General Specifications

Model FLXA202
2-Wire Analyzer

GS 12A01A03-01EN

General

The model FLXA™202 2-Wire Analyzer, one model of FLEXA™ series, offers single or dual sensor measurement. The modular-designed analyzer offers 4 kinds of measurements – pH/ORP (oxidation-reduction potential), contacting conductivity (SC), inductive conductivity (ISC) or dissolved oxygen (DO) – with the respective sensor module.

For dual sensor measurement, the combination of two same type sensor inputs – pH/ORP and pH/ORP (analog sensor only), SC and SC, and DO and DO – are available with two sensor modules. Dual sensor measurement offers additional functionalities; calculated data function and redundant system.

Variety of calculated data from two measuring parameters is selectable for each measurement. On the redundant system built on two measuring parameters of two sensor inputs, main output parameter is automatically switched over to the second sensor output in case of the main sensor’s failure condition.

Addition to conventional analog pH/ORP sensors, the analyzer FLXA202 can be connected to Yokogawa’s digital sensor, FU20F / FU24F / SC25F Digital pH/ORP SENCOM™ Sensor.

In the FLXA202 Human Machine Interface (HMI), 2-wire type analyzer FLXA202 offers easy touch screen operation and simple menu structure in 12 languages. Menus of display, execution and setting are displayed in a selected language.

The analyzer FLXA202 automatically recognizes the installed sensor module and prepares the necessary menus for right configuration, even for dual sensor measurement.

For immediate measurement, the FLXA202 offers quick setup functionality. The quick setup screen appears when the analyzer is powered. Only a few setups – date/time, language, basic sensor configurations and output – will start the measurement.

The FLXA202 offers the best accuracy in measurement with temperature compensation functionality and calibration functionality. Sensor diagnostics and sensor wellness indication make measurement reliable. Logbook of events and diagnostic data is a useful information source for maintenance.

For the wide range of industrial environment, the FLXA202 is designed with the enclosure of aluminum alloy cast with corrosion-resistant coating.

Features

• 4 kinds of measurements; pH/ORP, SC, ISC and DO
• Dual sensor measurement on 2-wire type analyzer; pH/ORP and pH/ORP, SC and SC, and DO and DO
• Calculated data from dual sensor measurement
• Redundant system on dual sensor measurement
• Connection of FU20F / FU24F / SC25F Digital pH/ORP SENCOM Sensor
• Easy touch screen operation on 2-wire type analyzer
• Simple HMI menu structure in 12 languages
• Quick setup menu for immediate measurement
• Indication of sensor wellness
• Enclosure – aluminum alloy cast.

FLEXA, FLXA, SENCOM are trademarks or registered trademarks of Yokogawa Electric Corporation.
All other company and product names mentioned in this document are trademarks or registered trademarks of their respective companies.
We do not use TM or ® mark to indicate those trademarks or registered trademarks in this document.

Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan

GS 12A01A03-01EN
©Copyright Sep. 2015
7th Edition Mar. 23, 2018
General Specifications

1. Basic

■ Measurement Object/Sensor Type
- pH/Oxidation-reduction Potential (pH/ORP) (analog sensor)
- Conductivity (SC)
- Inductive Conductivity (ISC)
- Dissolved Oxygen (DO)
- pH/Oxidation-reduction Potential (pH/ORP) (digital sensor)

Note: The available measurement object depends on a sensor module installed on the analyzer.

■ Analyzer Structure
Module structure

- Composition of Analyzer
One (1) Housing assembly
One (1) or two (2) Sensor modules

- Combination of Sensor Module when two modules are installed
Combinations of two same sensor modules are available;
  - pH/ORP and pH/ORP (analog sensor)
  - SC and SC
  - DO and DO

2. Measurement

2-1. pH/Oxidation-reduction Potential (pH/ORP) with analog sensors

■ Input Specification
Dual high impedance input ($\geq 10^{12} \Omega$)

■ Input Range
  - pH: -2 to 16 pH (with option /K: 0 to 14 pH)
  - ORP: -1500 to 1500 mV
  - rH: 0 to 100 rH
  - Temperature: Pt1000: -30 to 140 ºC
    Pt100: -30 to 140 ºC
    6.8k: -30 to 140 ºC
    NTC 8k55: -10 to 120 ºC
    3k Balco: -30 to 140 ºC
    PTC500: -30 to 140 ºC

■ Output Range
  - pH: min. span 1 pH max. span 20 pH
    max. span 3000 mV
  - ORP: min. span 2 mV max. span 100 mV
  - rH: min. span 2 RH max. span 100 RH
  - Temperature: min. span 25 ºC max. span 170 ºC

■ Performance (Accuracy)
(The specifications are expressed with simulated inputs.)
  - pH
    Linearity: ±0.01 pH
    Repeatability: ±0.01 pH
    Accuracy: ±0.01 pH
  - ORP
    Linearity: ±1 mV
    Repeatability: ±1 mV
    Accuracy: ±1 mV

2-2. Conductivity (SC)

■ Input Specification
Two or four electrodes measurement with square wave excitation, using max 60m (200ft) cable (WU40/ WF10) and cell constants from 0.005 to 50.0 cm⁻¹

■ Input Range
  - Conductivity: min.: 0 µS/cm max.: 200 mS x (Cell constant) (over range 2000 mS/cm)
  - Resistivity: min.: 0.005 kΩ / (Cell constant) max.: 1000 MΩ x cm
  - Temperature: Pt1000: -20 to 250 ºC
    Pt100: -20 to 200 ºC
    Ni100: -20 to 200 ºC
    NTC 8k55: -10 to 120 ºC
    Pb36(JIS NTC 6k): -20 to 120 ºC

