This Start-up Manual explains mainly the installation and wiring of the FLXA402. For detailed information and other information, the User’s Manual of the FLXA402 should be referred to.
Introduction

Thank you for purchasing the FLXA™ 402 4-Wire Converter.
This Instructor’s Manual contains all essential information for the user to make full use of FLXA402.
Please read the following respective documents before installing and using the FLXA402.
The related documents are listed as follows.

### General Specifications

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<th>Contents</th>
<th>Document number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLXA402 4-Wire Converter</td>
<td>GS 12A01F01-01EN</td>
<td>Online manual</td>
</tr>
</tbody>
</table>

*“EN” in the document number is the language code.

### User’s Manual

<table>
<thead>
<tr>
<th>Contents</th>
<th>Document number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLXA402 4-Wire Converter</td>
<td>IM 12A01F01-01EN</td>
<td>Printed manual (This manual)</td>
</tr>
<tr>
<td>Start-up and Safety Precautions</td>
<td>IM 12A01F01-02EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Installation and Wiring</td>
<td>IM 12A01F01-03EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Operation of Converter</td>
<td>IM 12A01F02-01EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Operation of pH/ORP</td>
<td>IM 12A01F02-01EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Operation of SC</td>
<td>IM 12A01F03-01EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Operation of ISC</td>
<td>IM 12A01F04-01EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Operation of DO</td>
<td>IM 12A01F05-01EN</td>
<td>Online manual</td>
</tr>
</tbody>
</table>

*“EN” in the document number is the language code.

An exclusive User’s Manual might be attached to the products whose suffix codes or option codes contain the code “Z” (made to customers’ specifications). Please read it along with this manual.

### Technical Information

<table>
<thead>
<tr>
<th>Contents</th>
<th>Document number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLXA402 4-Wire Converter</td>
<td>TI 12A01F01-61EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>HART communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLXA402 4-Wire Converter</td>
<td>TI 12A01F01-62EN</td>
<td>Online manual</td>
</tr>
<tr>
<td>Modbus communication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*“EN” in the document number is the language code.

You can download the latest documents from our website.

### Drawing Conventions

Some drawings may be partially emphasized, simplified, or omitted, for the convenience of description.
Some screen images depicted in the user’s manual may have different display positions or character types (e.g., the upper / lower case). Also note that some of the images contained in this user’s manual are display examples.
Notes on Handling User’s Manuals

- Please hand over the user’s manuals to your end users so that they can keep the user’s manuals on hand for convenient reference.
- Please read the information thoroughly before using the product.
- The purpose of these user’s manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.
- No part of the user’s manuals may be transferred or reproduced without prior written consent from YOKOGAWA.
- YOKOGAWA reserves the right to make improvements in the user’s manuals and product at any time, without notice or obligation.
- If you have any questions, or you find mistakes or omissions in the user’s manuals, please contact our sales representative or your local distributor.

Trademark Notices

FLEXA, FLXA and SENCOM are trademarks or registered trademarks of Yokogawa Electric Corporation.

All other company and product names mentioned in this user’s manual are trademarks or registered trademarks of their respective companies.

We do not use TM or ® mark to indicate those trademarks or registered trademarks in this user’s manual.

Product Disposal

The instrument should be disposed of in accordance with local and national legislation/regulations.

Warranty and service

Yokogawa products and parts are guaranteed free from defects in workmanship and material under normal use and service for a period of (typically) 12 months from the date of shipment from the manufacturer.

Individual sales organizations can deviate from the typical warranty period, and the conditions of sale relating to the original purchase order should be consulted. Damage caused by wear and tear, inadequate maintenance, corrosion, or by the effects of chemical processes are excluded from this warranty coverage.

