
**User's
Manual**

**FLXA202 / FLXA21
2-Wire Analyzer
Installation and Wiring
(Introduction and General Description)**

IM 12A01A03-01EN

Introduction

Thank you for purchasing the FLXA™ 202/FLXA™ 21 2-Wire Analyzer.

Please read the following respective documents before installing and using the FLXA202/FLXA21.

When the FLXA21 with the output of FOUNDATION Fieldbus or PROFIBUS PA Communication is used, please refer to the User's Manual, IM 12A01A02-71E or IM 12A01A02-72E, too.

The related documents are as follows.

General Specifications

Contents	Document number	Note
FLXA202 2-wire Analyzer	GS 12A01A03-01EN	For FLXA202. Online manual
FLXA21 2-wire Analyzer	GS 12A01A02-01E	For FLXA21. Online manual
FLXA21 2-wire Analyzer FOUNDATION Fieldbus Communication	GS 12A01A02-71E	For FLXA21. Online manual
FLXA21 2-wire Analyzer PROFIBUS PA Communication	GS 12A01A02-72E	For FLXA21. Online manual

* the "E" or "EN" in the document number is the language code.

User's Manual

Contents	Document number	Note
FLXA202/FLXA21 2-wire Analyzer Start-up Manual	IM 12A01A02-12E	Attached to the product, printed document
FLXA202/FLXA21 2-wire Analyzer Safety Precautions	IM 12A01A02-20E	For intrinsic safety, nonincendive and Increased Safety ec. Attached to the product, printed document
FLXA202/FLXA21 2-wire Analyzer Installation and Wiring	IM 12A01A03-01EN	Online manual (This manual)
FLXA202/FLXA21 2-wire Analyzer Operation of pH/ORP	IM 12A01A03-31EN	For pH/ORP (-P1) selection Online manual
FLXA202/FLXA21 2-wire Analyzer Operation of SC	IM 12A01A03-32EN	For Conductivity (SC) (-C1) selection Online manual
FLXA202/FLXA21 2-wire Analyzer Operation of ISC	IM 12A01A03-33EN	For Inductive conductivity (ISC) (-C5) selection Online manual
FLXA202/FLXA21 2-wire Analyzer Operation of DO	IM 12A01A03-34EN	For Dissolved oxygen (DO) (-D1) selection Online manual
FLXA202 2-wire Analyzer Operation of SENCOM SA-pH/ORP	IM 12A01A03-36EN	For pH/ORP of SENCOM SA (-S5) selection Online manual
FLXA202 2-wire Analyzer Operation of SENCOM SA-SC	IM 12A01A03-37EN	For Conductivity (SC) of SENCOM SA (-S5) selection Online manual
FLXA21 2-wire Analyzer FOUNDATION Fieldbus Communication	IM 12A01A02-71E	For FLXA21, output "-F" Online manual
FLXA21 2-wire Analyzer PROFIBUS PA Communication	IM 12A01A02-72E	For FLXA21, output "-P" Online manual

* The "E" or "EN" in the document number is the language code.

Note: Please read the Safety Precautions (IM 12A01A02-20E) before using the product.

The Safety Precautions includes Control Drawings of intrinsic safety, nonincendive and Increased Safety ec that describes specific condition for using FLXA202/FLXA21 in hazardous/classified location.

An exclusive User's Manual might be attached to the products whose suffix codes or option codes contain the code "Z" (made to customers' specifications). Please read it along with this manual.

Technical Information

Contents	Document number	Note
FLXA202 2-wire Analyzer Selection Guide for Intrinsic Safety type Associated Apparatus	TI 12A01A02-42EN	Online manual
FLXA202/FLXA21 2-Wire Analyzer HART Communication	TI 12A01A02-60E	Online manual

* The "E" or "EN" in the document number is the language code.

You can download the latest documents from our website. Scan QR code.

<http://www.yokogawa.com/an/flxa202/download/>



Read corresponding user's manual for details about sensors or other related products.

■ Notes on Handling User's Manuals

- Please hand over the user's manuals to your end users so that they can keep the user's manuals on hand for convenient reference.
- Please read the information thoroughly before using the product.
- The purpose of these user's manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.
- No part of the user's manuals may be transferred or reproduced without prior written consent from YOKOGAWA.
- YOKOGAWA reserves the right to make improvements in the user's manuals and product at any time, without notice or obligation.
- If you have any questions, or you find mistakes or omissions in the user's manuals, please contact our sales representative or your local distributor.

■ Drawing Conventions

Some drawings may be partially emphasized, simplified, or omitted, for the convenience of description.

Some screen images depicted in the user's manual may have different display positions or character types (e.g., the upper / lower case). Also note that some of the images contained in this user's manual are display examples.

■ Composition of this User's Manual

The FLXA202/FLXA21 2-Wire Analyzer offers following measurements: pH/ORP (oxidation-reduction potential), conductivity (SC), inductive conductivity (ISC), dissolved oxygen (DO), pH/ORP with SA11 SENCOM™ Smart Adapter, SC with SA11 SENCOM Smart Adapter.

This document explains mainly about installation and wiring, or common information on each measurement.

For other information on operation, configuration or calibration, which varies depending on the specification, see the corresponding manuals titled "Operation of..." as shown in the next table.

Model	1st input code	Contents	Document number
FLXA202 FLXA21	All	Start-up Manual	IM 12A01A02-12E
FLXA202 FLXA21		Safety Precautions	IM 12A01A02-20E
FLXA202 FLXA21		Installation and Wiring (This manual)	IM 12A01A03-01EN
FLXA202 FLXA21	-P1	Operation of pH/ORP	IM 12A01A03-31EN
FLXA202 FLXA21	-C1	Operation of SC	IM 12A01A03-32EN
FLXA202 FLXA21	-C5	Operation of ISC	IM 12A01A03-33EN
FLXA202 FLXA21	-D1	Operation of DO	IM 12A01A03-34EN
FLXA202	-S5	Operation of SENCOM SA-pH/ORP	IM 12A01A03-36EN
FLXA202	-S5	Operation of SENCOM SA-SC	IM 12A01A03-37EN
FLXA21		FOUNDATION Fieldbus Communication	IM 12A01A02-71E
FLXA21		PROFIBUS PA Communication	IM 12A01A02-72E

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We do not use TM or ® mark to indicate those trademarks or registered trademarks in this user's manual.

■ Terminology

SENCOM SA: SA11 SENCOM Smart Adapter, or pH/ORP sensors or conductivity (SC) sensors to which SA11 SENCOM SA is attached, including PH8E*P...V, FU20-VS, SC4AJ, SC8SG etc..

■ FLXA202/FLXA21's fonts

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FLXA202 / FLXA21

2-Wire Analyzer

Installation and Wiring

IM 12A01A03-01EN 11th Edition

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1. INTRODUCTION AND GENERAL DESCRIPTION

This manual describes how to use the FLXA202/FLXA21 with Yokogawa's or other companies' sensors. Please read carefully this manual and the instruction manual of the relevant sensor before using this instrument.

For the specifications of the FLXA202/FLXA21, please refer to the General Specifications. (GS 12A01A03-01EN, GS 12A01A02-01E)

The FLXA202/FLXA21 2-Wire Analyzer can perform 4 kinds of measurements – pH/ORP (oxidation-reduction potential), contacting conductivity (SC), inductive conductivity (ISC) or dissolved oxygen (DO) – with the respective sensor module.

Up to two analog sensors can be connected. (pH/ORP, SC, ISC)

For dual sensor measurement, the combination of two same type analog sensor inputs – pH/ORP and pH/ORP, SC and SC, and DO and DO – are available with two sensor modules.

In addition to conventional analog connections, digital sensor measurement using SA11 SENCOM Smart Adapter is available.

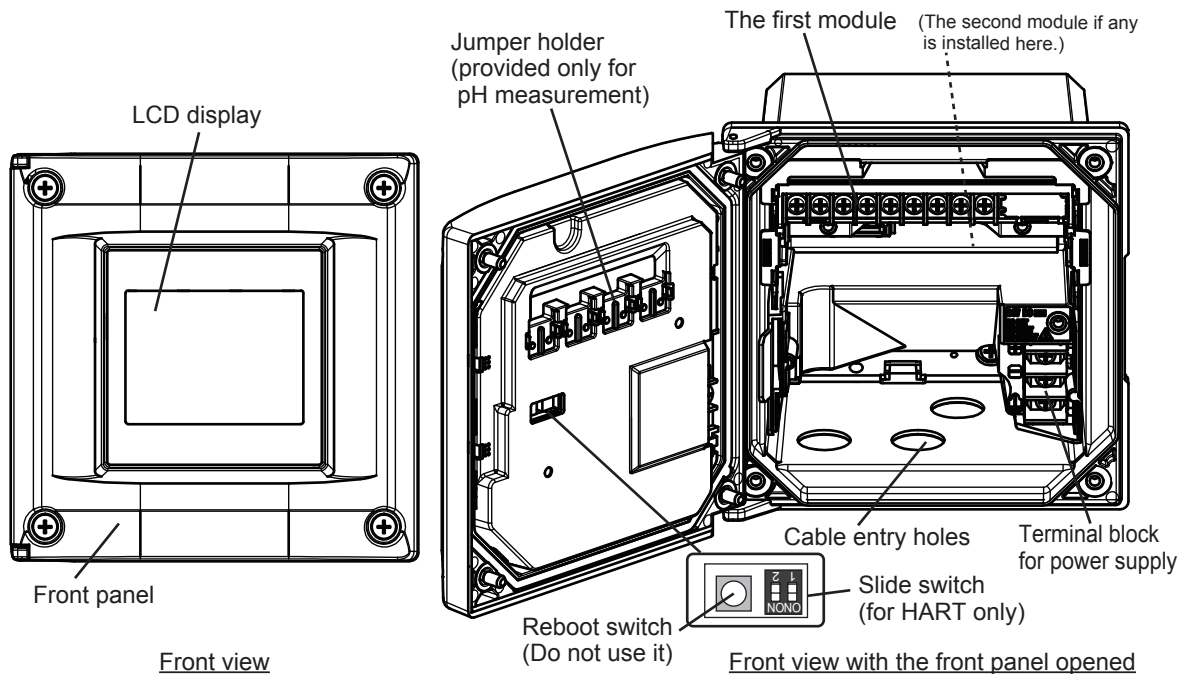


Figure 1.1 FLXA202 Parts names and descriptions

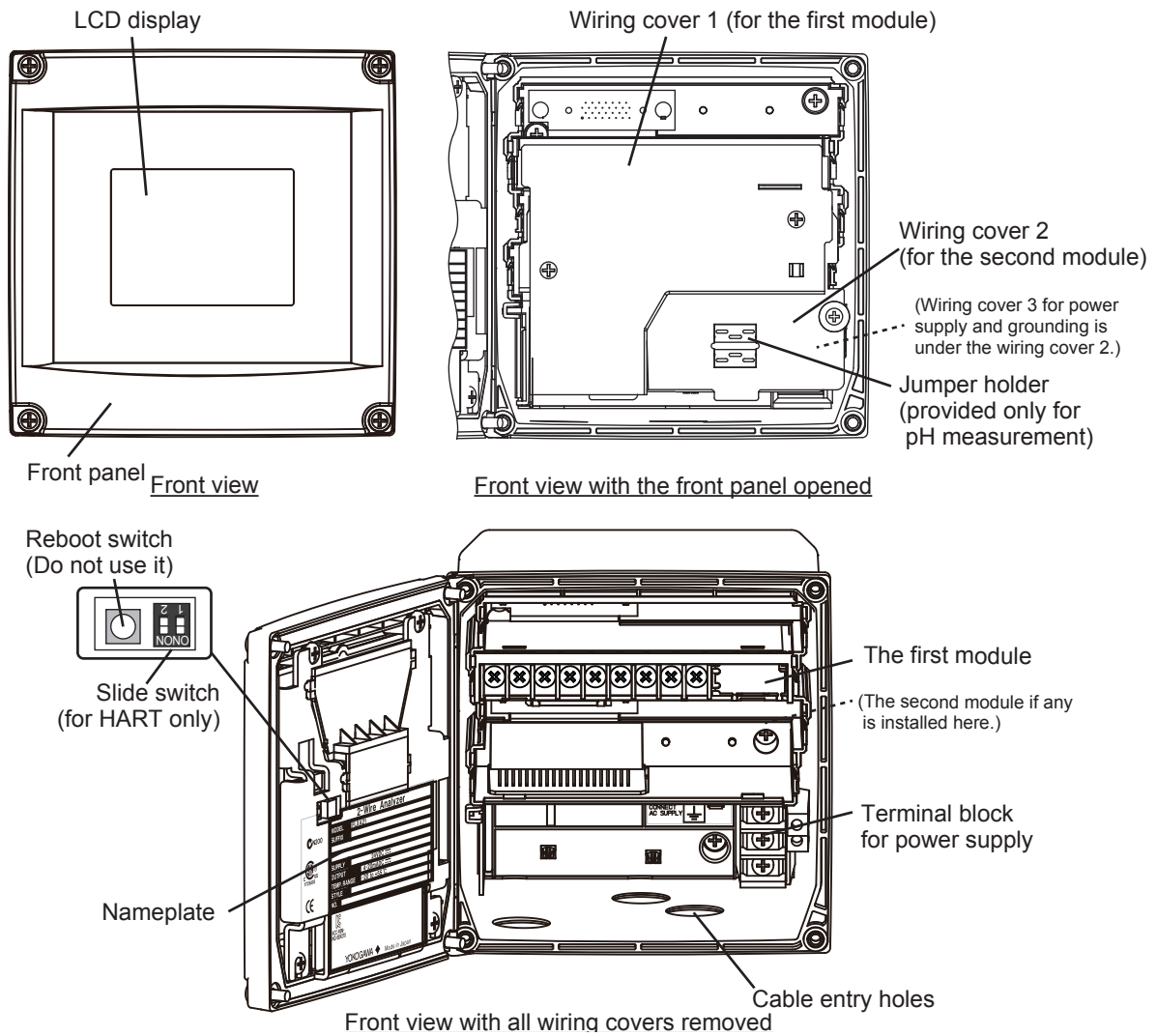


Figure 1.2 FLXA21 Parts names and descriptions

1.1 Instrument check

Upon delivery, unpack the instrument carefully and inspect it to ensure that it was not damaged during shipment. If damage is found, retain the original packing materials (including the outer box) and then immediately notify the carrier and the relevant Yokogawa sales office.

■ Checking the model and suffix code

● FLXA202

Make sure the model and suffix code on the nameplate affixed to the left side of the housing. Refer to 1.5 Model & Suffix Codes

NOTE

Be sure to apply correct power to the unit , as detailed on the nameplate.

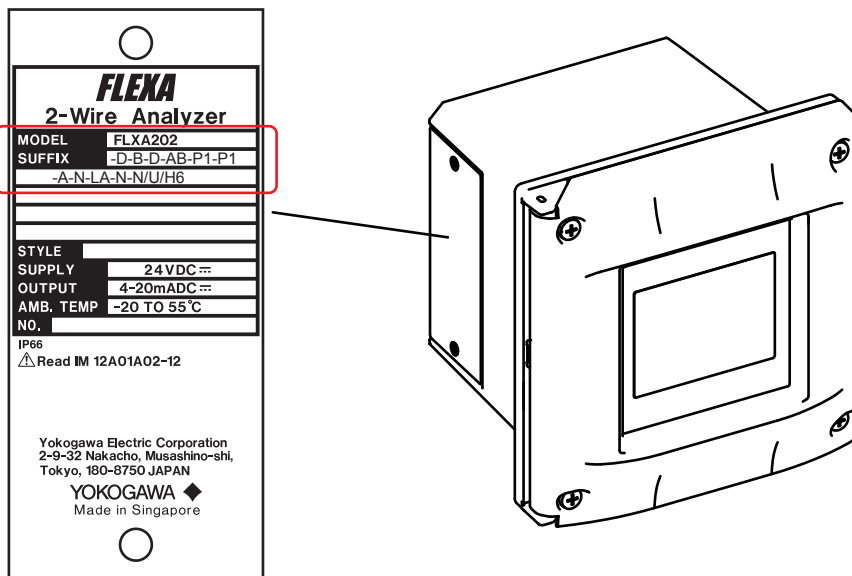


Figure 1.3 Example of nameplate (FLXA202)

● FLXA21

Loosen four front panel screws of the FLXA21, open the panel to the left, and make sure the model and suffix code on the nameplate affixed to the left side or inside of the housing agrees with your order. Refer to 1.5 Model & Suffix Codes

CAUTION

When you open the front panel, make sure the screws are completely out of the screw holes, and then open the front panel slowly in order not to damage the threaded parts on the housing. If the threaded parts are damaged and the screws cannot be tightened, the waterproof performance will deteriorate.

NOTE

Be careful not to lose the four front panel screws.

