General Specifications

Model FLXA402
4-Wire Converter

GS 12A01F01-01EN

General

The new FLXA402 4-Wire Converter is designed to combine the superior functionality and ease of use from the Yokogawa EXAxt series with the digitization of the future.

The FLXA402 is designed to accept traditional analog or SENCOM 4.0 digital Smart sensors. The FLXA402 offers the possibility of connecting to five sensor measurements at one time.

The modular-designed converter is a multi-parameter instrument offering a wide range of measurement choices; such as: pH/ORP (oxidation-reduction potential), Resistivity/Conductivity (SC), Inductive conductivity (ISC), % Concentration, Dissolved Oxygen (DO) and 4-20 mA input – with the respective sensor module. Multiple sensor measurements offer additional functionalities; calculated data function that can be customized.

The FLXA402 converter includes a color Human Machine Interface (HMI), that offers easy touch screen operation and simple instinctive menu structure in 11 languages. Start up and commission time is minimal. Menus of display, execution and setting are displayed in a selected language.

The FLXA402 offers a variety of communications, mA/HART, Modbus TCP, Modbus RTU/RS485. And FieldMate working on tablet PC can be used as a local display via Bluetooth or RS485.

Features

- Connectable to multiple sensors
- Easily viewable color LCD
- Touch screen operation
- Aluminum alloy cast with corrosion-resistant coating for wide range of industrial environments
- IP66/NEMA Type4X ½ DIN enclosure for field mounting and panel mounting.
- Simple HMI menu structure in 11 languages
- Calculated data from sensor measurements
- Connection of new SENCOM SA Smart Adapter
- Easy maintenance using SD card, Ethernet, RS485 and Bluetooth
- Indication of sensor wellness

FLXA402 Related products and documents

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<td>GS 12B06W03-01E-E</td>
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<td>GS 12B06W02-04E-E</td>
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<td>GS 12B06J09-01E-E</td>
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</table>
| DO30G Sensor for Dissolved Oxygen | GS 12J05D03-01E-
| Analyzer                        |               |
| DO30G and FD30/PB30 Sensor and   | GS 12J06K04-E-E |
| fittings for Dissolved Oxygen    |               |
| DO70G Optical Dissolved Oxygen    | GS 12J05D04-01E |
| Sensor                          |               |
| Sensor Holders                  | GS 12J05C02-00E |
| FSA111 FieldMate                | GS 01R01A01-01E |

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Please select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present.
## System Configuration

Configuration according to module combination

<table>
<thead>
<tr>
<th>1st Input (Code)</th>
<th>System configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH/ORP, SC, ISC, DO (-P1, -C1, -C5, -D1)</td>
<td>Config. A</td>
</tr>
<tr>
<td>Digital sensor (-D5)</td>
<td></td>
</tr>
<tr>
<td>SENCOM SA (-S5)</td>
<td>Direct connection</td>
</tr>
<tr>
<td></td>
<td>Multiple sensor measurement (*)</td>
</tr>
</tbody>
</table>

(*): Multiple sensor connection with a junction box BA11. When FLXA402 Type (-DD) is selected, multiple sensor connection is not available.

### Configurable sensors

<table>
<thead>
<tr>
<th>Measure</th>
<th>pH/ORP</th>
<th>SC</th>
<th>ISC</th>
<th>DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog sensors *2 (-P1, -C1, -C5, -D1)</td>
<td>FU20</td>
<td>SC4A</td>
<td>ISC40G</td>
<td>DO30G</td>
</tr>
<tr>
<td></td>
<td>FU24</td>
<td>SC42</td>
<td>ISC40S</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM21/SM20</td>
<td>SC4AH</td>
<td>ISC40Q</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PH20</td>
<td>SC21</td>
<td>ISC40SJ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC26V</td>
<td>SC29C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC21</td>
<td>SC4J</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC29C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PH8E+P</td>
<td>SC21G</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PH4+P</td>
<td>SC8SG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR8E+G</td>
<td>SC210G</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR4+P</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Digital sensor (Optical DO Sensor) (-D5) | FU20-VS | SC4A...-VS | ISC40G...-VS | DO70G |
| | PH21 | SC42...-V | ISC40S...-V | |
| | PH24 | SC4AJ...-VS | ISC40Q...-VS | |
| | PH8E+P...-V | SC8SG...-VS | | |

*1: Inside parenthesis explain suffix code for 1st (2nd) input
*2: means conventional sensors, not including sensors for SENCOM SA.