In the event of warranty claim, the defective goods should be sent (freight paid) to the service department of the relevant sales organization for repair or replacement (at Yokogawa discretion). The following information must be included in the letter accompanying the returned goods:

- Part number, model code and serial number
- Original purchase order and date
- Length of time in service and a description of the process
- Description of the fault, and the circumstances of failure
- Process/environmental conditions that may be related to the failure of the device.
- A statement whether warranty or non-warranty service is requested
- Complete shipping and billing instructions for return of material, plus the name and phone number of a contact person who can be reached for further information.

Returned goods that have been in contact with process fluids must be decontaminated/disinfected before shipment. Goods should carry a certificate to this effect, for the health and safety of our employees.

Material safety data sheets should also be included for all components of the processes to which the equipment has been exposed.
◆ CE marking products

- **Authorized Representative in EEA**
The Authorized Representative for this product in EEA is Yokogawa Europe B.V. (Euroweg 2, 3825 HD Amersfoort, The Netherlands).

- **Identification Tag**
  This manual and the identification tag attached on packing box are essential parts of the product. Keep them together in a safe place for future reference.

- **Users**
  This product is designed to be used by a person with specialized knowledge.

- **How to dispose the batteries:**
  This is an explanation about the EU Battery Directive. This directive is only valid in the EU.
  Batteries are included in this product. Batteries incorporated into this product cannot be removed by yourself. Dispose them together with this product.
  When you dispose this product in the EU, contact your local Yokogawa Europe B.V. office.
  Do not dispose them as domestic household waste.
  Battery type: Manganese dioxide lithium battery

  ![Battery Symbol]

  Notice: The symbol (see above) means they shall be sorted out and collected as ordained in the EU Battery Directive.

- **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.
  This product should be disposed in accordance with local and national legislation/regulations. The WEEE Directive is only valid in the EU.

- **RE Directive**
  When FLXA402 contains Bluetooth communication, FLXA402 is built in compliance with requirements of RE Directive:
  We, Yokogawa Electric Corporation hereby declare that this equipment, FLXA402 is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
Control of Pollution Caused by the Product

This is an explanation for the product based on “Control of Pollution caused by Electronic Information Products” in the People’s Republic of China.

产品中有害物质的名称及含量

<table>
<thead>
<tr>
<th>部件名称</th>
<th>铅(Pb)</th>
<th>汞(Hg)</th>
<th>镉(Cd)</th>
<th>六价铬(Cr (VI))</th>
<th>多溴联苯(PBB)</th>
<th>多溴二苯醚(PBDE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>外壳(金属)</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>外壳(塑料)</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>印刷电路板组件</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

○：表示该有害物质在该部件中所有均质材料中的含有量都在GB/T26572所规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含有量超出GB/T26572所规定的限量要求。

环保使用期限：这个标志是基于SJ/T11364，在中国（不包括台湾，香港，澳门）贩售的电子电器产品所适用的环保使用期限。
只要遵守产品上关于安全及使用上的注意事项，从制造之日起计算在该年限内，不会发生制品内的有害物质外泄，突然变异，对环境或人体以及财产产生重大影响的情况。

（注）该年限是《环境保护使用期限》，不是产品的保质期限。另外，关于替换部件的推荐替换周期，请阅读使用说明书。

Safety Precautions

WARNING

Installation and wiring
The FLXA402 should only be used with equipment that meets the relevant IEC, American or Canadian standards.
Yokogawa accepts no responsibility for the misuse of this unit.
Don’t install “general purpose type” instruments in the hazardous area.
Do not use an abrasive or organic solvent in cleaning the instrument.

Electrostatic discharge
The FLXA402 contains devices that can be damaged by electrostatic discharge. When servicing this equipment, please observe proper procedures to prevent such damage. Replacement components should be shipped in conductive packaging. Repair work should be done at grounded workstations using grounded soldering irons and wrist straps to avoid electrostatic discharge.
CAUTION

The Instrument is packed carefully with shock absorbing materials, nevertheless, the instrument may be damaged or broken if subjected to strong shock, such as if the instrument is dropped. Handle with care.

This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.