■ Output Range
  - Conductivity: min. 0.01 µS/cm max. 2000 mS/cm (max 90% zero suppression)
  - Resistivity: min. 0.001 kΩ x cm max. 1000 MΩ x cm (max 90% zero suppression)
  - Temperature: min. span 25 ºC max. span 270 ºC

■ Performance (Accuracy)
(The specifications are expressed with simulated inputs.)
  - Conductivity
    2 µS x K cm⁻¹ to 200 mS x K cm⁻¹
    Accuracy: ±0.5%F.S.
    1 µS x K cm⁻¹ to 2 µS x K cm⁻¹
    Accuracy: ±1%F.S.
  - Resistivity
    0.005kΩ / K cm⁻¹ to 0.5MΩ /K cm⁻¹
    Accuracy: ±0.5%F.S.
    0.5MΩ / K cm⁻¹ to 1MΩ /K cm⁻¹
    Accuracy: ±1%F.S.
  - Temperature
    with Pt1000, Pb36, Ni100
    Accuracy: ±0.3 ºC
    with Pt100, NTC 8k55
    Accuracy: ±0.4 ºC
  - Temperature compensation
    NaCl table: ±1 %
    Matrix: ±3 %
  - Step response: 90 % (< 2 decades) in 7 seconds

Note: "F.S." means maximum setting value of analyzer output.
"K" means cell constant.
YOKOGAWA provides conductivity sensors of which cell constants are 0.1 to 10 cm⁻¹.
2-3. Inductive Conductivity (ISC)

- **Input Specification**
  Compatible with the Yokogawa inductive conductivity ISC40 series with integrated temperature sensor: NTC30k or Pt1000.

- **Input Range**
  Conductivity: 0 to 2000 mS/cm at 25 ºC reference temperature.
  Temperature: -20 to 140 ºC
  Cable length: max. 60 meters total length of fixed sensor cable + WF10(J) extension cable.
  Influence of cable can be adjusted by doing an AIR CAL with the cable connected to a dry cell.

- **Output Range**
  Conductivity: 
  - min. span: 100 µS/cm
  - max. span: 2000 µS/cm (max 90% zero suppression)
  Temperature: 
  - min. span: 25 ºC
  - max. span: 160 ºC

- **Performance (Accuracy)**
  (The specifications are expressed with simulated inputs.)
  (Output span is 0-100 µS/cm or more)
  Conductivity: 
  - Linearity: ±(0.4 %F.S. + 0.3 µS/cm)
  - Repeatability: ±(0.4 %F.S. + 0.3 µS/cm)
  - Temperature: ±0.3 ºC
  Step response: 90 % (< 2 decades) in 8 seconds
  Note: "F.S." means maximum setting value of analyzer output.

2-4. Dissolved Oxygen (DO)

- **Input Specification**
  The FLXA202 accepts output from membrane covered Dissolved Oxygen sensors. These sensors can be Galvanic type, where the sensor generates its own driving voltage or Polarographic type, where the sensor uses external driving voltage from the converter.
  The input range is 0 to 50 µA for Galvanic sensors and 0 to 1 micro A for Polarographic sensors.
  For temperature compensation, the FLXA202 accepts Pt1000 (DO30 sensor) and NTC22k elements (OXYFERM and OXYGOLD sensors).

- **Input Range**
  DO30 sensor:
  - Dissolved Oxygen: 0 to 50 mg/l (ppm)
  - Temperature: -20 to 150 ºC
  Note: Process temperature for DO30 is 0 to 40 ºC
  Hamilton sensors:
  - Oxyferm:
    - Measurement range: 10 ppb to 40 ppm
    - Temperature range: 0 to 130 ºC
  - Oxygold G:
    - Measurement range: 2 ppb to 40 ppm
    - Temperature range: 0 to 130 ºC
  - Oxygold B:
    - Measurement range: 8 ppb to 40 ppm
    - Temperature range: 0 to 100 ºC

- **Output Range**
  DO concentration:
  - mg/l (ppm):
    - min.: 1 mg/l (ppm)
    - max.: 50 mg/l (ppm)
  - ppb:
    - min.: 1 ppb
    - max.: 9999 ppb
  % saturation:
  - min.: 10 %
  - max.: 600 %
  Temperature:
  - min. span: 25 ºC
  - max. span: 170 ºC

- **Performance (Accuracy)**
  (The specifications are expressed with simulated inputs.)
  Performance in ppm mode:
  - Linearity: ±0.05 ppm or ±0.8% F.S., whichever is greater
  - Repeatability: ±0.05 ppm or ±0.8% F.S., whichever is greater
  - Accuracy: ±0.05 ppm or ±0.8% F.S., whichever is greater
  Performance in ppb mode:
  - Linearity: ±1 ppb or ±0.8% F.S., whichever is greater
  - Repeatability: ±1 ppb or ±0.8% F.S., whichever is greater
  - Accuracy: ±1 ppb or ±0.8% F.S., whichever is greater
  Temperature:
  - Linearity: ±0.3 ºC
  - Repeatability: ±0.1 ºC
  - Accuracy: ±0.3 ºC
  Note: "F.S." means maximum setting value of analyzer output.

