

**EYELA**

Vacuum constant  
temperature  
dryer

Vacuum dry oven

Model VOS-452SD  
Model VOS-602SD

## Panel key operation manual



Important

This manual is designed to use this unit safely with the best performance.

**Please read this manual carefully, especially  
on “Safety precautions” before use.**

Keep this instruction manual beside the unit.

Thank you for choosing  
**EYELA**  
 Product.

## ■ Introduction

This panel key operation manual describes the panel key operation procedures for  
 Vacuum dry oven  
 VOS-452SD  
 VOS-602SD.

Read through and understand the instructions contained in this manual before using the unit.

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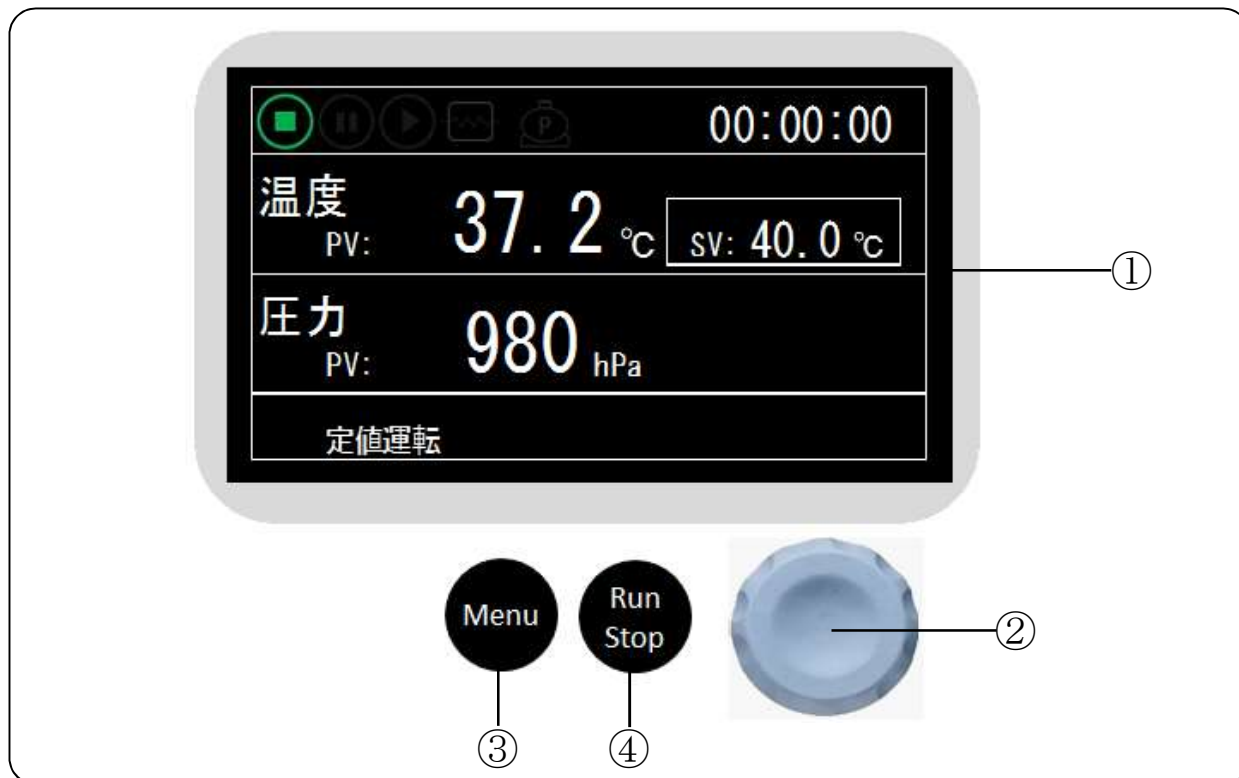
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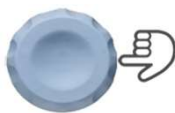


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※The control programs are subject to be updated without notice for the improvement of the product.

# 1 Names and Functions of Panel Keys

## 1-1 Control panel



No.	Name	Function
①	Display	Display information according to operations. [Main Screen] is displayed in the figure shown above.
②	Dial Key Turn  Press 	[When selecting] By turning: Items to be selected are changed. By pressing: The selected item is fixed.  [When changing] The value is changed by turning it. The selected value is fixed by pressing it. [When an alarm message is displayed] The message is cleared by pressing it.
③	[Menu] Key 	[When the main screen is displayed] Display the menu screen by pressing the key. [When selecting] Return to the previous screen by pressing the key. [When changing] (before pressing the key) Return to the previous value by pressing the key.
④	[Run/Stop] Key 	If this key is pressed while the main screen is displayed, temperature control starts or stops.  Temperature control does not start when an alarm occurs.

## 1-2 Display



No.	Name	Function
①	Operating status icon	Display an icon according to operating status of the unit. ※1
②	Heater icon	Display it when the heater is on.
③	Measured temperature Temp.PV	Display the current internal temperature. The color of the text changes depending on the status. White: When temp. control is stopped (Stop) or paused (Pause) Red: When an alarm occurs. Yellow: When the displayed temp. does not reach the set temp. after starting temp. control. Green: When the displayed temp. reaches the set temp. after starting temp. control.
④	Auto-start icon	The display changes according to temperature control status. Lighting display: When Auto-start is enabled while temp. control is stopped. Blinking display: Auto-start is running. Nothing is displayed in cases other than the above-mentioned status.
⑤	Timer display (Counting display)	During Auto-start: Display the remaining time until the operation starts. (hr: min: sec) Fixed value operation: Display the elapsed time. 24-hour cycle operation: Display the elapsed time (cleared after elapsing 24 hours). Program operation: Display the remaining time of the current step.
⑥	Priority control display	Display the priority control (temperature priority/time priority) of the current step when Program operation is set.
⑦	Set temperature Temp.SV	Display the set temperature which is currently set. The range of the set temperature varies depending on models.
⑧	Measured pressure Prss.PV	Display the current internal pressure. Normally it is displayed in white characters, and in red when an error occurs.
⑨	Operation lock icon	Indicate the status that the operation is locked.
⑩	Temperature control mode Status display	Display the temperature control mode which is currently set. Display the status of error detection, etc. ※2
⑪	Step display	Display the number of the running step and the total number of steps when Program operation or 24-hour cycle operation is set. 0 is displayed for the running step when temperature control is stopped.
⑫	Display of number of runs	Display the number of runs in temperature control mode and the number of repetitions when Program operation or 24-hour cycle operation is set. 0 is displayed for the number of runs during standby. The maximum number for displaying is 99. 99 is displayed even when the number of runs exceeds 99 times.

※Two types of language, [English] and [Japanese] are available for display.

In this manual, all instructions are explained using the [Japanese] screen.

### ① Operation status icon (\*1)

Stop :



Pause :



Run :



[Pause] is displayed in the following cases:

- Auto-start is running.
- Door is opened during controlling temperature.
- Temperature control is paused.  
→ step sections for which no target temperature to be controlled is set




### Step

“Step” means a process of the program, which are executed in order from Step 1. After the temperature is controlled at the set temperature and the time condition is satisfied, it proceeds to the next step.



### Number of repetitions

The number of runs can be set in Program operation and 24-hour cycle operation. The relationship between the set number of repetitions and the number of runs is as follows:

- Run once (no repetition)  
Set number of repetitions → 1
- Run between 2 and 99 times  
Set number of repetitions → 2 to 99
- Repeat until the control is stopped by  key  
Set number of repetitions → ∞



### Alarm code

Alarm codes means codes which are assigned to each alarm type. For details, refer to [5. Alarm Function].

### ⑩ Temperature control mode & Status display (\*2)

[Temperature control mode]

Fixed value operation:

Fixed value operation

Program operation:

Program \*

24-hour cycle operation:

24-hour operation

Program\* :

Eight sets (programs 1 to 8) can be set in Program operation.

[Status]

During Auto-start:

Auto start

Door is open during controlling temp.

Door open

Temperature control is paused:

Pause

Alarm occurs:

F-0

Temperature control finished:

Finish

When the unit is in the above-mentioned state, “temperature control mode” or “state” is displayed alternately.

When an alarm occurs, “operation mode” or “alarm code” is displayed alternately.



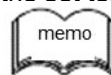
### Temperature priority control

Temperature priority control is a control which enables to keep the set temperature for a set time after the measured temperature reaches the set temperature.



### Time priority control

Time priority control is a control which enables to switch to the next step after elapsing the set time. The temp. is controlled to keep the set temp. during the period of the set time, and the set time includes the time for rising and falling of temp. until reaching the set temp.



### Termination of temp. control

This means that temp. control are finished after the actual number of runs reaches the number of repetitions set in Program operation or 24-hour cycle operation.



### Set temperature range



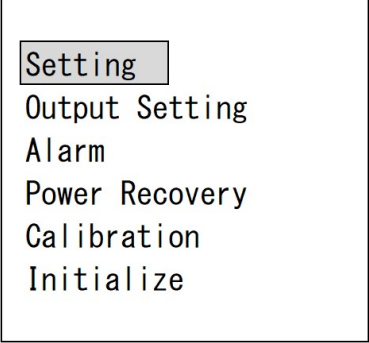


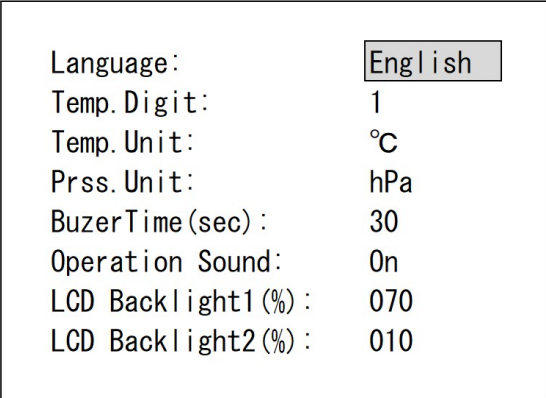
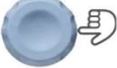

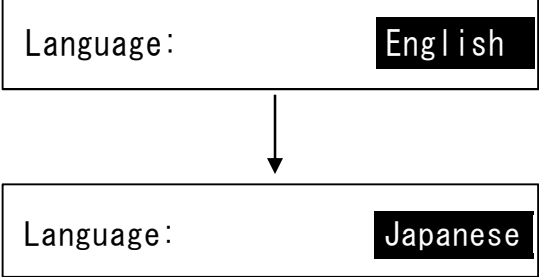
The lower and upper limits of the set temperature range vary depending on models.




