General Specifications

XS530
Pressure Measurement Module

Sushi Sensor

GS 01W06F01-01EN

■ GENERAL

This General Specifications (GS) describes the specifications for Pressure Measurement Module.

The XS530 Pressure Measurement Module has the function of measuring the gauge pressure of gases and liquids in a piping. This product acts as a wireless pressure sensor in combination with "XS110A Wireless Communication Module" and it is suitable for Industrial IoT (IIoT) applications. The electrical power of the XS530 Pressure Measurement Module is supplied through the XS110A.

Monitoring gauge pressure from a remote location reduces operator rounds.

Refer to General Specifications of "XS110A Wireless Communication Module" for details of wireless features.

■ FEATURES

- **Pressure Sensors for Industrial IoT**

In combination with XS110A Wireless Communication Modules, this module acts as battery-powered wireless pressure sensors with an environmental resistance for industrial use. This product designs to realize easy installation for a production site to support direct installation into a piping and wetted material has highly resistant to corrosion.

- **Modular Structure**

The module structure enables replacing the battery without removing the measurement module from the piping, and it makes smooth maintenance of the sensor.

- **Supporting Hazardous Location Installation**

The XS530 in combination with XS110A can be installed in hazardous areas, such as petrochemical plants, paint plants, steel plants, where flammable gas or vapor may exist.

- **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

☐ MEASUREMENT RANGE

Pressure:

	Range	Measurement Range	Maximum Pressure
Gauge Pressure*1	-E	−0.1 to 5 MPa*2 (−14.5 to 720 psi)	7.5 MPa (1080 psi)
	-H, -S	−0.1 to 35 MPa*2 (−14.5 to 5070 psi)	50 MPa (7250 psi)

*1: Pressure measurement span cannot be changed
*2: Refer to Fig.1 if the pressure is below atmospheric pressure.

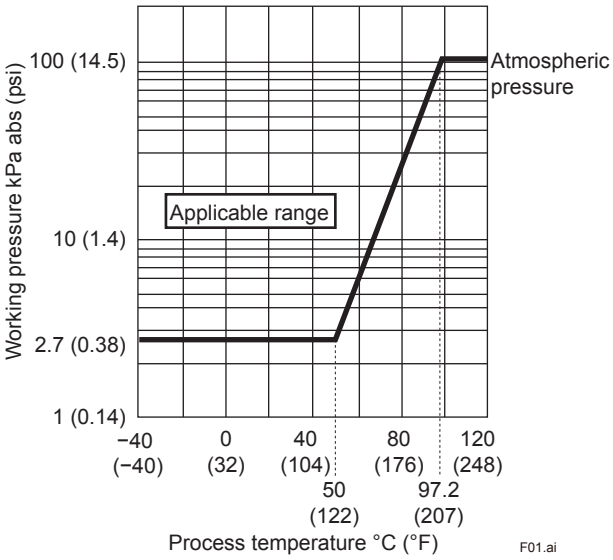

Fig.1 Working Pressure and Process Temperature

Temperature:
–40 to 85°C (–40 to 185°F)

☐ PERFORMANCE SPECIFICATIONS

Measurement Accuracy:
Pressure*1: ± 0.25% of Full scale
Temperature: ± 5°C typ.
*1 Measurement Accuracy will be changed when electromagnetic noise applied.

YOKOGAWA

Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Tel.: 81-422-52-5885 Fax.: 81-422-52-2102

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Ambient Temperature Effects (Zero Shift):
± 0.02% of Full scale/°C

Stability (Measurement Range: -H, -S)
± 0.3% of Full Scale Typical* (First year)
*: When 17.5 MPa is applied continuously

Attitude Error:
About 300 Pa/90°
Rotation in diaphragm plane has no effect.

Atmospheric Pressure Fluctuation Error
Range Code: -E
0.02% of Full scale/1 kPa
Range Code: -H, -S
0.003% of Full scale/1 kPa

Temperature Measurement Unit:
internal sensor of the Pressure Measurement Module

Update Period:
1 minute to 3 days

Battery Characteristics:
Battery life is 10 years under the following conditions*
• Ambient temperature: 23 ± 2°C
• Update Period: 1 hour
* Environmental condition such as vibration may affect the battery life.