2-5. pH/Oxidation-reduction Potential (pH/ORP) with digital sensor, FU20F pH/ORP SENCOM Sensor

- **Input Specification**
  Bi-directional digital communication (RS-485) between FU20F and FLXA202

- **Input Range (depending on FU20F)**
  pH:
  - 0 to 14 pH
  ORP:
  - -1500 to 1500 mV
  rH:
  - 0 to 100 rH
  Temperature: -10 to 105 ºC

- **Output Range**
  pH:
  - min. span 1 pH
  - max. span 20 pH
  ORP:
  - min. span 100 mV
  - max. span 3000 mV
  rH:
  - min. span 2 rH
  - max. span 100 rH
  Temperature: min. span 25 ºC
  - max. span 170 ºC
3. Electrical

■ Output Signal

General: One output of 4-20 mA DC
Note: Tolerance: ±0.02 mA
Bi-directional HART digital communication, superimposed on mA (4-20mA) signal

Output function:
Linear or Non-linear (21-step table)

Burn out function: (NAMUR 43 except ISC)
Without HART/PH201G:
Down: 3.6 mA (signal: 3.8 to 20.5 mA for pH/ORP, SC and DO)
(signal: 3.9 to 20.5 mA for ISC)
Up: 22mA

With HART/PH201G:
Down: 3.6 mA for pH/ORP, SC and DO
(signal: 3.8 to 20.5 mA for pH/ORP, SC and DO)
(signal: 3.9 to 20.5 mA for ISC)
Up: 22mA

■ Power Supply

Nominal 24 V DC loop powered system

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

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

Note: When the FLXA202 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.

Table:

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Load resistance (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24.718</td>
<td>0-1295</td>
</tr>
<tr>
<td>22.8-22.86</td>
<td>250</td>
</tr>
<tr>
<td>18.2-21</td>
<td>250</td>
</tr>
<tr>
<td>16.2-18.18</td>
<td>250</td>
</tr>
<tr>
<td>22.8-22.47</td>
<td>250</td>
</tr>
</tbody>
</table>

Digital Communication Range (HART)

Maximum Load Resistance
pH/ORP (analog sensor), SC and DO:
Refer to the Figure 1.
ISC and pH/ORP SENCOM sensor:
Refer to the Figure 2.

■ Display

LCD with a touch screen:
Black/White: 213 x 160 pixels
Contrast adjustment available on the touch screen

Message language:
12 (English, Chinese, Czech, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian and Spanish)
One analyzer has all 12 languages.
Note: Description for a selection of language and language names are written in English.
Note: Only English alphabet and numeric are available for a tag number, an additional description for each value on the display screen and passwords.
Note: Only for message language on the screen, 12 languages are provided.

4. Mechanical and others

■ Housing

Case, Cover:
• Aluminum alloy cast + epoxy coating
• Aluminum alloy cast + urethane coating
• Aluminum alloy cast + high anti-corrosion coating

Color: Silver gray
Protection: IP66 (except Canada), NEMA Type 4X (USA), CSA Type 3S/4X (Canada)

■ Cable and Terminal

Cable size:
Outer diameter: 6 to 12 mm (suitable for M20 cable gland)
Terminal screw size: M4
torque of screw up: 1.2 N•m

Wire terminal:
Pin terminal, ring terminal and spade terminal can be used for analyzer’s power supply terminals and sensor terminals.

Grounding terminal:
Ring terminal should be used.
Pin terminal: pin diameter: max. 1.9 mm
Ring and spade terminal: width: max. 7.8 mm

■ Cable Entry

3 holes,
M20 cable gland x 3 pcs
Close up plug x 1 pc
Note: Cable gland and plug are delivered with an analyzer, but not assembled into the analyzer.

■ Mounting

Mounting hardware (option):
• Universal mounting kit (Note)
• Pipe and wall mounting hardware
• Panel mounting hardware

Note: This kit contains the pipe and wall mounting hardware and the panel mounting hardware.

Hood (option):
• Stainless steel
• Stainless steel with urethane coating
• Stainless steel with epoxy coating

■ Stainless Steel Tag Plate

When the additional code “/SCT” with a tag number is specified, the tag plate on which the tag number is inscribed is delivered with the analyzer.
Tag plate is hanging type.
■ Conduit Adapter
Using optional adapter
  • G1/2 (quantity: 3)
  • 1/2NPT (quantity: 3)
  • M20 x 1.5 (quantity: 3)
These conduit adapters are delivered with an analyzer, but not assembled into the analyzer.

■ Size of Housing Case
165 x 165 x 155 mm (W x H x D) (without cable gland)

■ Weight
Approx. 2.5 kg

■ Ambient Operating Temperature
-20 to +55 ºC

■ Storage Temperature
-30 to +70 ºC

■ Humidity
10 to 90% RH at 40ºC (Non-condensing)

■ Document
Following documents are delivered with an analyzer;
  Paper copy:
    Start-up Manual
    written in English
    Safety Precautions
    written in English
  CD-ROM:
    Start-up Manual
    written in English
    User's Manual
    written in English
    Safety Regulations Manual
    for European region
    written in 25 languages
    General Specifications
    written in English
    Technical Information
    for HART Communication
    written in English
    User Setting Table
    of 5 kinds of measurement/sensor type
    written in English

5. Digital Communication

■ Kind of Digital Communication
  • HART (HART 5) or PH201G dedicated distributor
Note: Only one kind of digital communication is available for one analyzer.

■ Output Value Parameter (HART)
Four value parameters (measured values) are available for one digital communication.
  • For 1-sensor measurement, these parameters are measured values.
  • For 2-sensor measurement, refer to the next item.