# 1-3 Operation

Here, how to change the settings of the unit is explained using "Change the display language to [Japanese]" as an example.

Other settings can be changed in the same way.

## [Setting to Japanese]

	CHECK/OPERATION	DISPLAY
①	<p>Press  Menu key while the main screen is displayed. The menu screen is displayed. The selected [Item] is surrounded by a black frame and displayed in [Text Color: Black]/[Background Color: Light blue].</p> <p>[Setting] is selected in the picture on the right. If any items other than [Setting] are selected, turn  the Dial key to select [Setting].</p>	
②	<p>Press  the Dial key to display the setting screen.</p> <p>The selected [Set value] is surrounded by a black frame and displayed in [Text color: Black]/[Background color: Light blue].</p> <p>[Language:English] is selected in the picture on the right. If any items other than [Language] are selected, turn  the Dial key to select [Language].</p>	
③	<p>Press  the Dial key to change the [Language] setting. The set value which can be changed is surrounded by black frame and displayed in [Text color: Yellow]/[Background color: Black].</p> <p>Turn  the Dial key to display [Japanese].</p>	

	CHECK/OPERATION	DISPLAY
④	<p>Press  Dial key to change the [Language] setting from [English] to [Japanese].</p> <p>※The changed setting, [Japanese] in this case, is reflected from the next display.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>Language: <span style="border: 1px solid gray; padding: 2px;">Japanese</span></p> <p>Temp. Digit: 1</p> <p>Temp. Unit: °C</p> <p>Prss. Unit: hPa</p> <p>BuzzerTime(sec): 05</p> <p>Operation Sound: On</p> <p>LCD Backlight1(%): 070</p> <p>LCD Backlight2(%): 010</p> </div>
⑤	<p>Press  Menu key to display the menu screen in Japanese.</p>	<div style="border: 1px solid black; padding: 5px;"> <p><span style="border: 1px solid gray; padding: 2px;">設定</span></p> <p>出力設定</p> <p>アラーム</p> <p>電源復帰</p> <p>補正</p> <p>データ初期化</p> </div>
⑥	<p>Press  Menu key again to display the main screen.</p>	<div style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <p style="text-align: right;">00:30:00</p> <p>温度 PV: <span style="font-size: 2em;">37.2</span> °C <span style="border: 1px solid gray; padding: 2px;">SV: 40.0 °C</span></p> <p>圧力 PV: <span style="font-size: 2em;">980</span> hPa</p> <p style="text-align: center;">定値運転</p> </div>



### Reset setting



Even after you turn Dial key and change the set value,




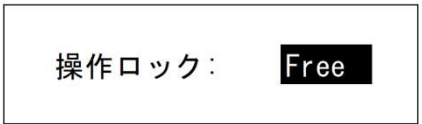

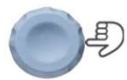
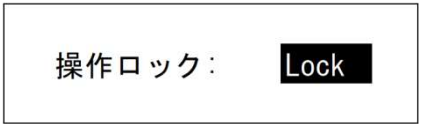
If you do not press Dial key,

The set value returns to the value before the change by pressing Menu key.

## 1-4 Operation lock

Operation lock function is possible to prevent misoperation.  
The setting can be checked even while the operation lock function is on.

### [Setting of operation lock]

	CHECK/OPERATION	DISPLAY
①	You can know whether the operation lock is ON or OFF in [Main Screen].	Display in the lower left of [Main screen].  The above icon is displayed when the operation lock is ON.
②	To set or cancel the operation lock, while [Main Screen] is displayed, Pressing and holding  Menu key, Turn  Dial key. [Operation Lock Setting Screen] is displayed.	
③	Turn  Dial key to change the operation lock setting.  In the figure on the right, the setting is changed from [Free (Unlocked)] to [Lock (Locked)].  Press  Dial key, and Fix the operation lock setting and display [Main Screen].  ※If no operation is performed for about 60 seconds, the operation lock setting is not reflected, and the screen returns to [Main Screen].	

※Even if the operation lock is ON,



Run/Stop key operation can be performed.



## 2 Temperature control

This product has three kinds of temperature control modes:

- Fixed value operation
  - Program operation
  - 24-hour cycle operation,
- as well as Auto-start function.

### 2-1 Fixed value operation

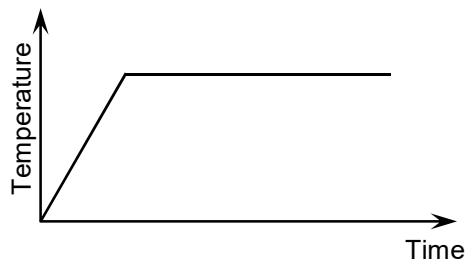
Any temperature to be controlled can be set, and continuous operation is performed at the preset temperature.

To start or stop the operation,





Press  the Run/Stop key



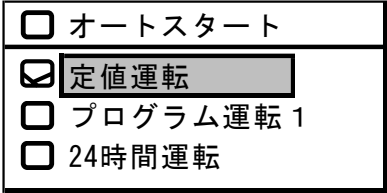

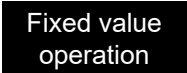





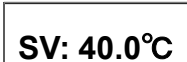




while [Main Screen] is displayed.

The set temperature can be also changed during controlling temperature.



#### [Setting of Fixed value operation]

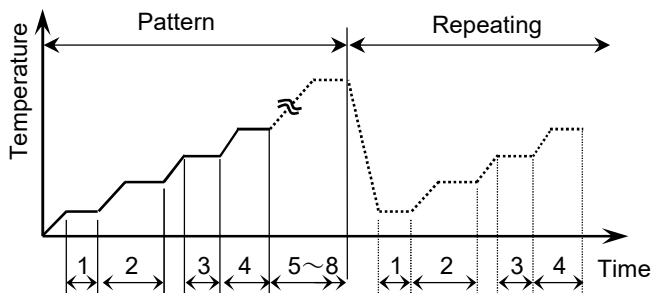
	CHECK/OPERATION	DISPLAY
	<p>In [Main screen] check whether the temperature control mode is set to [Fixed value operation].</p> <p>If any screens other than [Main screen] are displayed,</p> <p>① Press  Menu key until [Main screen] appears.</p> <p>If the temperature control mode is set to any modes other than Fixed value operation, change it to [Fixed value operation] through the procedure ②.</p>	<p>Display in the lower left of [Main screen].</p> <div style="border: 1px solid black; background-color: black; color: white; padding: 5px; text-align: center;">             Fixed value operation         </div>
	<p>Press  Dial key while the main screen is displayed.</p> <p>② [Temperature control mode selecting screen] appears.</p> <p>The temperature control mode which is currently set is indicated with  .</p> <p>In the figure on the right, [Program operation] is set and selected.</p>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> オートスタート  <input type="checkbox"/> 定値運転  <input checked="" type="checkbox"/> プログラム運転 1  <input type="checkbox"/> 24時間運転         </div>
	<p>Turn  Dial key to select [Fixed value operation].</p> <p>③</p>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> オートスタート  <input checked="" type="checkbox"/> 定値運転  <input checked="" type="checkbox"/> プログラム運転 1  <input type="checkbox"/> 24時間運転         </div>

	CHECK/OPERATION	DISPLAY
④	Press  Dial key.  [Fixed value operation] is indicated with  , and the operation mode changes from [program] to [Fixed value operation].	
⑤	Press  Menu key to return to [Main screen] and confirm that the temperature control mode is [Fixed value operation].	Display in the lower left in [Main screen].  
⑥	Turn  Dial key while the main screen is displayed.  The display of the set temperature changes from [text color in WHITE/background color in BLACK] to [text color in BLACK/background color in YELLOW], and then temperatures can be set.	 Text color: White Background color: Black    Text color: Black Background color: Yellow
	After that, turn  Dial key to the temperature to which you want to set.  Numerical values increase by turning it to the right and decrease to the left. The faster you turn it, the more the value increase or decrease. The figure on the right shows the result of changing the temperature from 40.0°C to 100.0°C.	   
	If the temperature to which you want to set is displayed,  Press  Dial key.  The set temperature is updated.	 Text color: White Background color: Black

## 2-2 Program operation

Temperature control is performed in a combination with temperature and time using 8 steps at a maximum. Priority control (for temperature and time) can be set for each step.






The preset program is operated repeatedly as many times as the preset number of times (up to 99 times). Eight programs can be saved at a maximum. Those programs can be referred but cannot be changed during Auto-start or controlling temperature.



(1)(3): Temperature priority  
(2)(4): Time priority

### [Program operation setting]

	CHECK/OPERATION	DISPLAY						
①	<p>Press  Menu key while [Main Screen] is displayed. [Temperature control mode selecting screen] is displayed.</p> <p>※When temperature control is in progress under Program operation, the active [⑤ Program operation checking screen] is displayed.</p>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> オートスタート  <input checked="" type="checkbox"/> 定値運転  <input type="checkbox"/> プログラム運転 1  <input type="checkbox"/> 24時間運転         </div> <p>The number of the preset Program operation</p>						
②	<p>Select [ Operation *] and press  Dial key.</p> <p>[Program selecting screen] is displayed.</p> <p>In the figure on the right, [Program 1] is set and selected.</p>	<div style="border: 1px solid black; padding: 5px;"> <input checked="" type="checkbox"/> プログラム 1  <input type="checkbox"/> プログラム 2  <input type="checkbox"/> プログラム 3  <input type="checkbox"/> プログラム 4  <input type="checkbox"/> プログラム 5  <input type="checkbox"/> プログラム 6         </div>						
③	<p>Turn  Dial key and select a Program No. to be run, and then press  Dial key.</p> <p>[Program setting screen] is displayed. [Program 2] is selected in the figure on the right. Set the following items.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Item</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Number of steps</td> <td>1~8</td> </tr> <tr> <td>Number of repetitions</td> <td>01~99 ∞</td> </tr> </tbody> </table> <p>※When the number of repetitions is set to [∞], temperature control continues until  Run/Stop key is pressed.</p> <p>Press  Menu key or select [Back], and then press  Dial key to return to [② Program selecting screen] of the previous screen.</p> <p>Turn  Dial key and select [Next], and press  Dial key to move to the next setting.</p>	Item	Setting	Number of steps	1~8	Number of repetitions	01~99 ∞	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>プログラム2</p> <p>ステップ数: <input style="width: 30px; text-align: center;" type="text" value="8"/></p> <p>繰り返し回数: <input style="width: 30px; text-align: center;" type="text" value="01"/></p> <p style="text-align: center;">戻る      次へ</p> </div> <div style="text-align: center; font-size: 2em; font-weight: bold;">↓</div> <div style="border: 1px solid black; padding: 5px;"> <p>プログラム2</p> <p>ステップ数: <input style="width: 30px; text-align: center;" type="text" value="8"/></p> <p>繰り返し回数: <input style="width: 30px; text-align: center;" type="text" value="01"/></p> <p style="text-align: center;">戻る      <input style="width: 30px; text-align: center;" type="text" value="次へ"/></p> </div>
Item	Setting							
Number of steps	1~8							
Number of repetitions	01~99 ∞							

