1. **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 this operation guide. Use of the instrument in a manner not prescribed herein may cause personal injury, death, or equipment damage. You may not be covered by the warranty and may be held responsible for any damages thereby caused. If the instrument is installed or operated incorrectly, serious accidents may occur.

   (2) The instrument must be used in a safe manner. In the event of any trouble or damage, call the instrument manufacturer, and inform them of the trouble or damage. Do not attempt to repair the instrument yourself.

2. **Model and Suffix Codes**

   - **UT35A «Standard Code Model»**
   - **UT32A/RSP**

3. **How to Install**

   (1) **Installation Location**

   The instrument should be installed in indoor locations meeting the following conditions:

   - **Instrumental panel**
     - The instrument is designed to be mounted in an instrumental panel. Mount the instrument in a location where it will not be inadvertently touched.
     - This instrument is designed to be used in well ventilated locations to prevent the instrument's internal temperature from rising.

   - **Well ventilated locations**
     - Mount the instrument in a location with adequate ventilation to ensure that the instrument's internal temperature does not exceed 40°C.

   - **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.

   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 occur. 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 subject to temperatures that remain close to an average temperature of 20°C. Do not mount it in locations subject to direct sunlight or close to a heater, which adversely affects the instrument.

   - **Locations with substantial amounts of oily fumes, steam, moisture, dust, or corrosive gases**
     - Install the instrument in locations where fumes, steam, moisture, dust, or corrosive gases adversely affect the instrument. Do not mount the instrument in locations subject to any of these substances.

   - **Areas near electromagnetic field generating sources**
     - Install the instrument in a location subject to electromagnetic fields 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's LCD display is difficult to see in locations where there is much light. It is difficult to see from extremely low or high angles. Mount the instrument in a location where it can be seen as much as possible from the front.

   - **Areas close to flammable materials**
     - Do not place the instrument directly on flammable surfaces. If an instrument site is close to a flammable material and the instrument must be placed close to a flammable material, provide a shield made from 1/1.6 mm thick stainless steel or 1.6 mm thick unplated steel with a space of at least 150 mm between the instrument and the top, bottom, and sides.

   - **Areas subject to being splashed with water**
     - Be sure to turn OFF the power supply to the controller before installing it on the panel to avoid an electric shock.

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**Warning and Disclaimer**

(1) YOKOGAWA makes no warranties regarding the product except those stated in the WARRANTY that is provided.

(2) The product is provided on an “as is” basis. YOKOGAWA assumes no liability to any person or entity for any loss or damage, direct or indirect, arising from the use of this product or from any unpredictable defect of the product.
4. Hardware Specifications

This instrument is for Measurement Category No.1. Evaluation of all critical measurements in locations falling under Measurement Categories No.2, No.3, and No.4.

![Image of hardware specifications](image)

**4.1. Universal Input (Equipped as standard)**

- **Number of inputs:** 1
- **Input type, instrument range, and measurement accuracy:** See the table below.

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Instrument Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>0 to 10 V</td>
<td>±0.2% of full-scale value</td>
</tr>
<tr>
<td>DC current</td>
<td>0 to 20 mA</td>
<td>±0.1% of full-scale value</td>
</tr>
<tr>
<td>Resistance</td>
<td>0 to 100 Ω</td>
<td>±0.01 Ω</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 Hz to 1 kHz</td>
<td>±1% of full-scale value</td>
</tr>
<tr>
<td>Phase angle</td>
<td>-180° to 180°</td>
<td>±0.1°</td>
</tr>
</tbody>
</table>

**4.2. Contact Input Specifications**

- **Number of inputs:** See the table of Model and Suffix Codes.
- **Input type:** No-voltage contact input or transistor contact input
- **Input contact rating:** 12 V DC, 1 mA or more
- **Use:** A contact with a minimum on-current of 1 mA or less.