■ Digital Communication of 2-Sensor Measurement (HART)
Even when two sensor modules are installed, only one digital communication is available for 2-sensor measurement.
Four value parameters can be selected from the followings;
  Measured values of two sensors
  Calculated data of 2-sensor measurement
  Redundant system output

■ Specific Contact Output with dedicated distributor, model PH201G (Style B)
The distributor, model PH201G, is designed to connect with the 2-Wire Analyzer.
This distributor supplies drive power to the analyzer and receives simultaneously 4-20 mA DC signal from the analyzer.
This signal is converted to 1-5 V DC signal in the distributor.
This distributor also receives digital signals superimposed on the 4-20 mA DC signal, and provides contact outputs
Input/Output signal:
  Number of available drive/signal point: 1
  Output signal: 1-5 V DC (2 points) (Note)
  Load resistance: 2 kΩ or less (1-5 V DC output)
  Isolation system: Loop isolation type
Note: Two output signals for one analyzer’s analog output are provided. Two 1-5 V DC output signals are same.
Contact output:
  Contact rating:
    250 V AC, maximum 100 VA
    220 V DC, maximum 50 VA
  Hold contact output:
    NC contact, normally energized
    Contact closes when power is off or during Hold situation.
  Fail contact output:
    NC contact, normally energized
    Contact closes when power is off or during Fail/Warning conditions.
  Wash contact output:
    NO contact
    Contact closes during wash cycles.
## Regulatory Compliance (FLXA202)

### Safety, EMC and RoHS Compliance

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

**EMC:**
- EN 61326-1 Class A, Table 2 (For use in industrial locations)
- EN 61326-2-3
- RCM: EN 61326-1 Class A, Table 2

**Korea Electromagnetic Conformity**
- Standard Class A

**Russian:**
- TR CU 020/2011

**RoHS:**
- EN 50581: 2012 (Style 1.02 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.

**Information of the WEEE Directive**
- This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply.
- The WEEE Directive is only valid in the EU.

### Explosion Protected Type Compliance

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type* Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
<td>‘Type’ in MS code</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>United States (FM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada (CSA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All Rights Reserved. Copyright © 2015, Yokogawa Electric Corporation
■ Control Drawings

(1) ATEX and IECEx Intrinsic safety “ia”

Model: FLXA21/FLXA202

Specific Conditions of Use

- When the enclosure of the Analyzer is made of aluminum alloy (FLXA202), and when the Analyzer used in an explosive atmosphere requiring equipment of Category 1 G or EPL Ga, it must be installed in such a way that, even in the event of rare incidents, an ignition source due to impact friction sparks is excluded.

- When accessing the display window or other non-metallic parts of the enclosure of FLXA202/FLXA21, take following measures to minimize the risk of explosion from electrostatic discharge.
  - Also, avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth.
  - Earth the operator through a wrist-strap,
  - Operate FLXA202/FLXA21 on the conductive floors, wearing anti-static work clothes and anti-static safety shoes,
  - Neutral the operator and FLXA202/FLXA21 by a static elimination bar which has a metal part earthed through resistor from 100kΩ to 100MΩ.

In case that those measures cannot be taken or static electricity cannot be suppressed, bring a gas detector and make sure there is no ignition capable atmosphere around FLXA202/FLXA21 before the operation.

Notes:

1. The associated apparatus must be a linear source.
2. Measuring Module 2 is not necessarily installed. As for ISC module and SENCOM module, only one module is permitted to be installed at a time.
3. Sensor 1 and Sensor 2 may be used simultaneously with compatible apparatus only.

WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE USER’S MANUAL
Mar. 23, 2018-00

Control drawing (4-20mA type)
Installation for Zone 0, 1 / Division 1
Applicable models: FLXA21-D-x-x-CD-xx-xx-A-..., FLXA202-D-x-x-CD-xx-xx-A-…

Specific conditions of use
- Electrostatic charges on the non-metallic or coated parts of the two wire analyzer shall be avoided.

Specific conditions of use for FLXA202-D-x-x-DE-xx-xx-A-... when it is used as “Ex nA ic”
- The cable glands accompanying the equipment may not provide sufficient clamping. Additional clamping of the cable shall be provided to ensure that pulling and twisting are not transmitted to the termination. Alternatively, Ex d, Ex e, or Ex n cable glands which provide sufficient clamping shall be used instead of the accompanying cable gland.
- The gaskets of the cable glands shall be protected from light.
- Analyzer must be installed in such a way that the air vent is physically protected from any possible impact.
1. Installation must be in accordance with the Canadian Electric Code Part I (C22.1), ANSI/ISA-RP12.06.01 and relevant local codes.

2. The associated apparatus must be a linear source meeting the following conditions.

   \[
   \begin{align*}
   U_o (or \, V_{oc}) & \leq U_i \\
   I_o (or \, I_{sc}) & \leq I_i \\
   P_i & \leq P_o \\
   C_i (or \, C_{a}) & \geq C_i + C_{cable} \\
   L_i (or \, L_{a}) & \geq L_i + L_{cable}
   \end{align*}
   \]

3. Control equipment connected to the associated apparatus must not use or generate a voltage which exceeds \( U_{m} \) of the associated apparatus.

4. The control drawing of the associated apparatus must be followed when installing the equipment.

5. Measuring Module 2 is not always installed. As for ISC module and SENCOM module, only one module is permitted to be installed at a time.

6. When installed in Zone 0 or 1, or Division 1, Sensor 1 and Sensor 2 may be simple apparatus or intrinsically safe apparatus meeting the conditions below.

   \[
   \begin{align*}
   U_i (or \, V_{m}) & \geq U_o \\
   I_i (or \, I_{m}) & \geq I_o \\
   P_i & \geq P_o \\
   C_i & \leq C_o - C_{cable} \\
   L_i & \leq L_o - L_{cable}
   \end{align*}
   \]

7. The control equipment must be an associated non-incendive field wiring apparatus meeting the conditions below. Alternatively, it may be general-purpose equipment, if a suitable wiring method other than non-incendive field wiring is employed.

   \[
   \begin{align*}
   U_o (or \, V_{oc}) & \leq U_i \\
   C_o (or \, C_{a}) & \geq C_i + C_{cable} \\
   L_o (or \, L_{a}) & \geq L_i + L_{cable}
   \end{align*}
   \]

8. When FLXA202-D-x-x-DE-xx-xx-A-... is used as "Ex nA ic", it must be installed in accordance with one of the following:

   a) in a SELV or PELV system, or
   b) via a safety isolating transformer complying with the requirements of IEC 61558-2-6, or a technically equivalent standard, or
   c) directly connected to apparatus complying with IEC60950 series, IEC61010-1, or a technically equivalent standard, or
   d) fed directly from cells or batteries.

