The following symbol is used in the instrument. It indicates the possibility of injury to the user or damage to the instrument and signifies that the user must refer to the operation guide or user’s manual for special instructions. The same symbol is used in the operation guide and user’s manuals for pages that the user needs to refer to, together with the term “WARNING” or “CAUTION.”

1. Safety Precautions

The symbol is used to indicate the conditions that cause serious or fatal injury to the user, and indicates precautions that should be taken to prevent such occurrences.

2. Model and Suffix Codes

The symbol is used to indicate conditions that cause injury to the user or damage to the instrument or property and indicates precautions that should be taken to prevent such occurrences.

AC

AC/DC

The equipment wholly protected by double insulation or reinforced insulation.

Functional grounding terminals

(Do not use the terminal as a protective grounding terminal)

Identifies important information required to operate the instrument.

■ Warning and Disclaimer

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

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 the product from any unpredictable defect of the product.

YOKOGAWA's service personnel. There are dangerous high voltage environments with high concentrations of corrosive gas (H2S, etc.) and/or areas extremely vulnerable to magnetic fields. The instrument is intended for indoor use only. Use under conditions that may cause malfunction is not recommended.

(1) Use only with the specified commands. (2) Use only with the specified condition. (3) Use only with the specified bit, mode, or parameter setting. (4) Use only with the specified signal condition or type. (5) Use only with the specified signal condition or type. (6) Use only with the specified signal condition or type.

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.

Do not mount the instrument in the following locations:

• Outdoor:

○ Locations subject to direct sunlight or close to a heater

○ Locations subject to direct sunlight or in a location with strong magnetic fields that remain close to an average temperature of 23°C. Do not mount it in locations subject to direct sunlight or in a location with strong magnetic fields.

○ Locations with substantial amounts of oily fumes, steam, moisture, dust, or corrosive gases

■ Accessories (sold separately)

The following is an accessory sold separately.

- LLS05 Parameter Setting Software
- External Precision Pressure Source

3. How to Install

Installation Location

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

- Instrumental panel

This instrument is designed to be mounted in an instrumental panel. Mount the instrument in a location where the terminal ports will not be inappropriately touched.

- Well-ventilated locations

Mount the instrument in a well-ventilated location to prevent the instrument’s internal temperature from rising.

- No exposure to wind

Make sure that the terminal port is not exposed to wind. Exposure to wind may cause the temperature sensor accuracy to deteriorate. To protect multiple indicating controls, see the external dimensions/panel cutout dimensions, which follow. If mounting other instruments adjacent to the instrument, comply with these panel cutout dimensions to provide sufficient clearance between the instruments.

- Locations with little mechanical vibration

Install the instrument in a location subject to little mechanical vibration.

- Horizontally

Mount the instrument horizontally and ensure that it is level, with no inclination to the right or left.
4. Hardware Specifications

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

### Input Specifications

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Temperature Accuracy</th>
<th>Relative Humidity</th>
<th>Power Requirement</th>
</tr>
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<tbody>
<tr>
<td>TC (Types: B, E, J, K, N, R, S, T)</td>
<td>±0.5°C or ±0.1% (TJC)</td>
<td>40% - 90% (non-condensing)</td>
<td>24 VDC</td>
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<tr>
<td>RTD (Types: PT100, PT500, Pt1000)</td>
<td>±0.2°C or ±0.1% (TJC)</td>
<td>10% - 90% (non-condensing)</td>
<td>24 VDC</td>
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### Contact Input Specifications

- **Number of inputs**: 6 (2 for power supply, 3 for temperature measurement, 1 for communication)

### Universal Input (Equipped as standard)

- **Number of inputs**: 6
- **Input Type**: Instrument, range, and measurement accuracy. See the table below.
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<td>TC (Types: B, E, J, K, N, R, S, T)</td>
<td>±0.5°C or ±0.1% (TJC)</td>
<td>-200°C to +1800°C</td>
<td>±1°C or ±0.1% (TJC)</td>
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<tr>
<td>RTD (Types: PT100, PT500, Pt1000)</td>
<td>±0.2°C or ±0.1% (TJC)</td>
<td>-200°C to +850°C</td>
<td>±1°C or ±0.1% (TJC)</td>
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### Measurement Category

