General Specifications

Model FLXA21
2-Wire Analyzer
FOUNDATION Fieldbus Communication

General

FOUNDATION Fieldbus is the digital communication line for the field instruments, whose signal is internationally standardized by Fieldbus Foundation.
The Fieldbus bi-directional digital communication performance makes possible for the field instruments and the control devices to be a complete on-line system, superseding the existing analog transmission lines.
Vendor-independence and openness allow communication between devices of different manufactures with no special interface adjustment.
FLXA™21 FOUNDATION Fieldbus model offers more flexible instrumentation through a higher level communication capability and proposes the cost reduction by multidrop wirings with fewer cables.

In the FLXA21 Human Machine Interface (HMI), 2-wire type analyzer FLXA21 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 FLXA21 automatically recognizes the installed sensor module and prepares the necessary menus for right configuration.
For immediate measurement, the FLXA21 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 FLXA21 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.

Features

• Interoperability
FOUNDATION Fieldbus specifications grant the interoperability of the field instruments without preparing designated software for the instrument.

• Multi-sensing function
FLXA21 FOUNDATION Fieldbus model, has three independent AI function blocks.

• Alarm function
FLXA21 FOUNDATION Fieldbus model securely supports various alarm functions, such as high/low alarm, notice of block error, etc. based on Fieldbus specifications.

• Link master function
FLXA21 FOUNDATION Fieldbus model support the Link Master function. This function enables backup of network manager and local control only by field devices.

• Self-diagnostic function
A reliable self-diagnostic function based on the NAMUR NE107 standard detects failures in the hardware of pH/ORP sensor, conductivity sensor, and communications.

• 2 kinds of measurements; pH/ORP, Conductivity (SC)

• Connection of digital FU20F pH/ORP SENCOM Sensor

• Simple HMI menu structure in 12 languages

• Quick setup menu for immediate measurement

• Indication of sensor wellness

• Software download function
Software download function permits to update FLXA21 software via a FOUNDATION fieldbus. Typical use of this function is to add new features such as function blocks and diagnostics to existing devices

• Supported tools
DTM for FieldMate™
FLXA21 FOUNDATION Fieldbus model can be connected with DeltaV/AMS by EMERSON Process Management.
This device can't be connected with DeltaV 9.3 / AMS 9 and older version of them.
Version of them are follows:

  DeltaV 10.3 / AMS 10.5
  DeltaV 11.3 / AMS 11.5
  DeltaV 12.3 / AMS 12.5
  DeltaV 13.3 / AMS 13.0

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## General Specifications

### 1. Basic

- **Measurement Object/Sensor Type**
  - pH/Oxidation-reduction Potential (pH/ORP) (analog sensor)
  - Conductivity (SC)
  - 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) Sensor module

### 2. Measurement

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

- **Input Specification**
  
  Dual high impedance input (≥10\(^12\) Ω)

- **Input Range**
  
  pH: -2 to 16 pH
  ORP: -1500 to 1500 mV
  rH: 0 to 100 rH
  
  Temperature:
  - Pt1000: -30 to 140 °C
  - Pt100: -30 to 140 °C
  - 6k8: -30 to 140 °C
  - PTC10k: -30 to 140 °C
  - NTC 8k55: -10 to 120 °C
  - 3k Balco: -30 to 140 °C
  - PTC500: -30 to 140 °C

- **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
  
  Repeatability: ±0.1 °C
  
  Accuracy: ±0.3 °C

  with Pt100
  
  Linearity: ±0.4 °C
  
  Repeatability: ±0.1 °C
  
  Accuracy: ±0.4 °C

#### 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 °C
  Pt100: -20 to 200 °C
  Ni100: -20 to 200 °C
  NTC 8k55: -10 to 120 °C
  Pb36 (JIS NTC 6k): -20 to 120 °C

- **Performance (Accuracy)**
  
  (The specifications are expressed with simulated inputs.)
  