9. When FLXA202-D-x-x-DE-xx-xx-A-... is used as "Ex nA ic" and with the accompanying cable glands, cable with an external diameter of 6 to 12 mm must be used for field wiring. The cable glands must be secured with a tightening torque of 6 Nm so that they can be released only with the aid of a tool. Unused cable glands shall be sealed with the accompanying metal plug.
(3) FM

Intrinsic safety, Nonincendive

Models: FLEXA Series
Date: April 17, 2015

Rev. 1: May 29, 2017
Doc. No.: IFM039-A71

Yokogawa Electric Corporation

Control drawing (4–20 mA type)
Installation for Division 1 / Zone 0, 1

Applicable models: FLXA21-D-x-x-CD-xx-xx-A-..., FLXA202-D-x-x-CD-xx-xx-A-...

Unclassified Location Hazardous (Classified Location)
Class I, Division 1, Groups A, B, C, D, or
Class I, Zone 0, 1, Group IIC
Temperature Class: T4

Measuring Module 1, 2 (Note 8):

<table>
<thead>
<tr>
<th>Type of Measuring Module</th>
<th>pH</th>
<th>SC</th>
<th>DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo</td>
<td>11.76 V</td>
<td>11.76 V</td>
<td>5.36 V</td>
</tr>
<tr>
<td>Io</td>
<td>116.5 mA</td>
<td>60.6 mA</td>
<td>106.16 mA</td>
</tr>
<tr>
<td>Po</td>
<td>0.3424 W</td>
<td>0.178 W</td>
<td>0.1423 W</td>
</tr>
<tr>
<td>Lo</td>
<td>1.7 mH</td>
<td>8 mH</td>
<td>0.45 mH</td>
</tr>
</tbody>
</table>

Specific conditions of use:
- Electrostatic charges on the non-metallic or coated parts of the two wire analyzer shall be avoided.
- In the case where the enclosure of the analyzer is made of Aluminum, if it is mounted in ZONE 0, it must be installed such that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

Supply +

Control Equipment (Note 9)

Supply –

Housing Assembly

Measuring Module 1

Measuring Module 2

FLEXA Series Analyzer

Sensor 1 (Note 8)

Sensor 2 (Note 8)

Supply +, Supply – (Note 4):

Ui: 30 V
Ii: 100 mA
Pi: 0.75 W
Ci: 13 nF
Li: 0 mH

(Note 7)
1. This drawing replaces the former control drawing IKE039-A12.

2. No revision to this drawing without prior approval of FM.

3. Installation must be in accordance with the National Electric Code (NFPA 70), ANSI/ISA-RP12.06.01 and relevant local codes.

4. The associated apparatus must be an FM-approved linear source meeting the following conditions.

   - \( U_o \) (or \( V_{oc} \)) \( \leq \) \( U_i \) (or \( U_{i} \))
   - \( I_o \) (or \( I_{sc} \)) \( \leq \) \( I_i \) (or \( I_{i} \))
   - \( P_o \) \( \leq \) \( P_i \) (or \( P_{i} \))
   - \( C_o \) (or \( C_{a} \)) \( \geq \) \( C_i + C_{cable} \)
   - \( L_o \) (or \( L_{a} \)) \( \geq \) \( L_i + L_{cable} \)

5. Control equipment connected to the associated apparatus must not use or generate a voltage which exceeds \( U_m \) of the associated apparatus.

6. The control drawing of the associated apparatus must be followed when installing the equipment.

7. Measuring Module 2 is not always installed. As for ISC module and SENCOM module, only one module is permitted to be installed at a time.

8. When installed in Division 1, Zone 0 or Zone 1, Sensor 1 and Sensor 2 may be simple apparatus or intrinsically safe apparatus meeting the conditions below.

   - \( U_i \) (or \( V_{max} \)) \( \geq \) \( U_o \)
   - \( I_i \) (or \( I_{max} \)) \( \geq \) \( I_o \)
   - \( P_i \) \( \geq \) \( P_o \)
   - \( C_i \) \( \leq \) \( C_o - C_{cable} \)
   - \( L_i \) \( \leq \) \( L_o - L_{cable} \)

9. Control equipment must be an FM-approved associated nonincendive field wiring apparatus meeting the conditions below. Alternatively, it may be general-purpose equipment, if a suitable wiring method other than nonincendive field wiring is employed.

   - \( U_o \) (or \( V_{oc} \)) \( \leq \) \( U_i \) (or \( U_{i} \))
   - \( C_o \) (or \( C_{a} \)) \( \geq \) \( C_i + C_{cable} \)
   - \( L_o \) (or \( L_{a} \)) \( \geq \) \( L_i + L_{cable} \)

10. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – WHEN THE EQUIPMENT IS USED IN HAZARDOUS LOCATIONS, AVOID ANY ACTION WHICH GENERATE ELECTROSTATIC DISCHARGE SUCH AS RUBBING WITH A DRY CLOTH.