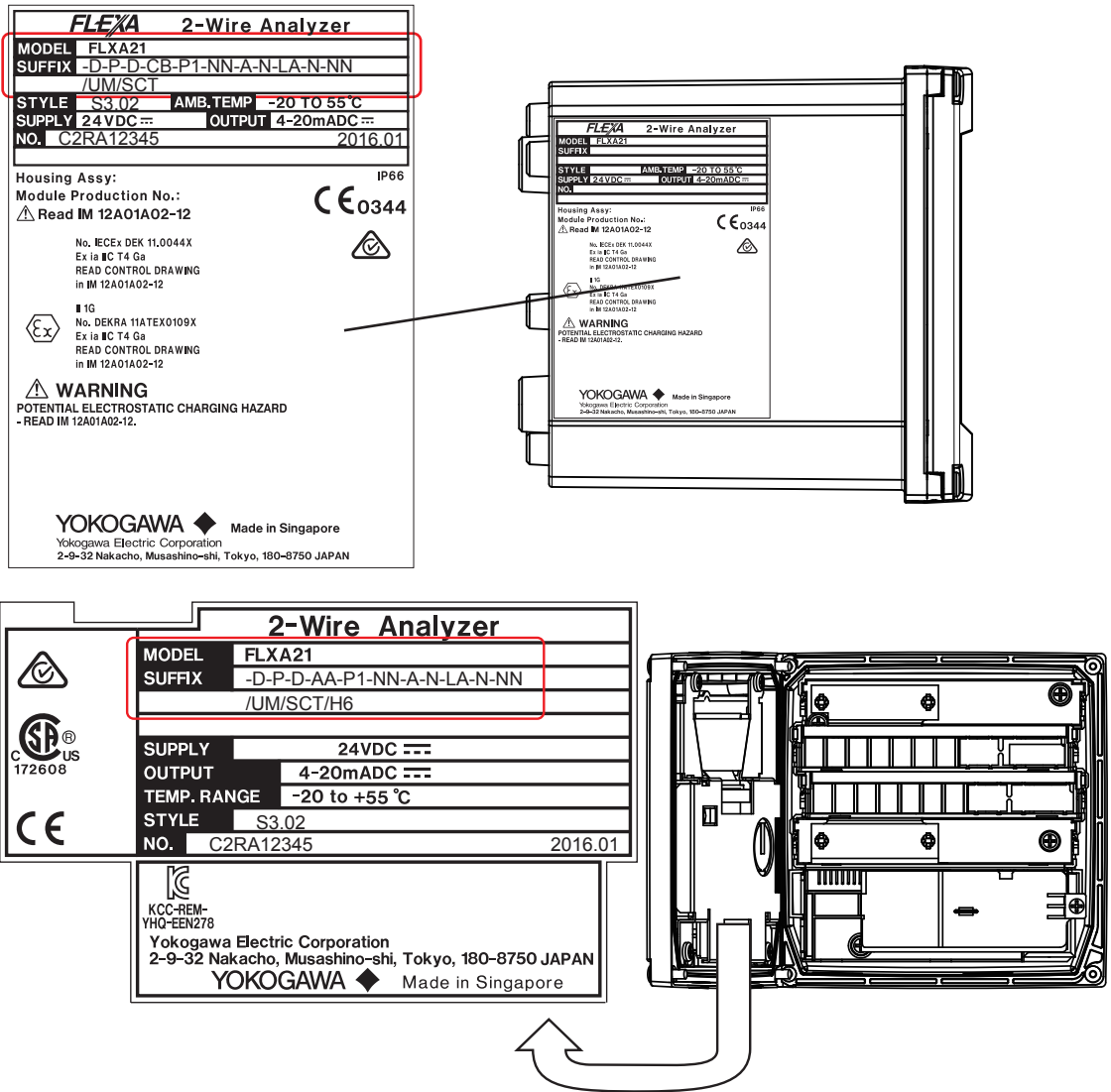


Figure 1.4 Example of nameplate (FLXA21)

● **Checking the accessories**

Make sure the accessories in Table 1.1 are included.

Table 1.1 Accessories

Product Name		Quantity	Remark
Cable glands	FLXA202	3 sets	One rubber plug attachment.
	FLXA21	3 or 4 sets	4 sets when 2 sensors are used. One grommet for grounding attachment.
pH analyzer (-P1)	Jumper	2 pcs/module	
	Grommet set	1 set/module	
SENCOM SA (-S5)	Grommet	1	
	Accessory	1 set	One shield bracket, 2 screws, 2 ferrite cores, 2 wiring bands
Option	Bracket	1 set	Option code /UM*, /U, /PM
	Sun shade hood	1 set	Option code /H6, /H7, /H8
	Tag plate	1	Option code /SCT
	Adapter for conduit work	3 or 4 sets	Option code /CB4, /CD4, /CF4 4 sets when FLXA21 are used.
Startup Manual		1 copy	
Safety Precautions		1 copy	For intrinsic safety, nonincendive and Increased Safety ec.

*: The universal mounting kit (/UM) contains the brackets for both /U and /PM options.

NOTE

Rule of The Serial Number is as follows.

The Serial Number is defined by nine (9) alphanumeric characters as follows.

X₁X₂Y₃M₄N₅N₆N₇N₈N₉ e.g. 92NA07704

X₁X₂: Production Site
 Y₃M₄: Year/Month code
 N₅N₆N₇N₈N₉: Tracking number

Table 1.2 Production year code

Year	Year code	Year	Year code	Year	Year code	Year	Year code
2010	K	2015	R	2020	W	2025	2
2011	L	2016	S	2021	X	2026	3
2012	M	2017	T	2022	Y	2027	4
2013	N	2018	U	2023	Z	2028	5
2014	P	2019	V	2024	1	2029	6

Table 1.3 Production month code

Month	Month code	Month	Month code	Month	Month code
January	1	May	5	September	9
February	2	June	6	October	A
March	3	July	7	November	B
April	4	August	8	December	C

1.2 Screen operation

CAUTION

Press the touch screen only with your finger. Do not use a tool with a sharp tip (ex. pencil, ballpoint pen), a thin stick, a tool with a hard tip etc. to avoid scratches on the touch screen.

Press the center of the icon or character to avoid wrong operation.

The main screen operations are as follows.

When you press any of the following icons on the screen, the screen changes to the respective display or executes the respective function.



Returns to the main display (or home display).



Returns to the previous display.



Moves the cursor for selecting the menu item. Pressing the icon moves the cursor down to the next item. When the cursor is on the item at the very bottom, the cursor jumps back to the item at the top.



Confirms the input; for example, the selected menu item or setting value.

NOTE

When no operation is performed for 10 minutes or 60 minutes (depending on the setting of “Auto Return”), the display except Trend display automatically changes to the Monitor display (or to the Main display or the Home display when the MONITOR display is disabled).

The figures in this section show the pH measurement for example.

Each display is different in details due to settings. Each display is only an example for some settings.

■ Monitor display



Figure 1.5 Example of monitor display

Monitor display

The Monitor display appears upon startup when the MONITOR display is enabled.

When the measurement value (primary value) on the main or home display is pressed, the monitor display appears.

- A: Measurement value
- B: Unit
- C: Sensor No.

■ Main display

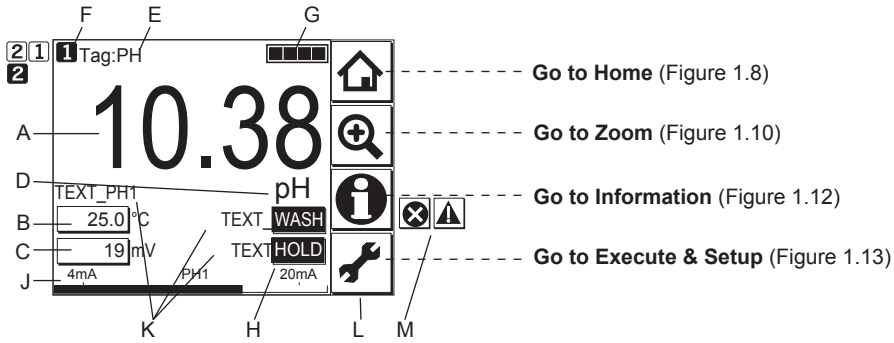


Figure 1.6 Example of main display

Main display

The Main display appears upon startup when one sensor is connected and the MONITOR display is disabled.

- A: Measurement value: Primary value (large characters/user selectable)
- B, C: Measurement value: Second and tertiary values (small characters)
- D: Unit for the primary value
- E: Tag No. (user programmable)
- F: Sensor No. *
- G: Sensor wellness indicator ** (More ■ indicate the better condition.)
- H: Hold/Wash indicators (appear only during the Hold/Wash operations)
- J: Analog output display and parameter * (ex.: PH1...PH=Parameter, 1=sensor number)
- K: Additional text (set in alphanumeric characters/user programmable)
- L: Function buttons (Home, Zoom, Status, Execute & Setup)
- M: Fault/Warning indicators (indicated in blinking only during Fault/Warning status)

- * Sensor No. of process parameter selected in Output setup (see the section of Output setup described in each corresponding operation manual) is indicated, for example 1. Right above the bar at the bottom of the Main display, the selected process parameter appears.
- ** Main display may not show the accurate sensor wellness immediately after the startup of the instrument. It takes about 10 minutes until the value is correctly reflected.

NOTE

Measurement values on the display can be set independent of the process parameter.

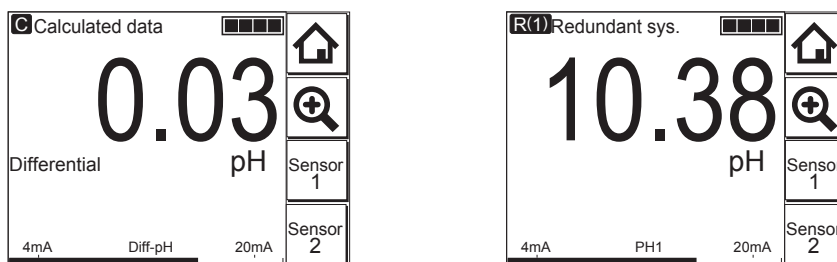


Figure 1.7 Example of calculated data and redundant system

■ Home display (when two sensors are connected)

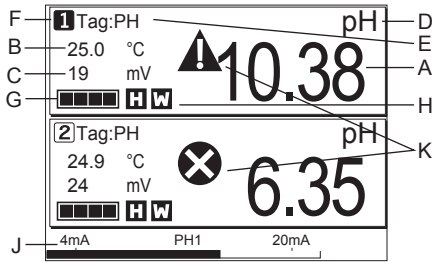


Figure 1.8 Example of home display

Home display

The Home display appears upon startup when two sensors are connected and the MONITOR display is disabled.

(Home display is not available when only one sensor is connected)

- A: Measurement value: Primary value (large characters/user selectable)
- B, C: Measurement value: Secondary and tertiary values (small characters)
- D: Unit for the primary value
- E: Tag No. (user programmable)
- F: Sensor No.
- G: Sensor wellness indicator (More ■ indicate the better condition.)
- H: Hold/Wash indicators (appear only during the Hold/Wash operations)
- J: Analog output display and parameter (e.g.: PH1...PH=Parameter, 1=sensor number)
- K: Fault/Warning indicators (indicated in blinking only during Fault/Warning status)

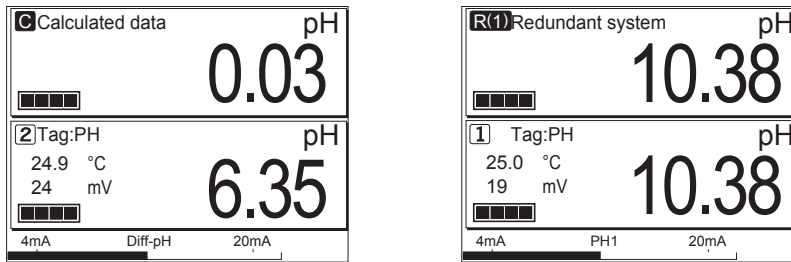


Figure 1.9 Example of home display of calculated data and redundant system

■ Zoom display 

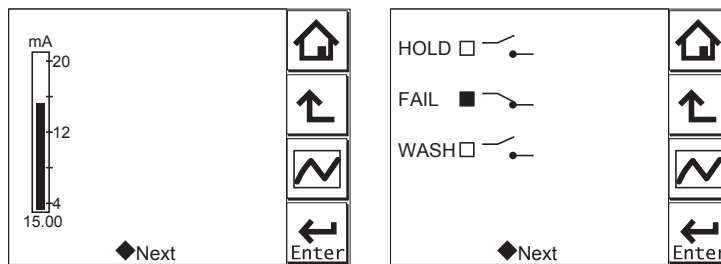


Figure 1.10 Example zoom display

The zoom display appears when the Zoom button on the main display is pressed.

The Zoom display shows an easy-to-read graphical display of the output status. Pressing Next displays the contact state if communication is set to PH201G distributor. Pressing Next again displays the status information of the instrument.

■ Trend display 

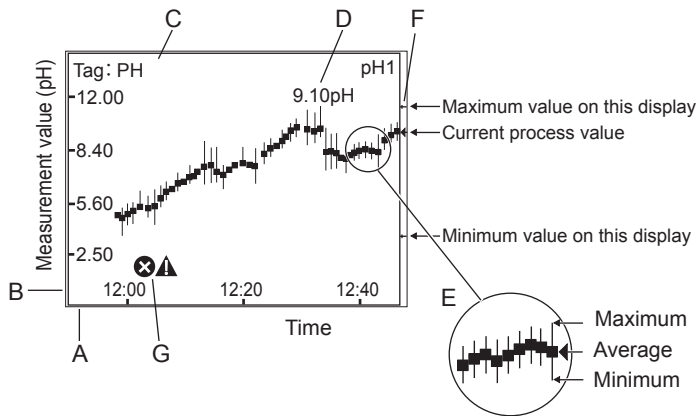


Figure 1.11 Example of trend display

Trend display

The Trend display appears when the Trend button on the Zoom display is pressed.

- A: X axis; Time axis (user programmable from 15 minutes to 14 days)
- B: Y axis; Measurement value axis (user programmable)
- C: Tag No.
- D: Current measurement value with unit
- E: Trend (maximum, minimum and average values during the display update time)
- F: Icon (current measurement value, and maximum and minimum values until the display update)
- G: Fault/Warning indicators (indicated in blinking only during Fault/Warning status)

■ Information button

Diagnosis information on converters and sensors appears.



No malfunction detected.



Warning

When a warning icon appears, maintenance is required. Pressing this icon displays an error message, and pressing the message displays the troubleshooting guidelines.



Fault

This icon indicates a malfunction. Pressing this icon displays an error message, and pressing the message displays the troubleshooting guidelines.

If "Burn" is set "Low" or "High" at Output setup, burnout is carried out.

For some errors concerned with setting, a message on the remedy can jump to the relevant setting directly.

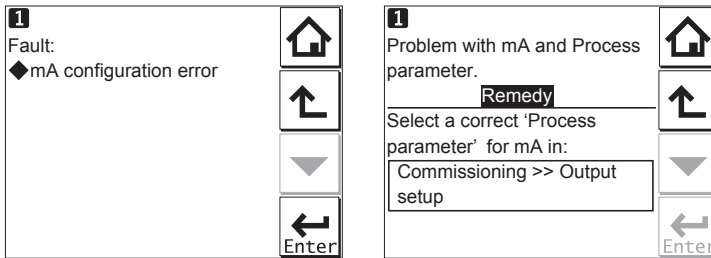


Figure 1.12 Example of jumping from remedy to setting

If neither a fault is detected nor warning is indicated, "Working properly" is displayed.

If a fault is detected or warning is indicated, up to 3 messages appear.

■ Execute & Setup

Allows you to calibrate and configure the instrument. These operations can be protected with a password.

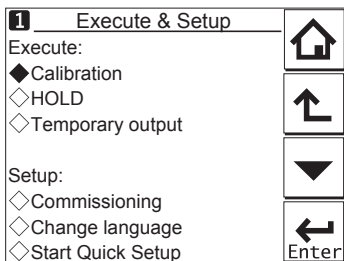


Figure 1.13 Example of Execute & Setup display

1.3 Passwords

Passwords can protect the FLXA202/FLXA21 from other persons' unauthorized access.