☐ FUNCTIONAL SPECIFICATION

Fluid to be Measured:
Gas, Liquid

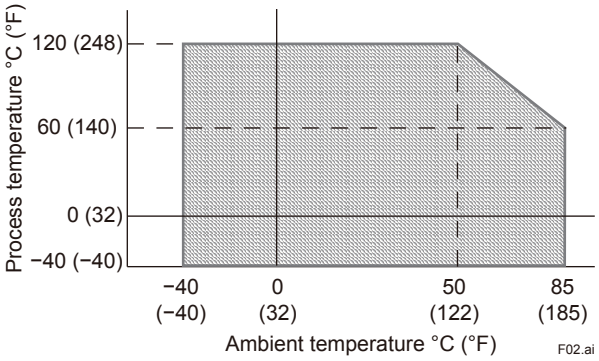
Zero-point Adjustment:
Conducted by Sushi Sensor App.

Diagnostic Function:
Memory failure, sensor failure, sensor
Measurement value error, input adjustment error

☐ INSTALLATION ENVIRONMENT

Ambient Temperature Limits:
Operating: –40 to 85°C (–40 to 185°F)
Storage: –40 to 85°C (–40 to 185°F)

Process Temperature Limits:
–40 to 120°C (–40 to 248°F)



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

Temperature Gradient:
Operating: Within ± 10°C/h
Storage: Within ± 20°C/h

Altitude:
[Type Code: 00] Up to 3000 m
[Type Code: K2, S2, F1, C1, P1, U1]
80 to 110 kPa (Up to 2000 m*)
*: Ta : over 10°C

Vibration Resistance:
0.21 mmP-P (10 to 60 Hz),
3 G (60 to 2 kHz)

Shock Resistance:
50 G 11 ms

☐ REGULATORY COMPLIANCE STATEMENTS

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

CE Conformity:
EMC Directive:
EN61326-1 Class A Table 2, EN61326-2-3, EN55011 Class A
ATEX Intrinsic Safety:
Refer to Table 1.
European Pressure Equipment Directive:
(Measurement Range: -S)
PED 2014/68/EU
Category: III, Module: H, Type of Equipment: Pressure accessory - Vessel, Type of Fluid: Liquid and Gas, Group of Fluid: 1 and 2
EU RoHS Directive compliant
Other Normative Standards:
Safety: EN61010-1 (Indoor/Outdoor use)

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

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

KC Marking:
Trade Name: Yokogawa Electric Corp.
Equipment Name: Pressure Measurement Module
Manufacturer: Yokogawa Electric Corp.

☐ PHYSICAL SPECIFICATION

Process Connection:
Refer to “MODEL AND SUFFIX CODES.”

Housing Material:
Stainless Steel

Material of Process Connection:
Diaphragm: Hastelloy C-276*1
Process Connector: 316L SST*2
*1: Hastelloy C-276 or ASTM N 10276 (equivalent to Hastelloy C -276)
*2: 316L SST or ASTM grade 316L

Weight:
600 g (1.32 lb)

Mounting:
Refer to “MODEL AND SUFFIX CODES.”