11. WARNING – IN THE CASE WHERE THE ENCLOSURE OF THE ANALYZER IS MADE OF ALUMINUM, IF IT IS MOUNTED IN ZONE 0, IT MUST BE INSTALLED SUCH THAT, EVEN IN THE EVENT OF RARE INCIDENTS, IGNITION SOURCES DUE TO IMPACT AND FRICTION SPARKS ARE EXCLUDED.

12. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY AND SUITABILITY FOR DIVISION 2 / ZONE 2.
(4) ATEX (Type n)

Type of protection ‘n’

- Ventilation class I area shall be avoided.
- If the equipment is installed in a way that the area is not properly ventilated,
  the cabinet and the machine shall be installed with the air vents accordingly.
- The cabinets shall be equipped with an airtight cover.
- The cabinet shall be equipped with a light-tight cover to prevent the entry of light.
- The cabinet shall be equipped with a gasket to prevent the entry of water.
- The cabinet shall be equipped with an air vent to prevent the entry of air.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a mechanical lock to prevent the entry of tools.
- The cabinet shall be equipped with a external gasket to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
- The cabinet shall be equipped with a protective cover to prevent the entry of dust.
- The cabinet shall be equipped with a protective cover to prevent the entry of tools.
- The cabinet shall be equipped with a protective cover to prevent the entry of water.
**Non Hazardous Area Hazardous Area**

<table>
<thead>
<tr>
<th>Model: FLXA202</th>
<th>Date: March 31, 2016</th>
</tr>
</thead>
</table>

**Rev. Doc.No.: NIE015-A71 P.1**

Yokogawa Electric Corporation

---

### Ex nA ic Ratings

**Supply +, Supply –**

- **Um:** 29.6V
- **Un:** 16V to 29.6V (pH/ORP, SC, DO one module)
  - 17V to 29.6V (ISC one module)
  - 21V to 29.6V (SENCOM one module)
  - 22.8V to 29.6V (pH/ORP, SC, DO two modules)

### Type of Measuring Module

**pH, SC, DO ISC SENCOM**

<table>
<thead>
<tr>
<th>Ui (or Vmax)</th>
<th>Io (or Imax)</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.76 V</td>
<td>116.5 mA</td>
<td>0.3424 W</td>
<td>100 nF</td>
<td>1.7 mH</td>
</tr>
<tr>
<td>11.76 V</td>
<td>60.6 mA</td>
<td>0.178 W</td>
<td>100 nF</td>
<td>8 mH</td>
</tr>
<tr>
<td>5.36 V</td>
<td>106.16 mA</td>
<td>0.1423 W</td>
<td>31 μF</td>
<td>0.45 mH</td>
</tr>
</tbody>
</table>

### Specific condition of use

- Electrostatic charges on the non-metallic or coated parts of the two wire analyzer shall be avoided.
- The cable gland accompanying the equipment may not provide sufficient clamping. Additional clamping of the cable shall be provided to ensure that pulling and twisting are not transmitted to the termination. Alternatively, an Ex d, Ex e, or Ex n cable gland which provides sufficient clamping shall be used instead of the accompanying cable gland.
- The gaskets of the cable glands shall be protected from light.
- Analyzer must be installed in such a way that the sensor is physically protected from any possible impact.

---

**Notes:**

1. Installation must be in accordance with IEC60079-14 and relevant local codes.
2. Measuring Module 2 is not always installed. As for ISC module and SENCOM module, only one module is permitted to be installed at a time.
3. When installed in an area where EPL Gc is required, Sensor 1 and Sensor 2 may be simple apparatus, Intrinsically safe apparatus meeting conditions below, or other EPL Gc equipment.

\[
\begin{align*}
\text{Ui} & \geq \text{Uo} \\
\text{Ii} & \geq \text{Io} \\
\text{Pi} & \geq \text{Po} \\
\text{Ci} & \leq \text{Co} - \text{Ccable} \\
\text{Li} & \leq \text{Lo} - \text{Lcable}
\end{align*}
\]

4. FLXA202 Analyzer must be installed in accordance with one of the following:

- In SELV or PELV system, or
- Via a safety isolating transformer complying with the requirements of IEC 61558-2-6, or a technically equivalent standard, or
- Directly connected to apparatus complying with IEC 60950 series, IEC 61010-1, or a technically equivalent standard, or
- Fed directly from cells or batteries.

5. When FLXA202 Analyzer is installed with accompanying cable glands, cable with an external diameter of 6 mm to 12 mm must be used. The cable glands must be secured with a tightening torque of 6 Nm so that they can be released only with the aid of a tool. Unused cable glands shall be sealed with the accompanying metal plug.

---

**Control Drawing**

- **Type of protection 'n'**
- NEPSI and KOSHA Intrinsic safety "ia"
### Model & Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLXA202</td>
<td></td>
<td></td>
<td>2-Wire Analyzer</td>
</tr>
</tbody>
</table>

**Power supply**

- **Option**: -D
  - **Description**: Always -D

**Housing** (Note 12)

- **Option**
  - -B: Aluminum alloy cast + urethane coating
  - -C: Aluminum alloy cast + epoxy coating
  - -D: Aluminum alloy cast + high anti-corrosion coating

**Display** (Note 13)

- **Option**: -D
  - **Description**: Anti-glare LCD

**Type** (Note 1)

- **Option**
  - -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 (Note 14)
  - -CD: IS for FM, CSA (Note 2)
  - -CF: IS for TiIL (Note 15)
  - -CG: IS for KOSHA (Note 3)
  - -CH: IS for NEPSI
  - -CQ: IS for EAC with PA
  - -CR: IS for EAC
  - -DB: Type n for ATEX, IECEx
  - -DD: NI for FM, CSA
  - -DE: Type n for CSA