- **1**: Measurement Category No.1
- **2**: Measurement Category No.2
- **3**: Measurement Category No.3
- **4**: Measurement Category No.4

### Standard Signal

- **Standard signal**: 4-20 mA
- **Standard output**: 0-10 V

### Retransmission Output Specifications

- **Number of outputs**: 6 (2 for power supply, 3 for temperature measurement, 1 for communication)

### 15 V DC Loop Power Supply Specifications

- **Number of outputs**: 6 (2 for power supply, 3 for temperature measurement, 1 for communication)

### Step Response Time Specifications

- **Response time**: 60 Hz or more (with high-speed current limiting circuit)

### Relay Contact Output Specifications

- **Contact type and number of outputs**: 1 normal open, 1 normal closed
- **Contacting**: Contact point 1(a) for both heating and cooling controls

### Transistor Contact Output Specifications

- **Number of outputs**: 6 (2 for power supply, 3 for temperature measurement, 1 for communication)

### Positional Output Specifications

- **Position signal**: Slide resistance: 1000 ± 2.5 % of total resistance
- **Positional relay output**: 1 to 10 mm (0.04 to 0.39 inch) (panel thickness)
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 controller before wiring to avoid an electric shock. Use a tester or similar device to ensure that no power is being supplied to a cable to be connected.
- For the wiring, the temperature rating is 75°C or more.
- As a safety measure, always install a circuit breaker (an IEC 60947-compatible product, 5 A, 100 V or 220 V AC) in an easily accessible location near the instrument. Moreover, provide an indication that the switch is a device for turning off the power to the instrument.
- Install the power cable keeping a distance of more than 1 cm from other 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) and the wiring construction standards in countries or regions where wiring is installed.
- Since the insulation provided to each relay output terminal is functional insulation, provide reinforced insulation to the external of the device as necessary. (Refer to the drawing below)

- When connecting two or more crimp-on terminal lugs to the single-terminal lugs before tightening the screw.
- Note that the wiring of two or more crimp-on terminal lugs to the single high-voltage terminal of the power supply and relay, etc. does not comply with the safety standard.

- Provide electricity from a single-phase power supply. If the power is noisy, install an isolating transformer on the primary side, and use a line filter on the secondary side. When measures against noise are taken, do not install the primary and secondary power cables close to each other.
- If there is a risk of external lightning surges, use a lightning arrester, etc.
- For TC input, use shielded compensating lead wires for wiring. For RTD input, use shielded wires that have low inductance resistance and cause no significant differences in resistance between the three wires.
- Since the control output relay has a life span (resistance load of 100,000 times) and if the relay is held open, relay contact failure may occur.
- The use of inductors (L) loads such as auxiliary relays, motors and solenoid valves causes malfunction or relay failure; always insert a CI filter for use with alternating current or a diode for use with direct current, as a spark-removal surge suppression circuit, into the line in parallel with the load.
- After completing the wiring, the terminal cover is recommended to be used for the instrument.

6. Terminal Wiring Diagrams

- **U35A**
- **DC Relay Wiring**

- **Transistor Output Wiring**

- **Cable Specifications and Recommended Cables**

- **Power Supply Specifications and Isolation**

- **Environmental Conditions**

Normal Operating Conditions:
- Ambient temperature: -10 to 50°C (side-by-side mounting, -10 to 40°C).
- If the CC-Link option is specified, 0 to 50°C for U35A; 0 to 40°C for U353A.
- Ambient humidity: 20 to 90% RH (no condensation allowed)
- Continuous vibration at 5 to 50 Hz, Full amplitude of 1.5 mm or less, 10 cycles per minute for 90 minutes each in the three axes directions
- Continuous vibration at 5 to 150 Hz, 4.9 mm or less, 10 cycles per minute for 90 minutes each in the three axes directions
- Shock: 14.7 m/s², 10 cycles or less
- Acceleration: 500 g or less or at sea level
- Warm-up time: 30 minutes or more after the power is turned on
- Storage time: Within 10 seconds

