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.

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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
  - 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.)
    - pH
      - Linearity: $\pm 0.01$ pH
      - Repeatability: $\pm 0.01$ pH
      - Accuracy: $\pm 0.01$ pH
    - ORP
      - Linearity: $\pm 1$ mV
      - Repeatability: $\pm 1$ mV
      - Accuracy: $\pm 1$ mV

Temperature
  - with Pt1000, 6.8k, PTC10k, NTC 8k55, 3k Balco, PTC500
    - Linearity: $\pm 0.3$ ºC
    - Repeatability: $\pm 0.1$ ºC
    - Accuracy: $\pm 0.3$ ºC
  - with Pt100
    - Linearity: $\pm 0.4$ ºC
    - Repeatability: $\pm 0.1$ ºC
    - Accuracy: $\pm 0.4$ ºC

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
      - $2 \mu S \times K\ cm^{-1}$ to $200 \mu S \times K\ cm^{-1}$
        - Accuracy: $\pm 0.5\%F.S.$
      - $1 \mu S \times K\ cm^{-1}$ to $2 \mu S \times K\ cm^{-1}$
        - Accuracy: $\pm 1\%F.S.$
    - Resistivity
      - $0.005k\Omega / K\ cm^{-1}$ to $0.5M\Omega / K\ cm^{-1}$
        - Accuracy: $\pm 0.5\%F.S.$
      - $0.5M\Omega / K\ cm^{-1}$ to $1M\Omega / K\ cm^{-1}$
        - Accuracy: $\pm 1\%F.S.$
    - Temperature
      - with Pt1000, Pb36, Ni100
        - Accuracy: $\pm 0.3$ ºC
      - with Pt100, NTC 8k55
        - Accuracy: $\pm 0.4$ ºC
    - Temperature compensation
      - NaCl table: $\pm 1\%$
      - Matrix: $\pm 3\%$
      - 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 mS/cm (max 90% zero suppression)
Temperature: min. span 25 ºC
max. span 160 ºC

■ Performance (Accuracy)
(The specifications are expressed with simulated inputs.)

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 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 ºC
DO30G sensor:
Measurement range: 0 to 20 mg/l (ppm)
Temperature: 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:
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 %H
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 %R
max. span 100 %R
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
Down: 3.9 mA for ISC
(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 40 V DC (for ISC)
21 to 40 V 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.

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
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.
5. Digital Communication

■ 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 °C

■ Storage Temperature
-30 to +70 °C

■ Humidity
10 to 90% RH at 40°C (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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Safety</td>
<td>UL 61010-1</td>
</tr>
<tr>
<td>CAN/CSA-C22.2 No.61010-1</td>
<td></td>
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<tr>
<td>CAN/CSA-C22.2 No.61010-2-030</td>
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<td>EN 61010-1</td>
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<td>EMC</td>
<td>EN 61326-1 Class A, Table 2 (For use in industrial locations)</td>
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<tr>
<td>EN 61326-2-3</td>
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<tr>
<td>Korea Electromagnetic Conformity</td>
<td>Standard Class A</td>
</tr>
<tr>
<td>Russian</td>
<td>TR CU 020/2011</td>
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<tr>
<td>RoHS</td>
<td>EN 50581: 2012 (Style 1.02 or newer)</td>
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<tr>
<td>Installation altitude: 2000 m or less</td>
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<tr>
<td>Category based on IEC 61010: I (Note 1)</td>
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<tr>
<td>Pollution degree based on IEC 61010: 2 (Note 2)</td>
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</table>

**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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#### Explosion Protected Type Compliance

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<tr>
<th>Item</th>
<th>Description</th>
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<tr>
<td>Europe (ATEX)</td>
<td>[Intrinsic safety &quot;ia&quot;]</td>
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<tr>
<td>Applicable Standard:</td>
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<tr>
<td>EN 60079-0: 2012 + A11: 2013,</td>
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<tr>
<td>EN 60079-11: 2012</td>
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<td>Certificate No:</td>
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<td>DEKRA 11ATEX0109X</td>
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<td>Ex ia IIC T4 Ga</td>
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<td>Ambient Temperature: -20 to 55°C</td>
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<tr>
<td>Control Drawing: Refer to (1)</td>
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</table>

| International (IECEx) | [Intrinsic safety "ia"]  |
| 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]  |
| 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) |

<p>| Canada (CSA) | [Intrinsically safe / Nonincendive]  |
| Applicable Standard:  |
| C22.2 No.0-10 (R2015), CAN/CSA-C22.2 No.94-M91 (R2011),  |
| C22.2 No.21-M1987 (R2013),  |
| CAN/CSA-C22.2 No.60079-0-11,  |
| CAN/CSA-C22.2 No.60079-11:14, CAN/CSA-C22.2 No.61010-1-12, CAN/CSA-C22.2 No.61010-2-030-12  |
| 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) |</p>
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<tr>
<th>Item</th>
<th>Description</th>
<th>‘Type’ in MS code</th>
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<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 ‘ia’] 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 Control Drawing: Refer to (6)</td>
<td>-CH</td>
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</table>
■ Control Drawings

(1) ATEX and IECEx intrinsic safety “ia”

Below the operation:

In cases where there is no equipment in Hazardous Area, point P2083 at the reference point 100Ω to 1000Ω.