Table 1 Specification for explosion protected type

Item	Description	Type
IECEx intrinsic safety	Certificate number: IECEx DEK 19.0027X Applicable 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 to 60°C (−40 to 140°F) Process temperature: −40 to 100°C (−40 to 212°F) Electrical parameters: Connector Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 3.9 µF, Li = 0 µH Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with XS110A.	**S2**
ATEX intrinsic safety	Certificate number: DEKRA 20ATEX0024 X Applicable standards: EN IEC 60079-0:2018, EN 60079-11:2012 Ex marking: Ⓔx II 2 G Ex ib IIC T4 Gb Ambient temperature: −40 to 60°C (−40 to 140°F) Process temperature: −40 to 100°C (−40 to 212°F) Electrical parameters: Connector Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 3.9 µF, Li = 0 µH Enclosure: IP66/IP67 in accordance with only EN 60529 when combined with XS110A.	**K2**
FM intrinsic safety	Certificate number: FM20US0109X Applicable standards: FM 3600:2018, FM 3610:2018, FM 3810:2018, ANSI/UL 60079-0 Ed. 7 (2019), ANSI/UL 60079-11 Ed. 6 (2018), ANSI/UL 61010-1 Ed. 3 (2012), NEMA 250:1991 Ex marking: IS CL I/II/III DIV 1 GP ABCDEFG T4, CL I ZN 0 AEx ia IIC T4 Ga Ambient temperature: −40 to 60°C (−40 to 140°F) Process temperature: −40 to 100°C (−40 to 212°F) Electrical parameters: Connector Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 3.9 µF, Li = 0 µH Enclosure: Type 4X when combined with XS110A.	**F1**
CSA intrinsic safety	Certificate number: CSA21CA80063719X Applicable standards: C22.2 No. 60079-0:19, CAN/CSA-C22.2 No. 60079-11:14, CAN/CSA-C22.2 No. 61010-1-12, C22.2 No. 94.2-15 Ex marking: Ex ia IIC T4 Ga, IS CL I/II/III DIV 1 GP ABCDEFG T4 Ambient temperature: –40 to 60°C (–40 to 140°F) Process temperature: −40 to 100°C (−40 to 212°F) Electrical parameters: Connector Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 3.9 µF, Li = 0 µH Enclosure: Type 4X when combined with XS110A.	**C1**
South Korea intrinsic safety	Certificate number: 20-AV4BO-0550X (XS110A+XS530) Applicable standards: Notice of Ministry of Labor 2020-33 Harmonized with IEC 60079-0 Ed.7.0 (2017), IEC 60079-11 Ed.6.0 (2011) Ex marking: Ex ib IIC T4 Ambient temperature: −40 to 60°C Process temperature: −40 to 100°C Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with XS110A.	**P1**
INMETRO intrinsic safety	Certificate number: DEKRA 20.0013X Applicable standards: ABNT NBR IEC 60079-0:2020 ABNT NBR IEC 60079-11:2013 Versão Corrigida:2017 Ex marking: Ex ib IIC T4 Gb Ambient Temperature: –40 to 60ºC Process Temperature: –40 to 100ºC Electrical parameters: Connector Ui = 6.88 V, Ii = 1.54 A, Pi = 0.3 W, Ci = 3.9 µF, Li = 0 µH Enclosure: IP66/IP67 in accordance with ABNT NBR IEC 60529 when combined with XS110A.	**U1**

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
XS530		Pressure Measurement Module
Inter-module communication	-A	Digital communication for XS-series
Area	2	Europe EU868
	3	North America US915
	4	Singapore, Malaysia, Thailand AS923-1
	5	Australia, Chile AU915
	6	New Zealand AS923-1
	7	South Korea KR920
	9	Brazil AU915
	G	Argentina AU915
Type	00	General Purpose*1
	K2	ATEX intrinsic safety*2
	S2	IECEx intrinsic safety*3
	F1	FM intrinsic safety*4
	C1	CSA intrinsic safety*8
	P1	South Korea intrinsic safety*5
	U1	INMETRO intrinsic safety*6
Range	-E	–0.1 to 5 MPa
	-H	–0.1 to 35 MPa*7
	-S	–0.1 to 35 MPa (Compliance with category III of PED)*9
Housing material	6	Stainless Steel
Process connection	4	1/2 NPT female
	7	1/2 NPT male
—	A	Always A
Mounting bracket	-J	316 SST 2-inch Horizontal Pipe Mounting
	-K	316 SST 2-inch Vertical Pipe Mounting
	-N	None
—	A	Always A

*1: Applicable when Area Code is 2 or 3.
*2: Applicable when Area Code is 2 or 4.
*3: Applicable when Area Code is 4, 5, 6 or G.
*4: Applicable when area code is 3 and sales country is United States.
*5: Applicable when Area Code is 7.
*6: Applicable when Area Code is 9.
*7: Not Applicable for Area Code 2.
*8: Applicable when area code is 3 and sales country is Canada.
*9: Applicable when Area Code is 2.

