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, 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.

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
- 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.
## General Specifications

### 1. Basic

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

*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
  - SC and SC
  - DO and DO

### 2. Measurement

#### 2-1. pH/Oxidation-reduction Potential (pH/ORP)

**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
- **PTC10k:** -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
- **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

**Performance (Accuracy)**
- (The specifications are expressed with simulated inputs.)
  - **Conductivity**
    - $2 \mu S \times K \ cm^{-1}$ to $200 \ mS \times K \ cm^{-1}$
    - Accuracy: ±0.5% F.S.
  - $1 \mu S \times K \ cm^{-1}$ to $2 \mu S \times K \ cm^{-1}$
    - Accuracy: ±1% F.S.
  - **Resistivity**
    - $0.005 \Omega / K \ cm^{-1}$ to $0.5 \Omega \times K \ cm^{-1}$
    - Accuracy: ±0.5% F.S.
    - $0.5 \Omega / K \ cm^{-1}$ to $1 \Omega / K \ cm^{-1}$
    - 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$^{-1}$.

#### 2-2. 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:**
  - with 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 / 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**
    - $2 \mu S \times K \ cm^{-1}$ to $200 \ mS \times K \ cm^{-1}$
    - Accuracy: ±0.5% F.S.
    - $1 \mu S \times K \ cm^{-1}$ to $2 \mu S \times K \ cm^{-1}$
    - Accuracy: ±1% F.S.
  - **Resistivity**
    - $0.005\Omega / K \ cm^{-1}$ to $0.5\Omega / K \ cm^{-1}$
    - Accuracy: ±0.5% F.S.
    - $0.5\Omega / K \ cm^{-1}$ to $1\Omega / K \ cm^{-1}$
    - 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 °C reference temperature.
  Temperature: -20 to 140 °C
  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 mS/cm (max 90% zero suppression)
  Temperature: min. span 25 °C, max. span 160 °C

- **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 °C
  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 µA for Polarographic sensors.
  For temperature compensation, the FLXA202 accepts Pt1000 (DO30 sensor) and NTC22k elements (OXYFERM and OXYGOLD sensors).

- **Input Range**
  Dissolved Oxygen: 0 to 50 mg/l (ppm)
  Temperature: -20 to 150 °C
  DO30G sensor:
    Measurement range: 0 to 20 mg/l (ppm)
    Temperature: 0 to 40 °C
  Hamilton sensors:
    Oxyferm:
      Measurement range: 10 ppb to 40 ppm
      Temperature range: 0 to 130 °C
    Oxygold G:
      Measurement range: 2 ppb to 40 ppm
      Temperature range: 0 to 130 °C
    Oxygold B:
      Measurement range: 8 ppb to 40 ppm
      Temperature range: 0 to 100 °C

- **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 °C
    max. span 170 °C

- **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 °C
    Repeatability: ±0.1 °C
    Accuracy: ±0.3 °C
  Note: "F.S." means maximum setting value of analyzer output.
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, SC and DO)
      - 17 to 40V DC (for ISC)
    - Two (2) Sensor modules (2 inputs):
      - 22.8 to 40V DC (for pH/ORP, 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.

- **Maximum Load Resistance**
  - Refer to the Figure 1.

![Figure 1 Supply Voltage and Load Resistance](image)

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.

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

■ Explosion Protected Type Compliance

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type* in MS code</th>
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<tbody>
<tr>
<td>Europe (ATEX)</td>
<td>[Intrinsic safety “ia”]</td>
<td>-CB</td>
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<tr>
<td>Applicable Standard:</td>
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<td></td>
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<td>EN 60079-0: 2012</td>
<td>2013,</td>
<td></td>
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<td>EN 60079-11: 2012</td>
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<td>Marking/Rating:</td>
<td>Ex ia IIC T4 Ga</td>
<td></td>
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<tr>
<td>Ambient Temperature:</td>
<td>-20 to 55°C</td>
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</tr>
<tr>
<td>Control Drawing:</td>
<td>Refer to (1)</td>
<td></td>
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</table>

