This instrument is an EMC class A product. In a domestic environment, this equipment may cause radio interference in which case the user needs to take adequate measures.

Power Supply
Ensure that the instrument’s supply voltage matches the voltage source available before turning ON the power.

Do not operate the instrument in locations with combustible or explosive gases or steam. Operation in such environments constitutes an extremely safety hazard. Use of the instrument in environments with high concentrations of corrosive gas (H2S, SO2, etc.) for extended periods of time may cause a failure.

Clean the Insulated Cases
The internal unit should not be removed by anyone other than YOKOGAWA’s service personnel. There are dangerous high voltage parts inside. Additionally, do not replace the fuse by yourself.

Damage to the Protective Construction
Operation of the instrument in a manner not specified in the user's manual may damage its protective construction.

Safety, Protection, and Modification of the Product

1. In order to protect the system controlled by this product and the product itself, and to ensure safe operation, observe the safety precautions described in the user manual. Use the instrument in a manner not prescribed herein may compromise the product’s functions and the protection features inherent in the device. We assume no liability for safety or responsibility for the product’s quality performance or functionality should users fail to observe these instructions when operating the product.

2. Installation of protection and/or safety circuits with respect to a lightning protection equipment for the system controlled by the product and the product itself; footstep or false alarm of a process or line using the system controlled by the product or the product itself; and/or installation of other protective and safety circuits are to be appropriately implemented as the manufacturer deems necessary.

3. Be sure to use the spare parts approved by YOKOGAWA when replacing parts or consumables.

4. This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, and medical equipment, among others.

5. This product is not intended to be used for applications of the坠落物防護装置 or the坠落物防護装置式安全装置 type. This product is not intended to be used in locations designated as a "Small equipment" product. Do not dispose of in domestic household waste. When disposing products in the EU, contact your local Yokogawa Europe B.V. office.

Installation

3. How to Install

Installation Location
Mount the instrument in a location where its terminals will not inappropriately be touched.
- Well ventilated mounts Mount the instrument in well ventilated locations to prevent the instrument's internal temperature from rising. However, make sure that the terminal portions are not exposed to wind. Exposure to wind may cause the temperature sensor to deteriorate. To mount multiple instruments, see the external dimensions/panel cutout dimensions which follow. If mounting other instruments adjacent to the instrument, comply with these panel cut-out dimensions to provide sufficient clearance between the instruments.
- Locations with little mechanical vibration Install the instrument in a location subject to little mechanical vibration.
- Horizontal location Mount the instrument horizontally and ensure that it is level, with no inclination to the right or left.

Note
If the instrument is moved from a location with low temperature and low humidity to a place with high temperature and high humidity, or if the temperature changes rapidly, condensation will result. Moreover, in the case of thermocouple inputs, measurement errors will result. To avoid such a situation, leave the instrument in the new environment under ambient conditions for more than 1 hour prior to using it.

Do not mount the instrument in the following locations:
- Outdoors
- Locations subject to direct sunlight or close to a heater
- Install the instrument in a location with stable temperatures that remain close to an average temperature of 23°C. Do not mount it in locations subject to direct sunlight or close to a heater. Doing so adversely affects the instrument.
- Locations with substantial amounts of oily fumes, steam, moisture, dust, or corrosive gases
- The presence of oily fumes, steam, moisture, dust, or corrosive gases adversely affects the instrument. Do not mount the instrument in locations subject to any of these substances.
- Areas near electromagnetic field generating sources
- Do not place magnets or tools that generate magnetism near the instrument. If the instrument is used in locations close to a strong electromagnetic field generating source, the magnetic field may cause measurement errors.
- Locations where the display is difficult to see
- The instrument is designed for use during the daytime, and this can be difficult to see from extremely oblique angles. Mount the instrument in a location where it can be seen as much as possible from the front.
- Areas close to flammable articles
- Absolutely do not place the instrument directly on flammable surfaces. If such a circumstance is unavoidable and the instrument must be placed close to a flammable item, provide a shield for it made of 1.43 mm thick stainless steel or 1.6 mm thick stainless steel with a space of at least 150 mm between it and the instrument on the top, bottom, and sides.
- Areas subject to being splashed with water
- Be sure to turn OFF the power supply to the indicator before installing it on the panel to avoid an electric shock.