Supply +, Supply –

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

Measuring Module 1, 2

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

Non-hazardous Area

Housing Assembly

Measuring Module 1

Measuring Module 2

FLXA21/FLXA202 Analyzer

Sensor 1

Sensor 2

Hazardous Area

Associated Apparatus

Model: FLXA21 /FLXA202  Date: February 19, 2010
Rev.4: July. 25, 2016 Doc. No.: IKE039-A12 P .1

Yokogawa Electric Corporation

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.

  To avoid electrostatic charge on the operator,

  - Earth the operator through a wrist-strap, or
  - Operate FLXA202/FLXA21 on the conductive floors, wearing anti-static work clothes and electrostatic safety shoes, or
  - Neutralize 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 simple apparatus or intrinsically safe apparatus.

4. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE USER’S MANUAL
intrinsic safety, Nonincendive, Type of protection 'n'

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

Yokogawa Electric Corporation

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

Measuring Module 2

FLEXA Series Analyzer

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

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.

Control equipment (Note 7, 8)

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.

Model: FLXA21 / FLXA202
Date: May 29, 2017

NOTE 5

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

Links to the next page
Notes:
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.
   - $U_o$ (or $V_{oc}$) ≤ $U_i$
   - $I_o$ (or $I_{sc}$) ≤ $I_i$
   - $P_o$ ≤ $P_i$
   - $C_o$ (or $C_{a}$) ≥ $C_i + C_{cable}$
   - $L_o$ (or $L_{a}$) ≥ $L_i + L_{cable}$
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.
   - $U_i$ (or $V_{max}$) ≥ $U_o$
   - $I_i$ (or $I_{max}$) ≥ $I_o$
   - $P_i$ ≥ $P_o$
   - $C_i$ ≤ $C_o - C_{cable}$
   - $L_i$ ≤ $L_o - L_{cable}$
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.
   - $U_o$ (or $V_{oc}$) ≤ $U_i$
   - $C_o$ (or $C_{a}$) ≥ $C_i + C_{cable}$
   - $L_o$ (or $L_{a}$) ≥ $L_i + L_{cable}$
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,
   b) via a safety isolating transformer complying with the requirements of IEC 61558-2-6, or a technically equivalent standard,
   c) directly connected to apparatus complying with IEC60950 series, IEC61010-1, or a technically equivalent standard,
   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:...
**Intrinsic Safety, Nonincendive**

**Model:** FLEXA Series  
**Date:** April 17, 2015  
**Rev.1:** May 29, 2017  
**Doc. No.:** IFM039-A71

### 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.

### Electrical Equipment

- **Supply +**, **Supply –**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ui</strong></td>
<td>30 V</td>
</tr>
<tr>
<td><strong>Ii</strong></td>
<td>100 mA</td>
</tr>
<tr>
<td><strong>Pi</strong></td>
<td>0.75 W</td>
</tr>
<tr>
<td><strong>Ci</strong></td>
<td>13 nF</td>
</tr>
<tr>
<td><strong>Li</strong></td>
<td>0 mH</td>
</tr>
</tbody>
</table>

### Control Equipment

- **Control Equipment**

### Housing Assembly

- **Housing Assembly**

### Measuring Module 1, 2 (Note 8):

<table>
<thead>
<tr>
<th>Type of Measuring Module</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.76 V</td>
</tr>
<tr>
<td>SC</td>
<td>11.76 V</td>
</tr>
<tr>
<td>DO</td>
<td>5.36 V</td>
</tr>
<tr>
<td>ISC</td>
<td>116.5 mA</td>
</tr>
<tr>
<td>SENCOM</td>
<td>60.6 mA</td>
</tr>
<tr>
<td><strong>Po</strong></td>
<td>0.3424 W</td>
</tr>
<tr>
<td><strong>Co</strong></td>
<td>100 nF</td>
</tr>
<tr>
<td><strong>Lo</strong></td>
<td>1.7 mH</td>
</tr>
</tbody>
</table>

### Model:** FLEXA Series  
**Date:** April 17, 2015  
**Rev.2:** September 15, 2017  
**Doc. No.:** IFM039-A71
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.