| International (IECEx) | [Intrinsic safety “ia”] | -CD |
| Applicable Standard: | | |
| Certificate No: | IECEx DEK 11.0044X | |
| Marking/Rating: | Ex ia IIC T4 Ga | |
| Ambient Temperature: | -20 to 55°C | |
| Control Drawing: | Refer to (1) | |

| United States (FM) | [Intrinsically safe / Nonincendive] | -CD |
| Applicable Standard: | | |
| Certificate No: | 3039632 | |
| Marking/Rating: | IS CL I, DIV 1, GP ABCD CL I, ZN 0, AEx ia IIC NI CL I, DIV 2, GP ABCD CL I, ZN 2 IIC | |
| T4: for ambient temperature: | -20 to 55°C | |
| Enclosure: | Type 4X | |
| Control Drawing: | Refer to (3) | |

| Canada (CSA) | [Intrinsically safe / Nonincendive] | -CD |
| Applicable Standard: | | |
| Certificate No: | 2425510 | |
| 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: | IP66, NEMA 4X | |
| Control Drawing: | Refer to (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.
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<tr>
<td><strong>Canada (CSA)</strong></td>
<td>Applicable Standard: C22.2 No.0-10 (R2015), CAN/CSA-C22.2 No.94-M91 (R2011), C22.2 No.213-M1987 (R2013), CAN/CSA-C22.2 No.61010-1-12, CAN/CSA-C22.2 No.61010-2-030-12 Certificate No: 2425510 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: IP66, NEMA 4X Control Drawing: Refer to (2)</td>
<td>-DE</td>
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<td><strong>China (NEPSI)</strong></td>
<td>[Intrinsic safety &quot;ia&quot;] Applicable Standard: GB3836.1-2010, GB3836.4-2010, GB 3836.20-2010 Certificate No: GYJ18.1051X Marking/Rating: Ex ia IIC T4 Ga Ambient Temperature: -20 to 55°C Enclosure: IP66, NEMA 4X Control Drawing: Refer to (6)</td>
<td>-CH</td>
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■ Control Drawings

Model: FLXA202 / FLXA21

Drawings

1.1 Control Panel (+ 200 mA I/F)

Non-hazardous Area

Supply +

Supply –

Housing Assembly

Measuring Module 1

Measuring Module 2

FLXA21 / FLXA202 Analyzer

Sensor 1

Sensor 2

Hazardous Area

Associated Apparatus

Model: FLXA202 / FLXA21

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 simple apparatus or intrinsically safe apparatus.

4. WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE USER'S MANUAL - ATEX and IECEx Intrinsic safety "ia"
(2) CSA Intrinsically safe, Nonincendive, Type of protection 'n'  

Model: FLXA21 / FLXA202  Date: May 29, 2017  
Rev. Doc. No.: ICS032-A71 P.1

Yokogawa Electric Corporation

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-...

Non-hazardous Area Hazardous Area
Class I, Zone 0, 1, Group IIC, or Class I, Division 1, Groups A, B, C, D
Temperature Class: T4

Supply +, Supply –

Housing Assembly

Measuring Module 1

FLEXA Series Analyzer

Sensor 1 (Note 6)
Sensor 2 (Note 6)

Measuring Module 1, 2 (Note 6):

Type of Measuring Module
pH, SC, DO ISC SENCOM

Uo 11.76 V 11.76 V 5.36 V
Io 116.5 mA 60.6 mA 106.16 mA
Po 0.3424 W 0.178 W 0.1423 W
Co 100 nF 100 nF 31 μF
Lo 1.7 mH 8 mH 0.45 mH

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.
- Specifications for the analyzer's nonmetallic or coated parts of the two wire analyzer shall be supplied.