**1st input**

- **Option**
  - -P1: pH/ORP (Note 4)
  - -C1: Conductivity (SC)
  - -C5: Inductive conductivity (ISC)
  - -D1: Dissolved oxygen (DO)
  - -S1: pH/ORP (SENCOM sensor) (Note 5)

**2nd input** (Note 6)

- **Option**
  - -NN: Without input
  - -P1: pH/ORP (Note 4)
  - -C1: Conductivity (SC)
  - -D1: Dissolved oxygen (DO)

**Output**

- **Option**: -A
  - **Description**: 4-20 mA + HART

- **Option**: -N
  - **Description**: Always -N

**Language set** (Note 7)

- **Option**
  - -LA: English and 11 languages

**Country** (Note 8)

- **Option**
  - -N: Global except Japan
  - -J: Japan

**Option Mounting hardware**

- **Mounting hardware**
  - /UM: Universal mounting kit (Note 9)
  - /U: Pipe and wall mounting hardware
  - /PM: Panel mounting hardware

- **Hood**
  - /H6: Hood, stainless steel
  - /H: Hood, stainless steel + urethane coating
  - /H8: Hood, stainless steel + epoxy coating

- **Tag plate**
  - /SCT: Stainless steel tag plate

- **Conduit adapter** (Note 10)
  - /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 Type n
  - /CD5: 1/2NPT x 3 pcs for Type n
  - /CF5: M20 x 1.5 x 3 pcs for Type n

**Measurement law**

- **Option**: /K
  - **Description**: With Measurement Law certificate (Note 11)

**Notes:**

1. Type "-C *" is intrinsic safety (IS), Type "-DB" is type n of ATEX and IECEx, Type "-DD" is nonincendive (NI) of FM and CSA, Type "-DE" is type n of CSA.
2. Type "-CD *" is intrinsic safety, but is available as nonincendive.
3. Korean IM is attached to FLXA202 instead of English IM.
4. This input to be come from an analog pH/ORP sensor.
5. When the analyzer is connected with the digital sensor (FU20F pH/ORP SENCOM Sensor)
6: 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. And, the combination of SENCOM sensor and SENCOM sensor is not available, either.

7: 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.

8: 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.

9: The universal mounting kit contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).

10: “/CBS”, “/CD5”, “/CF5” are exclusively for type “-DB” or “-DE”. “/CB4”, “/CD4”, “/CF4” cannot be used with type “-DB” or “-DE”. “/CB4”, “/CD4”, “/CF4” can be used with other types of the analyzer except for “-DB” or “-DE”.

11: 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 with an analog sensor is certified. The digital sensor (FU20F) is not certified. The output signal of 4 - 20 mA is certified. HART communication is not certified.

12: 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.

13: Type “-CF” is anti-reflection coated. Other types are anti-glare coated.

14: Product registration is done by Yokogawa Taiwan Corporation as an importer in Taiwan.

15: For detailed information refer to Japanese GS 12A01A03-01JA.
Dimensions and Mounting

Conduit Adapter (Option code: □/CB4, □/CD4, □/CF4)

Unit: mm (inch)

Conduit Adapter (Option code: □/CB5, □/CD5, □/CF5)

Unit: mm (inch)
(Note) The universal mounting kit (/UM) contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).

Panel mounting hardware (Option code: /PM, /UM)

```
Panel thickness
10-12
2-M5 length 35
```

```
Unit: mm
138 0
138 0
```

```
*: Tighten the four screws to a torque of 2 N-m.
```

Wall mounting hardware (Option code: /U, /UM)

```
For wall mounting
3-ø10 holes
```

```
Unit: mm
200
100
```

```
*: Tighten the four screws to a torque of 2 N-m.
```

Note: The wall on which the analyzer is mounted should be strong enough to bear the weight of more than 8 kg.
Pipe mounting hardware (Option code: □/U, □/UM)

Pipe 50A (ø60.5)

Pipe mounting (Horizontal)  Pipe mounting (Vertical)

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

Stainless steel hood (Option code: □/H6, □/H7, □/H8)

Unit: mm
### 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)
*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 or pH/ORP with the SENCOM sensor, 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. The SENCOM sensor is to be connected directly to the analyzer without a terminal box.
*7: Two outputs, output 1 and output 2, of PH201G or SDBT are same signals.
## Inquiry Specifications Sheet for FLXA202 2-Wire Analyzer

Make inquiries by placing checkmarks (☑) in the pertinent boxes and filling in the blanks.

1. **General Information**
   - Company name: 
   - Contact Person: ___________________  Department: ___________________
   - Plant name: ___________________
   - Measurement location: ___________________
   - Purpose of use: □ Indication, □ Recording, □ Alarm, □ Control

2. **Measurement Conditions**
   1. Process temperature: ______ to ______ [°C]
   2. Process pressure: ______ to ______ [kPa]
   3. Flow rate: ______ to ______ [l/min]
   4. Flow speed: ______ to ______ [m/s]
   5. Slurry or contaminants: □ No, □ Yes
   6. Name of process fluid: ___________________
   7. Components of process fluid: ___________________
   8. Others: ___________________

3. **Installation Site**
   1. Ambient temperature: ______ to ______ [°C]
   2. Location: □ Outdoors, □ Indoors
   3. Others: ___________________

4. **Requirements**

   4.1 **pH/ORP (analog sensor)**
   - 1st Input:
     - □ pH/ORP (analog sensor)
     - □ Conductivity (SC)
     - □ Inductive conductivity (ISC)
     - □ Dissolved oxygen (DO)
     - □ pH/ORP (digital sensor, FU20F)
   - 2nd Input:
     - □ With (same as 1st Input)
     - □ Without