**4.3. Analog Output Specifications**

- **Number of outputs:** 1
- **Control output:** Cooling-side control output of Heating/cooling (Retransmission output terminal): 1
  - **Output type:** Current output or voltage output
  - **Current output:** 4 to 20 mA DC or 0 to 20 mA DC load resistance of 600 Ω or less
  - **Voltage output:** ±15 V DC load resistance of 1000 Ω or less

**4.4. Retransmission Output Specifications**

- **Number of outputs:** Retransmission output: 1, shared with 15 V DC loop power or Cooling-side control output.
- **Current output:** 4 to 20 mA DC or 0 to 20 mA DC load resistance of 600 Ω or less
- **Voltage output:** ±15 V DC

**4.5. 15 V DC Loop Power Supply Specifications**

- **Supply output:** 15 V DC (with short-circuit current limiting circuit)
- **Step Response Time Specifications**
  - **Within 1 1/3 times of analog output response time when a step change of 10 to 90% of input span is applied.

**4.6. Relay Contact Output Specifications**

- **Contact type and number of outputs:**
  - **Output control:** contact point 1c 1 point
  - **Heating type:** contact point 1c 3 points for both heating and cooling sides
  - **Alarm output:** contact point 1c 3 points (common is independent)

**4.7. Transistor Contact Output Specifications**

- **Number of outputs:** See the table of Model and Suffix Codes.
- **Output type:** Open collector (SINK) current
- **Output contact rating:** Max. 50 mA
- **Output time resolution:** Min. 200 ms

**4.8. Positional Proportional Output Specifications**

- **Position signal output:**
  - **Slide resistance:** 100 Ω to 2 kΩ of total resistance
  - **Voltage output:** 100% slide and slide line: with disconnection detection 0% slide, without disconnection detection
- **Current input:** 4 to 20 mA (with disconnection detection)
- **Sampling period:** 50 ms
- **Measurement resolution:** 0.1% of input span
- **Position proportional relay output:**
  - UT35A: contact point 1c 2 points, 290 V AC, 3 or 30 V DC, 3 A (relay load) and UT32A: contact point 1c 2 points, 240 V AC, 3 or 30 V DC, 3 A (relay load)

**4.9. Heater Break Alarm Specifications**

- **Number of inputs:** 2
- **Voltage output (2):** (transistor contact output)
- **Use:** Measures the heater current using an external current transformer (CT) and generates a heater break alarm when the measured value is less than the break detection value.
- **Current transformer input resistance:** Approximately 5 A
- **Current transformer input range:** 0 to 10 A (12 Arms or more cannot be applied.)
- **Heater current measuring range:** Off. 0 to 3000 Arms
- **Heater current rating range:** 1 to 300 Arms
- **CT current rating range:** 800 mA, no load current accuracy of 500 Arms, 400 Arms, 100 Arms
- **Heater current measuring range:** 2000 Arms
- **Heater current measurement accuracy:** ±5% of current transformer input range
- **Break detector On-time:** Min. 0.2 second (for time proportional output)

**4.10. 24 V DC Loop Power Supply Specifications**

- **Use:** Power is supplied to a 2-wire transmitter.
- **Power supply:** 24 V DC
- **Rated current:** 4 to 20 mA DC
- **Supply output:** Approximately 30 mA (with short-circuit current limiting circuit)

**4.11. Safety and EMC Standards**

- **Safety:**
  - Compliant with IEC 61010-1 (IEC), IEC 61010-2-030 (IEC), IEC 61010- 2-020 (CE), approved by CANSAS Class 2. No. 61010-1 (CSA), approved by UL 61010-1.

- **Installation category:**
  - Pollution degree: 2
  - Measurement category: I (CAT I) (UL, CSA)
  - 0 (Other)

- **Rated measurement input:** 300 V AC
- **Rated transient overvoltage:** 1500 V

**4.12. EMC Compliance**

- **Equipment compliance:**
  - EN 61010-1:1994 + A1, Table 2 (for use in industrial locations)
  - EN 61326-2-1
  - EN 61000-3-2: 2006
  - EN 61000-3-3: 2003

- **EMC Regulation:**
  - Australia: AS/NZS 3260:2000
  - New Zealand: AS/NZS 3260:2000

**4.13. X-Cr: marking**

- Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance.
## 5. How to Connect Wires

- **Work wiring must be carried out by a person with basic electrical knowledge and practical experience.**
  - Be sure to turn OFF the power supply to the controller before wiring to avoid electric shock or damage to the wiring on the device.
  - Use a tester or a similar device to ensure that no power is being supplied to a cable to be connected.
  - For the wiring cable, the temperature rating is 70°C or more.
  - Install the power cable keeping a distance of more than 1 cm from sensitive wires.
  - The power cable is required to meet the IEC standards concerning the requirements of the area in which the instrument is being installed.
  - Wiring should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) or the wiring construction standards in countries or regions where wiring will be installed.
  - Since the insulation provided to each output terminal is functional insulation, provide Reinforced Insulation to the circuit, into the line in parallel with the load.
  - Do not use a 100-240 V AC power supply when not used for the instrument.