	CHECK/OPERATION	DISPLAY																																																										
	<p>[Step Setting Screen] is displayed.</p> <p>Set the following items for each step.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>SV(°C) Set temp.</td> <td>40.0~: Set temp. range for each model --: No setting</td> </tr> <tr> <td>T(HH:MM) Set time</td> <td>00:00 to 99:59 (hr: min)</td> </tr> <tr> <td>Priority control</td> <td>Temp: Give priority to temp. Time: Give priority to time</td> </tr> </tbody> </table> <p>④ ※Temperature control is not performed (paused) in the section where the set temperature is set to [-] (pause). In this case, temp. is controlled giving the priority to time.</p> <p>Press  Menu key, or select [Back] and press  Dial key to return to the previous screen, [③ Program setting screen]. Repeat this process until [Main screen] comes out.</p>	Item	Setting	SV(°C) Set temp.	40.0~: Set temp. range for each model --: No setting	T(HH:MM) Set time	00:00 to 99:59 (hr: min)	Priority control	Temp: Give priority to temp. Time: Give priority to time	<table border="1"> <thead> <tr> <th colspan="5">戻る</th> </tr> <tr> <th>No.</th> <th>SV (°C)</th> <th>T (HH:MM)</th> <th colspan="2">優先</th> </tr> </thead> <tbody> <tr><td>1</td><td>40.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>2</td><td>50.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>3</td><td>60.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>4</td><td>70.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>5</td><td>80.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>6</td><td>90.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>7</td><td>100.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>8</td><td>110.0</td><td>01:00</td><td colspan="2">Time</td></tr> </tbody> </table> <p>プログラム 2</p>	戻る					No.	SV (°C)	T (HH:MM)	優先		1	40.0	01:00	Temp		2	50.0	01:00	Time		3	60.0	01:00	Temp		4	70.0	01:00	Time		5	80.0	01:00	Temp		6	90.0	01:00	Time		7	100.0	01:00	Temp		8	110.0	01:00	Time	
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7	100.0	01:00	Temp																																																									
8	110.0	01:00	Time																																																									
	<p>Press  Dial key while temperature control is in progress under Program operation to check the current setting of the active Program operation.</p> <p>⑤ If  Menu key or  Dial key is pressed, or after 60 seconds elapse, the screen returns to [Main Screen].</p>	<table border="1"> <thead> <tr> <th>No.</th> <th>SV (°C)</th> <th>T (HH:MM)</th> <th colspan="2">優先</th> </tr> </thead> <tbody> <tr><td>1</td><td>40.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>2</td><td>50.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>3</td><td>60.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>4</td><td>70.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>5</td><td>80.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>6</td><td>90.0</td><td>01:00</td><td colspan="2">Time</td></tr> <tr><td>7</td><td>100.0</td><td>01:00</td><td colspan="2">Temp</td></tr> <tr><td>8</td><td>110.0</td><td>01:00</td><td colspan="2">Time</td></tr> </tbody> </table> <p>PV (°C) : 45.4</p> <p>ステップ : 1/8</p> <p>回数 : 01/01</p> <p>プログラム 2</p> <p>※The setting cannot be changed while Program operation is active.</p>	No.	SV (°C)	T (HH:MM)	優先		1	40.0	01:00	Temp		2	50.0	01:00	Time		3	60.0	01:00	Temp		4	70.0	01:00	Time		5	80.0	01:00	Temp		6	90.0	01:00	Time		7	100.0	01:00	Temp		8	110.0	01:00	Time														
No.	SV (°C)	T (HH:MM)	優先																																																									
1	40.0	01:00	Temp																																																									
2	50.0	01:00	Time																																																									
3	60.0	01:00	Temp																																																									
4	70.0	01:00	Time																																																									
5	80.0	01:00	Temp																																																									
6	90.0	01:00	Time																																																									
7	100.0	01:00	Temp																																																									
8	110.0	01:00	Time																																																									

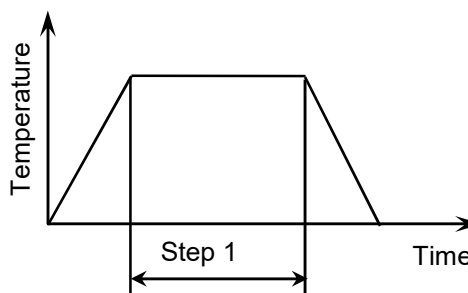


## Auto-stop

Auto-stop operation is possible under setting as shown below.

Number of steps : 1

Number of repetitions: 1

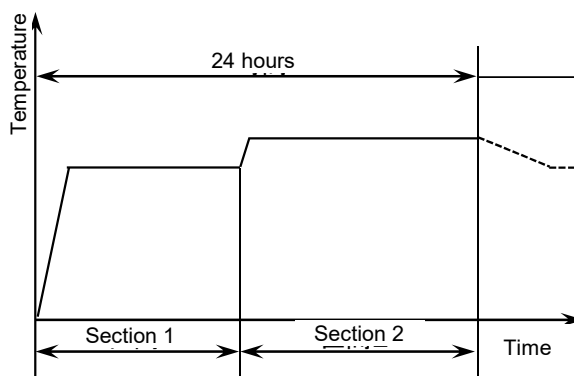


## 2-3 24-hour cycle operation




When a temperature and time is set in Section 1 and a temperature is also set in Section 2, the operation is repeated under the setting of Section 1 and Section 2 in 24-hour cycle. (up to 99 times)

The time until the temp. inside the chamber reaches the set temp. is also included in the set time (time priority).

Those settings can be referred but cannot be changed during Auto- start or controlling temp.

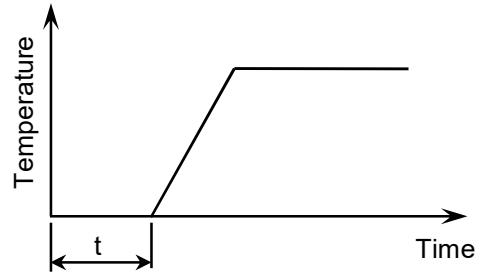


### [24-hour cycle operation setting]

	CHECK/OPERATION	DISPLAY															
①	<p>Press  Dial key while [Main Screen] is displayed.</p> <p>The active [② 24-hour cycle operation setting screen] is displayed while 24-hour cycle operation is running. [Temperature control mode selecting screen] is displayed when the operation is stopped.</p>	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> オートスタート  <input checked="" type="checkbox"/> 定値運転  <input type="checkbox"/> プログラム運転 1  <input type="checkbox"/> 24時間運転                 </div>															
②	<p>After [Temperature control mode selecting screen] is displayed, select [24-hour operation] and press  Dial key.</p> <p>[24-hour cycle operation setting screen] is displayed. Set the following items.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>24時間運転</p> <p>区間1 (°C): <span style="border: 1px solid black; padding: 2px;">40.0</span></p> <p>区間2 (°C): <span style="border: 1px solid black; padding: 2px;">--</span></p> <p>区間1時間 (時:分): 12:00</p> <p>繰り返し回数: 01</p> </div>															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Section 1 (°C)</td> <td>Set temperature for Section 1</td> <td>40.0~:Set temperature range for each model -- :No setting for temperature</td> </tr> <tr> <td>Section 2 (°C)</td> <td>Set temperature for Section 2</td> <td>40.0~:Sett temperature range for each model -- : No setting for temperature</td> </tr> <tr> <td>Time for Section 1 (hour: minute)</td> <td>Set time for Section 1</td> <td>00:00~23:59</td> </tr> <tr> <td>Number of repetitions</td> <td></td> <td>01~99 ∞</td> </tr> </tbody> </table>	Item	Description	Setting	Section 1 (°C)	Set temperature for Section 1	40.0~:Set temperature range for each model -- :No setting for temperature	Section 2 (°C)	Set temperature for Section 2	40.0~:Sett temperature range for each model -- : No setting for temperature	Time for Section 1 (hour: minute)	Set time for Section 1	00:00~23:59	Number of repetitions		01~99 ∞	
Item	Description	Setting															
Section 1 (°C)	Set temperature for Section 1	40.0~:Set temperature range for each model -- :No setting for temperature															
Section 2 (°C)	Set temperature for Section 2	40.0~:Sett temperature range for each model -- : No setting for temperature															
Time for Section 1 (hour: minute)	Set time for Section 1	00:00~23:59															
Number of repetitions		01~99 ∞															
	<p>※</p> <ul style="list-style-type: none"> <li>• The setting cannot be changed while 24-hour cycle operation is running.</li> <li>• Temperature control is not performed (paused) in the sections where the set temperature is set to [--].</li> <li>• The time for Section 2 is calculated by (24 hours minus time for Section 1).</li> <li>• Temperature control is performed giving the priority to time.</li> <li>• When the number of repetitions is set to [∞], temperature control continues until</li> </ul>																
	<p> Run/Stop key is pressed.</p>																

## 2-4 Auto-start

When the time until starting the operation (t) is set, the operation starts after the preset time elapses.  
 If the internal pressure is still high even after the preset time elapses, the operation does not start until the internal pressure becomes normal (almost same as atmospheric pressure or less).  
 Auto-start can be combined with all the other temperature control modes.



