic safety*2
	S2	IECEx intrinsic safety*3
—	-A	Always A
Housing material	6	Stainless Steel
Process Temperature*4	M	Up to 195°C (383°F)
	H	Up to 255°C (491°F)
	E	Up to 440°C (824°F)
—	A	Always A
Waveguide*5	0	None*6
	-1	Pipe Size 1/2" or 3/4"
	-2	Pipe Size 1"
	-3	Pipe Size 1 1/4"
	-4	Pipe Size 1 1/2"
	-5	Pipe Size 2"
—	A	Always A

*1: Applicable when Area Code is 2 or 3.
*2: Applicable when Area Code is 2 , 4 or H.
*3: Applicable when Area Code is 4 or H.
*4: The required heat dissipating parts for the selected Process Temperature Code are included as standard.
*5: For installation on pipes larger than 2", please contact us.
*6: If select Waveguide Code is None, be sure to arrange for the best waveguide for your installation.

8.3 OPTIONAL ACCESSORIES

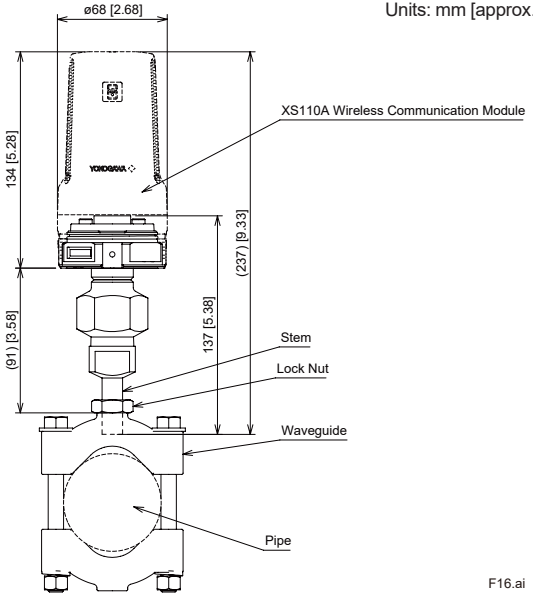
Item	Parts Number	Description
Protection Cap	F9097ND	Rubber protection cap*1
Waveguide 1/2" or 3/4"	F9097GH	316 SST or equivalent
Waveguide 1"	F9097GJ	316 SST or equivalent
Waveguide 1 1/4"	F9097GK	316 SST or equivalent
Waveguide 1 1/2"	F9097GL	316 SST or equivalent
Waveguide 2"*2	F9097GM	316 SST or equivalent
Heat sink	F9097GD	316 SST or equivalent
Heat sink extension bolt	F9097GE	316 SST or equivalent

*1: The protective cap temporarily shields the product's connector when the XS110A is detached from the XS822 for battery replacement or other purposes. Note that removing the XS110A compromises the product's waterproof and dustproof capabilities.
*2: For installation on pipes larger than 2", please contact us.

8.4 DIMENSIONS

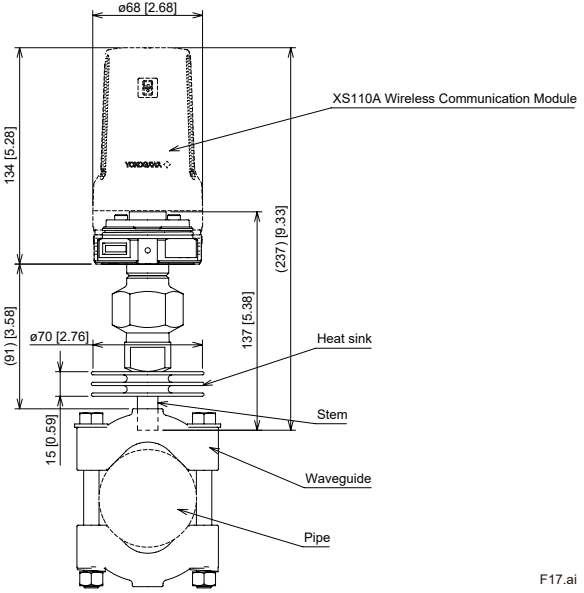
☐ Process Temperature Code M or for use at steam temperatures 195°C (383°F) or less

Units: mm [approx. inch]



