4. OPERATING PROCEDURE

4.1 Prior to starting screen operation

Observe the following when operating the screen.

- Do not strike or scratch the surface of the panel (display unit) with a sharp object such as a ball-point pen or screwdriver. Since this may scratch or damage the panel.

- Avoid indelibly staining the panel (display unit), or the display may become unclear or be damaged.

- In order to prevent scratches and damage, do not press the keys with anything other than fingers.

- Press the switch lightly to avoid damaging them.

- Do not spray insecticide or clean the operation panel with a volatile organic solvent (thinner or benzene), chemicals or chemical dustcloth to avoid damaging or discoloring the panel.

If the operation panel is dirty, clean it using a clean cloth dampened with neutral detergent and then completely wrung out.

(Cleaning with a volatile organic solvent will become a cause of switch breakdowns and screen clouding, etc.)
4.2 Screen configuration

**Operation monitoring screen**
Displays the various measured-values (PV, operation output values, alarm conditions, etc.)
→ Refer to "4.4.2 Operation monitoring screen" (P. 4–6).

**Setting screen**
Carries out setting of the various set-values of the REX–B850 (SV, alarm set-values, PID constants, etc.)
→ Refer to "4.4.3 Setting screen" (P. 4–23).

**Operation mode screen**
Carries out switching of the operation conditions such as executing the auto-tuning or control Run/Stop, etc.
→ Refer to "4.4.4 Operation mode screen" (P. 4–33).

**Initialize setting screen**
Carries out changing of the initialize set-values of the REX–B850 and OPL–B (Screen contrast adjustment, screen scanning setting, screen saver setting, Computer/Local selection, Unit/CH name setting, etc.)
→ Refer to "4.4.5 Initialize setting screen" (P. 4–46).

**Alarm message screen**
On the occurrence of an alarm, the message is automatically displayed.
→ Refer to "4.4.6 Alarm message screen (P. 4–63)".

**Error message screen**
On the occurrence of an error, the message with the contents of the error is automatically displayed.
→ Refer to "4.4.7 Error message screen" (P. 4–65).
4.3 Screen flow diagram

The start-up screen is displayed only when the power is turned on.

* Start-up screen

While the start-up screen is being displayed, REX-8850 errors are checked on the operation panel (OPL-B).
If there is any error, the error message screen is displayed.
4.4 Explanation of each screen

4.4.1 Operation menu screen

The operation menu screen allows the selection of each of the "Operation monitoring", "Setting", "Operation mode" and "Initialize setting" screens.

**Method of calling up the operation menu screen.**

Press the MENU switch to select the Operation menu screen from each screen.

![Operation Menu Diagram]

**Method of calling up each screen**

Select the desired screen from among the 4 screen items appearing on the Operation menu screen by pressing the relevant function switch.

---

**F1 switch:** Pressing this switch selects the "Operation monitoring menu" screen.
**F2 switch:** Pressing this switch selects the "Setting menu" screen.
**F3 switch:** Pressing this switch selects the "Operation mode menu" screen.
**F4 switch:** Pressing this switch selects the "Initialize menu" screen.

* For the contents and operation methods of the each screen, see description of 4.4.2 and afterwards.
4.4.2 Operation monitoring screen

The Operation monitoring screen monitors (Confirms by displaying) the set-values, measured-values, control output values, alarm output conditions, etc. in units of 1, 2, 4 or 8 channels.

■ Calling procedure

Press the F1 switch while the operation menu screen is displayed.

Select the desired monitor screen by pressing the F1 to F4 switches.

If the number of channels to be displayed on the screen is specified, the operation monitoring screen corresponding to the specified number of channels is selected.

* For the method of setting the number of display channels, see "1.9 Channel No. displayed on the operation monitoring setting screen" in the Supplementary Manual for OPL initialize/controller initialize.
Display details

Operation monitoring menu screen

* This screen is not specified when the channel is specified.

The channel display type can be selected by these switches.

F1 switch: Pressing this switch selects the "Operation monitoring (1–channel display type)" screen.
F2 switch: Pressing this switch selects the "Operation monitoring (2–channel display type)" screen.
F3 switch: Pressing this switch selects the "Operation monitoring (4–channel display type)" screen.
F4 switch: Pressing this switch selects the "Operation monitoring (8–channel display type)" screen.