### Config. A

- **1 sensor connects to 1st (and 2nd) input for each**
  - When 1st input is pH/ORP, SC, ISC, DO, SENCOM SA (-P1, -C1, -C5, -D1, -S5)
  - When FLXA402 Type (-DD) is selected, only one sensor can connect.
  - (e.g.) 1st input: pH sensor for SENCOM SA (-S5)
  - 2nd input: analog ISC sensor (-C5)

### Config. B

- **Multiple sensor measurement with BA11**
  - When 1st input connects to SENCOM SA (-S5) with BA11- multiple sensor measurement-BA11 can connect up to 4 sensors for SENCOM SA.
  - * When selecting type "-DD" (NI for FM), BA11-multiple sensor measurement is not available. Only one sensor can connect.
  - One sensor can connect to 2nd input.
  - (e.g.) 1st input: 4 pH sensors for SENCOM SA with BA11 (-S5)
  - 2nd input: pH sensor for SENCOM SA (-S5) (Figure. B)
General Specifications

1. Basic

- Measurement Object
  - 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 converter.

- Types of Sensor Module
  - Analog sensor module for analog sensors
    - PH: for analog pH/ORP
    - SC: for analog Resistivity/Conductivity
    - ISC: for analog Inductive Conductivity
    - DO: for analog Dissolved Oxygen
  - Digital sensor module
    - SENCOM SA: for SA11
  - Digital sensor: for optical DO

- Other Modules
  - IO: mA output, mA input, contact input
  - Relay: SPDT relay
  - Digital communication: Modbus TCP/IP (Ethernet) or Modbus RTU (RS485)

Combination of Sensor Module

There are two sensor module slots; up to Five sensor measurements are available in case of the combination of SENCOM SA module and BA11 junction box.

When FLXA402 (-DD) is selected, multiple sensor measurements are not available.

The combination of two same sensor modules or different type of sensor modules is possible except in the case of Optical DO sensor. Please reference the following combination chart.

<table>
<thead>
<tr>
<th>1st sensor module (1st input)</th>
<th>2nd sensor module (2nd input)</th>
<th># of Total Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog pH/ORP (-P1)</td>
<td>Analog pH/ORP (-P1)</td>
<td>2</td>
</tr>
<tr>
<td>Analog SC (-C1)</td>
<td>Analog SC (-C1)</td>
<td>2</td>
</tr>
<tr>
<td>Analog ISC (-C5)</td>
<td>Analog ISC (-C5)</td>
<td>2</td>
</tr>
<tr>
<td>Analog DO (-D1)</td>
<td>Analog DO (-D1)</td>
<td>2</td>
</tr>
<tr>
<td>SENCOM SA (-S5)</td>
<td>SENCOM SA (-S5)</td>
<td>2</td>
</tr>
<tr>
<td>Analog SC (-C1)</td>
<td>Analog pH/ORP (-P1)</td>
<td>2</td>
</tr>
<tr>
<td>Analog ISC (-C5)</td>
<td>Analog SC (-C1)</td>
<td>2</td>
</tr>
<tr>
<td>Analog DO (-D1)</td>
<td>Analog ISC (-C5)</td>
<td>2</td>
</tr>
<tr>
<td>SENCOM SA (-S5)</td>
<td>Analog DO (-D1)</td>
<td>2</td>
</tr>
</tbody>
</table>

Digital sensor module (for optical DO): Combination of two Digital sensor modules isn’t available. Digital sensor module should be in 1st sensor module (1st input).
2. Measurement

2-1. pH/ORP (PH)
   When 1st or 2nd input is -P1 (PH)
      (when 1st or 2nd input is -S5 (SENCOM SA), see
      2-6 SENCOM SA Smart Adapter.)