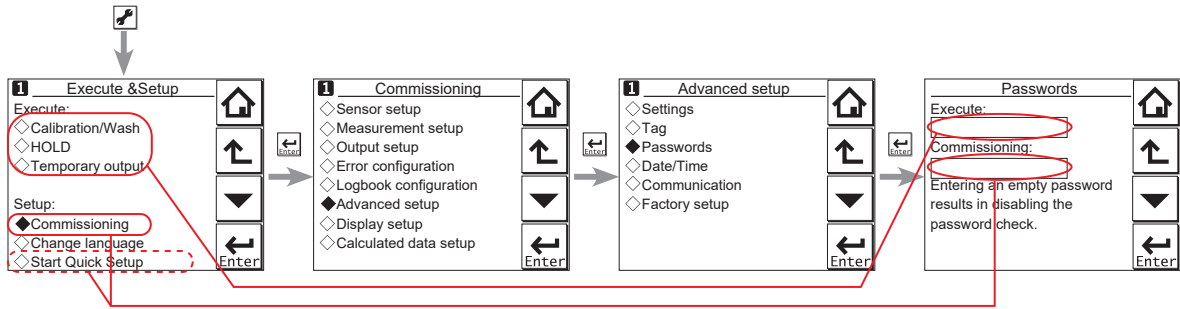


Figure 1.14 Example of passwords setting

You can establish separate password for “Execute: ” and “Commissioning: ”.

Password prompt shows up for each authentication as follows.

“Execute” password is required. “Calibration/Wash”, “Hold”, “Temporary output”

“Commissioning” password is required. “Commissioning”, “Start Quick Setup-Yes”

1.4 Regulatory Compliance

- Safety, EMC and RoHS Compliance (FLXA202/FLXA21)

Safety: UL 61010-1
 UL 61010-2-030
 CAN/CSA-C22.2 No.61010-1
 CAN/CSA-C22.2 No.61010-2-030
 EN 61010-1
 EN IEC 61010-2-030

EMC: EN61326-1 Class A, Table 2 (For use in industrial locations)
 Influence of immunity environment (Criteria A): Output shift is specified within ± 25% of F.S.

EN61326-2-3
 RCM: EN61326-1 Class A, Table 2
 Korea Electromagnetic Conformity Standard Class A 한국 전자파적합성 기준

A급 기기 (업무용 방송통신기자재)
 이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는
 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서
 사용하는 것을 목적으로 합니다.

Russian: TR CU 020/2011

RoHS: EN 50581: 2012 (FLXA202; Style 1.02 or newer, FLXA21; Style 3.03 or newer)

Installation altitude: 2000 m or less

Category based on IEC 61010: I (Note 1)


Pollution degree based on IEC 61010: 2 (Note 2)

Note 1: Installation category, called over-voltage category, specifies impulse withstand voltage.

Equipment with “Category I” (ex. two-wire transmitter) is used for connection to circuits in which measures are taken to limit transient over-voltages to an appropriately low level.

Note 2: Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.

● Explosion Protected Type Compliance

Item	Description	'Type' in MS code
Europe (ATEX)	FLXA202 and FLXA21: [Intrinsic safety "ia"] Applicable Standard: EN 60079-0: 2012 + A11: 2013, EN 60079-11: 2012 Certificate No: DEKRA 11ATEX0109X Marking/Rating:  II 1 G Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	-CB
International (IECEx)	FLXA202 and FLXA21: [Intrinsic safety "ia"] Applicable Standard: IEC 60079-0: 2011, IEC 60079-11: 2011 Certificate No: IECEx DEK 11.0044X Marking/Rating: Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	
United States (FM)	FLXA202 and FLXA21: [Intrinsically safe / Nonincendive] Applicable Standard: FM 3600, FM3610, FM3611, FM3810, NEMA 250, ANSI/UL 60079-0, ANSI/UL 60079-11, ANSI/UL 121201, ANSI/UL 61010-1, ANSI/UL 61010-2-030 Certificate No: FM20US0046X Marking/Rating: IS CL I DIV 1 GP ABCD T4, CL I ZN 0 AEx ia IIC T4 NI CL I DIV 2 GP ABCD T4, CL I ZN 2 IIC T4 T4: for ambient temperature: -20 to 55°C Enclosure: Type 4X Control Drawing: Refer to IM 12A01A02-20E	-CD
Canada (FM)	FLXA202 and FLXA21: [Intrinsically safe / Nonincendive] Applicable Standard: CAN/CSA-C22.2 No.94.2, CAN/CSA-C22.2 No.213, CSA-C22.2 No.60079-0, CAN/CSA-C22.2 No.60079-11, CAN/CSA-C22.2 No.61010-1, CAN/CSA-C22.2 No.61010-2-030 Certificate No: FM23CA0014X Marking/Rating: Ex ia IIC T4 Ga Intrinsically safe for Class I, Division 1, Groups A, B, C, D, T4 Nonincendive for Class I, Division 2, Groups A, B, C, D, T4 Ambient Temperature: -20 to 55°C Ambient Humidity: 0 – 100% (No Condensation) Enclosure: Type 4X Control Drawing: Refer to IM 12A01A02-20E	
United States (FM)	FLXA202 and FLXA21: [Nonincendive] Applicable Standard: FM 3600, FM3611, FM3810, NEMA 250, ANSI/UL 121201, ANSI/UL 61010-1, ANSI/UL 61010-2-030 Certificate No: FM20US0046X Marking/Rating: NI CL I DIV 2 GP ABCD T4, CL I ZN 2 IIC T4 T4: for ambient temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	-DD
Canada (FM)	FLXA202 and FLXA21: [Nonincendive] Applicable Standard: CAN/CSA-C22.2 No.94.2, CAN/CSA-C22.2 No.213, CAN/CSA-C22.2 No.61010-1, CAN/CSA-C22.2 No.61010-2-030 Certificate No: FM23CA0014X Marking/Rating: Nonincendive for Class I, Division 2, Groups A, B, C, D, T4 Ambient Temperature: -20 to 55°C Ambient Humidity: 0 – 100% (No Condensation) Enclosure: Type 4X Control Drawing: Refer to IM 12A01A02-20E	

Item	Description	'Type' in MS code
Europe (ATEX)	FLXA202: [Increased Safety 'ec'] Certificate: Not Applicable as per Annex VIII to ATEX 2014/34/EU Applicable Standard: EN IEC 60079-0, EN 60079-11, EN IEC 60079-7 Marking/Rating: Ex II 3 G Ex ec ic IIC T4 Gc Ambient Temperature: -20 to 55°C Enclosure: IP66 Control Drawing: Refer to IM 12A01A02-20E	-DB
International (IECEX)	FLXA202: [Increased Safety 'ec'] Applicable Standard: IEC 60079-0, IEC 60079-11, IEC 60079-7 Certificate No: IECEX DEK 16.0034X Marking/Rating: Ex ec ic IIC T4 Gc Ambient Temperature: -20 to 55°C Enclosure: IP66 Control Drawing: Refer to IM 12A01A02-20E	
China (NEPSI)	FLXA202 and FLXA21: [Intrinsic safety "ia"] Applicable Standard: GB/T 3836.1-2021, GB/T 3836.4-2021 Certificate No: GYJ22.3555X Marking/Rating: Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	-CH
Korea (KCs)	FLXA202: [Intrinsic safety "ia"] Applicable Standard: Notice of Ministry of Labor No. 2021-22 Certificate No: '1st input' in MS code -P1, -C1, -C5, -D1 : 21-KA4BO-0915X '1st input' in MS code -S5: 21-KA4BO-0917X Marking/Rating: Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	-CG
	FLXA21: [Intrinsic safety "ia"] Applicable Standard: Notice of Ministry of Labor No. 2021-22 Certificate No: 21-KA4BO-0915X Marking/Rating: Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Control Drawing: Refer to IM 12A01A02-20E	-EG

**WARNING****Installation and wiring**

The FLXA202/FLXA21 should only be used with equipment that meets the relevant IEC, American or Canadian standards. Yokogawa accepts no responsibility for the misuse of this unit.

**WARNING**

Don't install "general purpose type" instruments in the hazardous area.

**CAUTION**

The Instrument is packed carefully with shock absorbing materials, nevertheless, the instrument may be damaged or broken if subjected to strong shock, such as if the instrument is dropped. Handle with care.

**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.

**CAUTION**

When you open the front panel, make sure the screws are completely out of the screw holes, and then open the front panel slowly in order not to damage the threaded parts on the housing. If the threaded parts are damaged and the screws cannot be tightened, the waterproof performance will deteriorate.

**CAUTION**

The HART communication may be influenced by strong electromagnetic field. In this case another trial of the HART communication and/or operation with FLXA202/FLXA21 touch screen can be carried out.



WARNING

- Do not use an abrasive or organic solvent in cleaning the instrument.
 - Substitution of components may impair suitability for Division 2.
Do not remove or replace while circuit is live unless area is known to be non hazardous.
Explosion Hazard – Do not disconnect equipment unless area is known to be non hazardous.
Do not reset circuit breaker unless power has been removed from the equipment or the area is known to be non hazardous.
-



WARNING

Electrostatic discharge

The FLXA202/FLXA21 contains devices that can be damaged by electrostatic discharge. When servicing this equipment, please observe proper procedures to prevent such damage. Replacement components should be shipped in conductive packaging. Repair work should be done at grounded workstations using grounded soldering irons and wrist straps to avoid electrostatic discharge.

1.5 Model & Suffix Codes

● FLXA202

Model	Suffix code	Option code	Description
FLXA202	.....	.....	2-Wire Analyzer
Power supply	-D	.....	Always -D
Housing (*1)	-B	.....	Aluminum alloy cast + urethane coating
	-C	.....	Aluminum alloy cast + epoxy coating
	-D	.....	Aluminum alloy cast + high anti-corrosion coating
Display	-D	.....	Anti-glare LCD
Type (*2)	-AB	.....	General purpose for CE, RCM
	-AD	.....	General purpose for CSA
	-AG	.....	General purpose for KC
	-AQ	.....	General purpose for EAC with PA
	-AR	.....	General purpose for EAC
	-CB	.....	IS for ATEX, IECEx (*3)
	-CD	.....	IS for US, Canada (*4)
	-CF	.....	IS for Japan (*5)
	-CG	.....	IS for KCs (*6)
	-CH	.....	IS for NEPSI
	-CQ	.....	IS for EACEx with PA
	-CR	.....	IS for EACEx
	-DB	.....	Increased Safety ec for ATEX, IECEx
-DD	.....	NI for US, Canada	
1st input	-P1	.....	pH/ORP (*7)
	-C1	.....	Conductivity (SC) (*7)
	-C5	.....	Inductive conductivity (ISC)
	-D1	.....	Dissolved oxygen (DO)
	-S5	.....	SENCOM SA (SSA) (*8)
2nd input (*9)	-NN	.....	Without input
	-P1	.....	pH/ORP (*7)
	-C1	.....	Conductivity (SC) (*7)
	-D1	.....	Dissolved oxygen (DO)
Output	-A	.....	4-20 mA + HART
	-N	.....	Always -N
Language set (*10)	-LA	.....	English and 11 languages
Country (*11)	-N	.....	Global except Japan
	-J	.....	Japan
—	-NN	.....	Always -NN
Option	Mounting hardware	/UM	Universal mounting kit (*12)
		/U	Pipe and wall mounting hardware
		/PM	Panel mounting hardware
	Hood	/H6	Hood, stainless steel
		/H7	Hood, stainless steel + urethane coating
	Tag plate	/H8	Hood, stainless steel + epoxy coating
		/SCT	Stainless steel tag plate
	Conduit adapter (*9)	/CB4	G1/2 x 3 pcs
		/CD4	1/2NPT x 3 pcs
		/CF4	M20 x 1.5 x 3 pcs
		/CB5	G1/2 x 3 pcs for Increased Safety ec
/CD5		1/2NPT x 3 pcs for Increased Safety ec	
Measurement law	/CF5	M20 x 1.5 x 3 pcs for Increased Safety ec	
	/K	With Measurement Law certificate (*14)	

Notes:

- 1: Urethane coating is for acid resistance, and epoxy coating is for alkali resistance. For high anti-corrosion coating, both urethane coating and epoxy coating are applied.
- 2: Type “-C *” is intrinsic safety (IS), Type “-DB” is Increased Safety ec of ATEX and IECEx, Type “-DD” is nonincendive (NI) of US and Canada.
- 3: Product registration is done by Yokogawa Taiwan Corporation as an importer in Taiwan.
- 4: Type “-CD” is intrinsic safety, but is available as nonincendive.

- 5: For detailed information refer to Japanese GS 12A01A03-01JA.
- 6: Korean IM is attached to FLXA202 instead of English IM.
- 7: This input is to be come from an analog pH/ORP or Conductivity (SC) sensor.
- 8: SA11 SENCOM Smart Adapter enables digital measurement by connecting to dedicated sensor for pH/ORP or Conductivity (SC). When SENCOM SA is selected as 1st input, one sensor can be connected.
Multiple sensor connection is not available with BA11 Active Junction Box.
When selecting "-S5" as 1st input, only Type "-AB", "-AD" and "-AG" are available.
- 9: When a 2nd input is selected, only the same kind of the 1st input is available.
For example, when a 1st input is "-P1", the 2nd input must be the same "-P1".
The combination of ISC and ISC is not available.
- 10: These languages are message languages on the analyzer's display.
One analyzer has English and 11 languages.
All languages are as follows; English, Chinese, Czech, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian and Spanish.
- 11: When an analyzer is used in Japan, it must meet the Japanese Measurement Law, please select the "-J". Only SI units must be used on the analyzer and its documents in Japan.
- 12: The universal mounting kit contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).
- 13: "/CB5", "/CD5", "/CF5" are exclusively for type "-DB".
"/CB4", "/CD4", "/CF4" cannot be used with type "-DB".
"/CB4", "/CD4", "/CF4" can be used with other types of the analyzer except for "-DB"
- 14: The analyzer with Japanese Measurement Law certificate is available only for the following model;
FLXA202-D-[Housing code]-D-AB-P1-NN-A-N-LA-J-NN/[option code except /K]/K
Only one pH measurement is certified. The output signal of 4 - 20 mA is certified. HART communication is not certified.

● FLXA21

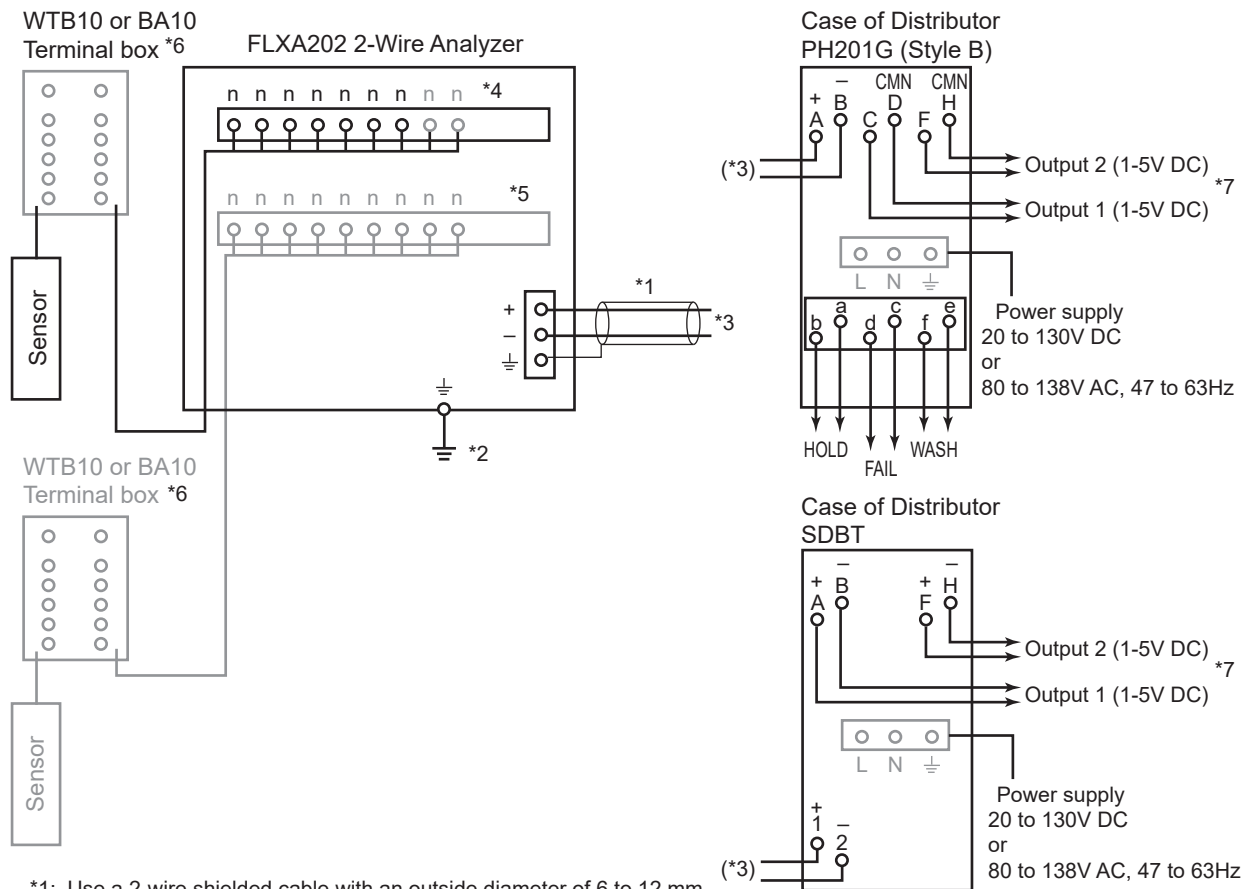
Model	Suffix code	Option code	Description
FLXA21	.....	.....	2-Wire Analyzer
Power supply	-D	.....	Always -D
Housing	-P	.....	Plastic
Display	-D	.....	Anti-glare LCD
Type	-AB -AD -AG -AQ -AR -CB -CD -CH -EG -EQ -ER -DD	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	General purpose for CE, RCM General purpose for CSA General purpose for KC General purpose for EAC with PA (*1) General purpose for EAC (*2) IS for ATEX, IEC Ex (*3) IS for US, Canada (*4) IS for NEPSI (*5) IS for KCs (*6) IS for EACEx with PA (*7) IS for EACEx (*8) NI for US, Canada (*9)
1st input	-P1 -C1 -C5 -D1	..... ..... ..... .....	pH/ORP Conductivity (SC) Inductive conductivity (ISC) Dissolved oxygen (DO)
2nd input (*10)	-NN -P1 -C1 -D1	..... ..... ..... .....	Without input pH/ORP Conductivity (SC) Dissolved oxygen (DO)
Output (*11)	-A	.....	4-20 mA + HART
—	-N	.....	Always -N
Language set (*12)	-LA	.....	English and 11 languages
Country (*13)	-N -J	..... .....	Global except Japan Japan
—	-NN	.....	Always -NN
Option	Mounting hardware Hood Tag plate Conduit adapter	/UM /U /PM /H6 /H7 /H8 /SCT /CB4 /CD4 /CF4	Universal mounting kit (*14) Pipe and wall mounting hardware Panel mounting hardware Hood, stainless steel Hood, stainless steel + urethane coating Hood, stainless steel + epoxy coating Stainless steel tag plate Conduit adapter (G1/2 x 4 pcs) Conduit adapter (1/2NPT x 4 pcs) Conduit adapter (M20 x 1.5 x 4 pcs)