Mounting the Instrument Main Unit
Provide an instrument panel sheet steel of 1 to 10 mm thickness. After opening the mounting hole on the panel, follow the procedures below to install the indicator:
1. Insert the indicator into the opening from the front of the panel so that the terminal board on the rear is at the far side.
2. Set the brackets in place on the right and left of the indicator as shown in the figure below, then tighten the screws of the brackets. Take care not to overtighten them.

External Dimensions and Panel Cutout Dimensions
4. Hardware Specifications

This instrument is for Measurement Category No.1. Do not use it for measurements in locations falling under Measurement Categories No.2, No.3, and No.4.

- Insulation resistance: Between power supply terminals and a grounding terminal 20 MΩ or more at 500 V DC
- Isolation resistance: 24 models secondary the terminals: Between 3000 primary V AC/DC power supply on the primary side and 100-240 V AC/DC power supply on the secondary side.

- **Rated Measurement**
  - Withstanding voltage: 2400 V AC/DC for 1 minute (UL, CSA).
  - Between primary terminals and secondary terminals: 2000 V AC for 1 minute (UL, CSA).
  - Between primary terminals and secondary terminals: 3000 V AC for 1 minute (CE).

- **Environmental Conditions**

  **Normal Operating Conditions**
  - Ambient temperature: -10 to 50°C
  - Ambient humidity: 20% to 98% RH (no condensation allowed)

  - Magnetic field: 400 Am or less
  - Continuous vibration at 5 to 55 Hz: Half amplitude of 1.5 mm or less, 1 octave/min for 90 minutes each in the three axes directions
  - Continuation vibration at 5 to 55 Hz: 4.9 mm or less, 1 octave/min for 90 minutes each in the three axes directions
  - Short-pulse vibration: 17.5 mm or less in seconds or less
  - Shock: 98 mm or less, 11 ms
  - Altitude: 2000 m above sea level
  - Warm-up time: 30 minutes or more after the power is turned on
  - Standby time: Within 20 seconds

- **Recommendation**

  - When connecting two or more crimp-on terminal lugs to the single terminal block, heed the crimp-on terminal lugs before tightening the screw.

  - Do not connect the wiring of two or more crimp-on terminal lugs to the single high-voltage terminal of the power supply does not comply with the safety standard.

5. How to Connect Wires

- Wiring work must be carried out by a person with basic electrical knowledge and practical experience.

- Be sure to turn OFF the power supply to the indicator before wiring to avoid an electric shock.

- To use or inspect each device ensure that no power is being supplied to a cable to be connected.

- For the wiring of the secondary, the temperature rating is 75°C or more.

- As a safety measure, always install a circuit breaker (an IEC 60947-2-4 conforms to the EMC marking) near the power supply to the instrument.

- Install the power cable keeping a distance of more than 1 cm from the rear panel wires.

- The power cable is required to meet the IEC standards concerned or the requirements of the area in which the instrument is being installed.

- Wiring should be installed to conform to NEC (National Electrical Code or C1-91-7) or the wiring construction standards in countries or regions where wiring will be installed.

- **Provide electricity from a single-phase power supply.** If the power is noisy, install an isolation transformer on the primary side. If the supply cable is a line filter on the secondary side. When measured against noise are taken, do not install the primary and secondary ground wire line.

- If there is a risk of external lightning surges, use a lightning arrester.

- After completing the wiring, the terminal cover is recommended to use for the instrument.

- The maintenance port cannot be used.

- **Provision of power supply from a single-phase power supply.** If the power is noisy, install an isolation transformer on the primary side.

- The power cable is a line filter on the secondary side. When measured against noise are taken, do not install the primary and secondary ground wire line.

- If there is a risk of external lightning surges, use a lightning arrester.

- After completing the wiring, the terminal cover is recommended to use for the instrument.

- The maintenance port cannot be used.

6. Terminal Wiring Diagrams

- **Recommended Crimp-on Terminal Lugs**

  Communication wires of cross-sectional area less than or equal to 0.34 mm² may not be secured tightly to the terminals. Check that the wire is firmly connected to the terminal by folding the connector of the wire connected to the clamp-on lug. Recommended length of the stripped wire: 7 mm

- **Cable Specifications and Recommended Cables**

<table>
<thead>
<tr>
<th>Power supply option</th>
<th>Recommended lightening torque: 0.6 N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 V, 24 V (DC)</td>
<td>Applicable wire size: Wire supply power supply: 1.25 mm² or more</td>
</tr>
<tr>
<td>100 V-240 V (AC)</td>
<td>(free voltage)</td>
</tr>
</tbody>
</table>

- **Connecting to the SENCOM Smart Adapter Interface**

  As shown in the following figure, insert the bar terminal of the SENCOM cable (W11/1) to the left side of the screw shaft, and tighten the screw.