+Associated Apparatus (Note 2)
–

Supply +, Supply – (Note 2):
Ui: 30 V
Ii: 100 mA
Pi: 0.75 W
Ci: 13 nF
Li: 0 mH

(Note 5)

Control Equipment (Note 7, 8)

Specific condition 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:

   \[ U_o \leq U_i \]
   \[ I_o \leq I_i \]
   \[ P_o \leq P_i \]
   \[ C_o \geq C_i + C_{cable} \]
   \[ L_o \geq L_i + L_{cable} \]

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. When installed in Zone 2 or Division 2, Sensor 1 and Sensor 2 may be simple apparatus or non-incendive field wiring apparatus meeting the conditions below, or alternatively, they may be equipment suitable for Zone 2 or Division 2 respectively, if a suitable wiring method other than non-incendive field wiring is employed.

   \[ U_i \geq U_o \]
   \[ I_i \geq I_o \]
   \[ P_i \geq P_o \]
   \[ C_i \leq C_o - C_{cable} \]
   \[ L_i \leq L_o - L_{cable} \]

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.

   \[ U_o \leq U_i \]
   \[ C_o \geq C_i + C_{cable} \]
   \[ L_o \geq L_i + L_{cable} \]

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 gland shall be sealed with the accompanying metal plug.

10. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD

11. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

12. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR ZONE 2 / DIVISION 2

Note: Optional equipment connected to the associated apparatus must not use a safety isolating transformer.
### Intrinsic safety, Nonincendive

**Model:** FLEXA Series  
**Date:** April 17, 2015

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

- **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):**  
- **Type of Measuring Module**
  - pH, SC, DO, ISC, SENCOM

<table>
<thead>
<tr>
<th>Component</th>
<th>Symbol</th>
<th>Uo</th>
<th>Io</th>
<th>Po</th>
<th>Co</th>
<th>Lo</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.76 V</td>
<td>116.5 mA</td>
<td>0.3424 W</td>
<td>100 nF</td>
<td>1.7 mH</td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>11.76 V</td>
<td>60.6 mA</td>
<td>0.178 W</td>
<td>100 nF</td>
<td>8 mH</td>
<td></td>
</tr>
<tr>
<td>DO</td>
<td>5.36 V</td>
<td>106.16 mA</td>
<td>0.1423 W</td>
<td>31 μF</td>
<td>0.45 mH</td>
<td></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.

---

### Installation for Division 2 / Zone 2

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

**Unclassified Location**  
**Hazardous**  
**(Classified) Location**  
- **Class I, Division 2, Groups A, B, C, D, or**  
- **Class I, Zone 2, Group IIC**, Temperature Class: T4

**Measuring Module 1, 2 (Note 8):**  
- **Type of Measuring Module**
  - pH, SC, DO, ISC, SENCOM

<table>
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<tr>
<th>Component</th>
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<td>0.45 mH</td>
<td></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.

---

**Control Equipment (Note 9)**

**Supply +, Supply - (Note 7):**
- **Ui:** 30 V
- **Li:** 0 mH
- **Ci:** 13 nF
- **Pi:** 0.75 W
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.

\[
\begin{align*}
U_0 \quad (or \quad V_{oc}) & \leq U_i \\
I_0 \quad (or \quad I_{sc}) & \leq I_i \\
P_0 & \leq P_i \\
C_0 \quad (or \quad C_a) & \geq C_i + C_{cable} \\
L_0 \quad (or \quad L_a) & \geq L_i + L_{cable}
\end{align*}
\]

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.

\[
\begin{align*}
U_i \quad (or \quad V_{max}) & \geq U_0 \\
I_i \quad (or \quad I_{max}) & \geq I_0 \\
P_i & \geq P_0 \\
C_i & \leq C_0 - C_{cable} \\
L_i & \leq L_0 - L_{cable}
\end{align*}
\]