- **Transportation and Storage Conditions**

Temperature: -20 to 70°C
- Temperature change rate: 20°C/h or less
- Humidity: 3 to 95% RH (no condensation allowed)

Effects of Operating Conditions:
- Effect of ambient temperature:
  - Voltage: VC input, ±1 %/°C or 0.1% of F.S.; whichever is larger
  - Current input: ±0.1% of F.S.; F.C.
  - RTD input: ±0.0%/°C (ambient temperature) or less
- Analog output: ±0.02% of F.S.; F.C. or less
- Effect of power supply voltage fluctuation
  - Analog input: ±0.1% of F.S.; F.C.
  - Analog output: ±0.1% of F.S.; or less
  - (Each within rated voltage range)

- **Recommended Crimp-on Terminal Lugs**

- **Power supply specifications**
  - Power supply relay output terminals
  - Power supply terminals
  - Power supply terminals (Option code DC)
  - (Mount it directly to the relay coil terminal [socket])

- **AC Relay Wiring**

- **Transistor Output Wiring**

- **WARNING**
  - Make sure that the input terminals are not shorted or grounded.

- **CAUTION**
  - Be sure to turn OFF the power supply to the controller before wiring to avoid an electric shock. Use a tester or similar device to ensure that no power is being supplied to a cable to be connected.
  - The terminals.
  - Between 3000 and 5000 VAC for 1 minute (UL, CSA).
  - Between primary terminals and secondary terminals: 3000 VAC for 1 minute (IEC).
  - Between primary terminals: 1500 VAC for 1 minute.
  - Between secondary terminals: 500 VAC for 1 minute.
  - Warnings should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) and the wiring construction standards in countries or regions where wiring is installed.
  - Power terminals to 24 VDC as models are the secondary terminals.
  - Insulation resistance: Between power supply terminals and a grounding terminal 20 MΩ or more at 50 V DC.
  - Isolation specifications:

- **PV (universal) input terminals:**
  - Control, retransmission (analog) output terminals
  - (not isolated between the analog output terminals) value position (feedback) input terminals
  - Control relay (contact point) control point (x+y) output terminals
  - Alarm 1 relay points (output terminals)
  - Alarm 2 relay points (output terminals)
  - Contact point (output terminals)
  - Contact point (output terminals) (3 points)
  - Limiting frequency output terminals
  - Control output (transmitter terminals)
  - Ethernet communication terminal
  - PROFINET/DeviceNet/CC-Link communication terminals

- The circuits divided by lines are insulated mutually.

- **Environmental Conditions**

Normal Operating Conditions:
- Ambient temperature: -10 to 50°C (side-by-side mounting, -10 to 40°C).
- If the CC-Link option is specified, 0 to 50°C for U35A; 0 to 40°C for U353A.
- Ambient humidity: 20 to 90% RH (no condensation allowed)
- Magnetic field: 0.1% or less
- Continuous vibration at 5 to 50 Hz: Half amplitude of 1.5 m or less, 10 cycles per minute for 90 minutes each in the three axes directions
- Continuous vibration at 5 to 150 Hz: 4.9 m/s² or less, 10 cycles per minute for 90 minutes each in the three axes directions
- Shock: 14.7 m/s², 10 cycles or less
- Acceleration: 500 g or less or at sea level
- Warm-up time: 30 minutes or more after the power is turned on
- Storage time: Within 10 seconds

- **Transportation and Storage Conditions**

Temperature: -20 to 70°C
- Temperature change rate: 20°C/h or less
- Humidity: 3 to 95% RH (no condensation allowed)

Effects of Operating Conditions:
- Effect of ambient temperature:
  - Voltage: VC input, ±1 %/°C or 0.1% of F.S.; whichever is larger
  - Current input: ±0.1% of F.S.; F.C.
  - RTD input: ±0.0%/°C (ambient temperature) or less
- Analog output: ±0.02% of F.S.; F.C. or less
- Effect of power supply voltage fluctuation
  - Analog input: ±0.1% of F.S.; F.C.
  - Analog output: ±0.1% of F.S.; or less
  - (Each within rated voltage range)
1. Names and Functions of Display Parts

- PV display (green light)
  - Displays an error code if an error occurs.
  - Displays the current parameter setting in the Parameter Display and Parameter Setting Display when the data display/ON OFF is set to ON.