  The W11/1 cable is available length up to a maximum of 100 m.

- **Do not use an unassigned terminal as the relay terminal.**

- **Do not use a 100-240 V AC power supply for the 24 V AC/DC model; otherwise, the instrument will malfunction.**
2. Calibrating the pH Sensor

The UM33A-S checks whether a SENCOR sensor is connected as well as other status of the sensor. Calibration is not possible if an error is occurring.

Do not remove the sensor during the calibration procedure.

Before making pH measurements, be sure to calibrate the pH meter with a standard buffer.

When calibrating the pH meter with a standard buffer, note the following points.

1. Before calibration, check that the sensor is adequately clean and that the electrodes work appropriately. Rinse the electrodes with distilled water to prevent the standard buffer from being contaminated.
2. Use fresh standard buffer at all times to avoid errors caused by contamination and alteration of the standard buffer. Standard buffers have expiration dates. Pay attention to the expiration date particularly for alkaline standard buffers, which absorb CO2 from the air.
3. We recommend the NIST/DIN 19266 standard buffer, which features excellent precision and buffer capacity. It is possible to use prepared standard buffers sold on the market (e.g., 7.00, 9.00, 10.00 pH), but they sometimes do not come with a temperature characteristics table, and their stability is inferior to the NIST (US) standard buffer.

Before calibration, be sure to thoroughly soak the electrodes to clean them, and replenish KCl compliant with the electrodes if necessary. For details, see the user’s manual for the sensor.

The calibration procedure is provided below:

1. Press the SET/ENTER key.

2. Press the PARA key and Left arrow key simultaneously.

3. The setup parameter menu SA11 is displayed.

4. Press the Right arrow key below.

5. The setup parameter CALB is displayed.

6. Press the PARA key and Right arrow key simultaneously.

7. The setup parameter STRT (start calibration) is displayed.

8. When the parameter CALB or MAN H is ON, LOCK lights and the current output is held.

9. Press the SET/ENTER key.

10. CHK1 blinks.

11. When the calibration of the first point is complete, CHK1 becomes solid.

12. Press the SET/ENTER key.

13. CHK2 blinks.

14. When the calibration of the second point is complete, CHK2 becomes solid.

15. Press the SET/ENTER key.

16. When all calibration is complete, END appears.

17. Press the SET/ENTER key once to return to the Operation Display.

When the parameter CALH or MAN H is OFF, press the SET/ENTER key to exit the calibration.
Setup Parameters

Hold down the PARA key and Left arrow key simultaneously for 3 seconds to move from the Operation Display or Parameter Setting Display to the Setup Parameter Setting Display. Press the DSP key once to return to the Operation Display.

Operation for Setting
- To select the parameter setting displayed as the initial value, press the Down arrow key to move to the next parameter.
- To change and set the parameter setting, press the SET/ENTER key to start the set point blinking. The blinking state allows you to make changes (setting mode). Use the Up/Down/Left/right arrow keys to change the setpoint. Press the SET/ENTER key to register the setting.

Warning Setting Parameter

The occurrence of errors can be indicated using numbers in the event display area. Menu symbol (MAR).

Function Setting Parameter

Menu number 30 (ON).

Calibration Function Selection Parameters (pH Sensor)

Menu symbol 3H (ON).

Output Setting Parameter

The measured value received from the sensor can be output using current according to the settings. It is linear output with 20 mA output to 1050 (20) and 4 mA output to 0 (20). Menu symbol 30 (OUT).