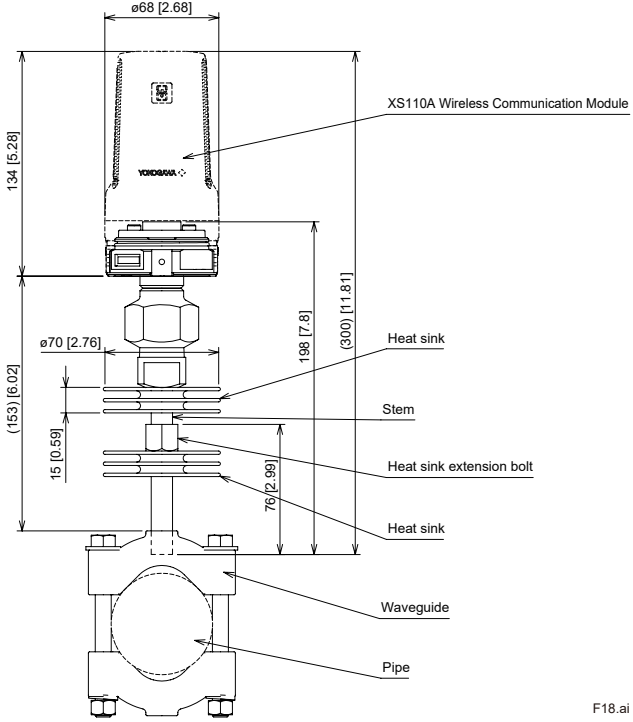
F16.ai

☐ Process Temperature Code H or for use at steam temperatures higher than 195°C (383°F) and 255°C (491°F) or less



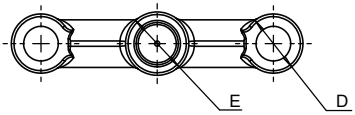
F17.ai

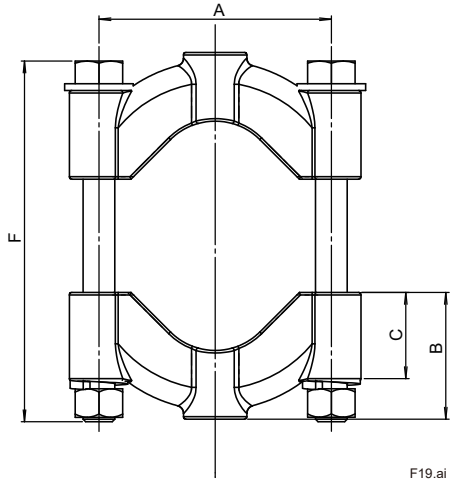
☐ Process Temperature Code E for use at steam temperatures higher than 255°C (491°F) and 440°C (824°F) or less



F18.ai

☐ Waveguide





F19.ai

Pipe Size	1/2" or 3/4"	1"	1 1/4"	1 1/2"	2"
Parts Num	F9097GH	F9097GJ	F9097GK	F9097GL	F9097GM
A	38 [1.55]	54 [2.20]	54 [2.20]	70 [2.86]	70 [2.86]
B	25 [1.02]	31 [1.27]	31 [1.27]	38 [1.55]	38 [1.55]
C	16 [0.65]	20 [0.82]	20 [0.82]	27 [1.10]	27 [1.10]
D	13 [0.53]	13 [0.53]	13 [0.53]	18 [0.74]	18 [0.74]
E	19 [0.77]	19 [0.77]	19 [0.77]	19 [0.77]	19 [0.77]
F	64 [2.61]	70 [2.88]	76 [3.10]	89 [3.63]	102 [4.12]

8.5 Regulatory Compliance Statements

This device meets the specified standards.

*: Please verify that the installation area complies with the relevant standards. For further regulatory information and approvals, contact a Yokogawa representative.

CE Conformity*1:

The Authorized Representative for this product in the EEA is:
Yokogawa Europe B.V. Euroweg 2, 3825 HD Amersfoort, THE NETHERLANDS.

EU RoHS Directive compliant.

EMC Directive: EN 61326-1 Class A Table 2, EN 61326-2-3,
EN 55011 Class A Group 1

*1: When area code is 4 or H(only Type = K2), CE mark is given on the marking. When area code is 4 or H, it cannot be used in Europe Economics Area.

CAUTION

- This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.
- This instrument complies with the EMC standard under specific conditions. If the installation, wiring, and so on are not accordance with this manual, the compliance conditions of the EMC standard may not be complied. Please conduct installation, wiring, and so on accordance with this manual.

Other Normative Standards:

Safety: EN61010-1 (Indoor/Outdoor use)

(1) Pollution Degree 2

"Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation must be expected.

(2) Installation Category I
"Overvoltage category (Installation category)" describes a number which defines a transient overvoltage condition. It implies the regulation for impulse with stand voltage. "I" applies to electrical equipment which is supplied from the circuit when appropriate transient overvoltage control means (interfaces) are provided.

The full text of the EU declaration of conformity is available at the following internet address:
https://myportal.yokogawa.com/

Canadian Safety Standards:
CAN/CSA-C22.2 No.61010-1
CSA-C22.2 No.94.2
IEC 60529
Indoor/Outdoor use
Pollution degree 2
Overvoltage category I

Degrees of Protection:
IP66/IP67 and Type 4X apply when connected to the XS110A.

Revision Information

Title : XS822 Steam Trap Monitoring Module

Manual No. : IM 01W06G01-01EN

Edition No.	Date	Page	Revision Item
1st	Nov. 2024	-	New publication
2nd	Jan. 2025	2-8, 2-9, 2-10, 8-1, 8-3, 8-8, 8-9	Add EU,North America and IECEx intrinsic safety
		2-5, 8-6	Correction of words
3rd	Mar. 2025	Table 2.1	Add Waveguide description to the list

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Printed in Japan