Notes:

- 1: The type “-AQ” is General purpose type of EAC with Pattern Approval for Russia.
- 2: The type “-AR” is General purpose type of EAC for Kazakhstan and Belarus.
- 3: The type “-CB” intrinsic safety type of ATEX and IECEx. Temperature class is T4.
Product registration is done by Yokogawa Taiwan Corporation as an importer in Taiwan.
- 4: The type “-CD” is intrinsic safety of US and Canada, and non-incendive of US and Canada. Temperature classes are T4.
- 5: The type “-CH” intrinsic safety type for NEPSI. Temperature class is T4.
- 6: The type “-EG” intrinsic safety type of KCs for Korea. Temperature class is T4.
- 7: The type “-EQ” intrinsic safety type of EAC with Pattern Approval for Russia. Temperature class is T4.
- 8: The type “-ER” intrinsic safety type of EAC for Kazakhstan and Belarus. Temperature class is T4.
- 9: The type “-DD” nonincendive type for US. Temperature class is T4.
- 10: When a 2nd input is selected, only the same kind of the 1st input is available.
For example, when a 1st input is “-P1”, the 2nd input must be the same “-P1”.
The combination of ISC and ISC is not available.
- 11: The FLXA21 has other output types of “FOUNDATION Fieldbus” communication (suffix code: -F) and “PROFIBUS PA” communication (suffix code: -P). Refer to GS 12A01A02-71E and GS 12A01A02-72E.
- 12: These languages are message languages on the analyzer’s display. One analyzer has English and 11 languages.
All languages are as follows; English, Chinese, Czech, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian and Spanish.
- 13: When an analyzer is used in Japan, it must meet the Japanese Measurement Law. Only SI units must be used on the analyzer and its documents in Japan.
- 14: The universal mounting kit contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).

2. WIRING AND INSTALLATION

Install the cable glands into the FLXA202/FLXA21 before installing it (2.3Installing the cable glands) Upon delivery, the cable glands are not installed.



- *1: Use a 2-wire shielded cable with an outside diameter of 6 to 12 mm.
- *2: Connect the analyzer to ground. (Class D ground: 100 ohm or less)
- *3: This line is connected to a distributor or 24V DC power supply.
- *4: Terminal numbers for each sensor module are shown below.
- *5: Two modules of the same kind of measurement/sensor type can be installed.
- *6: The terminal box may be necessary depending on the sensor cable length and the distance between the analyzer and the sensor. The terminal box cannot be used for connection to SA11 SENCOM Smart Adaptor.
- *7: Two outputs, output 1 and output 2, of PH201G or SDBT are same signals.

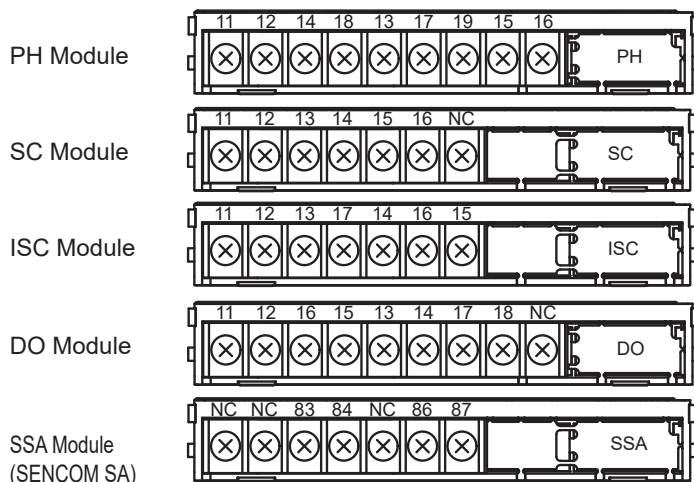
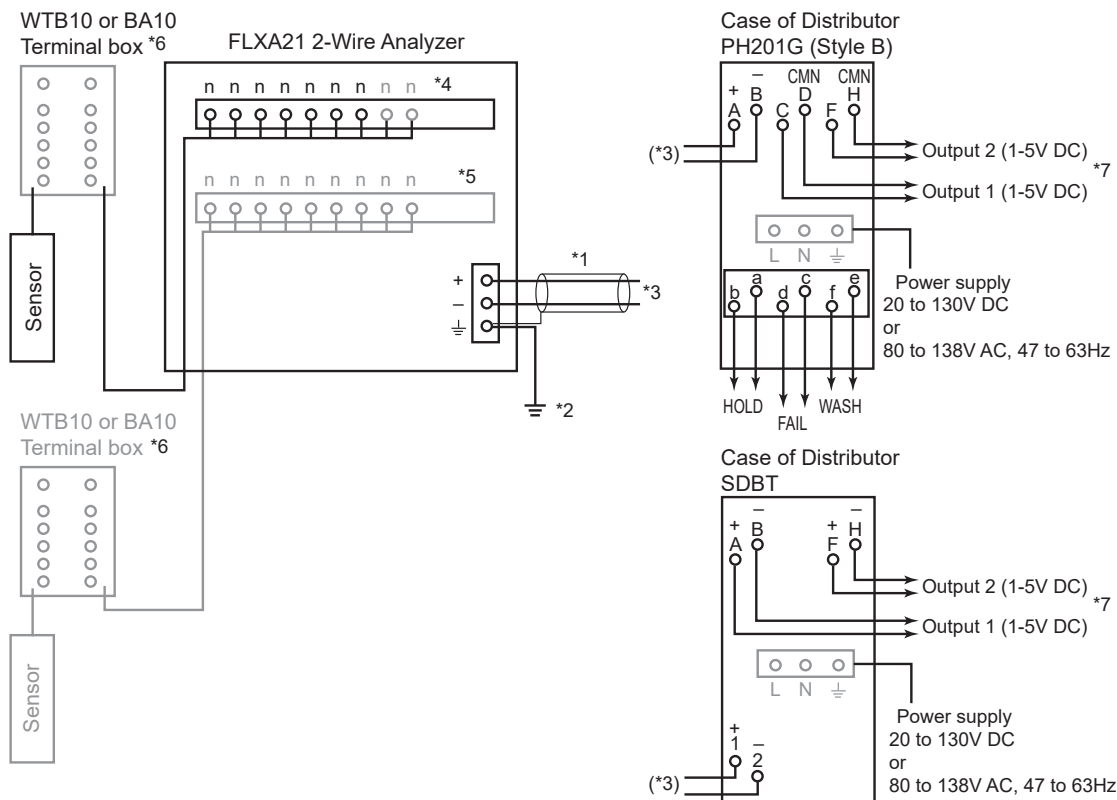


Figure 2.1 FLXA202 Wiring diagrams



- *1: Use a 2-wire shielded cable with an outside diameter of 6 to 12 mm.
- *2: Connect the analyzer to ground. (Class D ground: 100 ohm or less)
Connect the grounding cable to the \perp terminal of the power module inside.
Use a cable with an outside diameter of 3.4 to 7 mm for the grounding line.
- *3: This line is connected to a distributor or 24V DC power supply.
- *4: Terminal numbers for each sensor module are shown below.
- *5: Two modules of the same kind of measurement/sensor type can be installed. When measuring inductive conductivity, only one module can be installed.
- *6: The terminal box may be necessary depending on the sensor cable length and the distance between the analyzer and the sensor. Terminal box is specified by sensor.
- *7: Two outputs, output 1 and output2, of PH201G or SDBT are same signals.

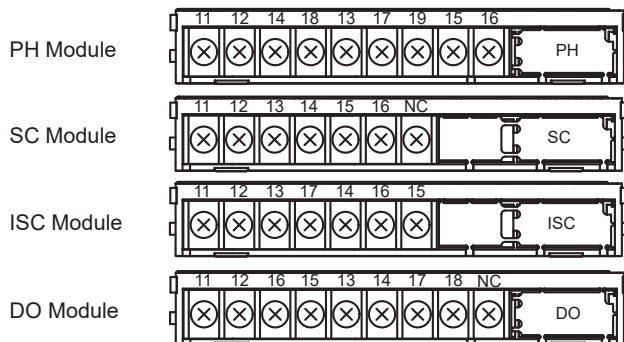


Figure 2.2 FLXA21 Wiring diagrams

2.1 Installation site

The FLXA202/FLXA21 is weatherproof and can be installed both inside and outside. It should, however, be installed as close as possible to the sensor to avoid long cable runs between the instrument and sensor. When the pH sensor is used, the cable length including the sensor cable should not exceed 20 meters (65.6 feet); 60 meters (197 feet) .

Select an installation site where the ambient temperature and humidity are within the limits of the instrument specifications. If the instrument is installed outside and exposed to direct sunlight, a sun shade hood should be used.

Ambient Operating Temperature: -20 to +55 °C

Storage Temperature: -30 to +70 °C

Humidity: 10 to 90% RH at 40°C (Non-condensing)

Select an installation site that meets the following conditions.

- Mechanical vibrations and shocks are negligible
- No relay switch and power switch are installed close to the converter
- There is space for cable connection beneath the cable glands
- Not exposed to direct sunlight or severe weather conditions
- Maintenance is possible
- No corrosive atmosphere
- Water Protection: IP66, NEMA Type 4X (USA), Type 4X(Canada)

2.2 Removing the wiring cover

Before installing this instrument, open the front panel and remove the wiring covers, and then install the cable glands.

NOTE

Wiring covers are required intrinsic safety and Increased Safety ec (Type is -C*, -DB). In the case of other types, the cover is not attached to the FLXA202.

● FLXA202

Remove wiring covers 1 and 2 by raising the circled area in Figure 2.3.

NOTE

Wiring covers are required intrinsic safety (Type is -C*).

In the case of type -S5, only wiring cover 1 is attached to the FLXA202.

In the case of other types, the cover is not attached to the FLXA202.

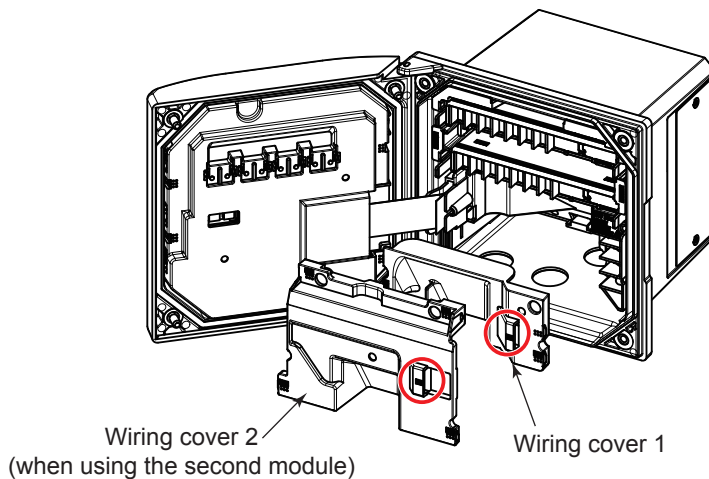


Figure 2.3 FLXA202 Wiring cover

● FLXA21

Remove all the wiring covers. They are fixed at the places marked with ○ (circle) and △ (triangle) in Figure 2.4. Be careful not to damage the pawls when removing the covers.

NOTE

Be careful not to lose the wiring cover screws.

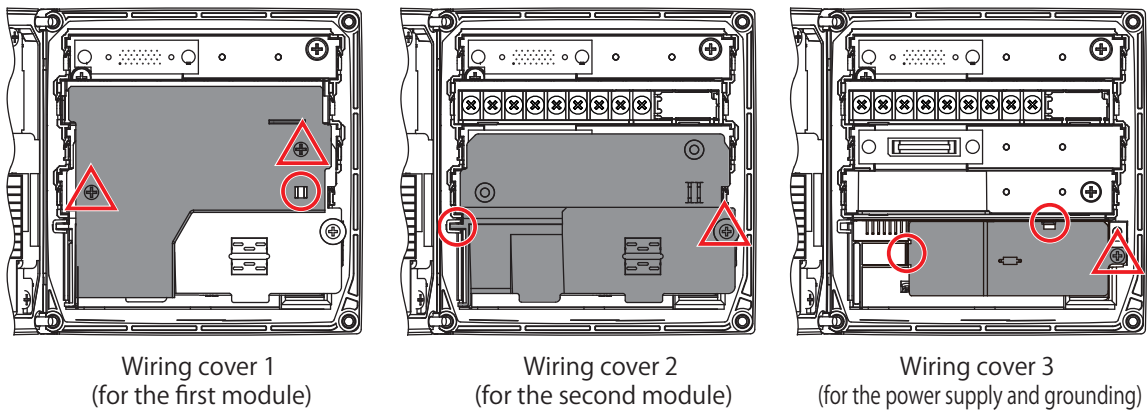


Figure 2.4 FLXA21 Wiring cover

2.3 Installing the cable glands

WARNING

For Increased Safety ec model (-DB),

- When the accompanying cable glands are used, external clamping is required additionally.
- When the optional conduit adaptors(/CB5, /CD5, /CF5) are used with accompanying cable glands, clamping; e.g) sealing fitting is required.
- If external clamping is not able to be prepared, Ex d, Ex e, or Ex n cable gland which provides sufficient clamping shall be used instead of the accompanying cable gland.
- Unused cable gland shall be sealed with the accompanying metal plug.

The supplied cable glands are for cables with an outside diameter of 6 to 12 mm (0.24 to 0.47 inches). Unused cable entry holes must be sealed with cable glands including the supplied close up plugs.

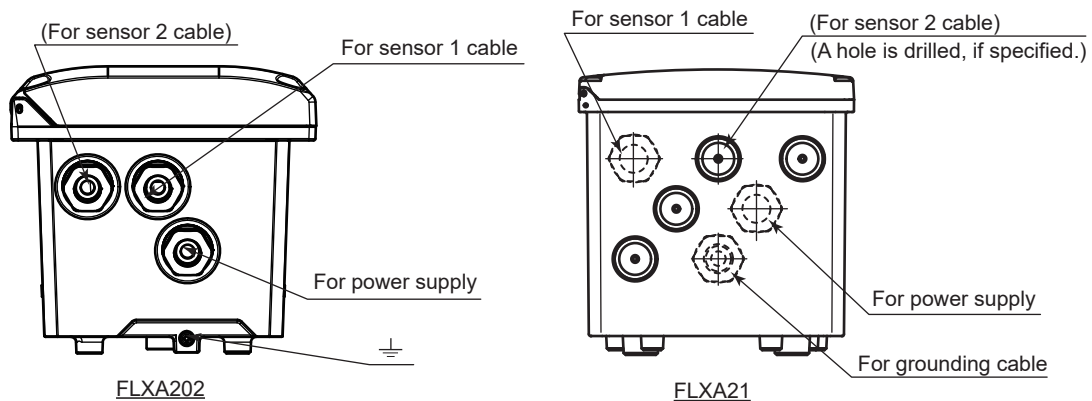


Figure 2.5 Cable gland diagram

CAUTION

Be careful not to be injured by the sharp hole edges on the housing.