■ OPTIONAL ACCESSORIES

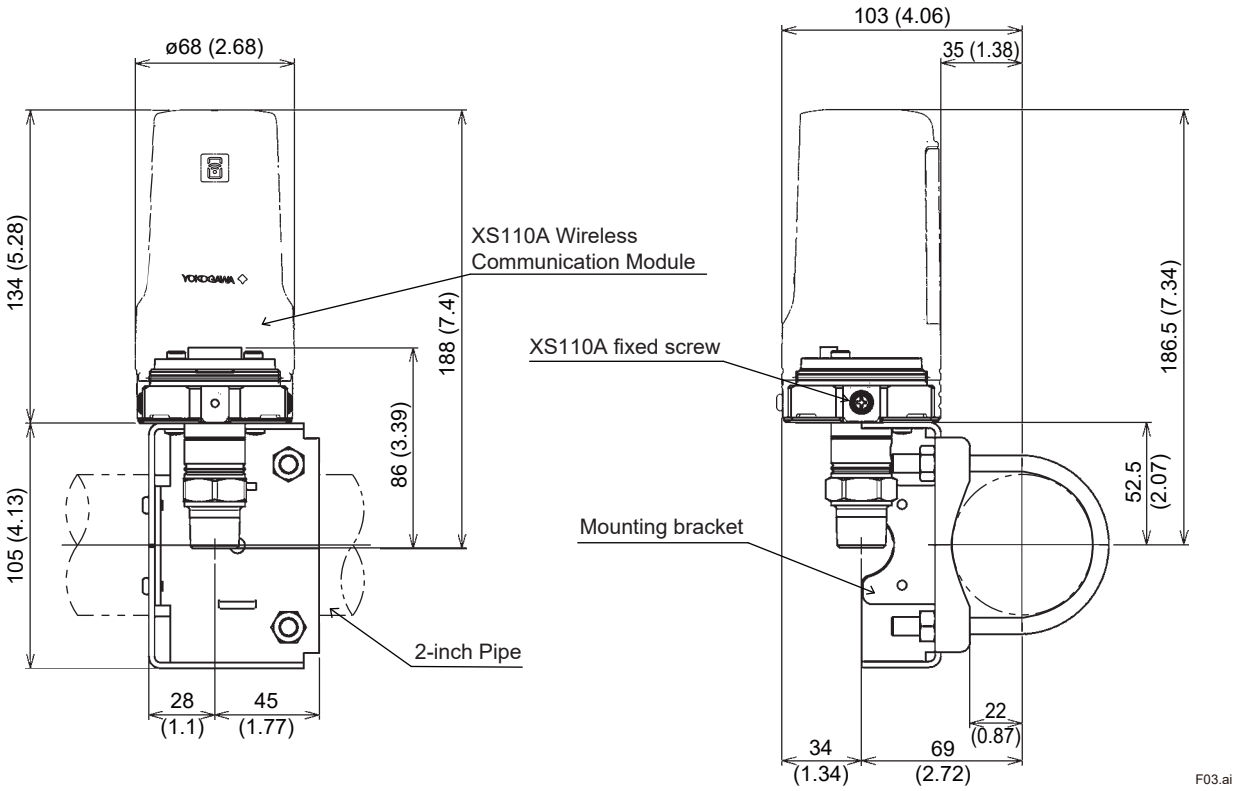
Item	Parts Number	Description
Protection Cap	F9097ND	Rubber protection cap*

* The protective cap is used to temporarily protect the connector of the product when the XS110A is removed from XS530 for battery replacement, etc. When the XS110A is removed from the product, waterproof and dustproof performance cannot be guaranteed.