### Environmental Conditions

**Normal Operating Conditions:**
- Ambient temperature: -10 to 50°C (side-by-side mounting: -10 to 45°C)
  - If the CC-Link option is specified, 0 to 50°C for UT35A/RSP, 0 to 40°C for UT32A/RSP, 0 to 40°C for UT32A/RSP with a CC-Link option.
  - Ambient humidity: 20 to 90% RH (no condensation allowed)
  - Magnetic field: 0.05 mT or less
  - Continuous vibration at 5 to 9.9 Hz: Half amplitude of 1.5 mm or less, 1 cm/s² for 90 minutes each in the three axes directions.
  - Continuous vibration at 9 to 15 Hz: 4.9 mm/s or less, 1 cm/s² for 90 minutes each in the three axes directions.
  - Short-term vibration: 14.7 m/s² or less
  - Shock: 800 m/s² or less, 11 ms
  - Altitude: 2000 m or less above sea level
  - Temperature: 90°C max. for more than 10 minutes
  - Waterproofing: IP65G or IP67G

**Transportation and Storage Conditions:**
- Temperature: -25 to 70°C
- Temperature change rate: 20°C/h or less
- Humidity: 5 to 95% RH (no condensation allowed)

### Effects of Operating Conditions

**Effect of ambient temperature:**
- Voltage: ±1 µV/C or ±0.01% of F.S., whichever is larger
  - Current input: ±0.01% of F.S.
  - RTD input: ±0.05°C (ambient temperature) or less
  - Analog input: ±0.05% of F.S. or less

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IM ESP01031-01EN page 3/12
### Operation Guide

**Digital Indicating Controller (Non-isolated Remote Input Type)**

**Initial Settings**

This guide can be turned on/off with the Fn key.

#### Contents
1. Names and Functions of Display Parts
2. Setup Procedure
3. Quick Setting Function (Setting of Input and Output)
4. Adjusting Valve Position Automatically (for a Position Proportional Type Controller Only)
5. Setting Alarm Type
6. Setting Alarm Setpoint

#### Names and Functions of Display Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>No.</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>1</td>
<td>PV display</td>
<td>Shows an error code if an error occurs.</td>
</tr>
<tr>
<td>(2)</td>
<td>2</td>
<td>Group display (green)</td>
<td>Shows PV, SET/ENTER, Display (green), and Parameter Setting Display in the Parameter Setting Display window.</td>
</tr>
<tr>
<td>(3)</td>
<td>3</td>
<td>Light-emitting diode (Green)</td>
<td>Shows the control mode.</td>
</tr>
<tr>
<td>(4)</td>
<td>4</td>
<td>Segment display (orange)</td>
<td>Displays the input output (OUT) and measured input (PV).</td>
</tr>
<tr>
<td>(5)</td>
<td>5</td>
<td>Event indicator (orange)</td>
<td>Shows the current set parameter, alarm condition, and parameter setting.</td>
</tr>
<tr>
<td>(6)</td>
<td>6</td>
<td>Key navigation indicator (green)</td>
<td>Shows the UP and/or DOWN left/right arrow key operation.</td>
</tr>
<tr>
<td>(7)</td>
<td>7</td>
<td>Parameter display level indicator (green)</td>
<td>Displays the setting conditions of the parameter display level.</td>
</tr>
<tr>
<td>(8)</td>
<td>8</td>
<td>Status indicator (green and red)</td>
<td>Shows the alarm status (NO or NC).</td>
</tr>
</tbody>
</table>

#### Setup Procedure

The following chart shows the setup procedure for UT32A/UT32A.

1. Install and wire a controller.
2. Press the Down arrow key. (NO)
3. The Quick setting function starts.
4. Press the SET/ENTER key while YES is displayed to start the Quick setting function.
5. Finally, EXIT is displayed. Change NO to YES and press the SET/ENTER key to complete the setup.