- Group display (green indicator)
  - Displays the selected parameter setting.

- Light indicator (green)
  - Displays the setpoint value in decimal (1/10).

- Function indicator (green)
  - Displays the function setting in decimal (1/10).

- Parameter display (green)
  - Displays the parameter display settings.

- Symbol indicator (green)
  - Displays the symbol setting.

- Control indicator (green and red)
  - Displays the control indication.

<table>
<thead>
<tr>
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<td>(7)</td>
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<td>Displays the control indication.</td>
</tr>
<tr>
<td>(8)</td>
<td>Operation display</td>
<td>Displays the operation setting.</td>
</tr>
</tbody>
</table>

2. Setup Procedure

The following flowchart shows the setup procedure for UT32A and UT32A.

3. Quick Setting Function (Setting of Input and Output)

The quick setting function is a function to easily set the basic functions of the controller.

- To change and set the parameter settings, press the SET/ENTER key to start the setpoint 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 settings.

4. Making Settings Using Quick Setting Function

Example: Setting to PID control, thermocouple type K (range of 0.0 to 508.0 °C), and current output

- Press the SET/ENTER key while YES is displayed to display the quick setting function.
- Press YES to set the PID parameter (IN) to 60 (270 to 1370 °C).
- Set the PV input unit parameter (UNIT) to C (Degree Celsius).
- Set the maximum value of PV input range parameter (RH) to 500.0.
- Set the minimum value of PV input range parameter (RL) to 0.0.
- Set the output type selection parameter (GT) to OUT terminals (current=0.02).
- Finally, EXIT is displayed. Change NO to YES and press the SET/ENTER key to complete the setup. Operation Display appears.

5. Flow of Quick Setting Function

In Quick setting mode, the parameter guide appears on the display panel.

- Press the SET/ENTER key while YES is displayed to display the quick setting function.
- Press YES to set the PV input unit parameter (UNIT) to C (Degree Celsius).
- Set the maximum value of PV input range parameter (RH) to 500.0.
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- Finally, EXIT is displayed. Change NO to YES and press the SET/ENTER key to complete the setup.
### Parameters to be set

#### Control Type

- **Parameter Symbol**: MAN, PA, PR
- **Name of Parameter**: Control Type
- **Setting Range**: STD: Control

#### Input Function

- **Parameter Symbol**: SDP
- **Name of Parameter**: PV
- **Setting Range**: U1: 0.000 to 0.000

### Deviation Setpoint

- **Hysteresis**: Abnormal

### Note

- Upper two digits (in output cycle time) for a Position Proportional Type Controller Only

### Adjusting Valve Position Automatically (for a Position 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 inputting feedback signals from the control valve. To adjust the valve position, you need to carry out the connection and bring the controller into manual mode. For more details see "Parameter Setting Display of Alarm Type" in the manual mode, see 5. Switching between AUTO and MAN in Operation.

#### 1. Show the Operation Display.

Hold down the keys for 3 seconds.

#### 2. Press the Right arrow key until OUT menu appears.

- **Symbol**: MAN is lit

#### 3. Press the SET/ENTER key.

- **Symbol**: OUT menu is displayed.

#### 4. Press the SET/ENTER key.

- **Symbol**: The parameter V-AT (automatic valve position adjustment) is displayed.

#### 5. OFF blinks.

Press the Up arrow key.

#### 6. ON is displayed. Blinks during the change.

Press the SET/ENTER key.

#### 7. ON has been registered and the automatic adjustment of the valve position starts.

The VAT blinks during the automatic adjustment. After the adjustment is completed, press the DISPLAY key or DIP key once to return to the Operation Display.