### [Auto-start setting]

	CHECK/OPERATION	DISPLAY						
①	<p>The setting of Auto-start can be checked from [Main Screen].</p> <p>[During stopping temp. control]</p> <ul style="list-style-type: none"> <li>• Auto-start setting: Disable/Enable</li> <li>• Auto-start time: 00:00 to 23:59(Hr: Min)</li> </ul> <p>[During Auto-start]</p> <ul style="list-style-type: none"> <li>• Time until starting temperature control</li> </ul> <p>※The setting of Auto-start cannot be checked while temperature control is in progress.</p>	<p>Display in the upper right of [Main screen].</p> <p>①Auto-start setting: When the temperature control setting is enabled,</p> <ul style="list-style-type: none"> <li>• Lighting display while temperature control is stopped</li> <li>• Blinking display during Auto-start</li> </ul> <p>②Auto-start time (hr: min: sec)</p> <p>When temperature control setting is enabled,</p> <ul style="list-style-type: none"> <li>• Auto-start time while temperature control is stopped</li> <li>• The remaining time before starting temperature control during Auto-start</li> </ul>						
②	<p>Press  Dial key while [Main Screen] is displayed to change the setting of Auto-start.</p> <p>[Temperature control mode selecting screen] comes out.</p> <p>※The setting of Auto-start cannot be changed during Auto-start or controlling temperature.</p>							
③	<p>Select [Auto START] and press  Dial key.</p> <p>[Auto start setting screen] is displayed. Set the following items.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Auto start</td> <td>Off: Disabled On : Enabled</td> </tr> <tr> <td>Time (Hr:Min)</td> <td>00:00~99:59</td> </tr> </tbody> </table> <p>Press  Menu key to return to the previous screen, [② Temperature control mode selecting screen].</p>	Item	Setting	Auto start	Off: Disabled On : Enabled	Time (Hr:Min)	00:00~99:59	
Item	Setting							
Auto start	Off: Disabled On : Enabled							
Time (Hr:Min)	00:00~99:59							

## 3 Display Correction

### 3-1 Temperature display correction

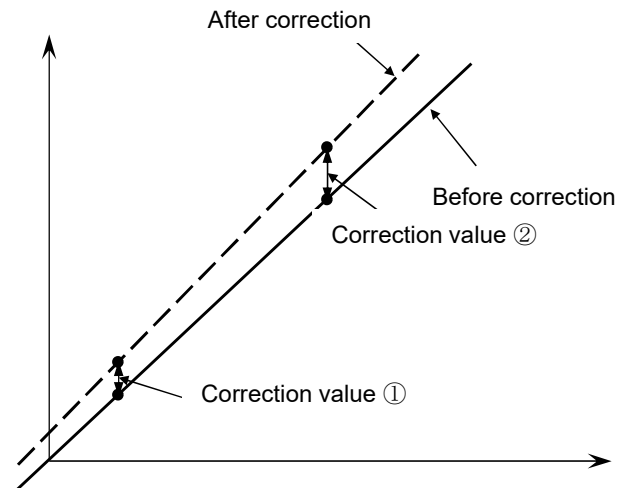
Temperature display correction function allows to correct the display of the temperature measured by temperature sensor through inputting two points.

The setting of temperature display correction cannot be changed but the preset values can be checked during controlling temperature or locking the operation.




#### Example)

Here, the correction method is explained using an example described below:

When the temp. measured by this unit is 21.2°C, and the temp. measured by a reference thermometer is 22.8°C, and the temp. measured by this unit is 60.5°C, and the temp. measured by a reference thermometer is 63.9°C.



#### [Temperature display correction setting]

	CHECK/OPERATION	DISPLAY									
①	Press  Menu key while [Main Screen] is displayed. [Menu] screen is displayed.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>									
②	Select [Correct] and press  Dial key.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>									
	[Correction selecting screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           温度2点補正            圧力2点補正         </div>									
③	Select [Temperature 2-point correction] and press  Dial key. [Temperature 2-point correction setting screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           温度2点補正(°C)           <table border="1" style="margin: 5px auto;"> <thead> <tr> <th></th> <th>補正前</th> <th>補正後</th> </tr> </thead> <tbody> <tr> <td>補正1</td> <td>40.0</td> <td>40.0</td> </tr> <tr> <td>補正2</td> <td>120.0</td> <td>120.0</td> </tr> </tbody> </table> </div>		補正前	補正後	補正1	40.0	40.0	補正2	120.0	120.0
		補正前	補正後								
補正1	40.0	40.0									
補正2	120.0	120.0									
	In the example, set each value as follows: <ul style="list-style-type: none"> <li>• "Before-correction" for "Correction 1" [40.0] → [21.2]</li> <li>• "After-correction" for "Correction 1" [40.0] → [22.8]</li> <li>• "Before-correction" for "Correction 2" [120.0] → [60.5]</li> <li>• "After-correction" for "Correction 2" [120.0] → [63.9]</li> </ul>										

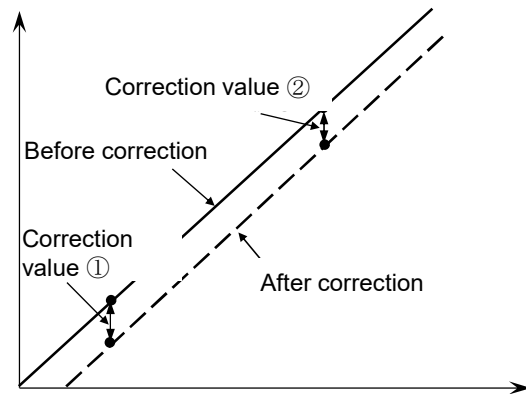
### 3-2 Pressure display correction

Pressure display correction function allows to correct the display of the pressure measured by pressure sensor through inputting two points. The setting of pressure display correction cannot be changed but the preset values can be checked during controlling temperature or locking the operation.




**Example)**

Here the correction method is explained using an example described below:

When the pressure measured by this unit is 10 hPa, and the pressure measured by a reference pressure gauge is 8 hPa, and the pressure measured by this unit is 980 hPa, the pressure measured by a reference pressure gauge is 979 hPa.



[Pressure display correction setting]

	CHECK/OPERATION	DISPLAY								
①	Press  Menu key while [Main Screen] is displayed. [Menu] screen is displayed.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>								
②	Select [Correct] and press  Dial key.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>								
	[Correction selecting screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           温度 2 点補正            圧力 2 点補正         </div>								
③	Select [Pressure 2-point correction] and press  Dial key. [Pressure 2-point correction setting screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           温度 2 点補正            圧力 2 点補正         </div>								
	In the example, set each value as follows: <ul style="list-style-type: none"> <li>• "Before-correction" for "Correction 1" [0] → [10]</li> <li>• "After-correction" for "Correction 1" [0] → [8]</li> <li>• "Before correction" for "Correction 2" [1000] → [980]</li> <li>• "After correction" for "Correction 2" [1000] → [979]</li> </ul>	<div style="border: 1px solid black; padding: 5px;">           圧力 2 点補正 (hPa)           <table border="1" style="margin: 10px auto;"> <thead> <tr> <th></th> <th>補正前</th> <th>補正後</th> </tr> </thead> <tbody> <tr> <td>補正1</td> <td>0</td> <td>0</td> </tr> <tr> <td>補正2</td> <td>1000</td> <td>1000</td> </tr> </tbody> </table> </div>		補正前	補正後	補正1	0	0	補正2	1000
	補正前	補正後								
補正1	0	0								
補正2	1000	1000								



### 4-1 Look & feel

The setting of "Look and Feel" can be changed, such as display language, LCD brightness, and the presence or absence of a buzzer.


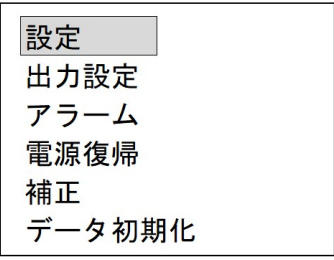



The setting cannot be changed but the set values can be checked during controlling temperature or locking the operation.



#### Look & Feel

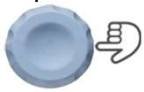
The overall impression of the appearance (look) such as the design, color, layout and typeface on the operating screen and the feeling of operation (feel) such as menus, buttons and responses, is called "Look & Feel".

#### [Look & Feel Setting]

	CHECK/OPERATION	DISPLAY																											
①	Press  Menu key while [Main Screen] is displayed. [Menu Screen] is displayed.																												
②	Select [SETTING] and press  Dial key. [Look & Field Setting Screen] is displayed. Set the following items. <table border="1" data-bbox="236 1081 898 2085"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Language</td> <td>Language to be displayed on LCD</td> <td>English/ Japanese</td> </tr> <tr> <td>Decimal point position for temperature</td> <td>Decimal point position for temperature display</td> <td>0: Not display numerical figures after decimal point 1: Display up to the first decimal place</td> </tr> <tr> <td>Temperature unit</td> <td>Unit for temperature display</td> <td>°C: Celsius °F: Fahrenheit</td> </tr> <tr> <td>Pressure unit</td> <td>Unit for pressure display</td> <td>hPa Torr</td> </tr> <tr> <td>Buzzer Time</td> <td>Duration of sounding buzzer</td> <td>(※1)</td> </tr> <tr> <td>Operating sound</td> <td>Presence or absence of switch operating sounds</td> <td>On Off</td> </tr> <tr> <td>LCD brightness 1</td> <td>LCD backlight brightness during normal use (*2)</td> <td>5~100%</td> </tr> <tr> <td>LCD brightness 2</td> <td>LCD Backlight brightness during standby (*2)</td> <td>5~100%</td> </tr> </tbody> </table>	Item	Description	Setting	Language	Language to be displayed on LCD	English/ Japanese	Decimal point position for temperature	Decimal point position for temperature display	0: Not display numerical figures after decimal point 1: Display up to the first decimal place	Temperature unit	Unit for temperature display	°C: Celsius °F: Fahrenheit	Pressure unit	Unit for pressure display	hPa Torr	Buzzer Time	Duration of sounding buzzer	(※1)	Operating sound	Presence or absence of switch operating sounds	On Off	LCD brightness 1	LCD backlight brightness during normal use (*2)	5~100%	LCD brightness 2	LCD Backlight brightness during standby (*2)	5~100%	 <p>(※1) How to set the duration of sounding the buzzer</p> <ul style="list-style-type: none"> <li>• 1 to 99 seconds</li> <li>• [--]: The buzzer does not sound.</li> <li>• [∞]: Press </li> </ul> <p>Dial key to stop the buzzer.</p> <p>(※2) If no operation is performed for approximately 120 seconds, the brightness of LCD backlight shifts from "Brightness 1" to "Brightness 2".</p> <p>After that, if the operation is performed or the temperature control setting is changed, the brightness of the LCD backlight shifts from "Brightness 2" to "Brightness 1".</p>
Item	Description	Setting																											
Language	Language to be displayed on LCD	English/ Japanese																											
Decimal point position for temperature	Decimal point position for temperature display	0: Not display numerical figures after decimal point 1: Display up to the first decimal place																											
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LCD brightness 2	LCD Backlight brightness during standby (*2)	5~100%																											

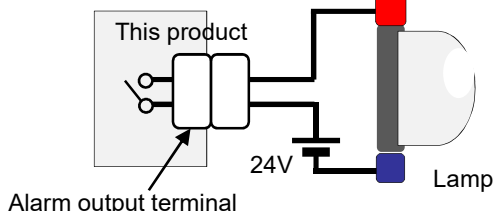
## 4-2 Alarm output

When safety functions, etc. is activated, errors can be output as alarm output to external devices. The alarm output is a relay contact output and is operated by latching operation. (Rated 250V/2A) The logic (short-circuit/open) of alarm output and the presence or absence of alarms can be set for each

alarm type. Press and hold  Dial key for 3 seconds or longer to cancel the alarm output


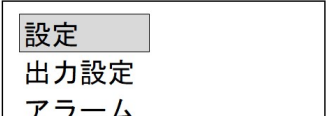

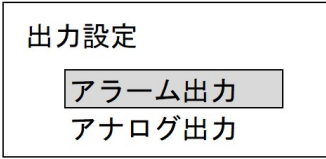

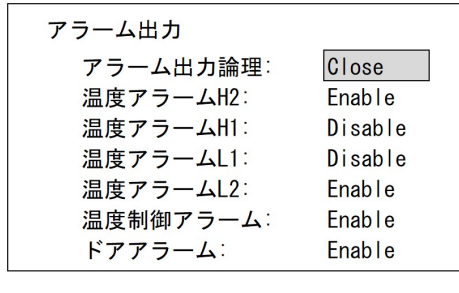
which is activated after an alarm occurs.