#### Quick Setting Function (Setting of Input and Output)

The Quick setting function is a function which allows you to quickly set the input type, output, and quick start function.

1. Control type setting
2. Input setup
3. Output setup
4. Other setup
5. Each setup is a function which is used in a basic function.

#### Making Settings Using Quick Setting Function

- **Example:** Setting to PID control, thermocouple type K (range of 0 to 1000°C), and current control output

- **Procedure:**
  1. Press the SET/ENTER key while YES for GSM (Quick setting mode) is displayed.
  2. Set the control type parameter (C) to PID (control).
  3. Set the PV input type parameter (IN) to K1 (-150 to 1370°C), or set the PV input range parameter (RH) to 500.0.
  4. Set the minimum value of PV input range parameter (RL) to 0.0.
  5. Set the output type selection parameter (CT) to OUT terminals (current+00.02).
  6. Finally, EXIT is displayed.

---

**Flow of Quick Setting Function**

1. The PV input unit parameter (UNIT) is displayed. Initial value: C (Degree Celsius)
2. The upper limit value of the setting range is displayed for the parameter RH (maximum value of PV input range).
3. The last digit of the upper limit value blinks. Change the setting using the Up/DOWN arrow keys to increase and decrease the value for 0.0.
4. The parameter RH (maximum value of PV input range) has been changed to 500.0.
5. The setpoint for the parameter RH has been registered.
6. Press the Down arrow key.
7. Follow the same procedure to set RL to 0.0 and CT to 00.02. Set other parameters as needed.
parameters to be set

control type

<table>
<thead>
<tr>
<th>parameter symbol</th>
<th>name of parameter</th>
<th>setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>control type</td>
<td>PID control (setpoint control) (1 point) hot (2 points)</td>
</tr>
</tbody>
</table>

input function

<table>
<thead>
<tr>
<th>parameter symbol</th>
<th>name of parameter</th>
<th>setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>PV input type</td>
<td>230VAC 50/60Hz (voltage)</td>
</tr>
<tr>
<td>N</td>
<td>maximum value of PV input range</td>
<td>0.0 to 200.0 %</td>
</tr>
<tr>
<td>N</td>
<td>minimum value of PV input range</td>
<td>0.0 to 200.0 %</td>
</tr>
<tr>
<td>2SP</td>
<td>SP input mode</td>
<td>0: No SP, 1: set SP, 2: max SP, 3: min SP</td>
</tr>
<tr>
<td>2SP</td>
<td>SP input value</td>
<td>0.0 to 200.0 %</td>
</tr>
<tr>
<td>N</td>
<td>maximum value of hysteresis</td>
<td>0.0 to 200.0 %</td>
</tr>
<tr>
<td>N</td>
<td>minimum value of hysteresis</td>
<td>0.0 to 200.0 %</td>
</tr>
</tbody>
</table>

output function

<table>
<thead>
<tr>
<th>parameter symbol</th>
<th>name of parameter</th>
<th>setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>output type selection</td>
<td>0: control output, 1: heating output, 2: output control alarm, 3: output control relay</td>
</tr>
<tr>
<td>N</td>
<td>output function code</td>
<td>0: OFF</td>
</tr>
<tr>
<td>N</td>
<td>control output load capacity</td>
<td>0: 5A load capacity</td>
</tr>
</tbody>
</table>

5. Setting alarm type

The following procedure shows an example of changing the alarm type (factory default: PV low limit alarm) to PV low limit alarm (setting 02).

1. Press the SET/ENTER key.
2. Show the operation display.
3. Hold down the key for 3 seconds.
4. The parameter AL1 (alarm type 1) is displayed.
5. Press the SET/ENTER key.
6. The last digit of the setpoint blinks.

The alarm 1 type setpoint 02 (PV low limit) is registered.

After the setup is completed, press the DISPLAY key or DISPlay key once to return to the operation display.

6. setting alarm setpoint

The following procedure shows an example of setting the alarm 1 setpoint of group 1 to 180.0.

Before setting the alarm setpoint, check the alarm type. To change the alarm type, see "5. setting alarm type."