- **Note**: When the adjustment is completed normally, the indication automatically returns to OFF.

- **Note**: When VAT is displayed on PV display, it indicates an error. Check the wiring for feedback input and perform the automatic adjustment again. To perform a valve adjustment manually, see User’s Manual (IM 05P01D31-1EN).

### Setting Alarm Setpoint

The following operating procedure shows an example of changing the alarm-1 type (factory default: PV high limit alarm) to PV low limit alarm (setpoint: 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. **Press the SET/ENTER key.**

6. **The parameter AL1 (alarm-1 type) is displayed.**

- **Symbol**: The last digit of the setpoint blinks.

- **Change the setpoint using the Up/Down arrow keys to increase and decreases the value and the Left/Right arrow keys to move between digits.**

- **Press the SET/ENTER key.**

7. **The alarm-1 type setpoint (02: PV low limit) is registered.**

- **After the setup is completed, press the DISPLAY key or DIP key once to return to the Operation Display.**

- **Symbol**: Stand-by action and excitation are turned on or off by selecting 1 or 0. (See "Setting Display of Alarm Type:" )

- **For the latch action, see User’s Manual (IM 05P01D31-1EN).**

### Initialize parameter values

You have changed your parameter values can be initialized to factory default values or user default values. For details, see "Parameter Initialization" in the User Manual (IM 05P01D31-1EN).
This operation guide describes key entries for operating the UT35A and UT32A. Although the display of UT35A is used in this guide, UT32A can be operated similarly. For operations using external contact inputs, see "6. Terminal Wiring Diagrams" in "Installation and Wiring.

If you cannot remember how to carry out an operation during setting, press the DISPLAY key or DSPK key once. This brings you to the display (Operation Display) that you can operate. The setting display is shown on the Operation Display Page (only). The setting display is a function for setting only. Please do not turn it off.

1. Monitoring-purpose Operation Displays Available during Operation

1.1 Operation Display Switching Diagram for Standard and Position Proportional Types

- **SP Display**
  - Displays the measured input value on PV display.
  - Displays the target setpoint (SP) on Operation Display (SP can be changed).
- **OUT Display**
  - Displays the measured input value on PV display.
  - Displays the control output value (OUT) on Setpoint display (OUT can be changed in manual mode).
  - Displays the value's feedback input value (at all to 100% value opening) in Position proportional control.

2. Setting Target Setpoint (SP)

1. Show the SP Display (Operation Display).
   - (This is an example of setting the target setpoint to 100.0.)
2. Press the SET/ENTER key to start the adjustment of the setpoint.
   - Blinking allows you to change the value.
3. To set the setpoint, use the Up/Down arrow keys to move between digits and the Up/Down arrow keys to increase and decrease the value.
   - When the required value is displayed, press the SET/ENTER key to register the setpoint.

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 SP has its PID group. The PID group set for the parameter PIDN (PID number selection) is used.

1. Show the Operation Display.
   - Hold down the PARAMETER key or PARA key for 3 seconds to display MODE menu.
2. Press the SET/ENTER key.
3. In cases where the communication is specified, the parameter R.L (REMOTE/LOCAL switch) is displayed.
4. Press the Dosen arrow key until the parameter SPNO. appears.
5. The parameter SPNO. (SP number selection) is displayed.
6. Press the SET/ENTER key.
   - \( \Delta \) Change the setting of the Up/Down arrow keys.
   - Blinks during the change.
7. The setpoint has been registered.
   - The parameter AT (auto-tuning switch) is displayed.
8. Press the SET/ENTER key to return to the Operation Display.

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.

Switching between AUTO and MAN is switched alternately.

6. Switching between RUN and STOP

RUN and STOP switching can be performed using any of the following: (1) Contact input, (2) Parameter, (3) Communication, and (4) User function key.

When AUTO is switched into MAN, the control output value in AUTO mode is held. The controller can be operated manually from the hold value.

If the manual preset output is set (MPOS parameter = OFF), the controller can be operated manually from the arbitrary output value (MPO1 to MPOS parameters).