   ■ Input Specification
      Dual high impedance input (≥10^{12} Ω)

   ■ 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
         6k8: -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: ±0.01 pH
         Repeatability: ±0.01 pH
         Accuracy: ±0.01 pH
      ORP
         Linearity: ±1 mV
         Repeatability: ±1 mV
         Accuracy: ±1 mV
      Temperature
         with Pt1000, 6k8, PTC10k, NTC 8k55, 3k Balco,
            PTC500
            Linearity: ±0.3 ºC
            Repeatability: ±0.1 ºC
            Accuracy: ±0.3 ºC
         with Pt100
            Linearity: ±0.4 ºC
            Repeatability: ±0.1 ºC
            Accuracy: ±0.4 ºC

   ■ Temperature compensation
      Function:
         Automatic or manual. Compensation to Nernst
            equation. Process compensation by configurable
            temperature coefficient, NEN6411 for water or
            strong acids/bases or programmable matrix.

   ■ Calibration
      Semi-automatic 1, 2 or 3 point calibration using
      pre-configured NIST, US, DIN buffer tables 4,
      7 & 9, or with user defined buffer tables, with

2-2. Conductivity (SC)
   When 1st or 2nd input is -C1 (SC)

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

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

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

   ■ Performance (Accuracy)
      (The specifications are expressed with simulated inputs.)
      Conductivity
         2 µS x K cm^{-1} to 200 mS x K cm^{-1}
            Accuracy: ±0.5%F.S.
         1 µS x K cm^{-1} to 2 µS x K cm^{-1}
            Accuracy: ±1%F.S.
      Resistivity
         0.005kΩ / K cm^{-1} to 0.5MΩ /K cm^{-1}
            Accuracy: ±0.5%F.S.
         0.5MΩ / K cm^{-1} to 1MΩ /K cm^{-1}
            Accuracy: ±1%F.S.
      Temperature
         with Pt1000, Pb36, Ni100
            Accuracy: ±0.3 ºC
         with Pt1000, 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 convertor 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)
   When 1st or 2nd input is -C5 (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.)
- **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

### Input Specification
The FLXA402 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 FLXA402 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
- **Temperature**:
  - Linearity: ±0.3 °C
  - Repeatability: ±0.1 °C
  - Accuracy: ±0.3 °C

Note: "F.S." means maximum setting value of converter output.

### 2-4. Dissolved Oxygen (DO)
When 1st or 2nd input is -D1 (DO)
When 1st input is -D5 (Digital sensor), see 2-5.
- **Digital Sensor**:
  - Note: When Type is -DO (NI for FM), -D1 (DO) cannot be selected.

### 2-5. Digital Sensor
When 1st input is -D5 (Digital sensor)
Measurement with the digital sensor DO70G Optical Dissolved Oxygen Sensor.
- See GS 12J05D04-01E for information on DO70G.
- Note: When Type is -DD (NI for FM), -D5 (Digital Sensor) cannot be selected.

### 2-6. SENCOM SA Smart Adapter
When 1st or 2nd input is -S5 (SENCOM SA)
Measurement with digital adapter SA11 SENCOM Smart Adapter.
- See GS 12A01F00-01E for information on SA11.
- Note: When Type is -DD (NI for FM), -S5 (SENCOM SA) cannot be selected.

### 2-7. Common Function
- **Logbook**
  - Software record of important events and diagnostic data readily available in the display.
- **Arithmetic by multiple sensors**
  - The arithmetic is carried out by processing the corresponding value of limited two sensors.
    - **Differential**: Sensor 1 - Sensor 2
    - **Average**: (Sensor 1 + Sensor 2) / 2
    - **Ratio**: Sensor 1 / Sensor 2
    - **Passage (%)**: Sensor 2 / Sensor 1 x 100
    - **Refection (%)**: (Sensor 1 - Sensor 2) / Sensor 1 x 100
    - **Deviation (%)**: (Sensor 2 - Sensor 1) / Sensor 1 x 100
    - **pH calib. (VGB)**: pH = 8.6 + log (Sensor 1 - Sensor 2 / 3)

Note:
- "(*) When the measuring object is conductivity, the arithmetic is performed.
- "(2) Only when SC sensors are connected, pH calib. (VGB) is carried out."
3. Electrical