1. Show the operation display.
2. Display mode menu with the same procedure as described in setting alarm type.
3. SP menu is displayed.
4. The parameter A1 is displayed.
5. Press the down arrow key until A1 appears.
6. Each parameter and group can be changed in the parameter setting displays of alarms using arrow keys.

Display the parameter and group that need to be changed.

5. Setting alarm type

The following procedure shows an example of changing the alarm 1 type (factory default: PV low limit alarm) to PV low limit alarm (setting 02).

1. Show the operation display.
2. Hold down the key for 3 seconds.
3. MODE menu is displayed.
4. Press the right arrow key until ALRM menu appears.
5. ALRM menu is displayed.
6. Press the SET/ENTER key.
7. The parameter A1 (alarm type 1) is displayed.

Note: Some examples may not be displayed depending on the model and suffix. codes.

For the factory default, the contact output is turned ON in normal operation, and the control output is turned OFF. The contact output turns on if the alarm occurs (PV value is below PV low limit alarm setpoint).

Note 1: SDP, St, and SL are displayed only for voltage input devices. 2. Outer terminals (relay) (relays 1 st, 2 nd) in OK status (2A). 3. Outer terminals (relay) in OFF status (1A/2A).

4. adjusting valve position automatically (for a proportional type controller only)

The following operating procedure describes how to input feedback signals from the control valve and adjust the fully-open and fully-closed positions of the control valve automatically. The fully-open and fully-closed positions of the valve can be adjusted automatically by manually providing feedback signals from the valve. To adjust the valve position, you need to carry out the connection and bring the controller into manual mode. For the connection, see "6. Terminal Wiring." In "Installation and Wiring," and for the manual mode, see "5. Switching between AUTO and MAN in "Operation mode."

note: Some examples may not be displayed depending on the model and suffix codes.

For the factory default, the control output turns on if the alarm occurs (PV value is below PV low limit alarm setpoint).

Note 2: Positive setpoint, Negative setpoint.

Initializing parameter values

Parameters that you have changed can be initialized to factory default values or user default values. For details, see "Parameter initialization" in the User's Manual (IM 05P01D31-01EN).

Changing the parameter display levels

This operation guide does not explain all the parameters. To display all the parameters, you need to change the parameter display level to professional setting mode. For details, see "Setting Security Functions" in the User's Manual (IM 05P01D31-01EN).
2. Setting Target Setpoint (SP)

1. Show the SP Display (Operation Display). (This is an example of setting the target setpoint to 150.6)
2. Press the SET/ENTER key to start the last digit of the setpoint blinking. Blinking allows you to change the value.
3. To set the setpoint, use the up and down arrows to move between digits and the Up/Down arrow keys to increase and decrease the value.
4. When the requested value is displayed, press the SET/ENTER key to register the setpoint.

3. Performing/Canceling Auto-tuning

Auto-tuning should be performed after setting a target setpoint. Make sure that the controller is in automatic mode (AUTO) and in run mode (RUN) before autotuning. Selection of tuning can be done by entering the PID constants, the PID manually. For setting the PID manually, see User's Manual (IM 05P01D31-01EN).

4. Selecting Target Setpoint Numbers (SPNO.)

The following operation procedure shows an example of changing the target setpoint number (SPNO.) from 1 to 2. Each SPNO has a PID group. The PID group set for the parameter Pdin (PID number selection) is used.

5. Switching between AUTO and MAN

AUTO and MAN switching can be performed using any of the following: (1) A/M key, (2) Contact input, (3) Communication, and (4) User function key. For details, see User's Manual (IM 05P01D31-01EN).

6. Switching between RUN and STOP

RUN and STOP switching can be performed using any of the following: (1) A/M key, (2) Contact input, (3) Communication, and (4) User function key. For details, see User's Manual (IM 05P01D31-01EN).

7. Monitoring-operation Purpose Displays Available during Operation

- SP Display
- OUT Display
- Param Display
- Fault Display

8. Monitoring-purpose Operation Displays Available during Operation

- Operation Display Switching Diagram for Standard and Position Proportional Types
- SP Display
- OUT Display
- Param Display
- Fault Display

- Operation Display Switching Diagram for Heating/Cooling Type
- SP Display
- OUT Display
- Param Display
- Fault Display

After showing the OUT Display, press the DISPLAY key or DSP display to show the following displays conditionally. For details, see User's Manual (IM 05P01D31-01EN).