  **Conductivity**
  
  More than 2 µS x K cm\(^{-1}\) to 200 mS x K cm\(^{-1}\)
  
  Accuracy: ±0.5% of reading
  
  1 µS x K cm\(^{-1}\) to 2 µS x K cm\(^{-1}\)
  
  Accuracy: ±1% of reading

  **Resistivity**
  
  0.005kΩ / K cm\(^{-1}\) to less than 0.5MΩ /K cm\(^{-1}\)
  
  Accuracy: ±0.5% of reading
  
  0.5MΩ / K cm\(^{-1}\) to 1MΩ / K cm\(^{-1}\)
  
  Accuracy: ±1% of reading

- **Temperature**
  
  with Pt1000, Pb36, Ni100
  
  Accuracy: ±0.3 °C

  with Pt100, NTC 8k55
  
  Accuracy: ±0.4 °C

- **Temperature compensation**
  
  NaCl table: ±1 %
  
  Matrix: ±3 %

  Step response: 90% (<2 decades) in 7 seconds (of reading on the display)

  Note: "K" means cell constant.

  YOKOGAWA provides conductivity sensors of which cell constants are 0.1 to 10 cm\(^{-1}\).

#### 2-3. 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 FLXA21

- **Input Range**
  
  depending on FU20F

  pH: 0 to 14 pH
  ORP: -1500 to 1500 mV
  rH: 0 to 100 rH

  Temperature: -10 to 105 °C

### 3. Electrical

- **Output Signal**
  
  Digital communication signal based on FOUNDATION Fieldbus protocol.

- **Communication Requirements**
  
  Supply Voltage: 9 to 32 V DC
  
  Current Draw: 24 mA (max)

  Bus connection and Fieldbus cable type according to recommendation based on IEC 1158-2.

- **Functional Specifications**
  
  Functional specifications for Fieldbus communication conform to the standard specifications (H1) of FOUNDATION fieldbus.

  DD and CFF: The actual file can be downloaded from www.fieldbus.com

- **Function Block**
  
  Three AI blocks
4. Mechanical and others

■ 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.

■ Housing
Case: Plastic (Polycarbonate)
Case color: Silver gray (equivalent to Munsell 3.2PB7.4/1.2)
Window: Polycarbonate (flexible)
Protection: IP66 (except Canada), NEMA Type 4X (USA), CSA Type 3S/4X (Canada)

■ Plate
Main name plate: inside case cover
Regulation plate: on the case outside

■ Cable and Terminal
Cable size:
Outer diameter:
6 to 12 mm (suitable for M20 cable gland)
3.4 to 7 mm (grounding cable)
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.
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,
Sleeve x 1 pc (for grounding cable line)
Note: Cable gland and plug are delivered with an analyzer, but not assembled into the analyzer.

■ Mounting
Mounting hardware (option):
• Universal mounting kit (Note)
• Pipe and wall mounting hardware
• Panel mounting hardware
Note: This kit contains the pipe and wall mounting hardware and the panel mounting hardware.
Hood (option):
• Stainless steel
• Stainless steel with urethane coating
• Stainless steel with epoxy coating

■ Stainless Steel Tag Plate
When the additional code “/SCT” with a tag number is specified, the tag plate on which the tag number is inscribed is delivered with the analyzer.
Tag plate is hanging type.

■ Conduit Adapter
Using optional adapter
• G1/2 (quantity: 4)
• 1/2NPT (quantity: 4)
• M20 x 1.5 (quantity: 4)
These conduit adapters are delivered with an analyzer, but not assembled into the analyzer.