- Calibration parameter

- Configuration Hold Parameter

- Error and Version Confirmation Parameter

- Initialization Parameter
List of Warning Code

<table>
<thead>
<tr>
<th>Warning Code</th>
<th>Message</th>
<th>Event number</th>
</tr>
</thead>
<tbody>
<tr>
<td>E111 (TMP1)</td>
<td>Temperature exceeding upper warning limit</td>
<td>1</td>
</tr>
<tr>
<td>E112 (TMP1)</td>
<td>Temperature exceeding lower warning limit</td>
<td>2</td>
</tr>
<tr>
<td>E113 (PHI1)</td>
<td>pH exceeding upper warning limit</td>
<td>3</td>
</tr>
<tr>
<td>E114 (PHI1)</td>
<td>pH exceeding lower warning limit</td>
<td>4</td>
</tr>
<tr>
<td>E115 (ORP)</td>
<td>ORP exceeding upper warning limit</td>
<td>5</td>
</tr>
<tr>
<td>E116 (ORP)</td>
<td>ORP exceeding lower warning limit</td>
<td>6</td>
</tr>
<tr>
<td>E117 (IMP)</td>
<td>Impedance RE electrode exceeding upper warning limit</td>
<td>7</td>
</tr>
<tr>
<td>E118 (IMP)</td>
<td>Impedance RE electrode exceeding lower warning limit</td>
<td>8</td>
</tr>
<tr>
<td>L001 (DA)</td>
<td>Measured value outside the matrix range</td>
<td>9</td>
</tr>
</tbody>
</table>

List of Sensor Error Code

<table>
<thead>
<tr>
<th>Error code</th>
<th>Message</th>
<th>Display precedence</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/F (NM)</td>
<td>Non-Volatile Memory ERROR</td>
<td>High</td>
</tr>
<tr>
<td>L001 (CR)</td>
<td>CRC ERROR User Data</td>
<td>High</td>
</tr>
<tr>
<td>L002 (CR)</td>
<td>CRC ERROR Factory Data</td>
<td>High</td>
</tr>
<tr>
<td>S11 (SA11)</td>
<td>SA11 Failure</td>
<td>High</td>
</tr>
<tr>
<td>P001 (SF)</td>
<td>Sensor Failure</td>
<td>High</td>
</tr>
<tr>
<td>P002 (SN)</td>
<td>Sensor ID Chip Failure</td>
<td>High</td>
</tr>
<tr>
<td>E111 (TMP1)</td>
<td>Temperature exceeding upper high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E112 (TMP1)</td>
<td>Temperature exceeding lower high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E113 (PHI1)</td>
<td>pH exceeding upper high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E114 (PHI1)</td>
<td>pH exceeding lower high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E115 (ORP)</td>
<td>ORP exceeding upper high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E116 (ORP)</td>
<td>ORP exceeding lower high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E117 (IMP)</td>
<td>Impedance RE electrode exceeding upper high input limit</td>
<td>High</td>
</tr>
<tr>
<td>E118 (IMP)</td>
<td>Impedance RE electrode exceeding lower high input limit</td>
<td>High</td>
</tr>
<tr>
<td>L001 (DA)</td>
<td>Measured value outside the matrix range</td>
<td>High</td>
</tr>
</tbody>
</table>

3. Troubleshooting

Troubleshooting Flow

- If the Operation Display does not appear after turning on the indicator’s power, check the procedures in the following chart.
- If a problem appears to be complicated, contact our sales representatives.

Remedies if Power Failure Occurs during Operations

- Instantaneous power failure within 20 ms.
- A malfunction is not recorded. The operation continues.
- Power failure for less than about 5 seconds, or for about 5 seconds or more. Affects the “settings” and “operation status.”

NOTE

- Write down the settings of parameters for a repair request.

Errors at Power On

The errors shown below may occur in the fault diagnosis when the power is turned on.

- If the display content is not connected, or an incompatible sensor is connected. According to the BURRN parameter value.
- Check the sensor type or the connection to the sensor.

Errors during Operation

The errors shown below may occur during operation.

- If the sensor is not connected, or an incompatible sensor is connected. According to the BURRN parameter value.
- Check the sensor type or the connection to the sensor.

- The last two characters of the manual number and general specification number indicate the language in which the manual is written.

Printed Manuals

- Manual Regulator with Analog Input Operation Manual (Japanese)
- Manual Regulator with Analog Input Operation Manual (Dutch)
- Manual Regulator with Analog input Operation Manual (Russian)
- Manual Regulator with Analog input Operation Manual (Chinese)
- Manual Regulator with Analog input Operation Manual (Spanish)
- Manual Regulator with Analog Input Operation Manual (French)
- Manual Regulator with Analog Input Operation Manual (German)
- Manual Regulator with Analog Input Operation Manual (Italian)

- Electronic Manuals

- You can download the latest manuals from the following websites:
  - http://www.yokogawa.com/utim/

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