9. The 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.

\[
\begin{align*}
U_0 \quad (or \quad V_{oc}) & \leq U_i \\
C_0 \quad (or \quad C_a) & \geq C_i + C_{cable} \\
L_0 \quad (or \quad L_a) & \geq L_i + L_{cable}
\end{align*}
\]

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.**
### ATEX (Type n)

**Type of protection**, *n*.

- **Flameproof equipment** is intended for use in a manner where the risk of explosion is eliminated.
- **Flameproof (Ex n)** is a protective concept for equipment consisting of a number of separate units, each of which is flameproof or intrinsically safe (Ex i). The concept is applicable to electrical equipment, both in the form of apparatus, or units in apparatus which, in common with the equipment, are intended for use in a category 2, 3, 3G environment.

#### 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 in place of the accompanying cable gland.
- Analyzer must be installed in such a way that the air vent is physically protected from impact.

#### Notes:

1. Installation must be in accordance with EN60079-14 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 the use of Category 3 G equipment is required, Sensor 1 and Sensor 2 may be simple apparatus, intrinsically safe apparatus meeting conditions below, or other Category 3 G equipment.
   - \( U_{i} \) (or \( V_{\text{max}} \)) &gt; \( U_{o} \)
   - \( I_{i} \) (or \( I_{\text{max}} \)) &gt; \( I_{o} \)
   - \( P_{i} \) &gt; \( P_{o} \)
   - \( C_{i} \) &lt; \( C_{o} - C_{\text{cable}} \)
   - \( L_{i} \) &lt; \( L_{o} - L_{\text{cable}} \)
4. FLXA202 Analyzer must be installed in accordance with one of the following:
   - In a 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 IEC60950 series, IEC61010-1, 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 gland shall be sealed with the accompanying metal plug.
6. The gaskets of the cable glands shall be protected from light.

---

**Diagram:**

- Measuring Module 1
- Measuring Module 2
- Ex n Module
- Power Supply / Control Equipment
- Housing Assembly
- FLXA202 Analyzer
- Sensor 1
- Sensor 2
- Measuring Module 1
- Measuring Module 2
(6) NEPSI and KOSHA
Intrinsic safety "ia"

(Refer to (1) ATEX and IECEx Control Drawing)

(5) IECEx (Type n)
Type of protection 'n'

Model: FLXA202                               Date: March 31, 2016
Rev. Doc.No.: NIE015-A71 P .1

Supply +, Supply –

- 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 analyzer 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.

\[
\begin{align*}
U_{i} & \geq U_{o} \\
I_{i} & \geq I_{o} \\
P_{i} & \geq P_{o} \\
C_{i} & \leq C_{o} - C_{cable} \\
L_{i} & \leq L_{o} - L_{cable}
\end{align*}
\]

4. FLXA202 Analyzer 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.

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 accompanying metal plugs.

- Specific condition of use

[Diagram of FLXA202 Analyzer]
# 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**
- **-D**: Always -D

**Housing (Note 1)**
- **-B**: Aluminum alloy cast + urethane coating
- **-C**: Aluminum alloy cast + epoxy coating
- **-D**: Aluminum alloy cast + high anti-corrosion coating

**Display (Note 2)**
- **-D**: Anti-glare LCD

**Type (Note 3)**
- **-AB**: General purpose for CE, RCM
- **-AD**: General purpose for CSA
- **-AQ**: General purpose for KC
- **-AR**: General purpose for EAC with PA
- **-CB**: IS for ATEX, IECEx (Note 4)
- **-CD**: IS for FM, CSA (Note 5)
- **-CF**: IS for TIIS (Note 6)
- **-CG**: IS for KOSHA (Note 7)
- **-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**
- **-P1**: pH/ORP
- **-C1**: Conductivity (SC)
- **-C5**: Inductive conductivity (ISC)
- **-D1**: Dissolved oxygen (DO)