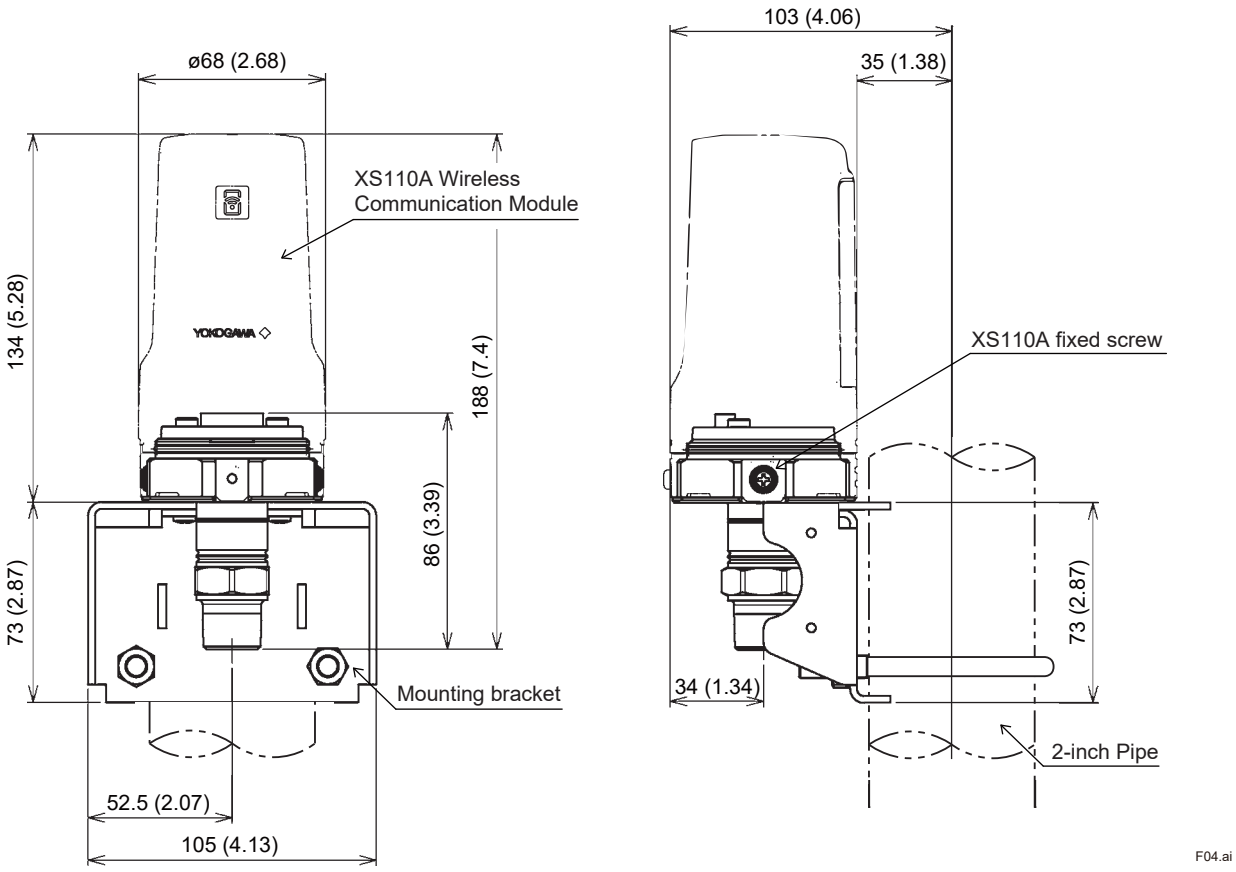
■ DIMENSIONS

● **2-inch Horizontal Pipe Mounting**

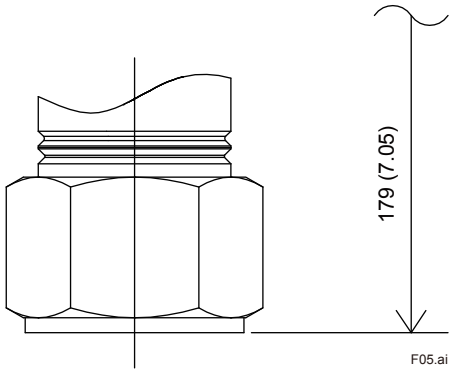
Unit: mm (approx. inch)



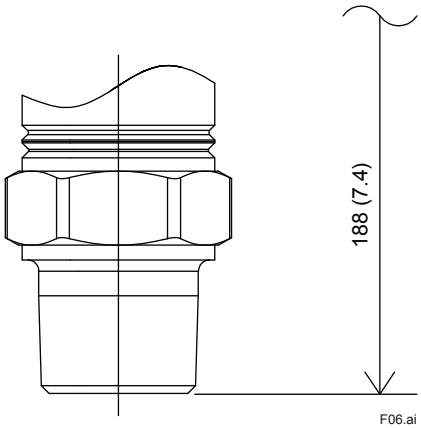
● **2-inch Vertical Pipe Mounting**



● **Process Connections: 1/2 NPT female (Process Connection Code 4)**



● **Process Connections: 1/2 NPT male (Process Connection Code 7)**



<Ordering Information>
1. Model, suffix codes, and option code

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<Related Products General Specifications>
XS110A Wireless Communication Module

Refer to GS 01W06D01-01EN

<Information on EU WEEE Directive>
EU WEEE (Waste Electrical and Electronic Equipment) Directive is only valid in the EU.
This instrument is intended to be sold and used only as a part of equipment which is excluded from WEEE Directive, such as large-scale stationary industrial tools, a large-scale fixed installation and so on, and, therefore, subjected to the exclusion from the scope of the WEEE Directive. The instrument should be disposed of in accordance with local and national legislation/regulations.