**e.g.) When a lamp (DC24V) is connected as a load to the alarm**



Alarm	Status of lamp	
	Normal mode	When the relevant alarms occur
Short circuit [Close]	Light off	Lighting
Opening [Open]	Lighting	Light off

### [Alarm output setting]

	CHECK/OPERATION	DISPLAY																								
①	Press  Menu key while [Main Screen] is displayed. [Menu Screen] is displayed.																									
②	Select [Output Settings] and press  Dial key. [Output Setting Selecting Screen] is displayed.																									
③	Select [Alarm Output] and press  Dial key.  [Alarm Output Setting Screen] is displayed. Set the following items.																									
	<table border="1"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Alarm output logic</td> <td>The logic of alarm output (See the above example.)</td> <td>Close: Short circuit Open : Open</td> </tr> <tr> <td>Temperature alarm H2</td> <td>Alarm output when temperature upper limit alarm 2 occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> <tr> <td>Temperature alarm H1</td> <td>Alarm output when temperature upper limit alarm 1 occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> <tr> <td>Temperature alarm L1</td> <td>Alarm output when temperature lower limit alarm 1 occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> <tr> <td>Temperature alarm L2</td> <td>Alarm output when temperature lower limit alarm 2 occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> <tr> <td>Uncontrollable temp. alarm</td> <td>Alarm output when the uncontrollable temperature alarm occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> <tr> <td>Door alarm</td> <td>Alarm output when the door alarm occurs</td> <td>Disable: Output disabled Enable : Output enabled</td> </tr> </tbody> </table>	Item	Description	Setting	Alarm output logic	The logic of alarm output (See the above example.)	Close: Short circuit Open : Open	Temperature alarm H2	Alarm output when temperature upper limit alarm 2 occurs	Disable: Output disabled Enable : Output enabled	Temperature alarm H1	Alarm output when temperature upper limit alarm 1 occurs	Disable: Output disabled Enable : Output enabled	Temperature alarm L1	Alarm output when temperature lower limit alarm 1 occurs	Disable: Output disabled Enable : Output enabled	Temperature alarm L2	Alarm output when temperature lower limit alarm 2 occurs	Disable: Output disabled Enable : Output enabled	Uncontrollable temp. alarm	Alarm output when the uncontrollable temperature alarm occurs	Disable: Output disabled Enable : Output enabled	Door alarm	Alarm output when the door alarm occurs	Disable: Output disabled Enable : Output enabled	
	Item	Description	Setting																							
	Alarm output logic	The logic of alarm output (See the above example.)	Close: Short circuit Open : Open																							
	Temperature alarm H2	Alarm output when temperature upper limit alarm 2 occurs	Disable: Output disabled Enable : Output enabled																							
	Temperature alarm H1	Alarm output when temperature upper limit alarm 1 occurs	Disable: Output disabled Enable : Output enabled																							
	Temperature alarm L1	Alarm output when temperature lower limit alarm 1 occurs	Disable: Output disabled Enable : Output enabled																							
	Temperature alarm L2	Alarm output when temperature lower limit alarm 2 occurs	Disable: Output disabled Enable : Output enabled																							
Uncontrollable temp. alarm	Alarm output when the uncontrollable temperature alarm occurs	Disable: Output disabled Enable : Output enabled																								
Door alarm	Alarm output when the door alarm occurs	Disable: Output disabled Enable : Output enabled																								

• Refer to [5. Alarm functions] for the details of each alarm.  
• If any alarms which are not listed on the above table occur, the alarm output is always enabled.

### 4-3 Analog output

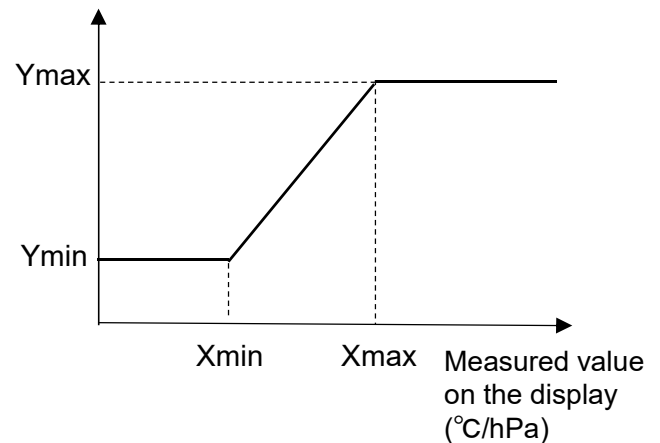
Voltage corresponding to either the measured temperature or the measured pressure can be output. The voltage range is 0 to 8000 mV.

These settings cannot be changed but the setting values can be checked during controlling temperature or locking the operation.

Example)




- Output interlock : Temperature
- Minimum temperature (Xmin) : 40.0°C
- Maximum temperature (Xmax): 200.0°C
- Minimum output (Ymin) : 0 mV
- Maximum output (Ymax) : 8000 mV

Analog output (mV)



With this setting, 0 mV is output when the temperature is 40°C or less, or 8000 mV is output when the temperature is 200°C or higher, and the voltage proportional to the temperature of 50 mV/°C is output in the range of 40°C to 200°C.

#### [Analog output setting]

	CHECK/OPERATION	DISPLAY																								
①	Press  Menu key while [Main Screen] is displayed. [Menu Screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>																								
②	Select [Output Settings] and press  Dial key. [Output Setting Selecting Screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           出力設定            アラーム出力            アナログ出力         </div>																								
③	Select [Analog Output] and press  Dial key. [Analog Output Setting Screen] is displayed. Set the following items.	<div style="border: 1px solid black; padding: 5px;">           アナログ出力            出力連動: <span style="border: 1px solid black; padding: 2px;">温度</span>            最小 最大            出力 (mV) :        0000 8000            温度 (°C) :        0.0 200.0            圧力 (hPa) :        0 1000         </div>																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Output interlock</td> <td>Interlocking measured values</td> <td>Temp./ Pressure/ ---(*※)</td> </tr> <tr> <td>Min. output</td> <td>Ymin</td> <td>0~8000mV</td> </tr> <tr> <td>Max. output</td> <td>Ymax</td> <td>0~8000mV</td> </tr> <tr> <td>Min. temp.</td> <td>Xmin</td> <td>0.0~600.0°C</td> </tr> <tr> <td>Max. temp.</td> <td>Xmax</td> <td>0.0~600.0°C</td> </tr> <tr> <td>Min. pressure</td> <td>Xmin</td> <td>0~1500hPa</td> </tr> <tr> <td>Max. pressure</td> <td>Xmax</td> <td>0~1500hPa</td> </tr> </tbody> </table> <p>※When the output interlock is [---], the analog output is always 0 mV.</p>	Item	Description	Setting	Output interlock	Interlocking measured values	Temp./ Pressure/ ---(*※)	Min. output	Ymin	0~8000mV	Max. output	Ymax	0~8000mV	Min. temp.	Xmin	0.0~600.0°C	Max. temp.	Xmax	0.0~600.0°C	Min. pressure	Xmin	0~1500hPa	Max. pressure	Xmax	0~1500hPa	
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Max. pressure	Xmax	0~1500hPa																								

## 5 Alarm Functions

### 5-1 Types of alarms to be detected

This unit has the following alarm functions. Codes are allocated to each alarm.  
Temperature control cannot be started while alarms occur.

Alarm name & code	Cause of alarm	Factor for cancelling alarm
Door alarm*1 A-2	<ul style="list-style-type: none"> <li>When the door is open for a longer time than the set time during controlling temperature.</li> <li>When temperature control is started with the door open.</li> </ul>	<ul style="list-style-type: none"> <li>Automatically cancelled when it is detected that the door is closed.</li> <li>Press Dial key when temperature control is stopped.</li> </ul>
Temperature alarm*2 A-0(H2): Upper limit 2 A-0(H1): Upper limit 1 A-0(L1): Lower limit 1 A-0(L2): Lower limit 2	<p>After the measured temperature (PV) reaches the set temperature (SV) during controlling temperature,</p> <ul style="list-style-type: none"> <li>Upper limit temperature alarm When the state of <math>PV &gt; SV + H1</math> or <math>PV &gt; SV + H2</math> continues.</li> <li>Lower limit temperature alarm When the state of <math>PV &lt; SV - L1</math> or <math>PV &lt; SV - L2</math> continues.</li> </ul>	<ul style="list-style-type: none"> <li>Press Dial key while temperature control is stopped.</li> <li>Temperature control is restarted after temperature control is paused.</li> <li>Change the set temperature.</li> <li>Upper limit temperature alarm When the state of <math>PV \leq SV + H1</math> or <math>PV \leq SV + H2</math> continues.</li> <li>Lower limit temperature alarm When the state of <math>PV \geq SV - L1</math> or <math>PV \geq SV - L2</math> continues.</li> </ul>
Heater short-circuit, F-6	<ul style="list-style-type: none"> <li>Heater cannot be turned OFF.</li> </ul>	<ul style="list-style-type: none"> <li>Turn OFF the power. ※3</li> </ul>
Heater burnout, F-0	<ul style="list-style-type: none"> <li>Heater cannot be turned ON.</li> </ul>	<ul style="list-style-type: none"> <li>Turn OFF the power. ※3</li> </ul>
Error in temperature sensor, F-1	When the temperature sensor detects a temperature which is out of the display range	When the temperature sensor detects a temperature which is in the display range
Uncontrollable temperature, A-1	When the measured temperature cannot reach the set temperature even after temperature control starts and then a certain period of time elapses.	<ul style="list-style-type: none"> <li>Press Dial key while temperature control is stopped.</li> <li>Temperature control is restarted after temperature control is paused.</li> <li>Change the set temperature.</li> <li>PV reaches SV.</li> </ul>
Power restoration, A-4	When the power is restored after a power shutdown during controlling temperature.	Only indicate that the power is restored after a power shutdown and then temperature control is restarted.
Pressure error, A-16	When the pressure sensor detects abnormally high pressure	When the pressure sensor doesn't detect abnormally high pressure anymore.
Memory error, F-85	Failed to read or save the internal memory.	Turn OFF the power. ※3
Circuit board error, F-98	<ul style="list-style-type: none"> <li>Failure in LCD</li> <li>Failure in control board of the unit</li> </ul>	Turn OFF the power. ※3

※1 Temperature control is paused when "Door open" is detected during controlling temperature.  
Temperature control is restarted when it is detected that the door is closed.