Install the supplied cable gland as shown in Figure 2.6. When using an adapter for conduit work, see Figure 2.7.

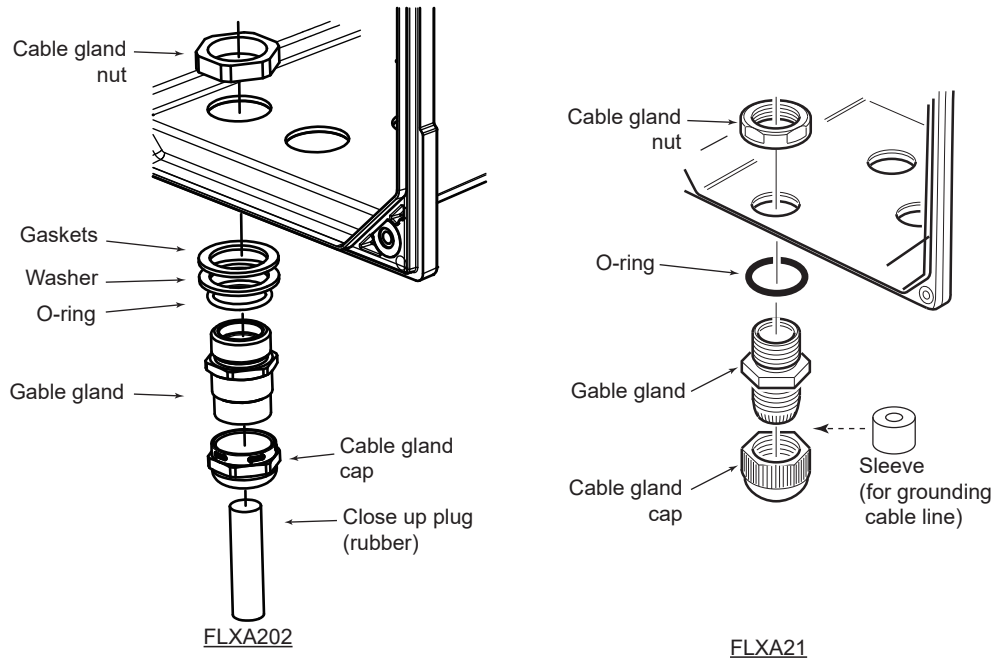


Figure 2.6 Cable glands

The unused cable glands should be sealed with the supplied close up plug.

CAUTION

When installing cable glands, hold cable glands and tighten cable gland nuts to a torque of 6 N•m. If cable glands, not gland nuts, are tightened, O-rings may be come out from the proper positions.

● **For FLXA202 type -S5**

For Type -S5, a shield bracket is included.

See Figure 2.7. Place the shield bracket inside the case to the position of the holes of the case. Set the cable gland nuts on the shield bracket aligning the holes to those of the shield bracket. Insert the cable glands through the holes from the outside of the case and tighten them.

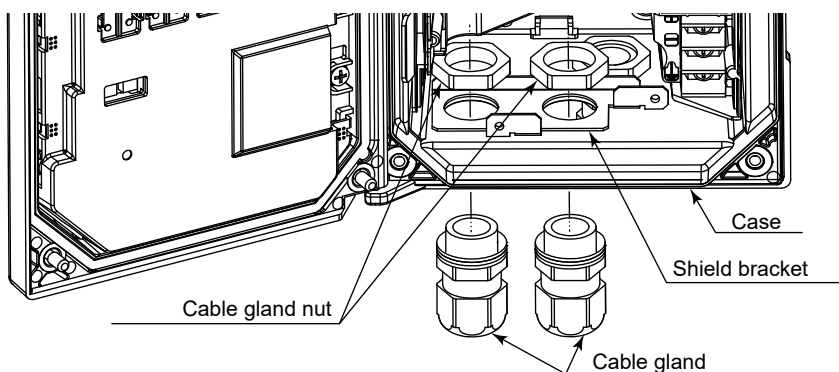


Figure 2.7 Shield bracket

● **Adapter for conduit work (option)**

When protecting the cable with a conduit, use an adapter (option codes: /CB4, /CD4, /CF4, /CB5, /CD5, or /CF5). Set the included cable gland for adapter and the adapter for conduit work as shown in figure 2.6, instead of using the cable gland of figure 2.6 (see figure 2.8). The cap of the cable gland for an adapter is not used.

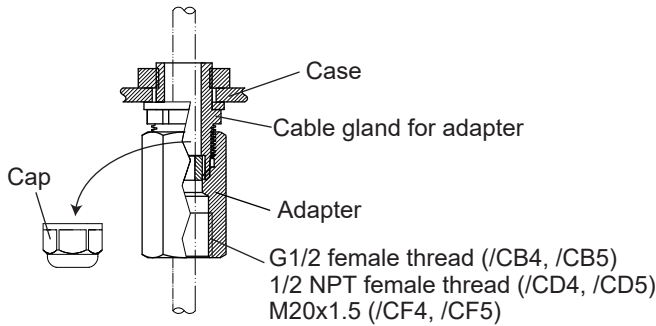


Figure 2.8 Adapter for conduit work (option)

CAUTION

When using a cable conduit, use a flexible conduit to avoid stress on the conduit adapter. The stress on the conduit adapter may damage the housing.

2.4 Wiring the power supply

First make sure that the power supply is in accordance with the given specifications.

Power Supply: Nominal 24 V DC loop powered system

The load resistance: impedance of electronic equipment: typically 250 Ohm.

Number of input modules: 1-sensor measurement or 2-sensor measurement.

One (1) Sensor module (1 input): 16 to 40V DC (for pH/ORP, SC and DO),
17 to 40V DC (for ISC), 21 to 40V DC (for SSA)

Two (2) Sensor modules (2 inputs): 22.8 to 40V DC (for pH/ORP, SC and DO)

Note: When the FLXA202/FLXA21 is used in the multi-drop mode of HART communication, the output signal is changed from 12.5 mA DC to 4 mA DC just after the power is turned on. Enough power supply for the instruments is to be provided.

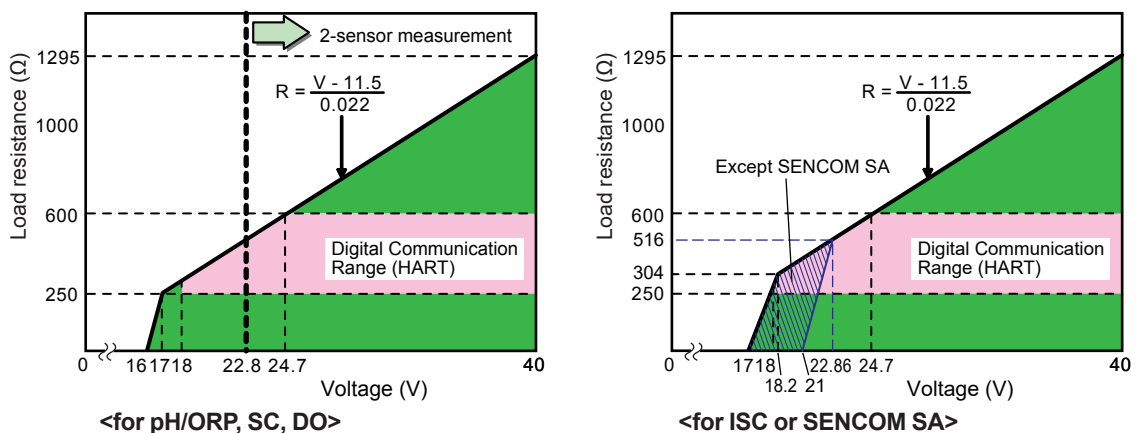


Figure 2.9 Supply Voltage and Load Resistance

Open the front panel and remove the wiring covers to make the terminal block accessible.

CAUTION

The FLXA202/FLXA21 is used with a DC power supply. Do not use an alternating current or 100 volt mains power supply.

The cable leading to the distributor (power supply) supplies the power to and transmits the output signal from the FLXA202/FLXA21.

Use a two conductor shielded cable with a minimum cross sectional area of 1.25 mm² and an outside diameter of 6 to 12 mm. The cable gland supplied with the instrument is compatible with these diameters.

Terminal screw size is M4, and torque of screw up is 1.2 N•m.

Pin terminal, ring terminal and spade terminal can be used for the power supply terminals and the grounding terminal.

Pin terminal: pin diameter: max. 1.9 mm

Ring and spade terminal: width: max. 7.8 mm

CAUTION

Cables that withstand temperatures of at least 60°C should be used for wiring.

CAUTION

Always place the shield cover over the power supply and contact terminals for safety reasons and to avoid interference.

2.4.1 Grounding

The method to connect the grounding terminal is different between FLXA202 and FLXA21.

For the safety of the user and to protect the instrument against interference, the converter housing must always be connected to a class D ground (a ground resistance of 100 ohm or less).

- **Grounding the FLXA202 housing**



WARNING

Use ring crimp terminals for grounding terminals. The size of the terminal screw is M4 and the screw tightening torque is 1.4 N•m.

Use the \perp terminal outside the converter housing for grounding (Figure 2.10A).

When connecting the converter to a distributor, connect the shield of a double-core shielded cable to the \perp terminal on the terminal block in the converter. Do not connect the shield to the ground terminal in the distributor.

● **Grounding the FLXA21 housing**

 **WARNING**

The size of the terminal screw is M4 and the screw tightening torque is 1.2 N•m.

Connect a single separate cable for grounding to the terminal block in the housing (Figure 2.10B).

Use a cable with an outer diameter of 3.4 to 7 mm.

Since the cable is very thin, set the sleeve inside the standard cap of the cable gland and pass the cable through it. Sleeves are supplied with cable glands (Figure 2.6).

When connecting the converter to a distributor, connect the shield of a double-core shielded cable to the \perp terminal on the terminal block in the converter. Do not connect the shield to the ground terminal in the distributor.

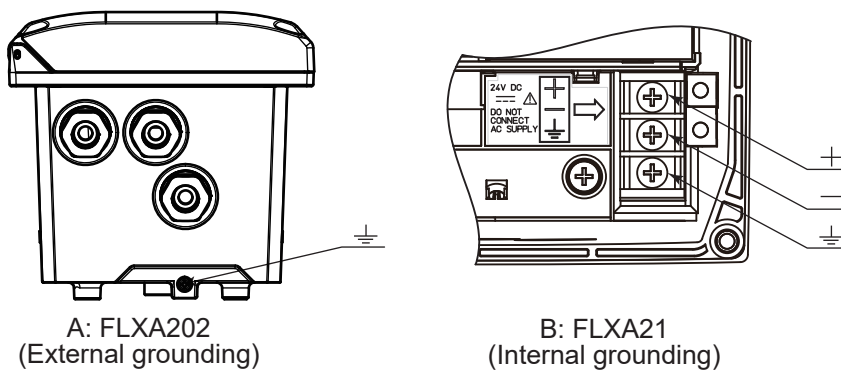


Figure 2.10 Grounding

2.4.2 Connection of the power supply

Pass the supply/output cable through the power cable hole shown in Figure 2.5 into the converter and connect it to the terminals marked +, – and \perp according to the marks on the power terminal (Figure 2.11).



WARNING

Use M4 screws for the power terminal block. Tightening torque is 1.2 N•m. Pin terminals, ring terminals, and spade terminals (Y-shaped terminals) can be used as wiring terminals.

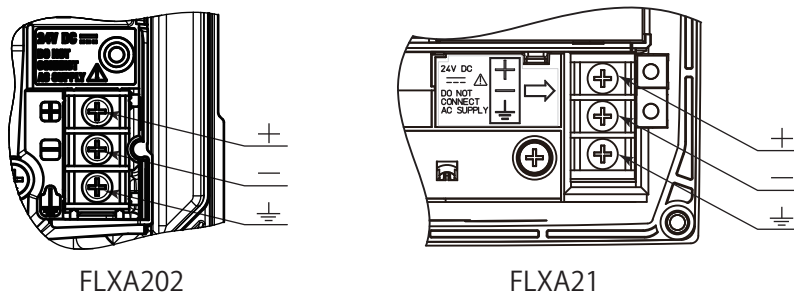


Figure 2.11 Power terminal

● FLXA202 -S5

Connect the power cable to the +/- terminals as shown above. When -S5 is specified, do not use the \perp terminal (Figure 2.11), but use instead the screw hole which is on the right side of the shield bracket. (Figure 2.12) Screw the cable into the hole with the supplied M4 screws. Tightening torque is 1.2 N•m.

When -S5 is specified, two pieces of Ferrite core are supplied. Attach the Ferrite core on the power cable as shown in Figure 2.12. Wiring bands are not used for this purpose.

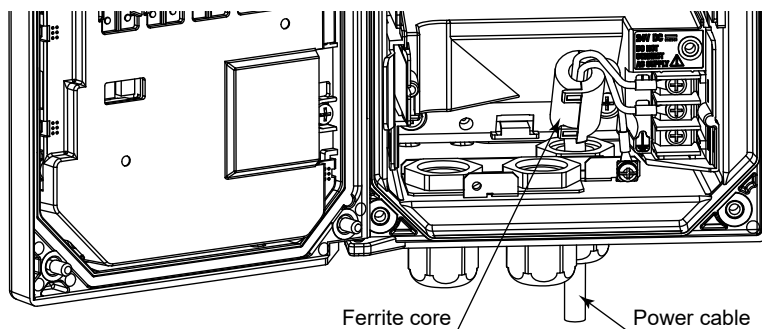


Figure 2.12 Ferrite core for power cable

Use the rest of the Ferrite cores for sensor wiring after installing the Wiring cover 1.

2.4.3 Wiring cover

NOTE

Wiring covers are required intrinsic safety and Increased Safety ec (Type is -C*, -DB).
 In the case of type -S5, only wiring cover 1 is attached to the FLXA202.
 In the case of other types, the cover is not attached to the FLXA202.

● FLXA202

When grounding and power supply wiring are complete, double-check the wiring and the like, and attach wiring cover 1 (Figure 2.13).
 When attaching the wiring cover, align the protruding parts marked with squares in the figure to the grooves.
 If only the first module is to be used, wire the detector to the first module.
 If the second module is to be used, wire the detector to the second module and attach wiring cover 2 before wiring the first module.
 Then, wire the detector to the first module.
 Detector wiring is indicated in 2.5 Sensor wiring.

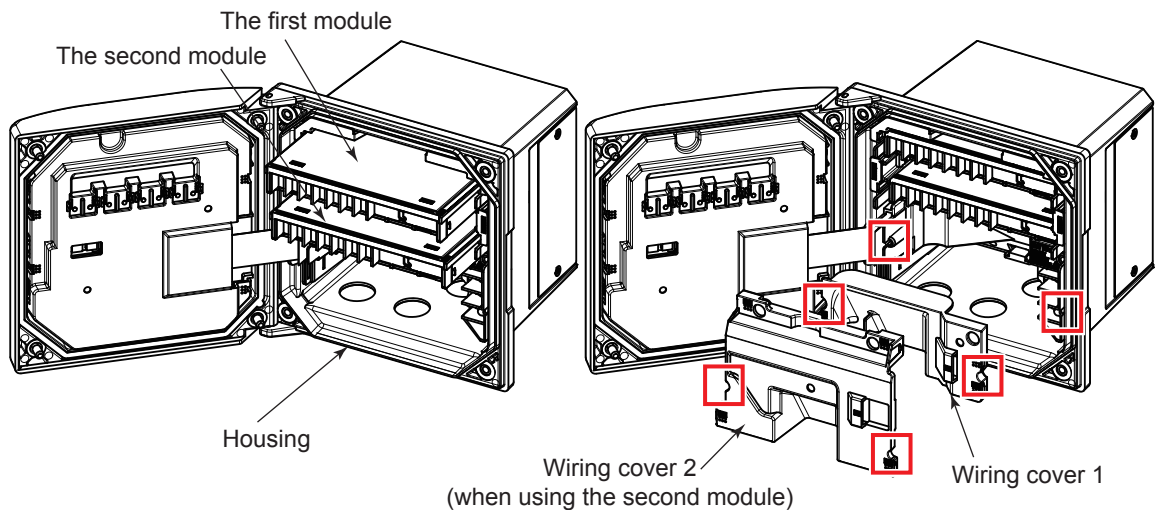


Figure 2.13 FLXA202 Wiring cover

NOTE

Wiring covers are required intrinsic safety (Type is -C*).
 In the case of type -S5, only wiring cover 1 is attached to the FLXA202.
 In the case of other types, the cover is not attached to the FLXA202.

● FLXA21

After grounding and connecting the power supply, check the wiring and then close the wiring cover 3 (Figure 2.4).
 When closing the cover, engage the positions marked with ○ in Figure 2.4 and fasten the cover with the screw at the position marked with Δ.

CAUTION

The screw in the area marked with Δ should be tightened to a torque of 0.35 to 0.45 N•m.