- Selecting a necessary screen by pressing the function switch on Operation monitoring menu screen.
- After changing to each of the screens, the pressing of the MENU switch at the bottom of the screen returns the screen again to the Operation monitoring menu screen.
[Operation monitoring screen configuration]

For 1, 2 or 4CH

For 8CH

Operation monitoring menu screen

Channel display type selection by pressing the F1 to F4 switches

PV/SV

Display of measured values/set-values

MV/H/MVC

Display of heating/cooling control output values

ALM1/ALM2

Display of first and second alarm outputs

BO/HBA

Display of burnout/heater break alarm outputs

CT/HBA

Display of CT input values and HBA set-values

PV

*For 8CH, only PV display is available.

Displayed when an alarm occurs.

Alarm message screen

MENU : Pressing the MENU switch

PARA : Pressing the PARA switch

F4 (Jump) : Pressing the F4 switch

*If an alarm occurs when any of the 1, 2 and 4–CH screens is displayed, press the A hidden switch once to change to the alarm monitor screen (ALM1/ALM2 or BO/HBA).

As only the PV (measured-value) monitor screen is available for 8–CH, if an alarm occurs when the 8–CH screen is displayed, press the A hidden switch once to change to the 1–CH display alarm monitor screen. However, if it is set to be automatically changed to the Alarm message screen when an alarm occurs, the alarm monitor screen cannot be selected even by pressing the A hidden switch.

*On the monitor screen, the screen display items can be selected for each parameter.

For the setting method, see "1.10 Display lock level setting screen" in the Supplementary Manual for OPL initialize/controller initialize.
Checking of alarm occurrence

There are the following 3 methods for checking alarm occurrence on the OPL-B side.

① At alarm occurrence, the SUB1 or SUB2 lamp on the front of OPL-B lights.
② At alarm occurrence, the Alarm Message screen is automatically selected.
③ At alarm occurrence, the alarm signal is output from the SUB output terminals at the rear of OPL-B.

* ①, ② or ③ above does not function if set to Unused. For setting details, see the following.
  - Chapter 4, OPERATING PROCEDURE: "Alarm message setting screen" in "4.4.5 Initialize setting screen"
  - "1.8 SUB output LED/relay function selection" in the Supplementary Manual for OPL initialize/controller initialize
  - Chapter 2, MOUNTING AND WIRING
Operation monitoring screen

The Operation monitoring screen monitors (Confirms by displaying) the set-values, measured-values, control output values, alarm output conditions, etc. Possible display types are 1-channel, 2-channel, 4-channel and 8-channel displays. Select the desired type according to the application.

PV/SV: Measured-value (PV)/set-values (SV) display

The measured-value (PV) and the set-value (SV) can be checked on this monitor screen. In addition, only the set-value (SV) can be changed on this screen.

1-channel display type

Measured-values (PV) and set-values (SV) corresponding to one channel are displayed.

Status display area

For display details, see the following table.

Measured-value (PV)/Set-value (SV) display

F4 switch (Set.)
Pressing this switch highlights the set-value (SV) on the screen so that settings can be changed.

PARA switch
Every time this switch is pressed, each item changes.

Current memory area number display

Each status is displayed only the operation monitoring 1-channel display type. For display details, see the following table.

<table>
<thead>
<tr>
<th>Display</th>
<th>Display contents</th>
<th>Display condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO</td>
<td>Burnout</td>
<td>Displayed when an alarm occurs in any of the used channels of all REX-B850s</td>
</tr>
<tr>
<td>HBA</td>
<td>Heater break alarm</td>
<td></td>
</tr>
<tr>
<td>ALM1</td>
<td>First alarm</td>
<td></td>
</tr>
<tr>
<td>ALM2</td>
<td>Second alarm</td>
<td></td>
</tr>
<tr>
<td>Comp.</td>
<td>Computer mode</td>
<td>Displayed in computer mode.</td>
</tr>
<tr>
<td>Stop</td>
<td>Control Run/Stop</td>
<td>Displayed when any REX-B850 stops during monitoring.</td>
</tr>
<tr>
<td>AT</td>
<td>Auto-tuning</td>
<td>Displayed when any channel is being auto-tuned during monitoring.</td>
</tr>
</tbody>
</table>
<Set-value (SV) setting method>

Pressing the F4 switch (Set.) while the measured-value (PV)/set-value (SV) display is shown highlights the set-value (SV) section so that settings can be changed. Press the F1 switch to shift the digit, and set the numeric value by pressing the F2 or F3 switch. Pressing the F4 switch establishes the set data. For details, see 4.4.3, "Setting procedure" (P.4-23).