When you open the front panel, make sure the screws are completely out of the screw holes, and then open the front panel slowly in order not to damage the threaded parts on the housing. If the threaded parts are damaged and the screws cannot be tightened, the waterproof performance will deteriorate.

The HART communication may be influenced by strong electromagnetic field.

In this case another trial of the HART communication and/or operation with FLXA402 touch screen can be carried out.

Be careful to touch the concentrated sulfuric acid.

### Safety, Protection, and Modification of the Product

- In order to protect the system controlled by the product and the product itself and ensure safe operation, observe the safety precautions described in this user’s manual. We assume no liability for safety if users fail to observe these instructions when operating the product.
- If this instrument is used in a manner not specified in this user’s manual, the protection provided by this instrument may be impaired.
- If any protection or safety circuit is required for the system controlled by the product or for the product itself, prepare it separately.
- Be sure to use the spare parts approved by Yokogawa Electric Corporation (hereafter simply referred to as YOKOGAWA) when replacing parts or consumables.
- Modification of the product is strictly prohibited.
- The following safety symbols are used on the product as well as in this manual.

#### WARNING

This symbol indicates that an operator must follow the instructions laid out in this manual in order to avoid the risks, for the human body, of injury, electric shock, or fatalities. The manual describes what special care the operator must take to avoid such risks.

#### CAUTION

This symbol indicates that the operator must refer to the instructions in this manual in order to prevent the instrument (hardware) or software from being damaged, or a system failure from occurring.

CAUTION

This symbol gives information essential for understanding the operations and functions.

NOTE

This symbol indicates information that complements the present topic.

This symbol indicates Protective Ground Terminal.

### Warning and Disclaimer

The product is provided on an “as is” basis. YOKOGAWA shall have neither liability nor responsibility to any person or entity with respect to any direct or indirect loss or damage arising from using the product or any defect of the product that YOKOGAWA can not predict in advance.
Compliant Standards

Safety:
- CE/Low Voltage Directive (FLXA402 without Bluetooth communication):
  - EN 61010-1, EN 61010-2-030
- UL:
  - UL 61010-1, UL 61010-2-030
- CSA:
  - CAN/CSA-C22.2 No.61010-1
  - CAN/CSA-C22.2 No.61010-2-030
- GB30439
- Russian:
  - 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-voltages to an appropriately low level.
Category II is energy-consuming equipment to be supplied from the fixed installation.

Note2
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:
- CE/EMC Directive (FLXA402 without Bluetooth communication):
  - EN 61326-1 Class A, Table 2 (For use in industrial locations)
  - Influence of immunity environment (Criteria A): Output shift is specified within ± 10 % of F.S.
  - EN 61326-2-3
  - EN 61000-3-2
  - EN 61000-3-3
- RCM:
  - EN 55011 Class A, Group 1

Korea Electromagnetic Conformity Standard

한국 전자파적합성 기준 Class A

Russian: TR CU 020/2011

Standards for Bluetooth communication:
- Compliant standard: Bluetooth Ver 3.0 Class2
- Applicable countries / regions: (regulations)
  - Japan, EU, USA, Canada, Australia, New Zealand, Singapore
- CE/RE Directive:
  - EN 61010-1
  - EN 61010-2-030
  - EN 62479
  - EN 301 489-1, EN 301 489-17
  - EN 61326-1 Class A, Table 2
  - EN 61326-2-3
  - EN 300 328
- RCM:
  - AS/ NZS 4268, AS/ NZS 2772.2
  - FCC15C
  - ICES-003
  - IMDA TS SRD

Environmental regulation:
- RoHS Directive: EN50581
- Waste Electrical and Electronic Equipment (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.
- REACH: Regulation(EC) 1907/2006
FM nonincendive approval (suffix code Type : -DD):

- Applicable Standard
  - FM Class 3600
  - FM Class 3611
  - FM Class 3810
  - ANSI/UL 121201
  - ANSI/UL 61010-1
  - ANSI/UL 61010-2-030
  - ANSI/NEMA 250
- Certificate No.
  - FM18US0281

◆ Control Drawing

When selecting the nonincendive model (suffix code Type : -DD), please check the condition of Control Drawing (NFM038-A81).