If a second module is used, wire the sensor for the second module and attach the wiring cover (refer to Figure 2.12).

Then, wire the sensor for the first module and attach the wiring cover (refer to Figure 2.11).

The sensor wiring is shown in 2.4 Wiring the power supply

NOTE

Be careful not to lose the wiring cover screws.

2.5 Sensor wiring

The FLXA202/FLXA21 can be used with a wide range of commercially available sensor types, both from Yokogawa and other manufacturers.

Terminal screw size is M4, and torque of screw up is 1.2 N•m.

Pin terminal, ring terminal and spade terminal can be used.

Pin terminal: pin diameter: max. 1.9 mm

Ring and spade terminal: width: max. 7.8 mm

For details on the sensors, refer to the respective instruction manuals of the sensors.

NOTE

When input 2 is used, the upper-level module is for input 1. Be careful not to make a mistake when wiring the modules.

● FLXA202

When wiring covers are available:

Attach wiring cover 1. If the second input is available, wire the second module in the lower level, and attach wiring cover 2.

Finally, wire the first module.

If the second input is not available, attach wiring cover 1, and then wire the first input.

Note that if the second input is not available, wiring cover 2 is not included.

When wiring covers are not available:

If the second input is available, wire the second module in the lower level first.

Then, wire the first module.

If the second input is not available, wire only the first input.

NOTE

Wiring covers are required intrinsic safety (Type is -C*).

In the case of type -S5, only wiring cover 1 is attached to the FLXA202.

In the case of other types, the cover is not attached to the FLXA202.

When all the detector wiring is complete, close the FLXA202 front cover, and turn the power on. Check that the screen displays normally.

CAUTION

Do not tighten up four front panel screws one by one.

Each front panel screw should be tightened up in two times of screwing. And, firstly the screw at the upper left should be screwed a bit, the next is at the lower right, third is at the upper right, and fourth is at the lower left. The second round is the same sequence again to tighten up four screws.

Do not use an electric screwdriver with high revolutions. If an electric screwdriver is used for these front panel screws, the revolutions of the electric screwdriver should be less than 400 rpm.

Four screws should be tightened to the following torque; 1.5 to 1.6 N•m

● FLXA21

When input 2 is used, first wire input 2 which is on the lower second module, and attach the wiring cover.

Even when input 2 is not used, first attach the power supply/grounding wiring cover and then the wiring cover for the second module, and finally wire input 1.

NOTE

When the wiring of sensors is finished, be sure to attach the wiring covers. Furthermore, make sure the module is locked with the mechanisms on the left and right of the module.

CAUTION

Confirm that all locking-tabs (including for BLANK slots) are in “Lock” position before you close the front panel. If the locking-tabs are in “Unlock” position, the front panel may be interfered with locking-tabs.

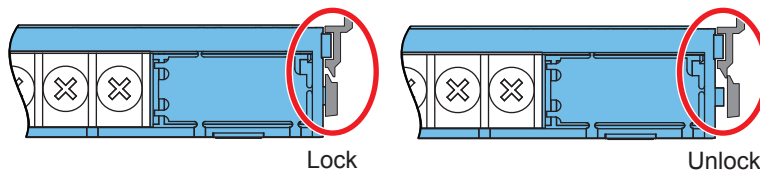


Figure 2.14 Locking the module

When all sensor wiring is completed, close the front panel of the FLXA21, and turn on the power. Make sure that the display is normal.

CAUTION

Do not tighten up four front panel screws one by one.

Each front panel screw should be tightened up in two times of screwing. And, firstly the screw at the upper left should be screwed a bit, the next is at the lower right, third is at the upper right, and fourth is at the lower left. The second round is the same sequence again to tighten up four screws.

Do not use an electric screwdriver with high revolutions. If an electric screwdriver is used for these front panel screws, the revolutions of the electric screwdriver should be less than 400 rpm.

Four screws should be tightened to the following torque; 0.8 to 0.9 N•m

■ Wiring of YOKOGAWA sensors

Sensor	Measurement	FLXA202/FLXA21 Terminals									Short *2 FLXA202 /FLXA21 Terminals	Remark
		11	12	13	14	15	16	17	18/13	19/15		
		Sensor cable marking (or color)							Jumper *1			
DO30G	DO	11	12	13	14	15	16					Fixed Cable
FU20/ PH20/ FU24	pH, pH & ORP, rH	11	12	13	14	15	16		Yes	No		Fixed Cable
FU20/ PH20/ FU24	ORP	11	12	13		14			Yes	Yes	13/14	Fixed Cable
FU20/ PH20/ FU24	pH Comp. ORP	11	12	15		14		16	No	Yes	13/14	Fixed Cable
FU20-VP/ FU24-VP	pH, pH & ORP, rH	E	F	B	D	A			Yes	No		VP6-SC
FU20-VP/ FU24-VP	ORP	E	F	B		D			Yes	Yes	13/14	VP6-SC
FU20-VP/ FU24-VP	pH Comp. ORP	E	F	A		D			No	Yes	13/14	VP6-SC
ISC40	ISC	11	12	13	14	15	16					Fixed Cable
PR20/ PR10	pH	11	12	13	14	15	16		Yes	No		Fixed Cable
SC21	pH			Blue	Liquid Earth	Red		(White)	No	No		WU20 Triax
SC24V	pH	E	F	C	H	A	B	D				VP8-DC
SC25V	pH	E	F	B	D	A			Yes	No		VP6-SC
SC29-PTG	pH Comp. ORP			Red	Liquid Earth	Blue		(White)				WU20 Triax
SC29-PTP	ORP			Blue	Liquid Earth	Red		(White)	Yes	Yes		WU20 Triax
SC42	SC	11	12	13	14	15	16					WU40 cable
SC4A	SC	11	12	13	14	15	16					Fixed Cable
SM21/ SR20/ SM60	pH	Green: Red	Green: Blue	Yellow: Red	Black	Red: Red	Red: Blue	Yellow: Blue	Yes	No		WU20 Color Coded Coax
SM29/ SR20	ORP			Yellow: Red	Black	Red: Red	Red: Blue	Yellow: Blue	Yes	Yes		WU20 Color Coded Coax
SX42	SC	Brown	Brown	Yellow: Green		Red					13/14 and 15/16	Sensor Wiring

*1: The jumper cables to short are attached to the product.

*2: Jumper cables to short are supplied by users.

Sensor	Measurement	Board Terminals					Remark
		82	83	84	86	87	
FU20F	pH, pH & ORP, rH	82	83	84	86	87	WU11 Cable

■ Wiring of HAMILTON sensors

Sensor	Measurement	FLXA202/FLXA21 Terminals										Short *2 FLXA202 /FLXA21 Terminals	Remark	
		11	12	13	14	15	16	17	18	18/13	19/15			
Sensor cable marking (or color)										Jumper *1				
CHEMTRODE	pH			Blue		Red		(White)			Yes	No	13/14	WU20D Cable
CHEMTRODE-ORP	ORP										Yes	Yes	13/14	
CHEMTRODE-VP	pH	E	F	B		A					Yes	No	13/14	VP6-SC
CLARITRODE	pH			Blue		Red		(White)			Yes	No	13/14	WU20D Cable
CLARITRODE-VP	pH	E	F	B		A					Yes	No		VP6-SC
CONDCUELL	SC	White/ Grey	Blue	Green	Pink	Brown	Yellow							Fixed Cable
CONDCUELL-VP	SC	Blue	Yellow	Black	Black Shield	Grey	Grey Shield							Hamilton VP Cable
EASYFERM	pH			Blue		Red		(White)			Yes	No	13/14	WU20D Cable
EASYFERM-VP	pH	E	F	B		A					Yes	No	13/14	VP6-SC
INCHTRODE	pH	E	F	B	D	A					Yes	No		VP6-SC
MECOTRODE	pH			Blue		Red		(White)			Yes	No	13/14	WU20D Cable
MECOTRODE-VP	pH	E	F	B		A					Yes	No		VP8-DC
OXYFERM-VP/ OXYGOLD	DO	White	Green		Green/ Yellow			Black	Red					Hamilton VP Cable
OXYSENS	DO	Yellow	Blue		Black			Clear	Brown					Fixed Cable
pHEASY	pH	E	F	B	D	A	B				Yes	No		
POLILYTE	pH			Blue		Red		(White)			Yes	No		WU20D Cable
POLILYTE-VP	pH	White	Green	Red	Blue	Black/ Clear					Yes	No		Hamilton VP Cable
POLILYTE PLUS-VP	pH	White	Green	Red	Blue	Black/ Clear					Yes	No		Hamilton VP Cable

*1: The jumper cables to short are attached to the product.

*2: Jumper cables to short are supplied by users.

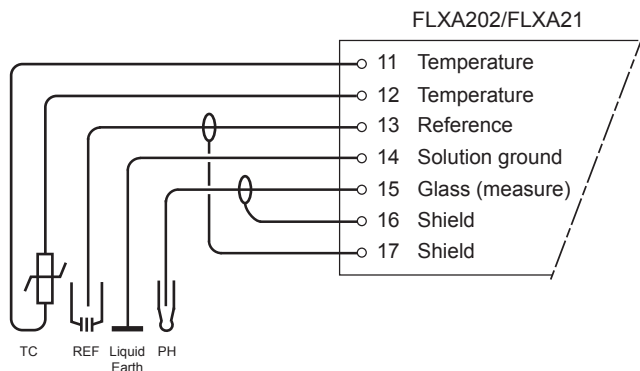
Color coding of Variopin cables

Cable	PIN	A	B	C	D	E	F	G	H
Hamilton	VP6-SC	Black/ Clear	Red	Grey	Blue	White	Green		
Hamilton	VP8-DC	Black/ Clear	Black Shield	Red/ Clear	Red Shield	White	Green	Yellow	Brown
WU20-V-S	VP6-SC	Clear	Brown	Black	Yellow	Red	Blue		
WU20-V-D	VP8-DC	Brown Core	Brown Shield	White Cored	White Shield	Red	Blue	Yellow	

2.5.1 Wiring the pH/ORP sensor

■ pH Measurement

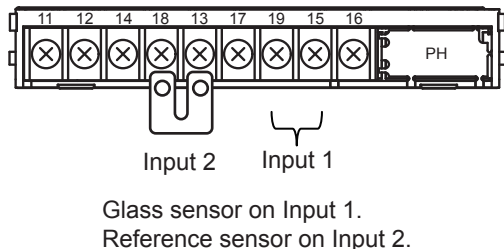
Conventional pH sensors are connected to the module as follows:



In addition to the wiring of the sensor, insure that a jumper for low-impedance sensor inputs is installed. The jumpers can be found on the plastic sensor module cover and can be stored in the lower level module wiring cover.

- pH Glass Electrode is a high impedance sensor input
- Standard reference electrodes and an ORP/REDOX electrode are low impedance sensor inputs
- Special electrodes using 2 glass sensor (example: Pfaunder, SC24V) do not need jumpers.

Terminals 15-19 are identified as input 1 (High Impedance) and terminals 13-18 are defined as input 2 (Low Impedance). For conventional pH sensors, the jumper is placed as illustrated:

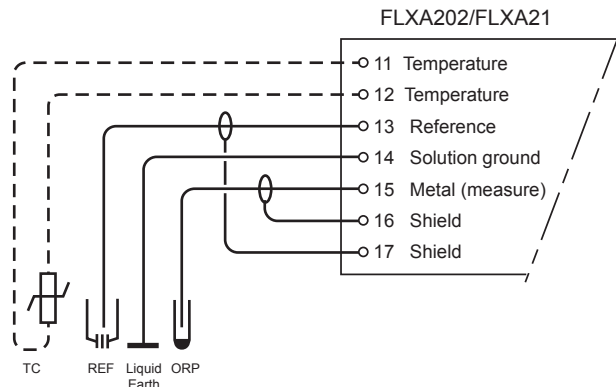


Store jumpers that you do not use in the jumper holder (see Figures 1.1 and 1.2).

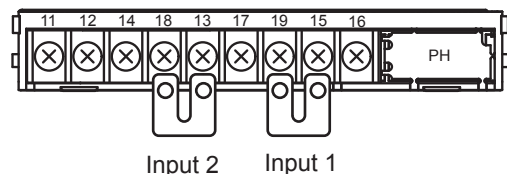
■ ORP Measurement

The ORP measurement uses the same sensor input module as the pH measurement. It is not uncommon to measure ORP as process variable and a pH Glass electrode as reference. This is the case with rH measurement and with pH compensated ORP measurement.

Conventional ORP sensors are connected to the module as follows:

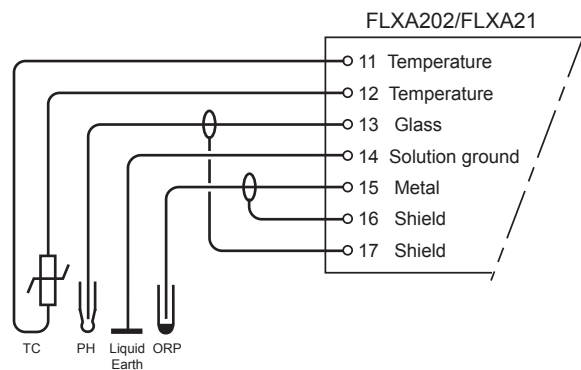


For conventional ORP sensors, the jumpers are placed as illustrated:

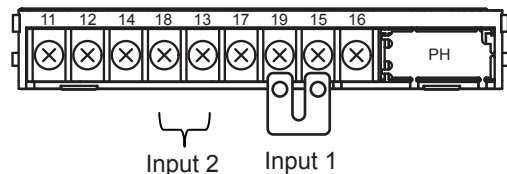


Metal sensor on Input 1.
Normal reference on Input 2.

pH Compensated ORP sensors are connected to the module as follows:



For pH Compensated ORP sensors, the jumper is placed as illustrated:



Metal sensor on Input 1.
pH glass (as reference) on Input 2.

NOTE

The special grommet is intended to be used to seal the multiple cables from the Yokogawa flow fittings such as FF20.

The designated cables are WU20 sensor cables, which are approximately 5 mm (0.2") in diameter, and K1500FV liquid earth cables, which are approximately 2.5 mm (0.1") in diameter.

For sensor systems using a single cable, like the FU20/FU24 and the PR10, PD20, PF20 and PS20, the standard gland will accommodate the cable adequately. Single cables between approximately 6 mm and 12 mm (0.24" and 0.47") can be sealed properly with these glands and the standard tulle.

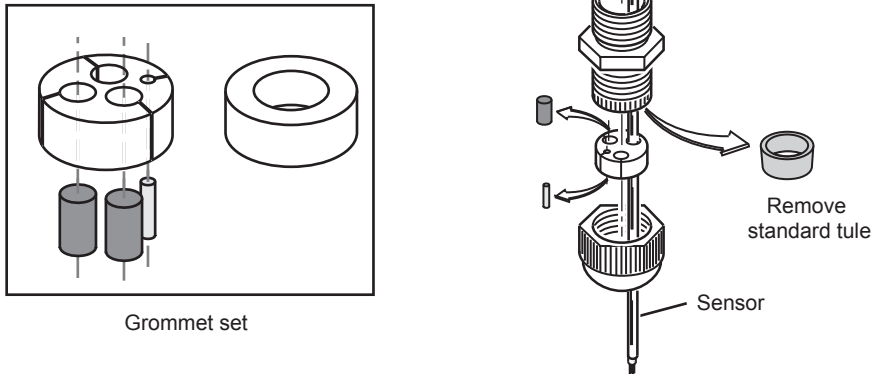
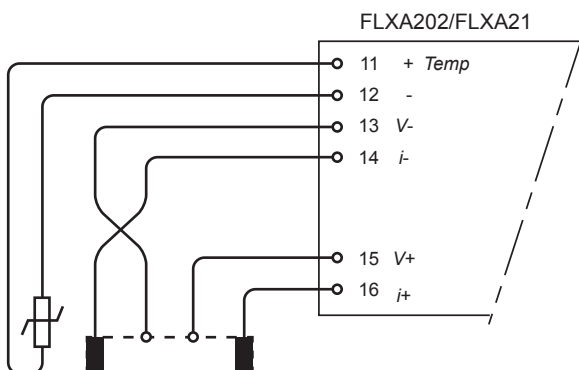


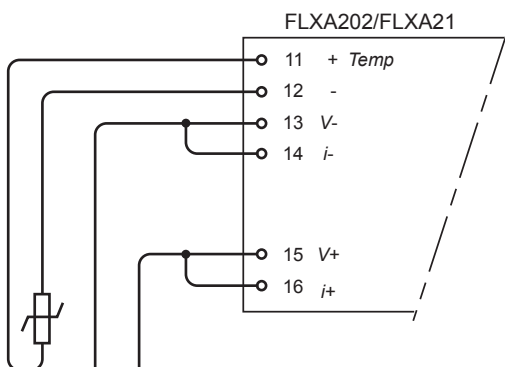
Figure 2.15 Grommet set use

2.5.2 Wiring the conductivity (SC) sensor

Contacting Conductivity, SC, sensors are connected to the module as follows:

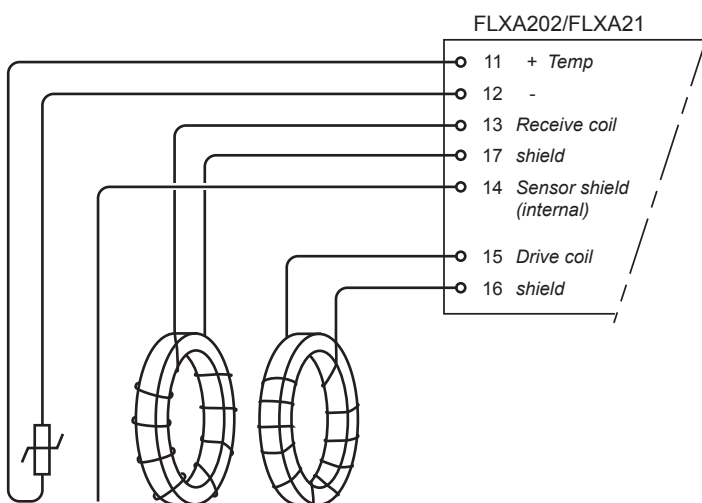


The above diagram shows wiring for 4-electrode conductivity sensors, such as SC42-SP34 large bore series. For 2-electrode conductivity sensors, such as SC42-SP36 small bore series, jumpers must be installed between terminals 13-14 and between terminals 15-16, as shown in the diagram below.