■ Size of Housing Case
144 x 144 x 151 mm (W x H x D) (without cable gland)

■ Weight
Approx. 1 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:
• User’s Manual for FOUNDATION Fieldbus Communication written in English
• 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
### Regulatory Compliance

#### 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  
EN 61326-2-5  
RCM: EN 61326-1 Class A, Table 2  
Korea Electromagnetic Conformity Standard Class A

**RoHS:** EN 50581: 2012 (Style 3.03 or newer)  
Installation altitude: 2000 m or less  
Category based on IEC 61010: I (Note 1)  
Pollution degree based on IEC 61010: 2 (Note 2)  

**Notes:**  
Note 1: Installation category, called over-voltage category, specifies impulse withstand voltage. Equipment with "Category I" (ex. two wire transmitter) is used for connection to circuits in which measures are taken to limit transient over-voltages to an appropriately low level.  
Note 2: Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.

#### Information of the WEEE Directive

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

### Explosion Protected Type Compliance

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>&quot;Type&quot; in MS code</th>
</tr>
</thead>
</table>
| **Europe (ATEX)**  | [Intrinsic safety "ia"]  
Certificate No: DEKRA 11ATEX109X  
Marking/Rating: Ex ia IIC T4 Ga, FISCO field device  
Ambient Temperature: -20 to 55°C  
Control Drawing: Refer to (1) |
| **International (IECEx)** | [Intrinsic safety "ia"]  
Certificate No: IECEx DEK 11.0044X  
Marking/Rating: Ex ia IIC T4 Ga, FISCO field device  
Ambient Temperature: -20 to 55°C  
Control Drawing: Refer to (1) |
| **United States (FM)** | [Intrinsically safe / Nonincendive]  
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  
FISCO field device  
T4: for ambient temperature: -20 to 55°C  
Enclosure: Type 4X  
Control Drawing: Refer to (3) |
| **Canada (CSA)** | [Intrinsically safe / Nonincendive]  
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.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, FISCO field device  
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) |
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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>‘Type’ in MS code</th>
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<td>United States (FM)</td>
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<td>Class 3600: 2011, Class 3611: 2004, Class 3810: 2005,</td>
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<td>NEMA 250: 2014</td>
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<td>T4: for ambient temperature: -20 to 55°C</td>
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<td>Enclosure: Type 4X</td>
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<td>Marking/Rating: Nonincendive for Class I, Division 2</td>
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<td>Groups A, B, C, D, T4</td>
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<td>Ambient Temperature: -20 to 55°C</td>
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<td>Ambient Humidity: 0 – 100% (No Condensation)</td>
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<tr>
<td></td>
<td>Enclosure: IP66, NEMA 4X</td>
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<td></td>
<td>Control Drawing: Refer to (2)</td>
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<td>China (NEPSI)</td>
<td>[Intrinsic safety “ia”]</td>
<td>-EG</td>
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<td>GB3836.1-2010, GB3836.4-2010, GB 3836.20-2010</td>
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<tr>
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</table>
CONTROL DRAWINGS

(1) ATEX
and IECEx
Intrinsic safety “ia”

Specific Conditions of Use
- When operating FLXA21 through the display window or touching the non-metallic part of the enclosure of 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,
  - Operate FLXA21 on the conductive floors, wearing anti-static work clothes and electrostatic safety shoes,
  - Neutralize the operator and FLXA21 by a static elimination bar which has a metal part earthed through a 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 FLXA21 before the operation.

Notes:
1. The associated apparatus must be a linear source or a FISCO power supply.
2. Sensor 1 may be simple apparatus or intrinsically safe apparatus.
3. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE USER’S MANUAL.
Intrinsic safety, Nonincendive

Model: FLEXA Series

Applicable models: FLXA21-D-x-x-CD-xx-xx-F-..., FLXA21-D-x-x-CD-xx-xx-P-...

Applicable models: FLXA21-D-x-x-DD-xx-xx-F-..., FLXA21-D-x-x-DD-xx-xx-P-...

specific condition of use:
- Electrostatic charges on the non-metallic or coated parts of the two wire analyzer shall be avoided.