   4.2 **pH/ORP (digital sensor)**
   - 1st Input:
     - □ pH 0 to 14
     - □ ORP ______ to ______ mV
   - 2nd Input:
     - □ pH 0 to 14
     - □ ORP ______ to ______ mV
4.2 Conductivity

☐ 1st Input

(1) Measuring range; .................................................................
(2) Transmission output; 4 to 20 mA DC
(3) Detector/sensor; SC4AJ □ Two electrode system (0.02 cm⁻¹) □ Two electrode system (0.1 cm⁻¹)
         SC8SG □ Two electrode system (0.01 cm⁻¹) □ Two electrode system (10 cm⁻¹),
         □ Four electrode system (10 cm⁻¹)
         SC210G □ Two electrode system (0.05 cm⁻¹) □ Two electrode system (5 cm⁻¹)
(4) Detector/sensor mounting method;
   SC4AJ □ Adapter mounting, □ Welding socket, □ Welding clamp
   SC8SG □ Screw-in, □ Flow-through
   SC210G □ Screw-in, □ Flange, □ Flow-through, □ Screw-in with gate valve
(5) Electrode cable length; SC4AJ □ 3m, □ 5m, □ 10m, □ 20m
   SC8SG □ 5.5m, □ 10m, □ 20m
   SC210G □ 3m, □ 5m, □ 10m, □ 15m, □ 20m
(6) Others;

☐ 2nd Input

(1) Measuring range; .................................................................
(2) Transmission output; 4 to 20 mA DC
(3) Detector/sensor; SC4AJ □ Two electrode system (0.02 cm⁻¹) □ Two electrode system (0.1 cm⁻¹)
         SC8SG □ Two electrode system (0.01 cm⁻¹) □ Two electrode system (10 cm⁻¹),
         □ Four electrode system (10 cm⁻¹)
         SC210G □ Two electrode system (0.05 cm⁻¹) □ Two electrode system (5 cm⁻¹)
(4) Detector/sensor mounting method;
   SC4AJ □ Adapter mounting, □ Welding socket, □ Welding clamp
   SC8SG □ Screw-in, □ Flow-through
   SC210G □ Screw-in, □ Flange, □ Flow-through, □ Screw-in with gate valve
(5) Electrode cable length; SC4AJ □ 3m, □ 5m, □ 10m, □ 20m
   SC8SG □ 5.5m, □ 10m, □ 20m
   SC210G □ 3m, □ 5m, □ 10m, □ 15m, □ 20m
(6) Others;

4.3 Inductive conductivity

(1) Measuring range; .................................................................
(2) Transmission output; 4 to 20 mA DC
(3) System configuration selection; □ ISC40GJ Sensor, □ Holder, □ Converter, □ BA20 Terminal box,
         □ WF10J Extension cable
(4) Sensor mounting method;
   □ ISC40FDJ Immersion holder, □ ISC40FFJ Flow-through holder,
   □ ISC40FSJ Direct insertion adapter
(5) ISC40GJ Sensor cable length; □ 5m, □ 10m, □ 15m, □ 20m
(6) WF10J Extension cable length; □ 5m, □ 10m, □ 20m, □ 30m, □ 40m
(7) Others;
4.4 Dissolved oxygen

☐ 1st Input

(1) Measuring range: ☐ 0 to 50 mg/L ☐ ________________
(2) Transmission output: 4 to 20 mA DC
(3) System configuration selection: ☐ Electrode, ☐ Holder, ☐ Converter, ☐ Cleaning system, ☐ Terminal box, ☐ Maintenance parts set, ☐ Calibration set
(4) Electrode cable length: ☐ 3m, ☐ 5m, ☐ 10m, ☐ 15m, ☐ 20m
(5) Type of holder: ☐ Guide pipe, ☐ Submersion, ☐ Flow-through, ☐ Suspension, ☐ Angled floating ball, ☐ Vertical floating ball
(6) Cleaning method: ☐ No cleaning, ☐ Jet cleaning
(7) Others;

☐ 2nd Input

(1) Measuring range: ☐ 0 to 50 mg/L ☐ ________________
(2) Transmission output: 4 to 20 mA DC
(3) System configuration selection: ☐ Electrode, ☐ Holder, ☐ Converter, ☐ Cleaning system, ☐ Terminal box, ☐ Maintenance parts set, ☐ Calibration set
(4) Electrode cable length: ☐ 3m, ☐ 5m, ☐ 10m, ☐ 15m, ☐ 20m
(5) Type of holder: ☐ Guide pipe, ☐ Submersion, ☐ Flow-through, ☐ Suspension, ☐ Angled floating ball, ☐ Vertical floating ball
(6) Cleaning method: ☐ No cleaning, ☐ Jet cleaning
(7) Others;

4.5 pH/ORP (digital sensor, FU20F)

(1) Measuring range: ☐ pH 0 to 14 ☐ ORP _______ to ______ mV ☐ ________________
(2) Transmission output: ☐ 4 to 20 mA DC ☐ pH ☐ ORP ☐ Temperature
(3) System configuration selection: ☐ Electrode, ☐ Holder, ☐ pH Converter, ☐ Cleaning system, ☐ Accessories
(4) Electrode cable length: ☐ 3m, ☐ 5m, ☐ 10m, ☐ 20m, ☐ ______ m
(5) Electrode operating pressure: ☐ 10 kPa or less, ☐ More than 10 kPa
(6) Type of holder: ☐ Guide pipe, ☐ Submersion, ☐ Flow-through, ☐ Suspension, ☐ Angled floating ball, ☐ Vertical floating ball
(7) Cleaning method: ☐ No cleaning, ☐ Jet cleaning
(8) Sample temperature: ☐ -5 to 105°C, ☐ -5 to 100°C, ☐ -5 to 80°C
(9) Others;