*The method of setting the 1-channel display type is described below. However, the method of setting the 2-channel or 4-channel display type is basically the same except for cursor movement between each channel. The cursor is moved between each channel for the 2-channel or 4-channel display type by pressing the F4 switch (ENT).
2-channel display type

Measured-values (PV) and set-values (SV) corresponding to 2 channels are displayed.

*The method of setting each set-value (SV) for the 2-channel display type is basically the same as for the 1-channel display type. For the setting method, see the Set-value (SV) setting method for the 1-channel display type.

4-channel display type

Measured-values (PV) and set-values (SV) corresponding to 4 channels are displayed.

*The method of setting each set-value (SV) for the 4-channel display type is basically the same as for the 1-channel display type. For the setting method, see the Set-value (SV) setting method for the 1-channel display type.
For the 8-channel display type, only measured values (PV) are displayed.

**NOTE**

Change the set-value for the 8-channel display type on the setting screen. For the setting method, see "4.4.3 Setting screen" (P. 4-23).
MVH/MVC: Heating/cooling control output values display

1-channel display type

Heating/cooling control output values corresponding to one channel are displayed.

2-channel display type

Heating/cooling control output values corresponding to 2 channels are displayed.
### 4-channel display type

Heating/cooling control output values corresponding to 4 channels are displayed.

<table>
<thead>
<tr>
<th>Channel No. display</th>
<th>MENU switch</th>
<th>Cooling control output value (MVC) display</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Returns to Operation monitoring menu-screen</td>
<td>Heating control output value (MVH) display</td>
</tr>
<tr>
<td>Hidden switch A</td>
<td>If this key is pressed while an alarm occurs, the alarm monitoring screen is displayed.</td>
<td>PARA switch</td>
</tr>
<tr>
<td></td>
<td>Every time this switch is pressed, each item changes.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F1 switch (U1)</th>
<th>Every time this switch is pressed, the unit (REX-B850) display is selected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2 switch (CH)</td>
<td>Every time this switch is pressed, the channel Nos. currently displayed change in steps of 4 channels.</td>
</tr>
</tbody>
</table>

Current memory area number display
ALM1/ALM2: First and second alarm outputs display

1-channel display type

The 1st or 2nd alarm status corresponding to one channel are displayed. If an alarm occurs, ON is displayed to the side of ALM1 or ALM2.

2-channel display type

The 1st or 2nd alarm status corresponding to 2 channels are displayed. If an alarm occurs, ON is displayed in the ALM1 or ALM2 column.
### 4-channel display type

The 1st or 2nd alarm status corresponding to 4 channels are displayed. If an alarm occurs, ON is displayed in the ALM1 or ALM2 column.

<table>
<thead>
<tr>
<th>Channel No. display</th>
</tr>
</thead>
<tbody>
<tr>
<td>MENU switch</td>
</tr>
<tr>
<td>Returns to Operation monitoring menu screen</td>
</tr>
<tr>
<td>Hidden switch A</td>
</tr>
<tr>
<td>If this key is pressed while an alarm occurs, the alarm monitoring screen is displayed.</td>
</tr>
</tbody>
</table>

**F1 switch (U1)**

Every time this switch is pressed, the unit (REX-B850) display is selected.

**F2 switch (CH)**

Every time this switch is pressed, the channel Nos. currently displayed change in steps of 4 channels.

**Second alarm (ALM2) status display**

At alarm occurrence: "ON" display

**First alarm (ALM1) status display**

At alarm occurrence: "ON" display

**PARA switch**

Every time this switch is pressed, each item changes.

**Current memory area number display**
BO/HBA: Burnout and Heater break alarm outputs display

1-channel display type

The burnout or heater break alarm status corresponding to one channel are displayed. If an error occurs, the error message is displayed to the side of BO or HBA.

2-channel display type

The burnout or heater break alarm status corresponding to 2 channels are displayed. If an error occurs, the error message is displayed in the BO or HBA column.
4-channel display type

The burnout or heater break alarm status corresponding to 4 channels are displayed. If an error occurs, the error message is displayed in the BO or HBA column.

Channel No. display

MENU switch
Returns to Operation monitoring menu screen

Hidden switch A
If this key is pressed while an alarm occurs, the alarm monitoring screen is displayed.

F1 switch (U1)
Every time this switch is pressed, the unit (REX-B950) display is selected.

F2 switch (CH)
Every time this switch is pressed, the channel Nos. currently displayed change in steps of 4 channels.