■ Transmission Signals

General:
- Isolated outputs: 4-20 mA DC
- Accuracy: +/- 0.02 mA
- Repeatability: +/- 0.02 mA
- Linearity: +/- 0.02 mA
- Maximum load: 600 ohm
- Bi-directional HART digital communication (HART 7 protocol) superimposed on mA1 (4-20mA) signal
- Number of outputs: selectable by suffix code.
  - 2 isolated outputs: -A2
  - 4 isolated outputs: -A4

Output function:
- Linear or Non-linear (21-step table) for available signals
- Signal: 3.8 to 20.5 mA

Burn out function:
- Burn up (22.0 mA) or burn down (2.2 mA) to signal failure according to NAMUR NE43.

Hold:
- The mA-outputs are frozen to the last/fixed value during calibration/commissioning.

■ Analog Input (mA Output type: –A4)
- It is used for pressure compensation (only DO) and temperature compensation (pH, SC, ISC, DO).

General:
- Isolated input: 4-20 mA DC
- Accuracy: +/- 0.02 mA
- Number of input: 1

■ Contact Outputs
- Note: When selecting Type-DD (NI for FM), check the condition of Control Drawing.

General:
- Four SPDT relay contacts with display indicators.
- Contacts are dry, not powered.
- Switch capacity:
  - Maximum values: 100 VA, 250 VAC, 5 Amps.
  - Maximum values: 50 Watts, 24 VDC, 5 Amps.
- Note: When contact output current is more than 4 Amps, ambient temperature should be less than 40 ºC.

Status:
- High/Low process alarms, selected from available signals.
- Configurable delay time and hysteresis.
- Warning/Failure annunciation
- Fail
  - Contact S4 is programmed as fail-safe contact.

Control function:
- On/Off
- Wash:
  - Contact can be used to start manual or interval time wash cycles.
- Hold:
  - Contact can be used to signal the Hold situation.

■ Contact Inputs
- Contact input controls starting WASH CYCLE or changing RANGE of 4-20 mA output (programmable) each for pH/ORP, SC, ISC and DO.

General:
- Isolated input
  - Close: less than 200Ω
  - Open: more than 100kΩ
- Voltage-free contact (do not apply voltage)

■ Digital communication (Option)
- Ethernet (Modbus TCP):
  - Cable length: Max.100m
- RS-485 (Modbus RTU):
  - 105200/38400/9600bps
  - Cable length: 115200bps: Max 600m
  - 38400bps, 9600bps: Max 1200m

■ Bluetooth
- Communication distance:
  - Approx. 10 m (depends on the operating environment.) (Class2)

■ Display
- QVGA color LCD with a touch screen.
- Message language: 11 (English, Chinese, Czech, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish)

■ Refresh interval of data
- 0.5 s: number of measurement = 1
- 1 s: number of measurement >= 2

■ Power supply
- Note: When selecting Type-DD (NI for FM), check the condition of Control Drawing.

FLXA402-A
- Ratings: 100-240 V AC
- Acceptable range: 90 to 264 V AC
- Ratings: 50/60 Hz
- Acceptable range: 50 Hz ±5%, 60 Hz ±5%
- Power Consumption: 35 VA

FLXA402-D
- Ratings: 12-24 V DC
- Acceptable range: 10.8 to 26.4 V DC
- Power Consumption: 15 W

4. Mechanical and others

■ Housing
- Case color and finish
  - Color: Silver gray
  - Finish: chemically resistant coating or high anti-corrosion coating
- Window
  - Polycarbonate (flexible)
- Protection
  - NEMA Type4X (USA), Type4X (Canada), IP66

■ Cable and Terminal
- Cable size:
  - Outer diameter: 6 to 12 mm (suitable for M20 cable gland)
- Terminal screw size: M3 (Power/Earth terminal: M4)

■ Cable Entry
- 8 holes
- M20 cable gland x 8 pcs
- Note: Cable gland and plug are delivered with an converter, but not assembled into the converter.

■ Mounting hardware (option)
- Universal mounting kit (Note)
- Pipe and wall mounting hardware
- Panel mounting hardware
- Note: This kit contains the pipe and wall mounting hardware and the panel mounting hardware.