Measuring Module 1 (Note 8):

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

Specific condition of use:

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

Supply +, Supply -

(Note 5):

FISCO field device

Ui: 24 V
Ii: 250 mA
Pi: 1.2 W
Ci: 2.72nF
Li: 0 mH

Supply +, Supply -

(Note 4, 5)

Control Equipment

(2)

Jan. 11, 2019
Notes:
1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electric Code (NFPA 70), ANSI/ISA-RP12.06.01 and relevant local codes.
3. FISCO installation must be in accordance with ANSI/UL-60079-25.
4. The associated apparatus must be FM-approved.
5. The associated apparatus must be a FISCO power supply or a linear source meeting the following conditions.
   \[
   \begin{align*}
   U_o &\leq U_i \\
   I_o &\leq I_i \\
   P_o &\leq P_i \\
   C_o &\geq C_i + C_{cable} \\
   L_o &\geq L_i + L_{cable}
   \end{align*}
   \]
6. Control equipment connected to the associated apparatus must not use or generate a voltage which exceeds \( U_m \) of the associated apparatus.
7. The control drawing of the associated apparatus must be followed when installing the equipment.
8. When installed in Division 1, Zone 0 or Zone 1, Sensor 1 may be a simple apparatus or an intrinsically safe apparatus meeting the conditions below.
   When installed in Division 2 or Zone 2, Sensor 1 may be a simple apparatus or a nonincendive field wiring apparatus meeting the conditions below, or alternatively, it may be equipment suitable for Division 2 or Zone 2 respectively, if a suitable wiring method other than nonincendive field wiring is employed.
   \[
   \begin{align*}
   U_i &\geq U_o \\
   I_i &\geq I_o \\
   P_i &\geq P_o \\
   C_i &\leq C_o - C_{cable} \\
   L_i &\leq L_o - L_{cable}
   \end{align*}
   \]
9. The control equipment must be an FM-approved FISCO power supply, FNICO power supply or an 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.
   \[
   \begin{align*}
   U_o &\leq U_i \\
   C_o &\geq C_i + C_{cable} \\
   L_o &\geq L_i + L_{cable}
   \end{align*}
   \]
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.
Mar. 23, 2018-00

Control drawing (FOUNDATION Fieldbus / PROFIBUS PA type)

Installation for Zone 0, 1 / Division 1

Applicable models: FLXA21-D-x-x-CD-xx-xx-F-..., FLXA21-D-x-x-CD-xx-xx-P-...

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

Measuring Module 1 (Note 6):

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<td>Lo</td>
<td>1.7 mH</td>
<td>8 mH</td>
<td>0.45 mH</td>
<td></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.

Electrical connections are not acceptable on conductive parts of the two wire analyzer and its associated equipment.

Supply +, Supply -

Control Equipment (Note 7)

- FISCO field device

Ui: 24 V
Ii: 250 mA
Pi: 1.2 W
Ci: 2.72 nF
Li: 0 mH

Measuring Module 1

Housing Assembly

FLXA21 Analyzer

Terminators

Other Field Devices

Sensor 1 (Note 6)

Measuring Module 2

FLXA21 Analyzer

Terminators

Other Field Devices

Sensor 2 (Note 6)

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

Measuring Module 2 (Note 6):

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

Installation for Zone 2 / Division 2

Applicable models: FLXA21-D-x-x-DD-xx-xx-F-..., FLXA21-D-x-x-DD-xx-xx-P-...

Non-hazardous Area Hazardous Area

Class I, Zone 2, Group IIC, or Class I, Division 2, Groups A, B, C, D

Temperature Class: T4

Supply +, Supply -

Control Equipment (Note 7)

- FISCO field device

Ui: 24 V
Ci: 2.72 nF
Li: 0 mH
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. FISCO installation must be in accordance with CAN/CSA-C22.2 No. 60079-25.