9. Troubleshooting

For details of each function, refer to the electronic manual. M 05P01D31-01EN
7. Switching between REM (Remote) and LCL (Local)

Remote and local switching can be performed using any of the following:
(1) Control input, (2) Parameter, (3) Communication, and (4) User function key.
LCL (Local)

Control is performed using the 8-bit local setpoint on the controller.
When the control input is ON, operation cannot be performed using the parameter, communication, or key.
When the control input is OFF, the 8-bit local setpoint is enabled and the controller can be operated using the parameter, communication, or key.

8. Manipulating Control Output in Manual Mode

In manual mode, control output is manipulated by operating the keys (the value is changed using the Up/Down arrow keys, then outputted as a input). If the SET ENTER key is pressed, the control output value changes according to the displayed value.
In stop mode (when the STOP lamp is lit), control output cannot be manipulated.

9. Troubleshooting Flow

If the Operation Display does not appear after turning on the controller's power, check the procedures in the following flowchart.
If a problem appears to be complicated, contact your sales representatives.

**Errors at Power On**

The errors shown below may occur in the fault diagnosis when the power is turned on.
(For details of Setpoint display and input/output action when each error occurs, see User's Manual (IM O5P01031-01EN).)

**Errors during Operation**

The errors shown below may occur during operation.
(For input/output action when each error occurs, see User's Manual (IM O5P01031-01EN).)

---

**Troubleshooting Flow**

If the Operation Display does not appear after turning on the controller’s power, check the procedures in the following flowchart.
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**Errors at Power On**

The errors shown below may occur in the fault diagnosis when the power is turned on.
For details of Setpoint display and input/output action when each error occurs, see User's Manual (IM O5P01031-01EN).

---

**Errors during Operation**

The errors shown below may occur during operation.
For input/output action when each error occurs, see User's Manual (IM O5P01031-01EN).
■ Operation Parameters

Hold down the PARAMETER key or PAR key for 3 seconds to move from the Operation Display to the Operation Parameter Setting Display. Press the DISPLAY key or DISP key once to return to the Operation Display.

The parameter groups can be switched using .

Move to the Setup Parameter Setting Display:

Hold down the PARAMETER key or PAR key and keep the left arrow key simultaneously for 3 sec.

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 settings, press the SET/ENTER key to start the set-

The blinking symbol shows the change being setting mode. Use the Up/Down/Left/Right arrow keys to change the setting. Press the SET/ENTER key to register the setting.

Note that some parameters which are not displayed depending on the model and suffix codes, control type (CNT), etc. The parameters for professions setting mode (LEVEL PRO) are not described in this manual. See User’s Manual (IM-05P01D31-01EN).

■ SP and Alarm Setpoint Setting Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>Target setpoint</td>
<td>0% to 100.0% of PV input range span (GV)</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>Sub-target setpoint (in two-level control)</td>
<td>0% to 100.0% of PV input range span (GV)</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>PID number selection</td>
<td>1 to 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>Warning 1 to 4 setpoint</td>
<td>0% to 100.0% of PV input range span (GV)</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the parameter SP (target setpoint), 4 groups are displayed for the factory default.
The number of groups can be changed by the setup parameter SPGR (number of SP groups).
For the alarm setpoint parameter, alarm 1 -> 4 are displayed for the factory default.
The number of alarms can be changed using the setup parameter ALNO. (number of alarms).
To change the number of SP groups or alarms, see User’s Manual (IM-05P01D31-01EN).

Note the following items to set SP and alarm setpoint:

1. When the SP is changed, the PID's operation reverses to the initial state.
2. When setting the SP, press and hold the DOWN key for 3 sec. to stop the motion of output.

■ SP-related Setting Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>Remote input method</td>
<td>On-PV remote (PV is 0% on SP), or remote SP input</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>Remote input filter</td>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>Remote input scale</td>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>Remote input span</td>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

■ PV-related Setting Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>PV setpoint alarm on/off</td>
<td>0% to 100.0% (4 minutes)</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>Alarm 1 -&gt; 4 delay time</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>Alarms number</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the alarm function setting parameter, 4 groups are displayed for the factory default.
The number of groups can be changed by the setup parameter SPF (number of PV groups).
To change the number of alarms, see User’s Manual (IM-05P01D31-01EN).
### Zone Control Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

For Zone control, set the setup parameter 2CN (zone PID selection) to Zone PID selection. Use the following table to record the reference point's setting value.