If the duration of "Door Open" exceeds the set time for the door alarm, the door alarm occurs.

※2 There are two types of temperature alarm, "Upper limit temperature alarm (overshoot)" and "Lower limit temperature alarm (undershoot)", each of which has two levels.

※3 If the same alarm is displayed after the power is turned on again, please contact our service center.

## 5-2 Actions in the event of alarms

When alarms occur, the following actions can be set for each alarm.

- ①Output: Run alarm output (relay contact output).
- ②Stop : Temperature control is stopped when temperature control is in progress.
- ③Disp : Alarm messages are displayed.
- ④Buzz : The buzzer sounds.

- To clear the displayed alarm message
- To stop the buzzer sounding

Press  Dial key.

- To cancel the alarm output run after alarm occurrence

Press and hold  Dial key for more than 3 seconds

[Setting of actions to be taken after alarms occur]

Classification	Type	Code	Action			
			①Output ※1	②Stop	③Disp	④Buzz
Door alarm	Door alarm	A-2	◎	◎	◎	◎
Temperature alarm	Temperature alarm upper limit 2	A-0(H2)	◎	◎	◎	◎
	Temperature alarm upper limit 1	A-0(H1)	◎	◎	◎	◎
	Temperature alarm lower limit 1	A-0(L1)	◎	◎	◎	◎
	Temperature alarm lower limit 2	A-0(L2)	◎	◎	◎	◎
Temperature control alarm	Heater short-circuit	F-6	●	●	◎	◎
	Heater burnout	F-0	●	●	◎	◎
	Temperature sensor error	F-1	●	●	◎	◎
	Uncontrollable temperature	A-1	◎	◎	◎	◎
Other alarms	Pressure error	A-16	●	●	◎	◎
	Memory error	F-85	●	◎※2	◎	◎
	Circuit board error	F-98	●※3	●※3	●※3	●※3
Power restoration Alarm	Power restoration	A-4	×	Refer to "6. Power restoration function".		

In the table: ◎:Can set, ●:Cannot set (always enabled), X:Cannot output

※1 The setting for output should be done according to [4-2 Alarm Output].

※2 The memory error has no impact on the running temperature control, but the following problems occur.

- The preset data which is previously saved is changed when the unit is turned on.
- The power restoration operation cannot be performed properly.

※3 The display and buzzer cannot be controlled due to out-of-control situation in case of a circuit board error. The alarm output is repeated between "Close" and "Open" periodically only in case of a circuit board error.

※ Some items cannot be set depending on alarm types.  
The items of which setting cannot be changed are always set to "enabled".

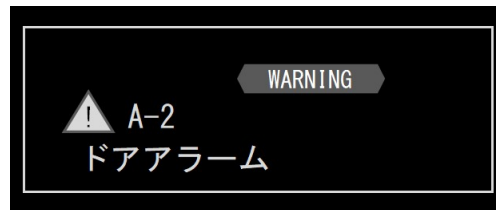
### 5-3 Door alarm (A-2)

If the door is opened during controlling temperature, temperature control is paused.




Temperature control is restarted when the door is closed.

A door alarm occurs when the door is open for a longer time than the set time.

[Door alarm setting]



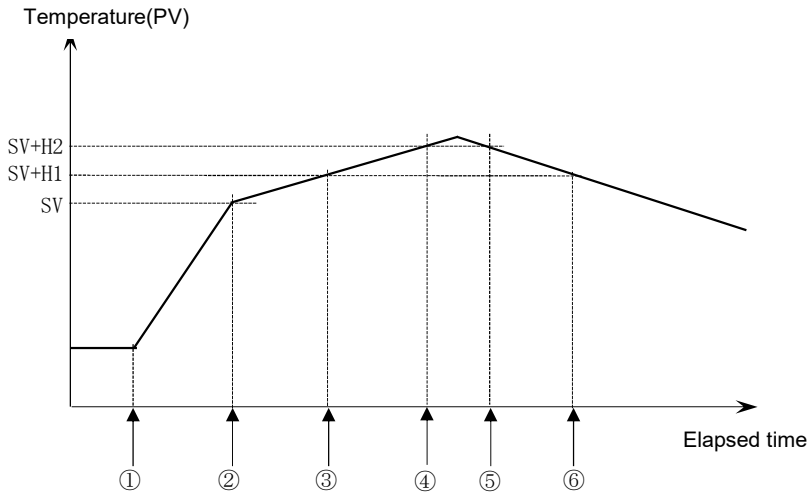
Door alarm occurring message

	CHECK/OPERATION	DISPLAY														
①	Press  Menu key while [Main Screen] is displayed. [Menu Screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>														
②	Select [Alarm] and press  Dial key.	<div style="border: 1px solid black; padding: 5px;">           設定            出力設定            アラーム            電源復帰            補正            データ初期化         </div>														
	[Alarm selecting screen] is displayed.	<div style="border: 1px solid black; padding: 5px;">           ドアアラーム            温度アラーム            温度制御アラーム            その他のアラーム         </div>														
③	Select [Door Alarm] and Press  Dial key. [Door alarm setting screen] is displayed. Set the following items.	<div style="border: 1px solid black; padding: 5px;">           ドアアラーム (A-2)            検出時間 (秒): <input type="text" value="060"/>            温度制御: Continue            メッセージ: Off            ブザー: Off         </div>														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Item</th> <th style="width: 55%;">Description</th> <th style="width: 30%;">Setting</th> </tr> </thead> <tbody> <tr> <td>Detection time</td> <td>Time to detect the door alarm after the door is opened</td> <td>0 to 600 seconds ---(※)</td> </tr> <tr> <td>Temperature control</td> <td>Continue or stop the temperature control when the door is closed after the door alarm occurs.</td> <td>Continue: Continue control. Stop : Stop control.</td> </tr> <tr> <td>Message</td> <td>Display messages when the door alarm occurs.</td> <td>On : Display messages. Off : Not display messages.</td> </tr> <tr> <td>Buzzer</td> <td>The buzzer sounds or does not sound when the door alarm occurs.</td> <td>On : Sound Off : Not sound</td> </tr> </tbody> </table>	Item	Description	Setting	Detection time	Time to detect the door alarm after the door is opened	0 to 600 seconds ---(※)	Temperature control	Continue or stop the temperature control when the door is closed after the door alarm occurs.	Continue: Continue control. Stop : Stop control.	Message	Display messages when the door alarm occurs.	On : Display messages. Off : Not display messages.	Buzzer	The buzzer sounds or does not sound when the door alarm occurs.	On : Sound Off : Not sound
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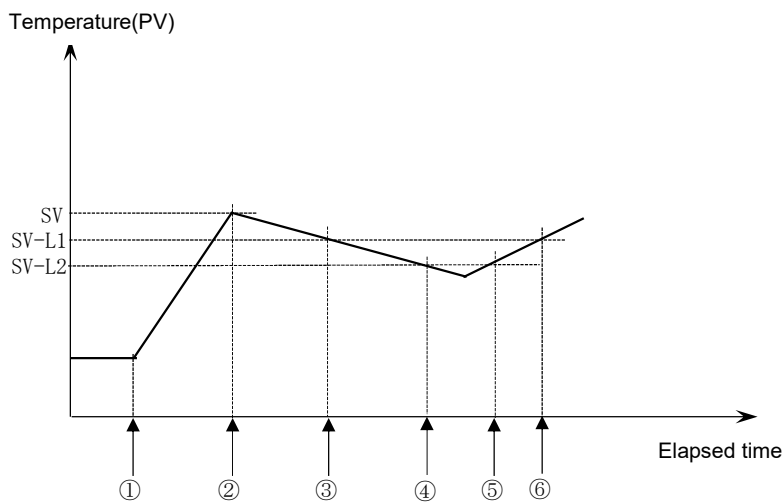
※) The door alarm is not detected in case of "--".

## 5-4 Temperature alarm (A-0)

After reaching the set temperature under temperature control, if the measured temperature (PV) exceeds the upper limit temperature, the temperature upper limit alarm (overshoot) occurs, and if the measured temperature (PV) falls below the lower limit temperature, the temperature lower limit alarm (undershoot) occurs. The temperature upper limit alarm and the temperature lower limit alarm has two levels, respectively.