7. Switching between STOP and RUN

RUN and STOP switching can be performed using any of the following: (1) Contact input, (2) Parameter, (3) Communication, (4) User function key.

Switching between STOP and RUN is performed using any of the following: (1) Contact input, (2) Parameter, (3) Communication, and (4) User function key.

When the controller is stopped, input and output are as follows:

- **Control output**
  - Displays the preset output value of the input parameter.
  - Displays the measured output value of each parameter.
  - Displays the value in output unit of each input.

8. Display in STOP mode

"STOP" is displayed on Symbol display and "pre rejects output value" is displayed on Data display.

9. Display in STOP mode

"STOP" is displayed on Symbol display and "pre rejects output value" is displayed on Data display.

**Display in STOP mode**

- The MAN lamp is lit in MAN mode.
7. Switching between REM (Remote) and LCL (Local)

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

LCL (Local) Control is performed using the target setpoint on the controller.

REM (Remote) Control is performed using a setpoint via communication for the target setpoint. This facilitates an example of switching from local to remote using the parameter. (On top in the case where the communication is specified.)

When the contact input is ON, operation cannot be performed using the parameter, communication, or key. When the contact input is OFF and the setting is switched using the parameter, communication, or key, the last operation performed is restored.

1. Show the Operation Display.
2. Hold down the PARAMETER key or PRAR key for 3 seconds to display MODE menu.
3. Press the SET/ENTER key.
4. Change the operation mode using the Up/Down arrow keys. Blink during the change.
5. The REM lamp is lit.

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 it is). Even if the SET/ENTER key is not pressed, the control output value changes according to the displayed value.

In step mode (when the STOP lamp is lit), control output cannot be manipulated.

Manual operation in Heating/cooling control

Symbol of cooling side setpoint operation control

Symbol of cooling side setpoint operation control

Target setpoint (SP) number

Up arrow key: concurrently decreases cooling-side control output and increases heating-side control output. 

Down arrow key: concurrently increases cooling-side control output and decreases heating-side control output. 

Other than the heating-side and cooling-side outputs are presented, or both of them are presented according to the dead band setting.

Actual output (%)

Actual output (%)

Control output

Control output

Manual operation control in Position proportional control 

Output manipulation in Position proportional control is not restricted from output limiters (ON, CL).

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 our sales representatives.

- Remedies if Power Failure Occurs during Operations
  - Instantaneous power failure within 20 ms. A power failure is not detected. Normal operation continues.
  - Power failure for less than about 5 seconds, of for about 5 seconds or more. Affects the “settings” and “operation status.”

If details, see User's Manual (IM 05P01D31-01EN).

NOTE

Draw up 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. (For details of Setpoint display and input/output action when each error occurs, see User’s Manual (IM 05P01D31-01EN).)

- Errors during Operation

The errors shown below may occur during operation. (For input/output action when each error occurs, see User’s Manual (IM 05P01D31-01EN).)

- Errors in Communication

In any communication, the data format will be as follows:

- Errors in Function

When an error occurs in input shown in Analog input display (Operation display), Setpoint display shows the same value as the PV display.

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For the alarm setting function parameter, 4 alarms are displayed for the factory default.
The number of alarms can be changed by the setup parameter ALND (number of alarms).
To change the number of alarms, see User’s Manual (IM SP01031-01EN).

### Alarm Function Setting Parameter

**Parameter**
- **SPv alarm level 1 to 4**: For all parameters, SP function parameter, use the parameter SPV-alarm level 1 to 4 (SP: 00 to 65.535 [minute second])
- **Alarm limit 1 to 4**: For all parameters, SP function parameter, use the parameter SPV-alarm limit 1 to 4 (SP: 00 to 65.535 [minute second])
- **Alarm mode**: For all parameters, SP function parameter, use the parameter Alarm mode (SP: OFF, 0 to 5)

### PV-related Setting Parameter

**Parameter**
- **PV input bias**: For all parameters, SP function parameter, use the parameter PV input bias (SP: -50 to 50% of PV input range span [10%])
- **PV input filter**: For all parameters, SP function parameter, use the parameter PV input filter (SP: OFF to 1.000)