■ Hood (option)
- Stainless steel
- Stainless steel with chemically resistant coating
■ Stainless Steel Tag Plate (option)
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 converter. Tag plate is hanging type.

■ Conduit adapter (option)
Using optional adapter
• G1/2 (quantity: 8)
• 1/2NPT (quantity: 8)
• M20 x 1.5 (quantity: 8)
These conduit adapters are delivered with an converter, but not assembled into the converter.

■ Size of Housing Case
165 x 165 x 168.5 mm (W x H x D) (without cable gland)

■ Weight
Max. 3.0 kg

■ Warm up time
Approx. 30 min.

■ 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 a converter;
Paper copy:
Start-up Manual and Safety Precautions
Other documents are to be downloaded from website:
User’s Manual
Safety Regulations Manual,
General Specifications,
User Setting Table of measurement / sensor type

■ Regulatory Compliance
Safety:
EN 61010-1
EN 61010-2-030
UL 61010-1
UL 61010-2-030
CAN/CSA-C22.2 No.61010-1
CAN/CSA-C22.2 No.61010-2-030
GB30439
TR CU 004/2011
Installation altitude: 2000 m or less
Category based on IEC 61010: I (DC model)
Category based on IEC 61010: II (AC model) (Note1)
Pollution degree based on IEC 61010: 2 (Note2)

Note1: Installation category, called over-voltage category, specifies impulse withstand voltage. Equipment with ‘Category I’ is used for connection to circuit in which measures are taken to limit transient over-voltage to an appropriately low level. Category II is energy-consuming equipment to be supplied from the fixed installation.

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.

EMC:
EN61326-1 Class A, Table 2
(For use in industrial locations)
EN61326-2-3
EN61000-3-2
EN61000-3-3
RCM: EN 55011 Class A, Group 1
Korea Electromagnetic Conformity Standard

■ Regulatory Compliance
Safety:
EN 61010-1
EN 61010-2-030
UL 61010-1
UL 61000-3-3
RCM: EN 55011 Class A, Group 1
Korea Electromagnetic Conformity Standard

■ Bluetooth
Compliant standard: Bluetooth Ver 3.0 Class2
Applicable countries / regions: (regulations)
Japan, EU, USA, Canada, Australia, New Zealand, Singapore
EN 301 489-1
EN 301 489-17
EN 300 328
EN 62479
FCC15C
ICES-003
AS/NZS4268, AS/NZS2772.2
IMDA TS SRD

Environmental regulation:
RoHS: EN50581
REACH: Regulation EC 1907/2006

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.

NAMUR: NE43, 107

FM nonincendive approval (suffix code Type : -DD)
Applicable Standard
FM Class 3600
FM Class 3611
FM Class 3810
ANSI/UL 1121201
ANSI/UL 61010-1
ANSI/UL 61010-2-030
ANSI/NEMA 250
Certificate No. FM18US0281

Marking/Rating: Nonincendive for Class I, Division 2, Groups A, B, C and D.
T6: for ambient temperature: -20°C to +40°C
T4: for ambient temperature: -20°C to +55°C
Enclosure: Type 4X
Control drawing: NFMO38-A81 (refer to next page)
Yokogawa Electric Corporation

Model: FLXA-02

Title: Control drawing

No.: NPM038-A01

Page: 01

Revision: 0

Date: 2018-06-20

Control Drawing

Non-hazardous Location

Class II, Div. 2, GP ABCD

Measuring Module 1, 2

NIEW parameter

<table>
<thead>
<tr>
<th>Type of Measuring Module</th>
<th>PH</th>
<th>SC</th>
<th>ISC</th>
<th>SENCOM SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo</td>
<td>11.76V</td>
<td>11.76V</td>
<td>11.76V</td>
<td>5.36V</td>
</tr>
<tr>
<td>Io</td>
<td>116.5mA</td>
<td>116.5mA</td>
<td>60.6mA</td>
<td>106.16mA</td>
</tr>
<tr>
<td>Po</td>
<td>0.3424W</td>
<td>0.3424W</td>
<td>0.176W</td>
<td>0.1423W</td>
</tr>
<tr>
<td>Co</td>
<td>4μF</td>
<td>4μF</td>
<td>4μF</td>
<td>3μF</td>
</tr>
<tr>
<td>Lo</td>
<td>4.5mH</td>
<td>4.5mH</td>
<td>19mH</td>
<td>0.455mH</td>
</tr>
</tbody>
</table>