For details, refer to the User’s Manual IM 12A01F01-02EN.
1. Instrument Check

Upon delivery, unpack the instrument carefully and inspect it to ensure that it was not damaged during shipment. If damage is found, retain the original packing materials (including the outer box) and then immediately notify the carrier and the relevant Yokogawa sales office.

- **Checking the model and suffix code**

  Make sure the model and suffix code on the nameplate affixed to the left side of the housing. Model and suffix code is shown in Table 3.

- **Mark position of FM nonincendive**

  When selecting the nonincendive model (suffix code Type : -DD), make sure the FM nonincendive information on the standard nameplate affixed to the right side of the housing.

- **Checking accessories**

  The instrument is shipped with standard accessories. Optional accessories are sold separately if necessary. Make sure the accessories in Table 1 or Table 2 are included.

### Table 1 Standard accessories

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Quantity</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable glands</td>
<td>8 sets</td>
<td>5 rubber plugs attachment. *1</td>
</tr>
<tr>
<td>pH analyzer</td>
<td>Jumper</td>
<td>2 pcs/module</td>
</tr>
<tr>
<td>SENCOM Smart adapter</td>
<td>Grommet set</td>
<td>1 set/module</td>
</tr>
<tr>
<td>RS-485 communication</td>
<td>Jumper</td>
<td>1 pcs For termination</td>
</tr>
<tr>
<td>Option</td>
<td>Bracket</td>
<td>1 set Option code /UM, /U, /PM*2</td>
</tr>
<tr>
<td></td>
<td>Sun shade hood</td>
<td>1 set Option code /H6, /H7</td>
</tr>
<tr>
<td></td>
<td>Tag plate</td>
<td>1 set Option code /SCT</td>
</tr>
<tr>
<td></td>
<td>Adapter for conduit work</td>
<td>4 set Option code /CB4, /CD4, /CF4, /CB6, /CD6, /CF6 *3</td>
</tr>
<tr>
<td>Safety Precautions, Startup Manual</td>
<td>1 copy</td>
<td>This manual</td>
</tr>
</tbody>
</table>

**Remark**

*1: When FLXA402 has Ethernet communication, one of them is only for Ethernet cable.

*2: The universal mounting kit (/UM) contains the brackets for both /U and /PM options.

*3: /CB6, /CD6 or /CF6 includes adapter only for Ethernet cable.
Table 2 Optional accessories

<table>
<thead>
<tr>
<th>Name</th>
<th>Parts number</th>
<th>Quantity</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduit adapter</td>
<td>G1/2</td>
<td>K9703WF</td>
<td>4 set for Option code /CB□</td>
</tr>
<tr>
<td></td>
<td>1/2NPT</td>
<td>K9703WG</td>
<td>4 set for Option code /CD□</td>
</tr>
<tr>
<td></td>
<td>M20×1.5</td>
<td>K9703WH</td>
<td>4 set for Option code /CF□</td>
</tr>
<tr>
<td>Mounting hardware</td>
<td>for pipe</td>
<td>K9703SS</td>
<td>1 set same as Option code /U</td>
</tr>
<tr>
<td></td>
<td>wall mounting (stainless)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>for panel</td>
<td>K9703ZD</td>
<td>1 set same as Option code /PM</td>
</tr>
<tr>
<td></td>
<td>mounting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sun shade hood</td>
<td>Stainless</td>
<td>K9698WK</td>
<td>1 set same as Option code /H6</td>
</tr>
<tr>
<td></td>
<td>stainless + urethane</td>
<td>K9698WL</td>
<td>1 set same as Option code /H7</td>
</tr>
<tr>
<td>Rubber plug attachment</td>
<td></td>
<td>K9334CN</td>
<td>1 pcs for Cable gland</td>
</tr>
<tr>
<td>Fuse</td>
<td></td>
<td>A1633EF</td>
<td>1 pcs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1005NL</td>
<td>1 pcs 2 GB industrial SD card</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(with power failure recovery)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Customers can provide the cards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with spec:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Storage capacity: 128 MB or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>greater Type: SD, SDHC</td>
</tr>
</tbody>
</table>