Heater break alarm (HBA) status display
At heater break occurrence: "HBA" display
At weld relay contact occurrence: "WRC" display

Burnout (BO) status display
At burnout occurrence: "BO" display
At burndown occurrence: "BD" display

PARA switch
Every time this switch is pressed, each item changes.

Current memory area number display

4 - 19
CT/HBA: CT input value and HBA set—value display

1—channel display type

CT input values and HBA set—values corresponding to one channel are displayed.

* If REX—B850 is not provided with the CT input, "-----" is displayed on the screen.

2—channel display type

CT input values and HBA set—values corresponding to 2 channels are displayed.

* If REX—B850 is not provided with the CT input, "-----" is displayed on the screen.
4-channel display type

CT input values and HBA set-values corresponding to 4 channels are displayed.

- Channel No. display
- MENU switch: Returns to Operation monitoring menu screen
- Hidden switch A: If this key is pressed while an alarm occurs, the alarm monitoring screen is displayed.
- F1 switch (U1): Every time this switch is pressed, the unit (REX-B850) display is selected.
- F2 switch (CH): Every time this switch is pressed, the channel Nos. currently displayed change in steps of 4 channels.
- Heater break alarm (HBA) set-value display
- Current transformer (CT) input value display
- PARA switch: Every time this switch is pressed, each item changes.
- Current memory area number display

* If REX-B850 is not provided with the CT input, "---" is displayed on the screen.
NOTES

- If the number of REX-B850 used is 1, the unit No. select switch (F1 switch) is invalid.
- Channels which are not in use are displayed as "----". (Except the display of channel Nos.)
- The operation monitoring screen is scanned only on the CH display screen selected from the operation monitoring menu screen. (A screen whose CH display differs is not scanned.)
- When the power is turned on again, the screen set by OPL initialize "Channel No. displayed on the operation monitoring setting" screen is displayed. For this setting, see the Supplementary manual for OPL initialize.
- Even if there are two or more display resolutions (1 °C/°F and 0.1 °C/°F), the relevant data items are displayed on the operation monitoring screen. However, data items in temperature engineering units of °C/°F cannot be displayed on the above screen.
- If an alarm (burnout alarm, heater break alarm, 1st alarm or 2nd alarm) occurs in any of the used channels when Operation monitoring screen is displayed, the alarm message screen appears.

Alarm message screen

*For messages displayed on the alarm message screen and screen details, see "4.4.6, Alarm message screen" (P. 4-63).

*The details of alarm message screen display/no-display can be changed. For details on these changes, see "4.4.5 Initialize setting screen" (P. 4-46)
4.4.3 Setting screen

The setting screen is used to set the temperature set-value, alarm set-value and control related parameters. To call each setting screen, press the F2 switch on the operation menu screen to display the setting menu screen. On the setting screen, the screen display items can be selected for each parameter.

For the setting method, see "1.10 Display lock level setting screen" in the Supplementary Manual for OPL initialize/controller initialize.

**Calling procedure**

F2: Pressing the F2 switch  
F3: Pressing the F3 switch  
F4: Pressing the F4 switch  
MENU: Pressing the MENU switch  
PARA: Pressing the PARA switch  
*: The simultaneous setting is enabled.
Display details

Setting menu screen

- **MENU switch**: Returns to Operation menu screen.
- **F4 switch (Open)**: If this switch is pressed after selecting the item, a screen for setting the selected item is displayed.
- **F2 switch (⇒), F3 switch (⇐)**: Any item which is to be called up can be selected.

Each setting screen

Each setting screen is shown below.

- **Channel No. or name display**
- **F1 switch (U1)**: Every time this switch is pressed, the unit (REX-B850) display is selected.
- **MENU switch**: Returns to the setting menu screen.
- **F2 switch (CH)**: Every time this switch is pressed, the channel Nos. currently displayed change in steps of 1, 2, 4 or 8 channels.
- **Setting display**
- **Current memory area number display**
- **F4 switch (Set.)**: Pressing this switch changes to the following screen.
- **PARA switch**: Every time this switch is pressed, each item changes.

Press the F4 switch (Set.).

- **Channel No. or name display**
- **MENU switch**: Pressing this switch returns to the above screen.
- **Hidden switch A**: Pressing this switch once changes to CH→ALL, and pressing it again returns to CH. (Used for simultaneous setting)
- **F1 switch (⇐)**: Every time this switch is pressed once, the cursor move to the left.
- **F2 switch (⇒)**: Every time this switch is pressed, the set - value decrements.
- **F3 switch (⇐)**: Every time this switch is pressed, the set - value increments.
- **F4 switch (ENT)**: The set set - value can be registered. The cursor moves to the next channel.
Setting procedure

Method of changing the settings

Example: Change the temperature in channel 1 of Unit 1 (U1) to 1000 °C from 0 °C.