2.5.3 Wiring the inductive conductivity (ISC) sensor

ISC40 sensors are connected to the module as follows:



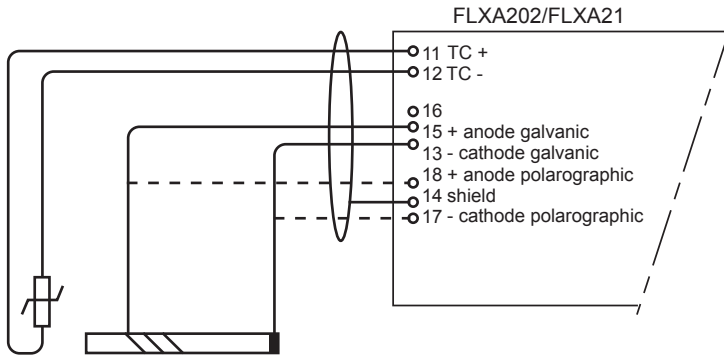
The sensors are supplied with integral cables and each individual wire is marked with the corresponding terminal numbers.

2.5.4 Wiring the dissolved oxygen (DO) sensor

The input module for DO measurement is suitable for different types of DO sensors:

- i. Galvanic sensors like model DO30G
- ii. Polarographic sensors like HAMILTON'S Oxyferm and Oxygold

The connection is as follows:



The DO30G sensor comes with integral cable and the wires are labeled with the corresponding terminal numbers.

2.5.5 Wiring sensors with SENCOM SA

When suffix code -S5 (SENCOM SA) for 1st input is specified.

The next figure shows a wiring with WU11, which connects to SENCOM SA (SA11 Smart Adapter).

Be sure to find the label "SENCOM SA" beside the terminals.

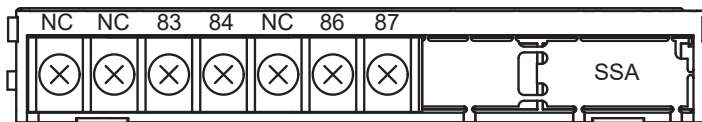
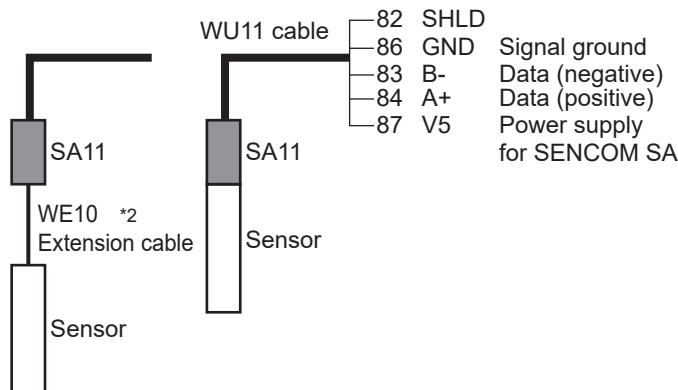


Figure 2.16 SENCOM module terminal assignment

Screws are all M3 with washers.



*: WE10 is an extension cable stretching between SA11 and sensors. WE10 is universal to connections if needed.

Figure 2.17 Wiring SENCOM SA

Connect a SA11 SENCOM Smart adapter to a sensor. Connect SA11 to FLXA 202 via WU11 SENCOM cable.

Read each exclusive user's manual for information on SA11 Smart Adapter, WU11 SENCOM cable, WE10 extension cable.

Because WU11 cables are thin, first remove the cable gland's standard packing and apply the supplied grommet instead.

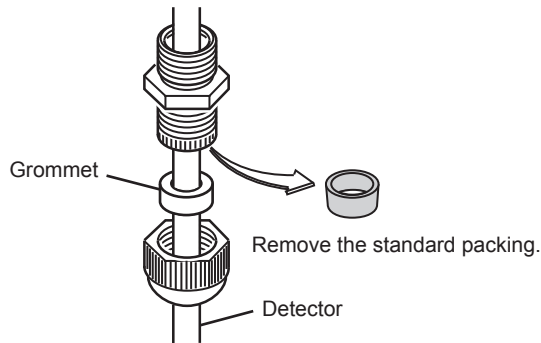


Figure 2.18 Cable gland

Wire WU11 SENCOM cable to the corresponding terminals on the module, except for the 82 SHLD (Shield cable).

The cable terminal for 82 SHLD (Shield cable) is not connected to the module. Use the supplied screw (M4) into the hole of the shield bracket with a screw tightening torque of 1.2 N•m.

After the wiring, attach a Ferrite core around cables excluding the shield cable. See Figure 2.19.

Thread a supplied Wiring band through a hole on the Ferrite core. Fasten firmly the Ferrite core and WU11 SENCOM cable together with the band.

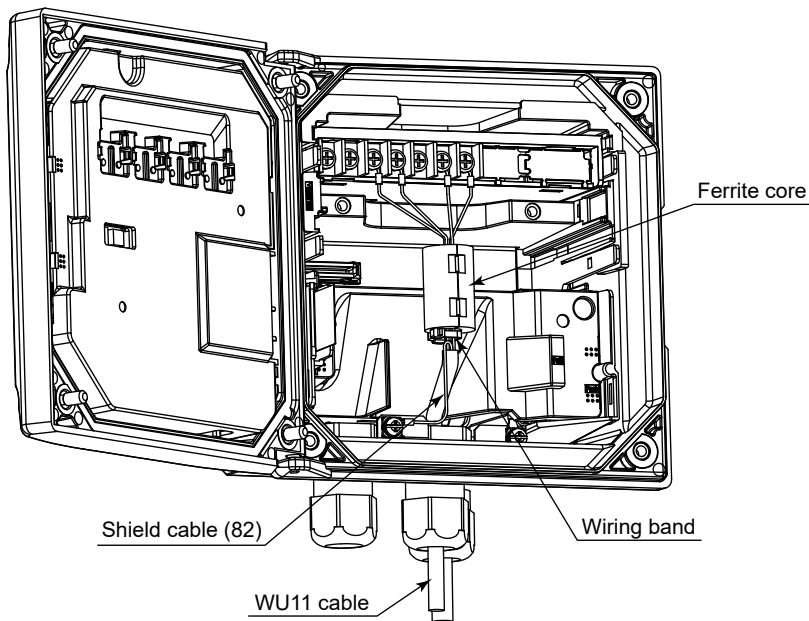


Figure 2.19 Ferrite core for WU11 SENCOM cable

FLXA202 acknowledges the connection of sensors, if not, FLXA202 alerts an error.

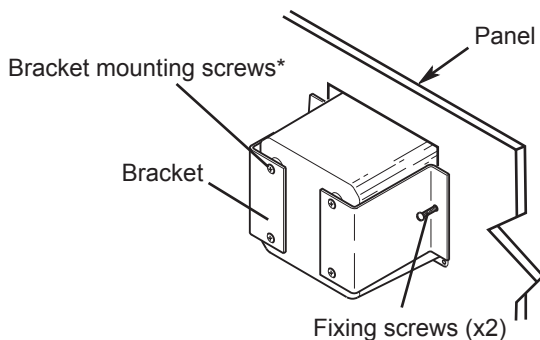
2.6 Mounting methods

See Figure 2.30. The FLXA202/FLXA21 has various mounting possibilities.

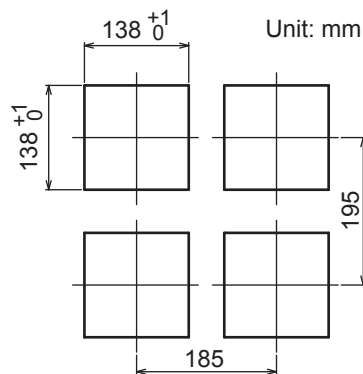
- Panel mounting using optional mounting hardware (/PM or /UM)
- Wall mounting using optional mounting hardware (/U or /UM)
- Pipe mounting using optional mounting hardware (/U or /UM) on a horizontal or vertical pipes (Nominal size: 50A)

The universal mounting kit (/UM) contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM). Some can be left unused.

Panel mounting

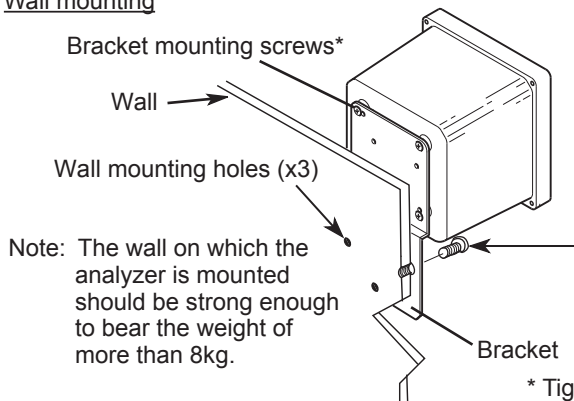


* Tighten the four screws to a torque of 2 N·m.



Spacing panel cutout

Wall mounting

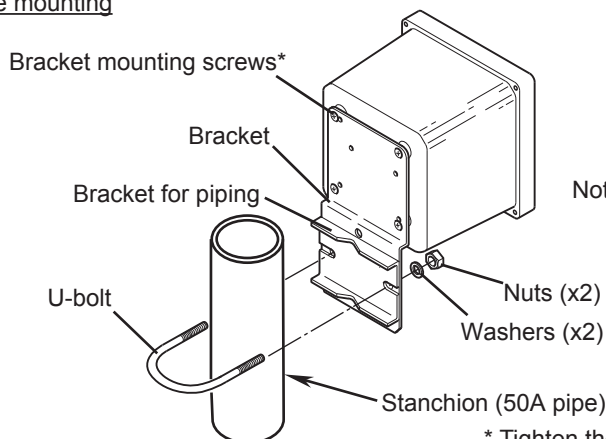


Note: The attached hardware is the same as that for the pipe mounting. Only the bracket is used for the wall mounting.

M8 bolt (not supplied)
Prepare bolts of the same length as the mounting hole.

* Tighten the four screws to a torque of 2 N·m.

Pipe mounting



* Tighten the four screws to a torque of 2 N·m.

Figure 2.20 Three types of mounting with the optional mounting hardware

See General Specifications (GS 12A01A03-01EN, or GS 12A01A02-01E) for the dimensions of the FLXA202/FLXA21 and mounting hardware.

2.7 Operation

When all wiring is completed, turn on the power of the instrument. Make sure that the LCD screen turns on. Then, the screen changes to the Quick Setup display. SENCOM SA alerts an error if no sensor is connected. If configuration is not correctly setup, an error may appear. or measurement values displayed may be abnormal. Check the initial settings and change them to suit your purpose.

NOTE

After turning on the power, it takes occasionally more than 1 minute to change to the Quick Setup display.

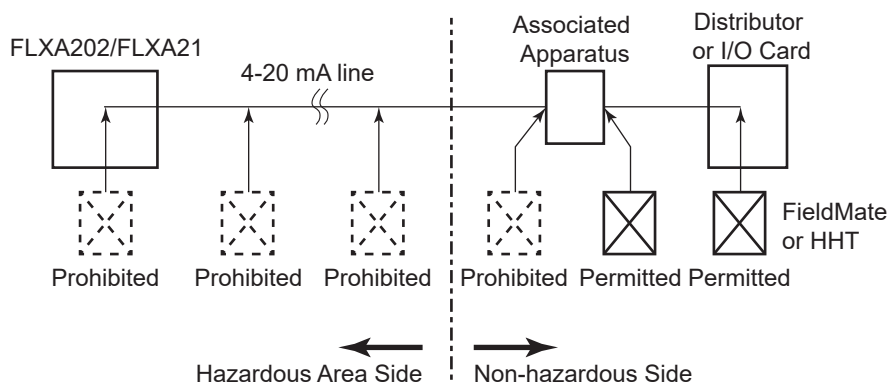
NOTE

A current of 12 mA is output for several seconds after power-on. This is the specification.

Operation from HART is also available.
Refer to Technical information, TI 12A01A02-60E.

CAUTION

When the FLEXA is intrinsic safety type or nonincendive type, DO NOT connect FieldMate™ or HHT (Hand Held Terminal) to the Hazardous side of Associated Apparatus. *1



*1: An Ex-certified HHT may be connected to "Prohibited" points in accordance with the instructions or control drawing of the HHT, if it is confirmed that the connection does not impair the type of protection, from assessment of the related electrical parameters and other conditions.

● **Change language**

When the power is turned on, the Quick setup display appears.

Upon delivery, the display language is set to English. If you want to use a language other than English, select your desired language.

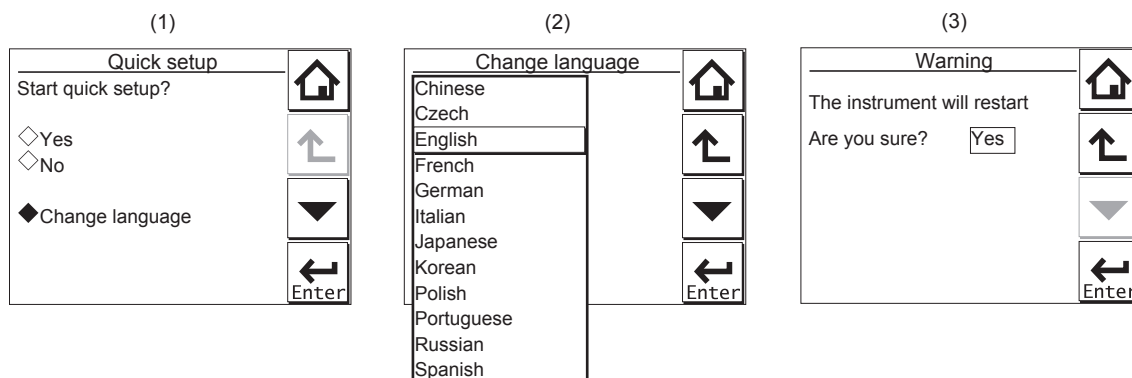


Figure 2.21 Changing the language

- (1) Select ♦Change language.
- (2) Select a desired language (click the  to scroll the language options.)
- (3) Click YES.

Changing languages automatically reboots the FLXA202/FLXA21.

Check that the parameters match your specifications and modify them if necessary before using the instrument.

A sheet for user settings is contained. Please take a note of your settings on it when you configure the FLXA202/FLXA21 and keep the sheet just in case.

Download the user setting sheet from <http://www.yokogawa.com/an/flxa202/download/>

3. MAINTENANCE

■ Periodic maintenance

The FLXA202/FLXA21 requires very little periodic maintenance, except to make sure the front window is kept clean in order to permit a clear view of the display and allow proper operation of the touchscreen. If the window becomes soiled, clean it using a soft damp cloth or soft tissue.

To deal with more stubborn stains, a neutral detergent may be used.

When you must open the front cover and/or glands, make sure that the seals are clean and correctly fitted when the unit is re-assembled in order to maintain the housing's weatherproof integrity against water and water vapor.

The pH measurement uses high impedance sensors and may otherwise be prone to problems caused by exposure of the circuitry to condensation.

CAUTION

Never use harsh chemicals or solvents. In the event that the window does become heavily stained or scratched, refer to the parts list for replacement part numbers.