Table 3 Model and suffix code

<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>·</td>
<td>4-Wire Converter</td>
</tr>
<tr>
<td>Power supply</td>
<td>-A</td>
<td>-D</td>
<td>AC version</td>
</tr>
<tr>
<td></td>
<td>-B</td>
<td>-D</td>
<td>DC version</td>
</tr>
<tr>
<td>Housing</td>
<td>-AB</td>
<td>-AD</td>
<td>General purpose for CE, RCM, China standard</td>
</tr>
<tr>
<td></td>
<td>-AG</td>
<td>-AQ</td>
<td>General purpose for CSA</td>
</tr>
<tr>
<td></td>
<td>-AJ</td>
<td>-AQ</td>
<td>General purpose for KC</td>
</tr>
<tr>
<td></td>
<td>-AR</td>
<td>-AR</td>
<td>General purpose for EAC with PA</td>
</tr>
<tr>
<td></td>
<td>-DD</td>
<td>-DD</td>
<td>General purpose for EAC</td>
</tr>
<tr>
<td></td>
<td>-P1</td>
<td>·</td>
<td>pH/ORP (PH)</td>
</tr>
<tr>
<td>1st input</td>
<td>-C1</td>
<td>·</td>
<td>Conductivity (SC)</td>
</tr>
<tr>
<td></td>
<td>-D1</td>
<td>·</td>
<td>Inductive conductivity (ISC)</td>
</tr>
<tr>
<td></td>
<td>-D5</td>
<td>·</td>
<td>Dissolved oxygen (DO)</td>
</tr>
<tr>
<td></td>
<td>-S5</td>
<td>·</td>
<td>Digital sensor (DO70G)</td>
</tr>
<tr>
<td></td>
<td>·</td>
<td></td>
<td>SENCOM SA</td>
</tr>
<tr>
<td>2nd input</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>-D5</td>
<td>·</td>
<td>Digital sensor (DO70G)</td>
</tr>
<tr>
<td></td>
<td>-S5</td>
<td>·</td>
<td>SENCOM SA</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 Output (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</td>
<td>-N</td>
<td>·</td>
<td>Global except Japan</td>
</tr>
<tr>
<td></td>
<td>-J</td>
<td>·</td>
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<td>M20 x 1.5 x 3 pcs + M20 for Ethernet x 1 pcs</td>
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2. **Wiring and Installation**

Open the front panel and remove the shield cover and then install the cable glands. The shield cover will be re-installed after the wiring is completed.
For details, refer to the User’s Manual IM 12A01F01-02EN.

2.1 **Installation site**

The FLXA402 is weatherproof and can be installed both inside and outside. It should, however, be installed as close as possible to the sensor to avoid long cable runs between the instrument and sensor.
Select an installation site where the ambient temperature and humidity are within the limits of the instrument specifications as below. If the instrument is installed outside and exposed to direct sunlight, a sun shade hood should be used.

- **Ambient Operating Temperature**: -20 to +55 °C
- **Storage Temperature**: -30 to +70 °C
- **Humidity**: 10 to 90% RH at 40°C (Non-condensing)

Select an installation site that meets the following conditions.

- Mechanical vibrations and shocks are negligible
- No relay switch and power switch are installed close to the converter
- There is space for cable connection beneath the cable glands
- Not exposed to direct sunlight or severe weather conditions
- Maintenance is possible
- No corrosive atmosphere

The FLXA402 can be mounted on a wall, pipe or panel when the mounting kit is ordered. For dimensional information please refer to the User’s Manual IM 12A01F01-02EN.