Notes:
1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Codes (NPPA 70, ANSI/UL- RP12.06.01 and relevant local codes.
3. When installed in Division 2, Sensor 1 and Sensor 2 may be simple apparatus or nonincendive field wiring apparatus meeting the conditions below, or alternatively, they may be equipment suitable for Division 2 respectively, if a suitable wiring method other than nonincendive field wiring is employed.
   \[ U_i \geq U_o \]
   \[ I_i \geq I_o \]
   \[ P_i \geq P_o \]
   \[ L_i \leq L_o \leq \text{Leable} \]
4. WARNING—EXPLOSION HAZARD. DO NOT OPEN WHILE THE EQUIPMENT IS ENERGIZED OR WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
5. WARNING—EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE THE FUSE WHILE THE EQUIPMENT IS ENERGIZED OR WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
6. WARNING—SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2.
### 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>FLXA402</td>
<td></td>
<td>-A</td>
<td>4-Wire Converter</td>
</tr>
<tr>
<td>Power supply</td>
<td></td>
<td>-D</td>
<td>AC version</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-D</td>
<td>DC version</td>
</tr>
<tr>
<td>Housing</td>
<td>-B</td>
<td></td>
<td>Aluminum alloy cast + urethane coating</td>
</tr>
<tr>
<td></td>
<td>-D</td>
<td></td>
<td>Aluminum alloy cast + high anti-corrosion coating</td>
</tr>
<tr>
<td>Type</td>
<td>-AB</td>
<td></td>
<td>General purpose for CE, RCM, China standard</td>
</tr>
<tr>
<td></td>
<td>-AD</td>
<td></td>
<td>General purpose for CSA</td>
</tr>
<tr>
<td></td>
<td>-AG</td>
<td></td>
<td>General purpose for KC</td>
</tr>
<tr>
<td></td>
<td>-AQ</td>
<td></td>
<td>General purpose</td>
</tr>
<tr>
<td></td>
<td>-AR</td>
<td></td>
<td>General purpose for EAC with PA</td>
</tr>
<tr>
<td></td>
<td>-DD</td>
<td></td>
<td>General purpose for EAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-D</td>
<td>Ni for FM (*8)</td>
</tr>
<tr>
<td>1st input (*9)</td>
<td>-P1</td>
<td></td>
<td>pH/ORP (PH)</td>
</tr>
<tr>
<td></td>
<td>-C1</td>
<td></td>
<td>Conductivity (SC)</td>
</tr>
<tr>
<td></td>
<td>-C5</td>
<td></td>
<td>Inductive conductivity (ISC)</td>
</tr>
<tr>
<td></td>
<td>-D1</td>
<td></td>
<td>Dissolved oxygen (DO)</td>
</tr>
<tr>
<td></td>
<td>-D5</td>
<td></td>
<td>Digital sensor (DO70G)</td>
</tr>
<tr>
<td></td>
<td>-S5</td>
<td></td>
<td>SENCOM SA (*2)</td>
</tr>
<tr>
<td>2nd input (*9)</td>
<td>-NN</td>
<td></td>
<td>Without input</td>
</tr>
<tr>
<td></td>
<td>-P1</td>
<td></td>
<td>pH/ORP (PH)</td>
</tr>
<tr>
<td></td>
<td>-C1</td>
<td></td>
<td>Conductivity (SC)</td>
</tr>
<tr>
<td></td>
<td>-C5</td>
<td></td>
<td>Inductive conductivity (ISC)</td>
</tr>
<tr>
<td></td>
<td>-D1</td>
<td></td>
<td>Dissolved oxygen (DO)</td>
</tr>
<tr>
<td></td>
<td>-S5</td>
<td></td>
<td>SENCOM SA (*3)</td>
</tr>
<tr>
<td>mA Output/Input</td>
<td>-A2</td>
<td></td>
<td>2 x 4-20 mA Output + 1 x Contact Input (mA1 output: with HART)</td>
</tr>
<tr>
<td></td>
<td>-A4</td>
<td></td>
<td>4 x 4-20 mA Output + 2 x Contact Input + 1 x 4-20 mA Input (mA1 output: with HART)</td>
</tr>
<tr>
<td>Contact Outputs</td>
<td>-WR</td>
<td></td>
<td>Contact outputs (Wash and Fail contact outputs)</td>
</tr>
<tr>
<td></td>
<td>-NR</td>
<td></td>
<td>Without Contact outputs (without Wash and Fail contact outputs)</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>-N</td>
<td></td>
<td>Without Bluetooth</td>
</tr>
<tr>
<td></td>
<td>-B</td>
<td></td>
<td>Bluetooth</td>
</tr>
<tr>
<td>Digital Communication</td>
<td>-N</td>
<td></td>
<td>Without Digital communication</td>
</tr>
<tr>
<td></td>
<td>-E</td>
<td></td>
<td>Modbus TCP/IP</td>
</tr>
<tr>
<td></td>
<td>-R</td>
<td></td>
<td>Modbus RTU (RS-485)</td>
</tr>
<tr>
<td>Country (*4)</td>
<td>-J</td>
<td></td>
<td>Global except Japan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-N</td>
<td>Japan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-NN</td>
<td>Always -NN</td>
</tr>
</tbody>
</table>