3. The associated apparatus must be a FISCO power supply or a linear source meeting the following conditions.

\[
\begin{align*}
U_o & \leq U_i \\
I_o & \leq I_i \\
P_o & \leq P_i \\
C_o & \geq C_i + C_{\text{cable}} \\
L_o & \geq L_i + L_{\text{cable}}
\end{align*}
\]

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

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

6. When installed in Zone 0 or 1, or Division 1, Sensor 1 may be a simple apparatus or an intrinsically safe apparatus meeting the conditions below. When installed in Zone 2 or Division 2, Sensor 1 may be a simple apparatus or a non-incendive field wiring apparatus meeting the conditions below, or alternatively, it may be equipment suitable for Zone 2 or Division 2 respectively, if a suitable wiring method other than non-incendive field wiring is employed.

\[
\begin{align*}
U_i & \geq U_o \\
I_i & \geq I_o \\
P_i & \geq P_o \\
C_i & \leq C_o - C_{\text{cable}} \\
L_i & \leq L_o - L_{\text{cable}}
\end{align*}
\]

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

\[
\begin{align*}
U_o & \leq U_i \\
C_o & \geq C_i + C_{\text{cable}} \\
L_o & \geq L_i + L_{\text{cable}}
\end{align*}
\]

8. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD

9. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

10. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR ZONE 2 / 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>FLXA21</td>
<td></td>
<td></td>
<td>2-Wire Analyzer</td>
</tr>
</tbody>
</table>

#### Power supply
- **-D**: Always -D

#### Housing
- **-P**: Plastic

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

#### Type
- **-AB**: General purpose for CE, RCM
- **-AD**: General purpose for CSA
- **-AG**: General purpose for KC
- **-CB**: IS for ATEX, IECEx (Note 5) (Note 7)
- **-CD**: IS for FM, CSA (Note 5)
- **-CH**: IS for NEPSI (Note 5)
- **-EG**: IS for KOSHA (Note 5)
- **-DD**: Ni for FM, CSA (Note 6)

#### 1st input
- **-P1**: pH/ORP (Note 3)
- **-C1**: Conductivity (SC)
- **-S1**: pH/ORP (SENCOM sensor)

#### 2nd input
- **-NN**: Without input

#### Output (Note 1)
- **-F**: FOUNDATION Fieldbus
- **-N**: Always -N

#### Language set (Note 2)
- **-LA**: English and 11 languages

#### Country
- **-N**: Global except Japan
- **-NN**: Always -NN

#### Option

<table>
<thead>
<tr>
<th>Mounting hardware</th>
<th>Hood</th>
<th>Tag plate</th>
<th>Conduit adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>/UM</td>
<td>/H6</td>
<td>/SCT</td>
<td>/CB4</td>
</tr>
<tr>
<td>/U</td>
<td>/H7</td>
<td>/PM</td>
<td>/CD4</td>
</tr>
<tr>
<td>/PM</td>
<td>/H8</td>
<td>/H6</td>
<td>/CF4</td>
</tr>
</tbody>
</table>

**Universal mounting kit (Note 4)**

**Pipe and wall mounting hardware**

**Panel mounting hardware**

**Stainless steel tag plate**

**Conduit adapter (G1/2 x 4 pcs)**

**Conduit adapter (1/2NPT x 4 pcs)**

**Conduit adapter (M20 x 1.5 x 4 pcs)**

**Notes:**
1. The FLXA21 has another output type of "4-20 mA + HART" (suffix code: -A). Refer to GS 12A01A02-01E.
2. 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.
3. This input is to be come from an analog pH/ORP sensor.
4. The universal mounting kit contains the pipe and wall mounting hardware (/U) and the panel mounting hardware (/PM).
5. Type "-CB", "-CD", "-CH", "-EG" are intrinsic safety (IS).
6. Type "-DD" is nonincendive (NI).
7. Product registration is done by Yokogawa Taiwan Corporation as an importer in Taiwan.
**Dimensions and Mounting**

For sensor 1 cable

For power supply

For grounding cable

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

- **Nut**
- **Packing**
- **G1/2 screw (CB4), 1/2 NPT screw (CD4)**
- **M20x1.5 screw (CF4)**

**Unit: mm (inch)**
- Approx. 56 (2.2")
- Packing: 49 (1.93")

---

FB4_01.ai

FB204.ai
(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)

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

Pipe mounting hardware (Option code: /U, /UM)
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 gland. (Class D ground: 100 ohm or less)

Connect the grounding cable to the terminal of the power module inside.