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**CAUTION**

When you open the front panel, make sure the screws are completely out of the screw holes, and then open the front panel slowly in order not to damage the threaded parts on the housing. If the threaded parts are damaged and the screws cannot be tightened, the waterproof performance will deteriorate.

**NOTE**

Be careful not to lose the four front panel screws.

2.2 **Wiring**

2.2.1 **Preparation**

Power supply and relay contact (if equipped) should be connected first. Those terminals are behind the shield cover. Next, connect the others. For details, refer to the User’s Manual IM 12A01F01-02EN. Read it carefully before wiring. This manual describes how to use the FLXA402 with Yokogawa’s or other companies’ sensors. Please read carefully this manual and the instruction manuals relevant to those sensors you use before using this instrument.

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**WARNING**

- Cables that withstand temperatures of at least 75 °C should be used for wiring.
- Wiring work should be performed to meet IP66 or higher requirements. Tighten four front panel screws to the following torque; 1.5 to 1.6 N·m
- Use cables that comply with UL2556VW-1 or equivalent.
- Always place the shield cover over the power supply and contact terminals for safety reasons and to avoid interference.
2.2.2 Cables, Terminals, glands and conduit adapter

The FLXA402 is supplied with terminals suitable for the connection of finished wires in the size range of 0.13 to 2.5 sq.mm. (26 to 14 AWG). The cable glands supplied will form a tight seal on cables with an outside diameter of 6 to 12 mm (0.24 to 0.47 inches). Unused cable entry holes must be sealed with cable glands including the close up plugs supplied. For details, refer to the User’s Manual IM 12A01F01-02EN.

2.2.3 Wiring the power supply

CAUTION

Make sure the power supply is switched off. Power rating must comply with FLXA402 specification. Power voltage must match with the one indicated on the name plate.

WARNING

- You must install external power supply switch or circuit breaker for power supply.
- The external power supply switch or a circuit breaker must comply with a current rating of 5A or IEC60947-1 or IEC60947-3
- Yokogawa recommend installing the external power supply switch, circuit breaker and FLXA402 converter all in the same location.
- Install the external power supply switch or circuit breaker to the place where operators access easily. To alert users, put a label on the external power switch.
- Wire cables of power supply, contact output securely with cable rack, conduit and vinyl band. Unplugged cables are dangerous and may cause an electric shock.

You should check local safety regulation to see if you shall install external circuit breaker. Follow the local regulation and install if necessary.

FLXA402 is protected by fuse which provides overcurrent protection of inner circuit. Specific current and voltage ratings of fuse vary depending on power system. Use always a time-delay fuse for 250 VAC fuse in accordance with IEC60127.
**WARNING**

Fuse replacement should be performed only by a qualified service personnel. See Chapter 4. MAINTENANCE, Fuse.

- **Access to terminal and cable entry**
  The power supply terminals are behind the shield cover. Guide the power cables through the gland. The terminals will accept wires of 2.5 mm² (14 AWG). Always use cable finishings. For details, refer to the User’s Manual IM 12A01F01-02EN.

- **Power supply terminals**
  Connect power supply to the power supply terminals. For details, refer to the User’s Manual IM 12A01F01-02EN.

- **Grounding the converter**
  For the safety of the user and to protect the instrument against interference, the housing must always be connected to ground. This has to be done by a cable with large cross-sectional area. This cable can be fixed to the rear of the housing or the internal ground connections. For details, refer to the User’s Manual IM 12A01F01-02EN.

**WARNING**

The minimum cross sectional area of the protective grounding wire should be 0.75 mm². For CSA safety standard (Type: - AB), use cables with a cross section of 0.75 - 2.1 mm².
2.2.4 Wiring the contact signals

- **Contact outputs**
  The FLXA402 unit’s four contacts (switches) that can be wired and configured to suit user requirements. Contact S4 is programmed as a fail-safe contact. Refer to the User’s Manual IM 12A01F01-02EN for contact outputs setup.
  Use a cable with the rated voltage of 300 V AC or higher and with the electric current capacity according to the load connected to contact output.