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### P Parameter (for Ladder Program)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### Setup Parameters

Hold down the PARAMETER key or PARA key and Left arrow key simultaneously for 3 seconds to move from the Operation Display to the Operation Parameter Setting Display.

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### Control Function Setting Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### PV Input Setting Parameter

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>User Setting</th>
<th>Display Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (F)</td>
<td>Parameter symbol</td>
<td>P1 to P1 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P2 (F)</td>
<td>Parameter symbol</td>
<td>P2 to P2 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P3 (F)</td>
<td>Parameter symbol</td>
<td>P3 to P3 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>P4 (F)</td>
<td>Parameter symbol</td>
<td>P4 to P4 parameter</td>
<td>-∞ to +∞</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### 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 tunning. The blinking state allows you to make changes (setting mode). Use the Up/Dow/Left/Right arrow keys to change the setpoint. Press the SET/ENTER key to register the setting.

Note that those are some parameters which are not displayed depending on the Model and Suffix codes, control type (C, H, etc). The parameters for professional setting mode (LELv, PRC) are not described in this manual. See User's Manual (IM-05P01D31-01EN).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Setting parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Setting parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Function Setting parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Action Setting parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS-485 Communication Setting Parameter (E3-terminal Area)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethernet Communication Setting Parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater Break Alarm Setting Parameter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table above contains various settings and parameters for the device, including input and output settings, settings for RS-485 communication, Ethernet communication, and heater break alarm settings. Each parameter is described in detail, including its purpose and configuration options.
### SELECT Display Setting Parameter (Menu symbol: CS / CA / CC)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1 to CS5</td>
<td>SELECT Display T-5</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record SELECT Display setting value.**
- **Enter the display number.**

### Key Lock Setting Parameter (Menu symbol: KL / DC / KL)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>KL1</td>
<td>Key lock</td>
<td>OFF / ON</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record Key lock setting value.**
- **Enter the following table to record Key lock number.**

### DI Function Registration Parameter (Menu symbol: SW / SB / DI)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1</td>
<td>DO1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB1</td>
<td>DO1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DI1</td>
<td>DO1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record DI setting value.**
- **Parameter: DI terminal**

### DO Setting Parameter (EI1/E4/terminal-area)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI1</td>
<td>EI1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EI4</td>
<td>EI4 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record DO setting value.**
- **Parameter: EI terminal Area: EI terminal Area**

### System Setting Parameter (Menu symbol: SY / SY)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SY1</td>
<td>SY1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record SY setting value.**
- **Parameter: SY terminal Area: SY terminal Area**

### DI Function Numbering Parameter (Menu symbol: RT / RT)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT1</td>
<td>BI of SP number</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RT2</td>
<td>BI of SP number</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record BI of SP number.**
- **Parameter: BI of SP number**

### AL1-AL3 Function Registration Parameter (Menu symbol: AL / AM / AL)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL1</td>
<td>AL1 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL2</td>
<td>AL2 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL3</td>
<td>AL3 function</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record AL setting value.**
- **Parameter: AL terminal Area: AL terminal Area**

### Error and Version Confirmation Parameter (for display only)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Status record</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>E1 function</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>E2</td>
<td>E2 function</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

- **Use the following table to record Error and Version Confirmation parameter.**

### Error and Version Confirmation Parameter (for display only)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Status record</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3</td>
<td>E3 function</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

- **Use the following table to record Error and Version Confirmation parameter.**

### Parameter Display Level Parameter (Menu symbol: DP / DP)

<table>
<thead>
<tr>
<th>Parameter symbol</th>
<th>Name of Parameter</th>
<th>Setting Range</th>
<th>Initial value</th>
<th>User setting</th>
<th>Display level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP1</td>
<td>DP1 setting mode</td>
<td>OFF</td>
<td>STD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Use the following table to record Parameter Display Level parameter.**
- **Parameter: DP terminal Area: DP terminal Area**

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

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