Notes:

- *1. Urethane coating is acid resistant.
- *2. On 1st input, with a connection to BA11 Junction Box, up to 4 sensors equipped with SA11 can be connected except when type “-DD” (Ni for FM) is selected. When Type “-DD” (Ni for FM) is selected, only 1 sensor equipped with SA11 can be connected. BA11 cannot be used.
- *3. On 2nd input, only 1 sensor equipped with SA11 can be connected.
- *4. Select only “-J” if you use the converter in Japan. Only SI unit (International System of Units) applies.
- *5. Universal mounting kit contains pipe, wall mounting hardware (/U) and panel mounting hardware (/PM).
- *6. Available only when “-E” (Modbus TCP/IP) via digital communication is selected.
- *7. There are 8 cable entry holes. Check the table below. If you need, purchase the adapters additionally to comply with requirements in the specification.
- *8. When selecting Type “-DD” (Nonincendive for FM), “-D1” “-D5” on 1st/2nd input, select SA11 “-CD” (IS for FM-US, FM-Canada). Please check Control Drawing about the other conditions.
- *9. When you select both 1st and 2nd inputs, prepare a sensor for each input. If you do not connect the sensor, an alarm will occur.

### Required No. of cable entry holes

<table>
<thead>
<tr>
<th>Spec.</th>
<th>Power</th>
<th>1st input</th>
<th>2nd input</th>
<th>mA output/input</th>
<th>Contact Outputs</th>
<th>Digital Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td></td>
<td>All</td>
<td>All</td>
<td>-NN</td>
<td>the others</td>
<td>-A2</td>
</tr>
<tr>
<td>Required No. of cable entry holes</td>
<td>1 1 0 1 1 2 2 0 0 1* 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Conduit exclusively for Ethernet
Following is the specification restriction by combination

- **Conduit adapter (need to be purchased additionally)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parts number</th>
<th>Quantity</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/2 (Cable gland for adapter + adapter)</td>
<td>K9703WF</td>
<td>4 set</td>
<td>for Option code /CB</td>
</tr>
<tr>
<td>1/2 NPT (Cable gland for adapter + adapter)</td>
<td>K9703WG</td>
<td>4 set</td>
<td>for Option code /CD</td>
</tr>
<tr>
<td>M 20 x 1.5 (Cable gland for adapter + adapter)</td>
<td>K9703WH</td>
<td>4 set</td>
<td>for Option code /CF</td>
</tr>
</tbody>
</table>