Use a cable with an outside diameter of 3.4 to 7 mm for the grounding line of the plastic housing.

The minimum cross sectional area of the protective grounding cable should be 0.75 mm².

*3: Terminal numbers for each sensor module are shown below.

*4: The terminal box may be necessary depending on the sensor cable length and the distance between the analyzer and the sensor.

The SENCOM sensor is to be connected directly to the analyzer without a terminal box.
Inquiry Specifications Sheet for FLXA21 2-Wire Analyzer (FOUNDATION Fieldbus Communication)

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 Normally [°C]
   (2) Process pressure: __________ to Normally [kPa]
   (3) Flow rate: __________ to Normally [l/min]
   (4) Flow speed: __________ to Normally [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) ☐ pH/ORP (digital sensor, FU20F)
   2nd Input: ■ Without

4.1 pH/ORP (analog sensor)
   (1) Measuring range: ☐ pH 0 to 14 ☐ ORP _______ to _______ mV ☐ __________
   (2) System configuration selection: ☐ Electrode, ☐ Holder, ☐ pH Converter, ☐ Cleaning system, ☐ Terminal box, ☐ Accessories
   (3) Electrode cable length: ☐ 3m, ☐ 5m, ☐ 7m, ☐ 10m, ☐ 15m, ☐ 20m, ☐ __________ m
   (4) Electrode operating pressure; ☐ 10 kPa or less, ☐ More than 10 kPa
   (5) Type of holder: ☐ Guide pipe, ☐ Submersion, ☐ Flow-through, ☐ Suspension, ☐ Angled floating ball, ☐ Vertical floating ball
   (6) Cleaning method: ☐ No cleaning, ☐ Ultrasonic cleaning, ☐ Jet cleaning, ☐ Brush cleaning
   (7) Sample temperature: ☐ -5 to 105°C, ☐ -5 to 100°C, ☐ -5 to 80°C
   (8) Others:

4.2 Conductivity
   (1) Measuring range: _________________________
   (2) 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)
   (3) 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
   (4) Electrode cable length: ☐ SC4AJ 3m, ☐ 5m, ☐ 10m, ☐ 20m
      - SC8SG ☐ 5.5m, ☐ 10m, ☐ 20m
      - SC210G ☐ 3m, ☐ 5m, ☐ 10m, ☐ 15m, ☐ 20m
   (5) Others:

4.3 pH/ORP (digital sensor, FU20F)
   (1) Measuring range: ☐ pH 0 to 14 ☐ ORP _______ to _______ mV ☐ __________
   (2) System configuration selection: ☐ Electrode, ☐ Holder, ☐ pH Converter, ☐ Cleaning system, ☐ Accessories
   (3) Electrode cable length: ☐ 3m, ☐ 5m, ☐ 10m, ☐ 20m, ☐ __________ m
   (4) Electrode operating pressure; ☐ 10 kPa or less, ☐ More than 10 kPa
   (5) Type of holder: ☐ Guide pipe, ☐ Submersion, ☐ Flow-through, ☐ Suspension, ☐ Angled floating ball, ☐ Vertical floating ball
   (6) Cleaning method: ☐ No cleaning, ☐ Jet cleaning
   (7) Sample temperature: ☐ -5 to 105°C, ☐ -5 to 100°C, ☐ -5 to 80°C
   (8) Others:

Subject to change without notice.