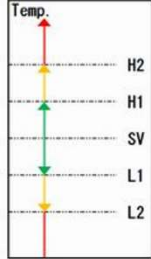
- ① Start temp. control    ③ A-0 (H1) Alarm occurs    ⑤ A-0 (H2) Alarm canceled  
 ② Reach set temp.    ④ A-0 (H2) Alarm occurs    ⑥ A-0 (H1) Alarm canceled



- ① Start temp. control    ③ A-0 (L1) Alarm occurs    ⑤ A-0 (L2) Alarm canceled  
 ② Reach set temp.    ④ A-0 (L2) Alarm occurs    ⑥ A-0 (L1) Alarm canceled



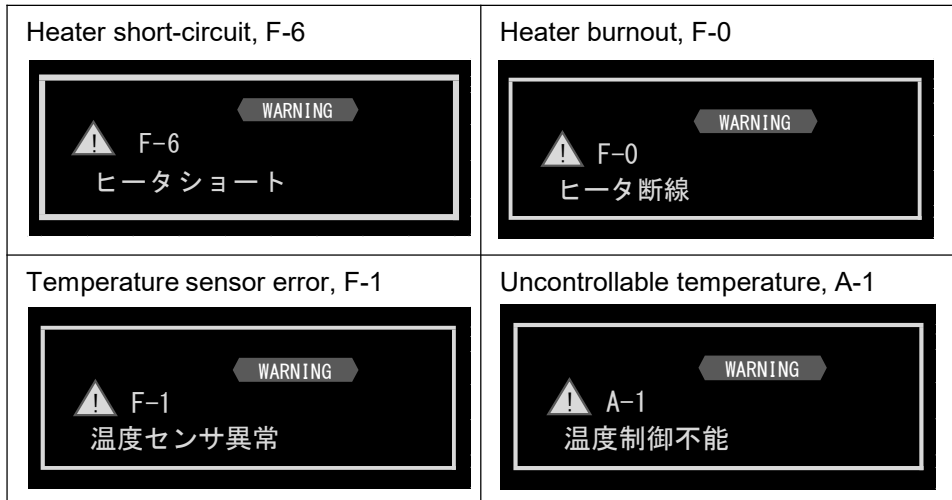
[Temperature alarm setting]

	CHECK/OPERATION	DISPLAY																																								
①	<p>Press  Menu key while [Main Screen] is displayed.</p> <p>[Menu Screen] is displayed.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>設定</p> <p>出力設定</p> <p>アラーム</p> <p>電源復帰</p> <p>補正</p> <p>データ初期化</p> </div>																																								
②	<p>Select [Alarm] and</p> <p>Press  Dial key.</p> <p>[Alarm selecting screen] is displayed.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>ドアアラーム</p> <p>温度アラーム</p> <p>温度制御アラーム</p> <p>その他のアラーム</p> </div>																																								
③	<p>Select [Temperature Alarm] and</p> <p>Press  Dial key.</p> <p>[Temperature alarm setting screen] is displayed.</p> <p>Set the following items.</p>	<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>温度アラーム (A-0)</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>°C</th> <th>停止</th> <th>表示</th> <th>ブザー</th> </tr> </thead> <tbody> <tr> <td>H2</td> <td>20.0</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>H1</td> <td>10.0</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>L1</td> <td>10.0</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>L2</td> <td>20.0</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table> </div> </div> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>Temperature alarm temperature</td> <td>Set temp. for temperature alarm H2: Temperature alarm upper limit 2 H1: Temperature alarm upper limit 1 L1: Temperature alarm lower limit 1 L2: Temperature alarm lower limit 2</td> <td>0.1~20.0°C --(※)</td> </tr> <tr> <td>Stop</td> <td>Continue or stop temperature control in the event of the temperature alarms</td> <td>—:Continue control ○:Stop control</td> </tr> <tr> <td>Display</td> <td>Display or not display alarm messages in the event of the temperature alarms.</td> <td>—:Not display ○:Display</td> </tr> <tr> <td>Buzzer</td> <td>The buzzer sounds or does not sound in the event of the temperature alarms.</td> <td>—:Not sound ○:Sound</td> </tr> </tbody> </table> <p>※) The temperature alarm does not occur in case of “---”.</p>		°C	停止	表示	ブザー	H2	20.0	○	○	○	H1	10.0	—	—	—	L1	10.0	—	—	—	L2	20.0	○	○	○	Item	Description	Setting	Temperature alarm temperature	Set temp. for temperature alarm H2: Temperature alarm upper limit 2 H1: Temperature alarm upper limit 1 L1: Temperature alarm lower limit 1 L2: Temperature alarm lower limit 2	0.1~20.0°C --(※)	Stop	Continue or stop temperature control in the event of the temperature alarms	—:Continue control ○:Stop control	Display	Display or not display alarm messages in the event of the temperature alarms.	—:Not display ○:Display	Buzzer	The buzzer sounds or does not sound in the event of the temperature alarms.	—:Not sound ○:Sound
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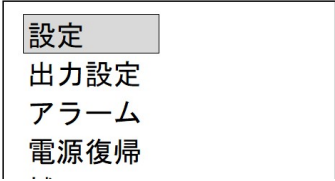

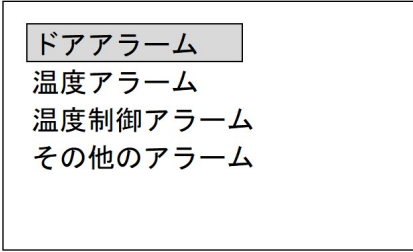



## 5-5 Temperature control alarm

Alarms which have any impact on controlling temperature are called “temperature control alarm”. The following four kinds of temperature control alarms are possible.






### [Temperature control alarm setting]

	CHECK/OPERATION	DISPLAY																									
①	<p>Press  Menu key while [Main Screen] is displayed.</p> <p>[Menu Screen] is displayed.</p>																										
②	<p>Select [Alarm] and press  Dial key.</p> <p>[Alarm selecting screen] is displayed.</p>																										
③	<p>Select [Temperature control alarm] and press  Dial key.</p> <p>[Temperature control alarm setting screen] is displayed.</p> <p>Set the following items. ※Cells of which setting cannot be changed are impossible to select.</p>	<p>温度制御アラーム</p> <table border="1"> <thead> <tr> <th>不具合</th> <th>コード</th> <th>停止</th> <th>表示</th> <th>ブザー</th> </tr> </thead> <tbody> <tr> <td>ヒータショート</td> <td>F-6</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>ヒータ断線</td> <td>F-0</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>センサ異常</td> <td>F-1</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>温度制御不能</td> <td>A-1</td> <td>—</td> <td>○</td> <td>○</td> </tr> </tbody> </table>	不具合	コード	停止	表示	ブザー	ヒータショート	F-6	○	○	○	ヒータ断線	F-0	○	○	○	センサ異常	F-1	○	○	○	温度制御不能	A-1	—	○	○
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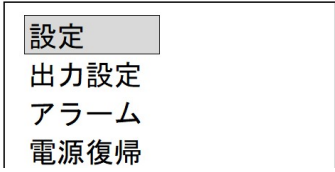

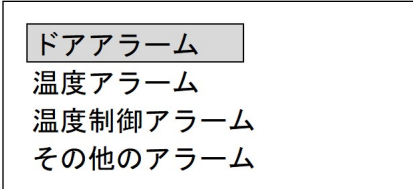

## 5-6 Other alarms

Alarms which occurs when any abnormal ambient environment is detected or errors in circuit board occur are classified as “other alarms”.

The following three kinds of other alarms are possible.

<p>Pressure error, A-16</p> 	<p>Memory error, F-85</p> 
<p>Circuit board error, F-98</p> 	

### [Setting of other alarms]

	CHECK/OPERATION	Display																				
①	<p>Press  Menu key while [Main Screen] is displayed.</p> <p>[Menu Screen] is displayed.</p>																					
②	<p>Select [Alarm] and press  Dial key.</p> <p>[Alarm selecting screen] is displayed.</p>																					
③	<p>Select [Other alarms] and press  Dial key.</p> <p>[Other alarm settings screen] is displayed. Set the following items. ※Cells of which setting cannot be changed are impossible to select. (Refer to “5-2 Actions in the event of alarms”).</p>	<p>その他のアラーム</p> <table border="1" data-bbox="861 1487 1394 1630"> <thead> <tr> <th>不具合</th> <th>コード</th> <th>停止</th> <th>表示</th> <th>ブザー</th> </tr> </thead> <tbody> <tr> <td>圧力異常</td> <td>A-16</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>メモリー異常</td> <td>F-85</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>基板異常</td> <td>F-98</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table>	不具合	コード	停止	表示	ブザー	圧力異常	A-16	○	○	○	メモリー異常	F-85	○	○	○	基板異常	F-98	○	○	○
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基板異常	F-98	○	○	○																		
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## 6 Power Restoration Function

This unit allows to set actions to be taken when the power is restored after power shutdown due to power failure during controlling temperature.



[Actions after the power is restored]

Status when the power is shut down	Power restoration mode			Buzzer	Message Display
	Off	On	Cont.		
Temperature control is stopped.	Stop the temperature control.	Temperature control remains stopped.	Temperature control remains stopped.	-	-
Auto-start running	Stop the temperature control.	Continue Auto-start. • Restart the remaining time counter. ※1 • Continue countdown.	Continue Auto-start. • Restart the remaining time counter. ※1 • Continue countdown.	-	-
Fixed value operation running	Stop the temperature control.	Continue the Fixed value operation. • Clear the elapsed time counter. ※2 • Start counting up.	Continue the Fixed value operation. • Restart the elapsed time counter. ※3 • Continue counting up.	○	○
Program operation running	Stop the temperature control.	Continue Program operation. • Return to the repeated count and restart. • Return to the active step No. • Clear the remaining time counter. ※4 • Continue counting when the time priority step is running. • Stop counting when the temperature priority step is running. ※5	Continue Program operation. • Return to the repeated count and restart. • Return to the active step No. • Restart the remaining time counter. ※1 • Continue counting when the time priority step is running. • Stop counting when the temperature priority step is running. ※5	○	○
24-hour cycle operation running	Stop the temperature control.	Continue 24-hour cycle operation. • Return to the repeated count and restart. • Return to the active section. • Clear the counter. ※6 • Continue counting.	Continue 24-hour cycle operation. • Return to the repeated count and restart. • Return to the active section. • Restart the elapsed time counter. ※3 • Continue counting.	○	○

—:No action, ○:Action is taken if “ON”

※1 The seconds in the counting value are rounded up in the timer display.

Example) If the timer display shows [01:30:25] when the power is shut down, it returns at [01:30:59].

※2 The counting value is cleared, and the timer display shows [00:00:00].

※3 The seconds in the counting value are rounded down in the timer display.

Example) If the timer display shows [01:30:25] when the power is shut down, it returns at [01:30:00].

※4 The seconds in the counting value for the restored step No. are rounded down in the timer display.



Example) If the timer display shows [01:30:25] when the power is shut down, it returns at [01:30:00].

※5 Counting starts when the displayed temperature reaches the set temperature.

※6 The counting value is cleared, and the timer display shows [00:00:00] when the power is restored in section 1.

The counting value in the timer display is changed to the set time for section 1 when the power is restored in section 2.