- **Contact inputs**
  It is necessary to use screening/shielding on the input signal cables. For details, refer to the User’s Manual IM 12A01F01-02EN.

2.2.5 Wiring the mA-input/ output signals

- **mA-input signals**
  The mA-inputs receive current signals of 4-20 mA. Should be used the cable beyond 30 V AC.
  It is necessary to use screening/shielding on the input signal cables.
  For details, refer to the User’s Manual IM 12A01F01-02EN.

- **mA-output signals**
  The output signals consist of current signals of 4-20 mA. The maximum load can be 600 ohms on each. Should be used the cable beyond 30 V AC. It is necessary to use screening/shielding on the output signal cables. For details, refer to the User’s Manual IM 12A01F01-02EN.

2.2.6 Wiring the sensor

The FLXA402 can be used with a wide range of commercially available sensor types, both from Yokogawa and other manufacturers.
Terminal screw size is M3, and torque of screw up is 0.6 N•m.
Pin terminal, ring terminal and spade terminal can be used.
For details, refer to the User’s Manual IM 12A01F01-02EN.

2.2.7 Wiring the communication

The FLXA402 can equip Ethernet (Modbus TCP/IP) communication, RS-485 (Modbus RTU) communication.
It is necessary to use screening/shielding on the communication cable.
For details, refer to the User’s Manual IM 12A01F01-02EN

**CAUTION**

Do not tighten up four front panel screws one by one.
Each front panel screw should be tightened up in two times of screwing. And, firstly the screw at the upper left should be screwed a bit, the next is at the lower right, third is at the upper right, and fourth is at the lower left. The second round is the same sequence again to tighten up four screws.
Do not use an electric screwdriver with high revolutions. If an electric screwdriver is used for these front panel screws, the revolutions of the electric screwdriver should be less than 400 rpm.
Four screws should be tightened to the following torque; 1.5 to 1.6 N•m
3. Operation

When all wiring is completed, turn on the power to the instrument. Make sure that the LCD screen turns on, and then wait for the Home display appears. If configurations are not proper, an error indicator may be displayed, or the measurement values displayed may be incorrect. Check the initial settings and change them to suit your purpose. For details, refer to the following User’s Manual.

For details, refer to the following User’s Manual.

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- **Change language**
  The default language setting for the FLXA402 is English. To select a different language other than English, refer to the User’s Manual IM 12A01F01-03EN.

- **Operation**
  According to the sensor to be used, refer to appropriate user’s manual about operation.

4. Maintenance

- **Periodic maintenance**
  The FLXA402 requires very little periodic maintenance, except to make sure the front window is kept clean in order to permit a clear view of the display and allow proper operation of the touchscreen. If the window becomes soiled, clean it using a soft damp cloth or soft tissue. To deal with more stubborn stains, a neutral detergent may be used.
  When you must open the front cover and/or glands, make sure that the seals are clean and correctly fitted when the unit is re-assembled in order to maintain the housing’s weatherproof integrity against water and water vapor.
  The pH measurement uses high impedance sensors and may otherwise be prone to problems caused by exposure of the circuitry to condensation.

  **CAUTION**
  Never use harsh chemicals or solvents. In the event that the window does become heavily stained or scratched, refer to the parts list for replacement part numbers.

- **Battery**
  The FLXA402 contains a lithium cell (battery) to support the clock function when the power is switched off. The cell has an expected working life of 10 years. Should this cell need to be replaced, contact your nearest Yokogawa service center.

- **Fuse**
  There is a circuit board mounted fuse protecting the instrument. If a fuse blows soon after the change, contact your nearest Yokogawa service center.
Revision record

Addition of regulation in Compliant Standard.

July 2020/ 3rd Edition
Addition of “Type: -AQ and -AR”.

Apr. 2019/ 2nd Edition
Addition of “Type: -DD”, etc.

Nov. 2018/ 1st Edition
Newly released.