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

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.

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

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.

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

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.
Control Drawing

Non Hazardous Area
Hazardous Area

+ Power Supply / Control Equipment (Note 4)
– Supply + Supply –
–

Housing Assembly
Measuring Module 1
Measuring Module 2
FLXA202 Analyzer
Sensor 1
Sensor 2

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

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 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.
- Analyzer must be installed in such a way that the air vent is physically protected from direct exposure.

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.

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

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

6. The gaskets of the cable glands shall be protected from light.

7. When the analyzer is used with field wiring provided by the customer, the following precautions shall be taken:
   a) All field wiring must be protected from light and electrostatic charges.
   b) The cable glands shall be protected from light.
   c) The cable glands shall be protected from dust and moisture.

8. The analyzer shall be installed in an area where the use of Category 3 G equipment is required.

9. When installing the analyzer in an area with hazardous dust, the analyzer shall be installed in a dust-tight enclosure.

10. When installing the analyzer in an area with hazardous air, the analyzer shall be installed in a dust-tight enclosure.

11. All installations must be in accordance with EN60079-14 and relevant local codes.
Non Hazardous Area

Hazardous Area

Power Supply / Control Equipment

Measuring Module 1

Measuring Module 2

FLXA202 Analyzer

Sensor 1

Sensor 2

Ex nAic 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

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 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 they are protected against contact, mechanical damage, and water and dust.

Ex nAic Ratings

- Installations must be in accordance with IEC60079-14 and relevant local codes.
- 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.
- 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.

U (or Vmax) ≥ Uo

I (or Imax) ≥ Io

Pi ≥ Po

Ci ≤ Co – Ccable

Li ≤ Lo – Lcable

Notes:

1. Installations 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. 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 IEC61558-2-6, 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.

4. FLXA202 Analyzer must be installed in accordance with IEC60079-14 and relevant local codes.
## 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
- **B**: Aluminum alloy cast + urethane coating
- **C**: Aluminum alloy cast + epoxy coating
- **D**: Aluminum alloy cast + high anti-corrosion coating

### Display
- **D**: Anti-glare LCD

### Type
- **-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 TiIS (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
- **-P1**: pH/ORP (Note 4)
- **-C1**: Conductivity (SC)
- **-D1**: Inductive conductivity (ISC)
- **-S1**: Dissolved oxygen (DO)

### 2nd input (Note 6)
- **-NN**: Without input
- **-P1**: pH/ORP (Note 4)
- **-C1**: Conductivity (SC)
- **-D1**: Dissolved oxygen (DO)

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

### Language set (Note 7)
- **LA**: English and 11 languages

### Country (Note 8)
- **N**: Global except Japan
- **J**: Japan

### Option
- **-UM**: Universal mounting kit (Note 9)
- **/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
- **/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
- **/K**: With Measurement Law certificate (Note 11)

### Measurement law
- **/K**: 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 is 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

**For sensor 1 cable**

**For sensor 2 cable**

**For power supply**

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

- Unit: mm
- Approx. 55 (2.2")
- 49 (1.93")
- 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")
- 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**: 1 to 12
- **2-M5 length**: 35

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

- **3-ø10 holes**: For wall mounting
- **4-M6**: For wall mounting

* 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)

M8 U-bolt

*: 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 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.

*7: Two outputs, output 1 and output 2, of PH201G or SDBT are same signals.

---

**Case of Distributor**

**PH201G (Style B)**

- **Output 1 (1-5V DC)**
- **Output 2 (1-5V DC)**

**Power supply**

- 20 to 130V DC
- 80 to 138V AC, 47 to 63Hz

**Case of Distributor**

**SDBT**

- **Output 1 (1-5V DC)**
- **Output 2 (1-5V DC)**

**Power supply**

- 20 to 130V DC
- 80 to 138V AC, 47 to 63Hz

---

**PH Module**

- **PH**
- **NC**
- **15**
- **16**
- **17**
- **18**
- **19**
- **20**

**SC Module**

- **SC**
- **15**
- **16**
- **17**
- **18**
- **19**
- **20**

**ISC Module**

- **ISC**
- **15**
- **16**
- **17**
- **18**
- **19**
- **20**

**DO Module**

- **DO**
- **15**
- **16**
- **17**
- **18**
- **19**
- **20**

**SENCOM Module**

- **SENCOM**
- **NC**
- **15**
- **16**
- **17**
- **18**
- **19**

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

4.1 **pH/ORP (analog sensor)**

   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;

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
  ☐ Terminal box, ☐ Maintenance parts set, ☐ Calibration set
(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;