- **Optional parts**

<table>
<thead>
<tr>
<th>Name</th>
<th>Parts number</th>
<th>Quantity</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting hardware for pipe, wall mounting (stainless)</td>
<td>K9703SS</td>
<td>1 set</td>
<td>same as Option code /U</td>
</tr>
<tr>
<td>Mounting hardware for panel mounting (stainless)</td>
<td>K9703ZD</td>
<td>1 set</td>
<td>same as Option code /PM</td>
</tr>
<tr>
<td>Sun shade hood Stainless</td>
<td>K9698WK</td>
<td>1 set</td>
<td>same as Option code /H6</td>
</tr>
<tr>
<td>Sun shade hood stainless + urethane</td>
<td>K9698WL</td>
<td>1 set</td>
<td>same as Option code /H7</td>
</tr>
<tr>
<td>Rubber plug attachment</td>
<td>K9334CN</td>
<td>1 pcs</td>
<td>for Cable gland</td>
</tr>
<tr>
<td>Fuse</td>
<td>A1633EF</td>
<td>1 pcs</td>
<td>250V/2.5A (minimum 5 pcs)</td>
</tr>
</tbody>
</table>
| SD card                            | A1005NL      | 1 pcs    | 2 GB industrial SD card (with power failure recovery) Customers can provide the cards with spec:
|                                    |              |          | Storage capacity: 128 MB or greater Type: SD, SDHC |

Customers can specify the SD card with the following specifications:
- Storage capacity:
  - 128 MB or greater
- Type:
  - SD, SDHC
### Dimensions

**Dimensions**

![Dimensions Diagram](image)

- **For Sensor modules**
- **For IO module**
- **For Communication module**
- **For power supply**
- **For Relay module**

**Dimensions**

- 165 mm x 137 mm x 80 mm

**Weight:** max. 3.0 kg

**Conduit adaptor (/CB4, /CD4, /CF4/, /CB6, /CD6, /CF6)**

- **Case**
- **Cable gland for adapter**
- **Adapter**

- G1/2 (/CB4, /CB6)
- 1/2NPT (/CD4, /CD6)
- M20x1.5 (/CF4, /CF6)

- **Approx. 55 (2.17)**
- **45 (1.77)**

**Unit:** mm (inch)
Note: Universal Mounting kit (/UM) contains pipe, wall mounting hardware (/U) and panel mounting hardware (/PM).

**Panel mounting hardware (/PM, /UM)**

- Panel thickness: 1 to 12
- 2-M5 length 35

Unit: mm

Spacing panel cutout

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

**Wall mounting hardware (/U, /UM)**

- 3-ø10 holes

Unit: mm

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

Note: For wall mounting, the wall should be strong enough to bear the weight of 8 kg or more.
Pipe mounting hardware (/U, /UM)

Pipe mounting (Horizontal)  
Pipe mounting (Vertical)

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

Hood Stainless steel (/H6, /H7)

Unit: mm
Wiring
Inquiry Specifications Sheet for FLXA402 4-Wire Converter

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; 

2. Measurement Conditions
   (1) Process temperature; 
   (2) Process pressure; 
   (3) Flow rate; 
   (4) Flow speed; 
   (5) Slurry or contaminants; 
   (6) Name of process fluid; 
   (7) Components of process fluid; 
   (8) Others; 

3. Installation Site
   (1) Ambient temperature; 
   (2) Location; 
   (3) Others; 

4. Requirements
   1st Input; 
   □ pH/ORP (PH) 
   □ Conductivity (SC) 
   □ Inductive conductivity (ISC) 
   □ Dissolved oxygen (DO) 
   □ Digital sensor 
   □ SENCOM SA (pH/ORP) 
   □ Without input 
   □ pH/ORP (PH) 
   □ Conductivity (SC) 
   □ Inductive conductivity (ISC) 
   □ Dissolved oxygen (DO) 
   □ SENCOM SA (pH/ORP) 
   mA output; 
   □ 2 x 4-20 mA Output + 1 x Contact Input 
   □ 4 x 4-20 mA Output + 2 x Contact Input + 1 x 4-20 mA Input 
   Contact Outputs; 
   □ Contact outputs 
   □ Without Contact outputs 
   Bluetooth; 
   □ Without Bluetooth 
   □ Bluetooth 
   Digital Communication; 
   □ Without Digital communication 
   □ Modbus TCP/IP (Ethernet) 
   □ Modbus RTU (RS-485) 
   Others; 

Sep. 25, 2020-02