### PID Setting Parameter

**Parameter**
- **PID manual**: For all parameters, SP function parameter, use the parameter PID manual (SP: 0.0 to 100.0, [0% to 100%])
- **PID auto**: For all parameters, SP function parameter, use the parameter PID auto (SP: OFF, 0 to 5)
- **PID swing**: For all parameters, SP function parameter, use the parameter PID swing (SP: 0.0 to 100.0, [0% to 100%])
- **PID info**: For all parameters, SP function parameter, use the parameter PID info (SP: OFF, 0 to 5)

### SP and Alarm Setpoint Setting Parameter

**Parameter**
- **SP and alarm setpoint**: For all parameters, SP function parameter, use the parameter SP and alarm setpoint (SP: 0.0 to 100.0, [0% to 100%])
- **SP info**: For all parameters, SP function parameter, use the parameter SP info (SP: OFF, 0 to 5)
### Output 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>RT3 (RET)</td>
<td>Output setting parameter</td>
<td>Current output form (or control output form) (lower two digits)</td>
<td>0: OFF, 1: OUT terminals (output)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SELECT Display Setting Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>SELECT Display Setting Parameter</td>
<td>0-5</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>C1</td>
<td>Choose the parameter to configure the Status Display that is frequently modified in display on the Operation Display: OFF: 0-5 ON: 0-15 Click on the setting value, see corresponding manual User’s Manual.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Key Lock Setting Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STL0</td>
<td>Key Lock</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>STL0</td>
<td>Front panel ALM key lock</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

### Dl Function Registration Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO01</td>
<td>Dl01 ON</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>DO01</td>
<td>REMOTE/LINK switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>STOP/RUN switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to AUTO</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to MAIN</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to REMOTE switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to LOCAL</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to STOP/START switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Switch to Latches</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>LED backlight ON/OFF switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>DO01</td>
<td>Photovoltaic power switch</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

### Dl Function Numbering Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dl01</td>
<td>Dl01 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl02 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl03 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl04 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl05 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl06 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl07 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
<tr>
<td>Dl01</td>
<td>Dl08 SP number</td>
<td>0-1</td>
<td>OFF</td>
<td>STD</td>
</tr>
</tbody>
</table>

### AL1-AL3 Function Registration Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL1</td>
<td>AL1 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
<tr>
<td>AL2</td>
<td>AL2 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
<tr>
<td>AL3</td>
<td>AL3 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
<tr>
<td>AL10</td>
<td>AL10 relay function selection</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>AL11</td>
<td>AL11 relay function selection</td>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

### DO Setting Parameter (E1/E4/Terminal Area)

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO01</td>
<td>DO01/D01 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
<tr>
<td>DO01</td>
<td>DO02/D02 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
<tr>
<td>DO01</td>
<td>DO03/D03 function selection</td>
<td></td>
<td></td>
<td>4550</td>
</tr>
</tbody>
</table>

### System Setting Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5044</td>
</tr>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5045</td>
</tr>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5046</td>
</tr>
</tbody>
</table>

### System Setting Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5044</td>
</tr>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5045</td>
</tr>
<tr>
<td>SET</td>
<td>System Reset (memory backup)</td>
<td></td>
<td></td>
<td>5046</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Status record</th>
<th>Minimum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>Error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VRV</td>
<td>System revision</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Parameter Display Level Parameter

<table>
<thead>
<tr>
<th>Parameter Code</th>
<th>Parameter Name</th>
<th>Setting Range</th>
<th>Initial Value</th>
<th>Display Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3</td>
<td>D3: Standard setting mode</td>
<td></td>
<td></td>
<td>STD</td>
</tr>
<tr>
<td>D3</td>
<td>D3: Standard setting mode</td>
<td></td>
<td></td>
<td>STD</td>
</tr>
<tr>
<td>D3</td>
<td>D3: Standard setting mode</td>
<td></td>
<td></td>
<td>STD</td>
</tr>
</tbody>
</table>

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