[Setting of power restoration function]

	CHECK/OPERATION	DISPLAY												
①	<p>Press  Menu key while [Main Screen] is displayed.</p> <p>[Menu Screen] is displayed.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>設定</p> <p>出力設定</p> <p>アラーム</p> <p>電源復帰</p> <p>補正</p> <p>データ初期化</p> </div>												
	<p>Select [Power Restoration] and press  Dial key.</p> <p>[Power restoration setting screen] is displayed.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>設定</p> <p>出力設定</p> <p>アラーム</p> <p>電源復帰</p> <p>補正</p> <p>データ初期化</p> </div>												
②	<p>Set the following items.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Item</th> <th style="width: 45%;">Description</th> <th style="width: 40%;">Setting</th> </tr> </thead> <tbody> <tr> <td>Recovery mode</td> <td>Select whether to continue temperature control or not.</td> <td>Off On Cont.</td> </tr> <tr> <td>Message</td> <td>Display of messages after power restoration</td> <td>Off: Not display On : Display</td> </tr> <tr> <td>Buzzer</td> <td>The buzzer sounds or does not sound after power restoration.</td> <td>Off: Not sound On: Sound</td> </tr> </tbody> </table>	Item	Description	Setting	Recovery mode	Select whether to continue temperature control or not.	Off On Cont.	Message	Display of messages after power restoration	Off: Not display On : Display	Buzzer	The buzzer sounds or does not sound after power restoration.	Off: Not sound On: Sound	<div style="border: 1px solid black; padding: 5px;"> <p>電源復帰</p> <p>復帰モード: <input type="text" value="Off"/></p> <p>メッセージ: 0n</p> <p>ブザー: 0n</p> </div>
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Recovery mode	Select whether to continue temperature control or not.	Off On Cont.												
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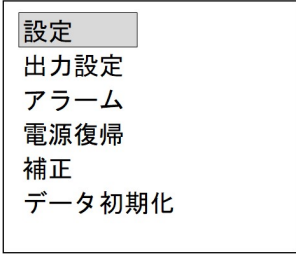

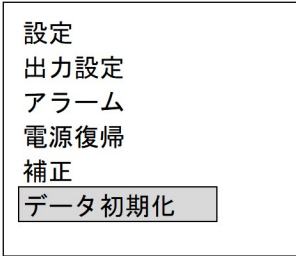

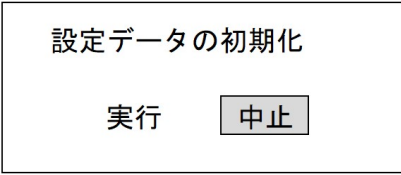

## 7

## Data Initialization

If the data is initialized, all settings for temperature control, display correction, alarms, etc. are reset to the factory default settings.

Please note that all settings saved before are cleared.

[Actions after the power is restored]

	CHECK/OPERATION	DISPLAY
①	<p>Press  Menu key while [Main Screen] is displayed.</p> <p>[Menu Screen] is displayed.</p>	
②	<p>Select [Data initialization] and press  Dial key.</p> <p>[Data initialization executing screen] is displayed.</p>	
	<p>Select [Yes] and press  Dial key.</p> <p>Start initial value setting.</p>	
	<p>When finished, [Initial value setting result] is displayed.</p>	 <p>※Since the default display language is [English], the result is displayed in English.</p>

## 8

## List of Setting Items and Initial Values

Item/Content	Setting	Initial value
Operation lock Enable/Disable changing the setting values	Free: Changeable Lock: Not changeable	Free
Temperature control mode	Fixed value operation Program operation 24-hour operation	Fixed value operation
Set temperature for Fixed value operation	Set temperature range (*1)	40.0°C
Program operation setting: Program No.	1~8	1
Program operation setting: Number of steps	1~8	2
Program operation setting: Number of repetitions	1~99, ∞	1
Program operation setting: Set temperature	Set temperature range (*1) --:Not set	40.0°C
Program operation setting: Set time	00:00 to 99:59 (hour: minute)	01:00
Program operation setting: Priority	Temperature priority Time priority	Temperature priority
24-hour cycle operation: Section 1: Set temperature	Set temperature range (*1) --:Not set	40.0°C
24-hour cycle operation: Section 2: Set temperature	Set temperature range (*1) --:Not set	40.0°C
24-time cycle operation: Section 1: Time	00:00 to 23:59 (hour: minute)	12:00
Number of repetitions in 24-hour operation	1~99, ∞	1
Auto-start	Off: Disabled, On : Enabled	Off
Auto-start time	00:00 to 99:59 (hour: minute)	00:10
Temperature display 2-point correction 1: Before correction	0.0~400.0°C	40.0°C
Temperature display 2-point correction 1: After correction	0.0~400.0°C	40.0°C
Temperature display 2-point correction 2: Before correction	0.0~400.0°C	120.0°C
Temperature display 2-point correction 2: After correction	0.0~400.0°C	120.0°C
Pressure display 2-point correction 1: Before correction	0~1200hPa	0hPa
Pressure display 2-point correction 1: After correction	0~1200hPa	0hPa
Pressure display 2-point correction 2: Before correction	0~1200hPa	1000hPa
Pressure display 2-point correction 2: After correction	0~1200hPa	1000hPa
Language	English/Japanese	English
Decimal point position for temperature	0:No display after decimal point 1:Display up to first decimal place	1
Temperature unit	°C:Celsius, °F: Fahrenheit	°C
Pressure unit	hPa/Torr	hPa
Buzzer time	01 to 99 seconds --:Not sound ∞:Continue to sound (until stopping by key operation)	30 seconds
Operation sound	Off: Not sound, On : Sound	On

※1 The set temperature range varies depending on models.

Item/Content	Setting	Initial value
LCD brightness 1 LCD brightness during operation	5~100%	070%
LCD brightness 2 LCD brightness during waiting operation	5~100%	010%
Alarm output logic	Close : Short circuit Open : Open	Close
Alarm output when temperature alarm H2 occurs	Disable: Disabled Enable : Enabled	Enable
Alarm output when temperature alarm H1 occurs	Disable: Disabled Enable : Enabled	Disable
Alarm output when temperature alarm L1 occurs	Disable: Disabled Enable : Enabled	Disable
Alarm output when temperature alarm L2 occurs	Disable: Disabled Enable : Enabled	Enable
Alarm output when temperature is out of control	Disable: Disabled Enable : Enabled	Enable
Alarm output when door alarm occurs	Disable: Disabled Enable : Enabled	Disable
Analog output interlocking	Temperature Pressure ----:Always 0mV	Temperature
Analog output minimum	0~8000mV	0mV
Analog output maximum	0~8000mV	8000mV
Analog output interlocking temperature minimum	0.0~600.0°C	0.0°C
Analog output interlocking temperature maximum	0.0~600.0°C	200.0°C
Analog output interlocking pressure minimum	0~1500hPa	0hPa
Analog output interlocking pressure maximum	0~1500hPa	1000hPa
[A-2] Door alarm detection time	0 to 600 seconds ---:Not detected	60 seconds
[A-2] Temperature control upon door alarm	Continue: Continue control Stop : Stop control	Continue
[A-2] Pop-up message upon door alarm	Off: Not display On : Display	On
[A-2] Buzzer upon door alarm	Off: Not sound On : Sound	On
[A-0(H2)] Temperature Alarm Threshold	0.1~20.0°C --:Not detected	20.0°C
[A-0(H1)] Temperature Alarm Threshold	0.1~20.0°C --:Not detected	10.0°C
[A-0(L1)] Temperature Alarm Threshold	0.1~20.0°C --:Not detected	10.0°C
[A-0(L2)] Temperature Alarm Threshold	0.1~20.0°C --:Not detected	20.0°C
[A-0(H2)] Temperature control upon temperature alarm	-:Continue control ○:Stop control	○
[A-0(H1)] Temperature control upon temperature alarm	-:Continue control ○:Stop control	-
[A-0(L1)] Temperature control upon temperature alarm	-:Continue control ○:Stop control	-
[A-0(L2)] Temperature control upon temperature alarm	-:Continue control ○:Stop control	○
[A-0(H2)] Pop-up message upon temperature alarm	-:Not display ○:Display	○
[A-0(H1)] Pop-up message upon temperature alarm	-:Not display ○:Display	-
[A-0(L1)] Pop-up message upon temperature alarm	-:Not display ○:Display	-
[A-0(L2)] Pop-up message upon temperature alarm	-:Not display ○:Display	○

Item/Content	Setting	Initial value
[A-0(H2)] Buzzer upon temperature alarm	-:Not sound ○:Sound	○
[A-0(H1)] Buzzer upon temperature alarm	-:Not sound ○:Sound	-
[A-0(L1)] Buzzer upon temperature alarm	-:Not sound ○:Sound	-
[A-0(L2)] Buzzer upon temperature alarm	-:Not sound ○:Sound	○
[F-6] Temperature control upon heater short-circuit	○:Always Stop	○
[F-0] Temperature control upon heater burnout	○:Always Stop	○
[F-1] Temperature control upon errors in temperature sensor	○:Always Stop	○
[A-1] Temperature control when temperature is out of control	-:Continue control ○:Stop control	-
[F-6] Pop-up message upon heater short-circuit	-:Not display ○:Display	○
[F-0] Pop-up message upon heater is burnout	-:Not display ○:Display	○
[F-1] Pop-up message upon errors in temperature sensor	-:Not display ○:Display	○
[A-1] Pop-up message when temperature is out of control	-:Not display ○:Display	○
[F-6] Buzzer upon heater short-circuit	-:Not sound ○:Sound	○
[F-0] Buzzer upon heater burnout	-:Not sound ○:Sound	○
[F-1] Buzzer upon errors in temperature sensor	-:Not sound ○:Sound	○
[A-1] Buzzer when temperature is out of control	-:Not sound ○:Sound	○
[A-16] Temperature control upon errors in pressure	○:Stop control	○
[F-85] Temperature control upon errors in memory	-:Continue control ○:Stop control	○
[F98] Temperature control upon errors in circuit board	○:Stop control	○
[A-16] Pop-up message upon errors in pressure	-:Not display ○:Display	○
[F-85] Pop-up message upon errors in memory	-:Not display ○:Display	○
[F98] Pop-up message upon errors in circuit board	○:Display	○(※2)
[A-16] Buzzer upon errors in pressure	-:Not sound ○:Sound	○
[F-85] Buzzer upon errors in memory	-:Not sound ○:Sound	○
[F98] Buzzer upon errors in circuit board	○:Sound	○(※3)
Power restoration mode	Off On (See "6.Power Restoration Function") Cont.	Off
Pop-up message display when power is restored	Off: Not display, On : display	On
Buzzer when power is restored	Off: Not sound, On : Sound	On

※2 Pop-up message may not be displayed due to errors in circuit board.

※3 The buzzer may not sound due to errors in circuit board.