**2nd input (Note 8)**
- **-NN**: Without input
- **-P1**: pH/ORP
- **-C1**: Conductivity (SC)
- **-C5**: Inductive conductivity (ISC)
- **-D1**: Dissolved oxygen (DO)

**Output**
- **-A**: 4-20 mA + HART
- **-N**: Always -N

**Language set (Note 9)**
- **-LA**: English and 11 languages

**Country (Note 10)**
- **-N**: Global except Japan
- **-J**: Japan
- **-NN**: Always -NN

**Option Mounting hardware**
- **/UM**: Universal mounting kit (Note 11)
- **/U**: Pipe and wall mounting hardware
- **/PM**: Panel mounting hardware
- **/H6**: Hood, stainless steel
- **/H7**: Hood, stainless steel + urethane coating
- **/H8**: Hood, stainless steel + epoxy coating
- **/SCT**: Stainless steel tag plate
- **/CB4**: G1/2 x 3 pcs for Type n
- **/CD4**: 1/2NPT x 3 pcs
- **/CF4**: M20 x 1.5 x 3 pcs
- **/CS5**: 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**
- **/K**: With Measurement Law certificate (Note 13)

**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 "-CF" is anti-reflection coated. Other types are anti-glare coated.
3. 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.
4. Product registration is done by Yokogawa Taiwan Corporation as an importer in Taiwan.
5. Type "-CD" is intrinsic safety, but is available as nonincendive.
6. For detailed information refer to Japanese GS 12A01A03-01JA.
7. Korean IM is attached to FLXA202 instead of English IM.
8. 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.
9:  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.
10:  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.
11:  The universal mounting kit contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).
12:  “/CB5”, “/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”.
13:  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.
### Dimensions and Mounting

**Conduit Adapter (Option code: CB4, CD4, CF4)**

- **Unit: mm**
- **Approx. 55 (2.2") 49 (1.93")**
- **Nut, Packing, Adapter, G1/2 screw (CB4), 1/2 NPT screw (CD4), M20x1.5 screw (CF4)**

**Conduit Adapter (Option code: CB5, CD5, CF5)**

- **Unit: mm**
- **Approx. 64 (2.52")**
- **Nut, Packing, Adapter, G1/2 screw (CB5), 1/2 NPT screw (CD5), M20x1.5 screw (CF4)**
(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

2-M5 length 35

2-M5 length 35

Panel thickness

Unit: mm

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

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

For wall mounting 3-ø10 holes

*: 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 mounting hardware (Horizontal) and (Vertical)

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

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

*7: Two outputs, output 1 and output2, of PH201G or SDBT are same signals.

---

**PH Module**

**SC Module**

**ISC Module**

**DO Module**
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

   1st Input: □ pH/ORP ☐ Conductivity (SC) ☐ Inductive conductivity (ISC)
              ☐ Dissolved oxygen (DO) ☐ With (same as 1st Input) ☐ Without
   2nd Input: □ pH/ORP ☐ Conductivity (SC) ☐ Inductive conductivity (ISC)
              ☐ Dissolved oxygen (DO) ☐ With (same as 1st Input) ☐ Without

4.1 pH/ORP

   □ 1st Input

   (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, □ Terminal box,
      □ Accessories
   (4) Electrode cable length: □ 3m, □ 5m, □ 7m, □ 10m, □ 15m, □ 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, □ Ultrasonic cleaning, □ Jet cleaning, □ Brush cleaning
   (8) Sample temperature: □ -5 to 105°C, □ -5 to 100°C, □ -5 to 80°C
   (9) Others:

   □ 2nd Input

   (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, □ Terminal box,
      □ Accessories
   (4) Electrode cable length: □ 3m, □ 5m, □ 7m, □ 10m, □ 15m, □ 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, □ Ultrasonic cleaning, □ Jet cleaning, □ Brush cleaning
   (8) Sample temperature: □ -5 to 105°C, □ -5 to 100°C, □ -5 to 80°C
   (9) Others:
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;