● Battery

The FLXA202/FLXA21 has a logbook feature that uses a clock to provide the timings. The instrument contains a lithium cell (battery) to continue the clock function while the power is turned off. Although the cell has an expected working life of 10 years, this is not guaranteed. When this cell needs replacing, contact your nearest Yokogawa service center.

■ Periodic maintenance of the sensor

Please follow the manual of each sensor about the maintenance of the sensor.

● Predictive maintenance



The FLXA202/FLXA21 has an original prediction function (wellness check).

By making settings concerning the sensor wellness check, you can grasp the condition of the sensor in the gauge display in the Detail screen and carry out predictive maintenance.

See the section of Sensor wellness on each corresponding user's manual Operation edition.

4. TROUBLESHOOTING



When a  or  indicator is displayed on the Main display, detailed error information can be given by pressing this indicator-button.

See ■ Information button

For setting of error items, refer to the Error configuration in Operation edition user's manual corresponding sensor in use. For each error item, Warning or Fault will be indicated. Some errors are indicated for those other than the item configured in Error setting.

■ Installation of sensor module

When a sensor module is not fixed properly, an error message on the Figure 4.1 may be displayed. Check the sensor module installation and lock mechanism.

On a 2-sensor measurement, if the different type sensors (for example, pH and SC) are installed, an error message on the Figure 4.2 will be displayed.

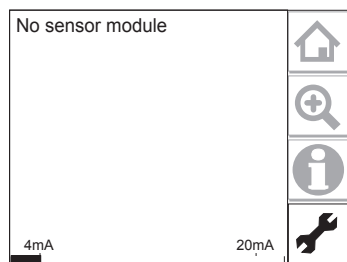


Figure 4.1 Error message when no sensor module is installed

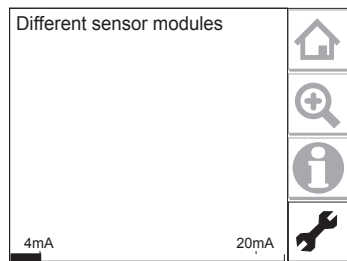


Figure 4.2 Error message for wrong combination of 2 sensor modules

■ If FLXA202-SENCOM SA makes communication error

A message of Checksum error or communication error may appear when FLXA202 is used with SENCOM SA. Check the connection between SENCOM SA and FLXA202 or restart (turn off/on the power) FLXA202.

■ FLXA21 Replacement of Modules

Only authorized person of Yokogawa is allowed to replace modules.

Be sure to keep the replacement procedure below.

CAUTION

Turn off the power supply to the analyzer before replacement of modules.

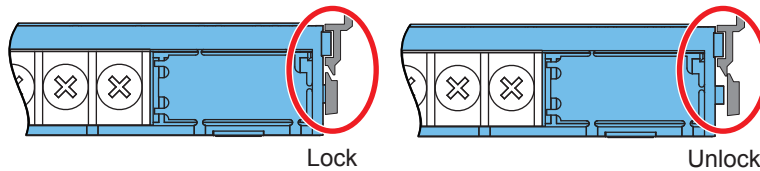


Figure 4.3 Locking the module

Do not hold the upper fine part when pulling out the module.

First, unlock the module by releasing the lock mechanism on the left and right of the module.

Use a slotted (flat head) screwdriver to pull-out the module. Before pull-out the module, loose a terminal screw to hook a screwdriver.

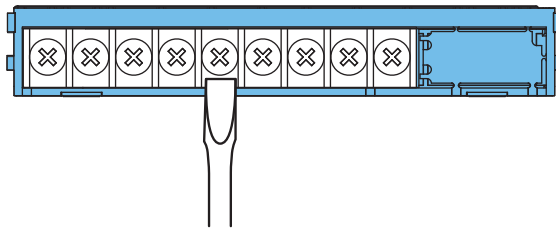


Figure 4.4 Pull-out the module

After replacement of modules, wire the sensor.

NOTE

When the wiring of sensors is finished, be sure to attach the wiring covers. Furthermore, make sure the module is locked with the mechanisms on the left and right of the module.

NOTE

Confirm that all locking-tabs (including for BLANK slots) are “Locked” position when close the front panel.

If locking-tabs are “Unlock” position, the front panel may be interfered with locking-tabs.

- **Checking nameplates of safety marking**

In case of Intrinsic safety type or type "n" or nonincendive model, confirm the name plate on the housing assembly and the sensor module. See IM 12A01A02-20E ■ Mark position of intrinsic safety and nonincendive.

CAUTION

Intrinsic safety type or Increased Safety ec or nonincendive housing assembly /sensor module are certified independently.

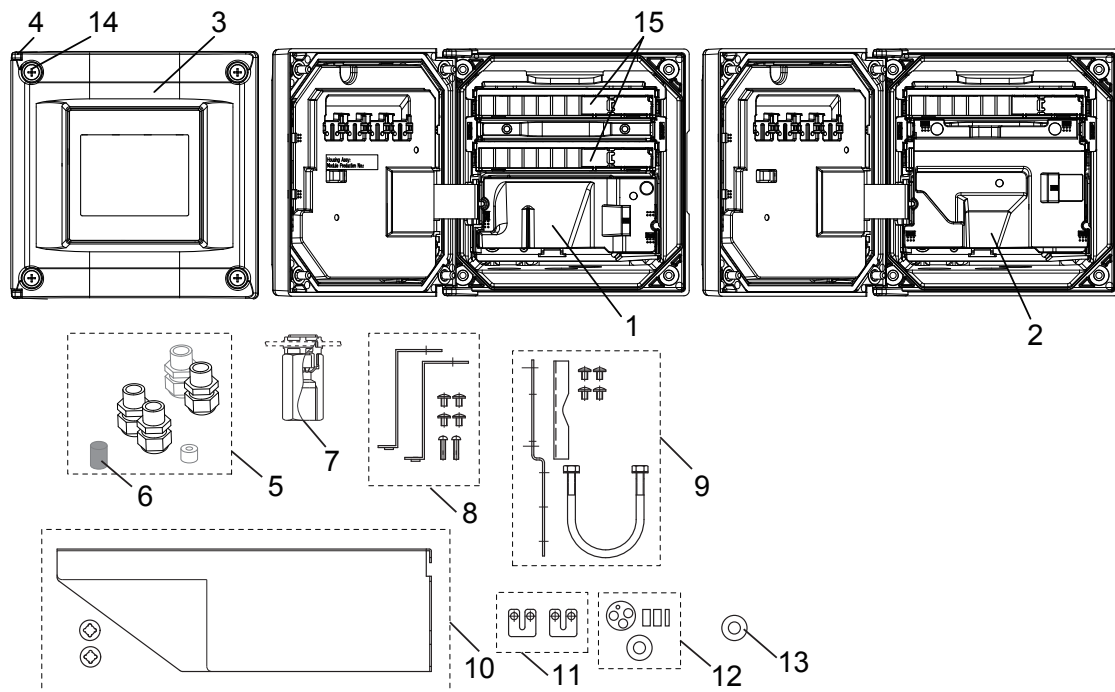
So they must be combined appropriately.

CAUTION

Don't use General Purpose housing assembly / sensor module as Intrinsic safety type module.

Customer Maintenance Parts List

FLXA202 2-Wire Analyzer



Item	Part No.	Qty	Description
1	K9699MD	1	Shield plate
2	K9699ME	1	Shield plate
3	—	—	Cover assembly
	K9699QK	1	urethane coating
	K9699QL	1	epoxy coating
4	K9699QM	1	high anti-corrosion coating
5	K9699PP	1	Hinge pin assembly (Hinge pin + spring)
	—	—	Cable gland assembly
	K9699ZN	1	For Increased Safety ec (metal cable gland x3, close up plug (rubber plug) x1)
	K9699ZM	1	Except Increased Safety ec (plastic cable gland x3, close up plug (rubber plug) x1)
6	K9334CN	1	Rubber plug (for auxiliary component)
7	—	—	Conduit adapter set
	K9699WF	1	G1/2 x 3pcs (option code: /CB4)
	K9699WG	1	1/2NPT x 3pcs (option code: /CD4)
	K9699WH	1	M20x1.5 x 3pcs (option code: /CF4)
8	K9703ZD	1	Panel mounting set (option code: /PM)
9	K9703SS	1	Pipe and wall mounting set (option code: /U)
10	—	—	Hood assembly
	K9698WK	1	Stainless steel (option code: /H6)
	K9698WL	1	Stainless steel + urethane coating (option code: /H7)
	K9698WH	1	Stainless steel + epoxy coating (option code: /H8)
11	A1525JT	2	Jumper (only for pH)
12	K9676BY	1	Grommet set (only for pH)
13	K9676CL	1	Grommet (only for SENCOM SA)
14	K9699PL	5	Screw assembly (M5 screw + spring)
15	—	—	Sensor module assembly (QIC sheet is included.)
	(see Table 1)		pH/ORP Sensor module assembly (11(Jumper) and 12(Grommet set) are included.)
	(see Table 1)		SC Sensor module assembly
	(see Table 1)		ISC Sensor module assembly
	(see Table 1)		DO Sensor module assembly
	(see Table 1)		SSA module assembly (13(Grommet) is included.)

Table 1 Item 15; Sensor module assembly (QIC sheet is included.)

Type code Module	-CB, -CD, -CF, -CG, -CH, -CQ, -CR (Intrinsic safety) *1	-AB, -AD, -AG, -AQ, -AR, -AJ (General purpose) *2	-DB, -DD (Nonincendive and Increased Safety ec) *1
pH/ORP	K9702SS	K9702SR	K9702SR
SC	K9702TS	K9702TR	K9702TR
ISC	K9702US	K9702UR	K9702UR
DO *3	K9702VS	K9702VR	K9702VR
SSA *3	K9702JR		

*1: If you like to replace sensor modules complied with intrinsic safety, Increased Safety ec, or nonincendive type for maintenance, please consult us.

*2: Module for general purpose use may not be used as intrinsic safety, nonincendive and Increased Safety ec.

*3: Exclude -CF.

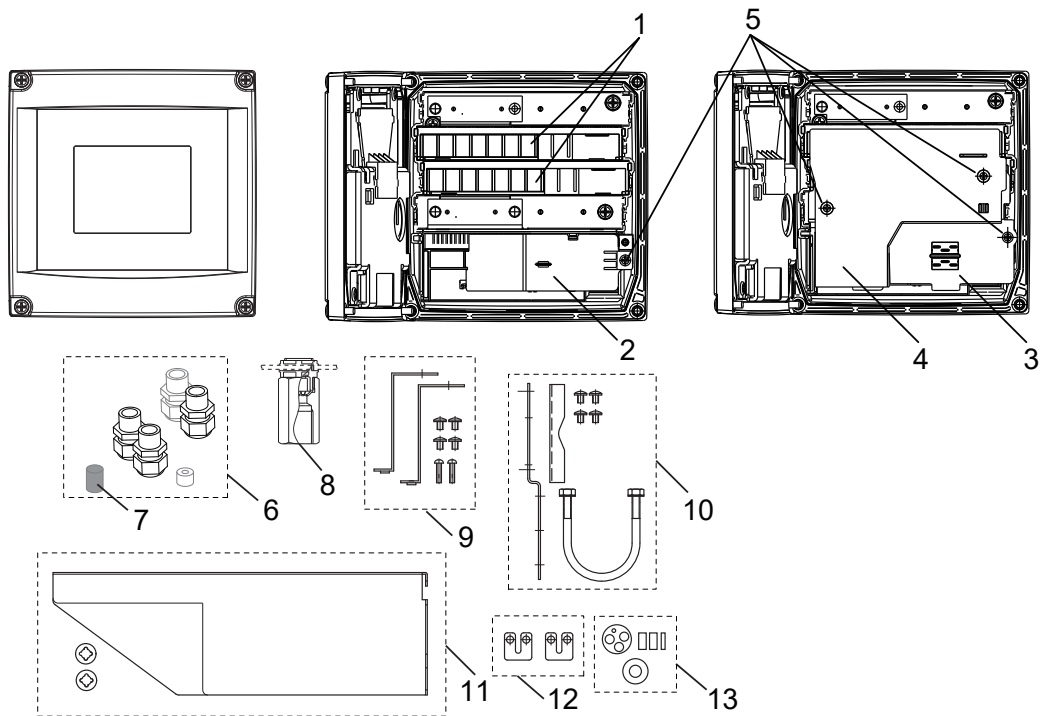
Table 2 Sensor module assembly and sensor module itself (As reference info.)

Sensor module assembly	Sensor module itself	Sensor module assembly	Sensor module itself
K9702SS	K9702SA	K9702SR	K9702SD
K9702TS	K9702TA	K9702TR	K9702TD
K9702US	K9702UA	K9702UR	K9702UD
K9702VS	K9702VA	K9702VR	K9702VD
K9702JR	K9702JC		

Note: Order the part number of the sensor module assembly (left column).

Customer Maintenance Parts List

FLXA21 2-Wire Analyzer



Item	Part No.	Qty	Description
1	— (see Table 1) (see Table 1) (see Table 1) (see Table 1)	— 1 1 1 1	Sensor module assembly (QIC sheet is included.) pH/ORP Sensor module assembly (12(Jumper) and 13(Grommet set) are included.) SC Sensor module assembly ISC Sensor module assembly DO Sensor module assembly
2	—	1	Shield plate
3	—	1	Shield assembly
4	—	1	Shield plate
5	Y9304LU	4	Screw
6	—	—	Cable gland assembly
7	K9698WF K9698WA K9698ZL K9334CN	1 1 1 1	For plastic housing (1 sensor) (cable gland x3, sleeve x1) For plastic housing (2 sensors) (cable gland x4, sleeve x1) For stainless steel housing (cable gland x3, close up plug (rubber plug) x1) Rubber plug (for auxiliary component)
8	—	—	Conduit adapter set
9	K9698WC K9698WD K9698WE K9703ZD	1 1 1 1	G1/2 x 4pcs (option code: /CB4) 1/2NPT x 4pcs (option code: /CD4) M20x1.5 x 4pcs (option code: /CF4) Panel mounting set (option code: /PM)
10	K9703SS	1	Pipe and wall mounting set (option code: /U)
11	— K9698WK K9698WL K9698WH	— 1 1 1	Hood assembly Stainless steel (option code: /H6) Stainless steel + urethane coating (option code: /H7) Stainless steel + epoxy coating (option code: /H8)
12	A1525JT	2	Jumper (only for pH)
13	K9676BY	1	Grommet set (only for pH)

Table 1 Item 1; Sensor module assembly (QIC sheet is included.)

Type code Module	-CB, -CD, -CH,-EG, -EQ, -ER (Intrinsic safety) *1	-AB, -AD, -AG, -AQ, -AR (General purpose) *2	-DD (Nonincendive) *1
pH/ORP	K9702SS	K9702SR	K9702SR
SC	K9702TS	K9702TR	K9702TR
ISC	K9702US	K9702UR	K9702UR
DO	K9702VS	K9702VR	K9702VR

*1: If you like to replace sensor modules complied with intrinsic safety, type-n, or nonincendive type for maintenance, please consult us.

*2: Module for general purpose use may not be used as intrinsic safety, nonincendive and type-n.

Table 2 Sensor module assembly and Sensor module itself (As reference info.)

Sensor module assembly	Sensor module itself
K9702SS	K9702SA
K9702TS	K9702TA
K9702US	K9702UA
K9702VS	K9702VA
K9702SR	K9702SD
K9702TR	K9702TD
K9702UR	K9702UD
K9702VR	K9702VD

Note: Order the part number of the sensor module assembly (left column).

Revision Record

- Manual Title : Model FLXA202 / FLXA21 2-Wire Analyzer Installation and Wiring
- Manual No. : IM 12A01A03-01EN

Mar. 2024/11th Edition

Revised CMPL 12A01A02-01E, CMPL 12A01A03-01EN: part numbers were changed.

Jan. 2024/10th Edition

Changed [Type of protection 'n'] to [Increased Safety 'ec']. (pages i, 1-5, 1-13, 1-16, 2-4, 2-5, 2-10, 4-3)

Revised CMPL 12A01A03-01EN.

Revised others.(pages 2-9, 2-20, 2-21)

Dec. 2023/9th Edition

Correction (page 1-16)

Dec. 2023/8th Edition

Changed TIIS to Japan. Revised CMPL 12A01A02-01E.

Oct. 2023/7th Edition

Revised Safety Compliance (page 1-11)

July 2023/6th Edition

Removed FLXA202 “-DE” (pages 1-16, 1-17, 2-4, 2-5, 2-10)

Revised FM, CSA in Explosion Protected Type Compliance (pages 1-12, 1-13)

June 2023/5th Edition

Revised CMPLs (part number changed)

Feb. 2023/4th Edition

Revised China (NEPSI), Korea (KCs) standard description. (page 1-13)

Sep. 2022/3rd Edition

Changed the diagram and description of the conduit adapter (page 2-7)

Dec. 2021/2nd Edition

Change KOSHA to KCs.

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