1. Call up any item whose setting is to be changed, select the desired unit by pressing the F1 switch(U1) and the desired channel by pressing the F2 switch(CH), then press the F4 switch(Set.).

2. First press the F1 switch(←) once to move the cursor to the 1st digit.

3. Next, move the cursor to digit to which the desired set-value is to be set by pressing the F1 switch(←), then set the value by pressing the F2(→) or F3(←) switch.

4. Press the F4 switch(ENT) after entering the set-value to save it.

   Set-value save completed—The cursor moves to the next channel automatically.

   Set-value save rejected—The set-value returns to the value before the save. (The cursor position remains unchanged.)
NOTES

- Use set-values conforming to the REX-B850 specification.
- When "Computer mode" is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.
- If an invalid numeric value is entered and then registered, it automatically returns to the previous numeric value and is inversely displayed.
  (Example: When trying to input a set-value of 800 °C in the REX-B850 with a range of 0 to 400 °C.)
- If the number of REX-B850 used is 1, the unit No. select switch (F1 switch) is invalid.
Simultaneous setting procedure (For each unit)

All of the same items on the selected unit (REX-B850) can be set to the same numeric value.

1. Call up the item whose setting need to be changed: select the units to be simultaneously set by pressing the F1 switch (U1) then press the F4 switch (Set).

2. Pressing the hidden switch A once changes the CH display at the top left to ALL.

3. In the same way as the normal setting procedure, press the F1 switch (→) once to move the cursor to the 1st digit.

4. Next, move the cursor to the digit to which the desired set-value is to be set by pressing the F1 switch (←), then set the set-value by pressing the F2 ( ) or F3 ( ) switch. (The example in the figure at the left is when the set-value is set to 1000°C.)

5. Press the F4 switch (ENT) after entering the set-value to save it. As a result, the set values of all the channels in the unit selected in Step 1 become the same value.

- Set-value save completed – The cursor moves to the next channel automatically.
- Set-value save rejected – The set-value returns to the value before the save. (The cursor position remains unchanged.)
Chapter 4 OPERATING PROCEDURE

NOTES

- Use set-values conforming to the REX-B850 specification.

- When "Computer mode" is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.

- If an invalid numeric value is entered and then registered, it automatically returns to the previous numeric value and is inversely displayed.
  (Example: When trying to input a set-value of 800 °C in the REX-B850 with a range of 0 to 400 °C.)

- If the number of REX-B850 used is 1, the unit No. select switch (F1 switch) is invalid.

- The simultaneous setting function is activated for each unit (REX-B850).

- To suspend simultaneous setting, press the hidden switch A to change the display "form ALL to CH".

- When set-values with a decimal point are mixed with those without a decimal point, note that the result of simultaneous setting may become as shown in the following figure.

Example: Set-values are set to 200.5 °C.

First change CH to ALL by pressing the hidden switch A, then set the set-value by pressing the F2(▼) or F3(▲) switch.

If the set-value is saved by pressing the F4 switch(ENT), for the set-value without a decimal point, the figures after the decimal point is omitted.
Each setting screens

Temperature set-value setting screen

- Setting range: Within input range
- Setting prior to factory shipment: 0.0

First alarm set-value setting screen

- Setting range: Within input range or span range
- Setting prior to factory shipment: 50.0

Second alarm set-value setting screen

- Setting range: Within input range or span range
- Setting prior to factory shipment: -50.0

Heating-side proportional band setting screen

- Setting range: 0.0 to 1000.0% (Heating control)
  0.1 to 1000.0% (Heating/cooling control)
- Setting prior to factory shipment: 3.0
**Cooling - side proportional band setting screen**

Setting range: 0.1 to 1000.0%
Setting prior to factory shipment: 3.0

* Setting will be invalid in ON/OFF action or heating action.

**Integral time setting screen**

Setting range: 0 to 3600 second (Heating control)
1 to 3600 second (Heating/cooling control)
Setting prior to factory shipment: 240

**Derivative time setting screen**

Setting range: 0 to 3600 second
Setting prior to factory shipment: 60

**Overlap/Deadband setting screen**

Setting range: -10.0 to +10.0%
Setting prior to factory shipment: 0.0