

User's manual / Controller guide

**Temperature (and humidity) chamber
Platinous J series**

**PR/PL/PU/PSL/PG/
PHP/PDR/PDL/PCR (N-instrumentation)**

4001504000591
January 15, 2016

- Read this operation manual thoroughly before operating the chamber.
- Carefully read and familiarize yourself with the "Safety precautions" section before using this product.
- Keep this operation manual handy for future reference.

Liability

Always use the chamber by observing the usage and handling methods described in this manual. ESPEC CORP. assumes NO responsibility whatsoever for accidents or chamber trouble arising from the failure to observe handling instructions contained herein. Do not perform any operation or handle the chamber in any way or form that is specifically prohibited. Careless usage of this sort may result in unexpected damage to the chamber or accidents.

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Introduction



Read this section before using the equipment.

For restricted use

This test chamber should be operated only by experienced engineers or persons who have received training in proper usage from an experienced engineer.

■ Definition of an experienced engineer

A person who understands the purpose of the product; who has received training in operation methods, daily maintenance and checks, etc.; and who can foresee and prevent risks associated with inherent dangers such as electricity.

Safety indications

The following safety indications are used throughout this manual.

■ Labels that indicate danger to people

DANGER	Means that extremely dangerous consequences may arise, with the risk of death or serious injury to the user, if the chamber is handled improperly.
WARNING	Means that dangerous consequences may arise, with the risk of death or serious injury to the user, if the chamber is handled improperly.
CAUTION	Means that dangerous consequences may arise, with the risk of minor injury or light wounds to the user, if the chamber is handled improperly.

■ Labels that instruct the user to avoid danger

PROHIBITED	This mark means that specific actions are prohibited in order to prevent a dangerous situation from arising.
Imperative Action Required	This mark means that it is imperative for the user to take specific actions (instructions) in order to prevent a dangerous situation from arising.




■ Label that indicates information on physical damage and environmental contamination

Notice	This mark means dangerous consequences may arise, with the possibility of damage to equipment and facilities or environmental pollution, if the equipment is handled incorrectly.
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Keywords

■ The following keywords are used throughout this manual.

Note	Provides information necessary for gaining full performance from the chamber or to prevent damage to the equipment.
Procedure	Explains how to operate the chamber on a step-by-step basis.
Reference	Offers additional information.

 CAUTION	
	<p>When performing operations in the test area or around the chamber, always ensure that the chamber is not remotely operated over the LAN or other communication interface.</p> <p>If there is any possibility the chamber will be remotely operated, take necessary precautions such as turning remote operation protection on.</p> <p>During chamber operations, sudden operation of the test area can result in injury.</p>
	<p>Ensure that the chamber clearly displays it is being operated from a remote location, and also properly notify the operator.</p>

ESPEC's environmental labeling "GREEN PRODUCT Label"

ESPEC has been striving for the development of eco-friendly products by establishing an environmentally conscious design and development guidelines for the prevention of global warming and pollution and the promotion of resource recycling.

As part of these efforts, in April 2009, we instituted the "GREEN PRODUCT Label" certification system for the products intended for the Japanese market.

The "GREEN PRODUCT Label" is equivalent to the environmental label for self-declared environmental claims "Type II" established by the International Organization for Standardization (ISO).



The certification criterion for green product labeling is as follows.

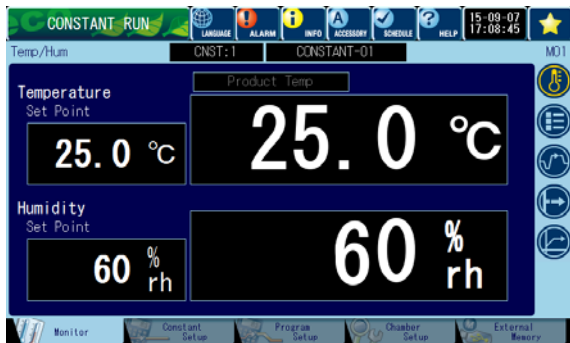
Products that are intended for the Japanese market and that satisfy the following requirements:

Area of environmentally conscious activity	Certification criterion
Energy-saving	Comparison with the former models 15% energy saving or more is achieved. (When the operation pattern specified by ESPEC is used and compared with the former model.)

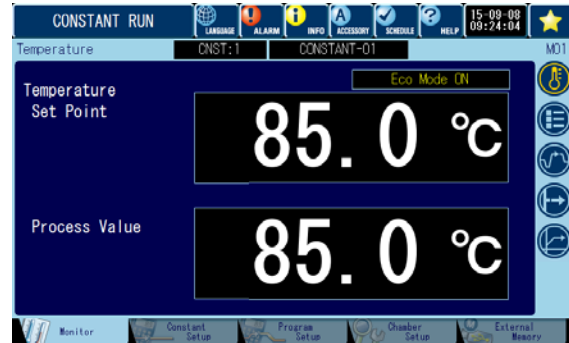
Energy Saving Advice: Provides tips for energy-saving operation.

Displays used in this manual

This manual was written using the Platinous J series temperature & humidity type as a base. When using the temperature type, the screens shown in this manual may differ somewhat from the actual screens. As shown below, the temperature type does not display items related to humidity.



Screen for temperature and humidity type



Screen for temperature type

- * PR, PL, PSL, PHP, PDR, PDL, and PCR are called temperature and humidity types, and PU and PG are called temperature types.

Manuals

The manuals are organized as shown below. Use the appropriate manual according to the information required.

Installation guide (booklet)	Describes how to bring in, move, and install the chamber. Provided with the chamber. (Also provided on the CD.)
CD user's manual	Contains the following contents.

Recorded contents of CD user's manual

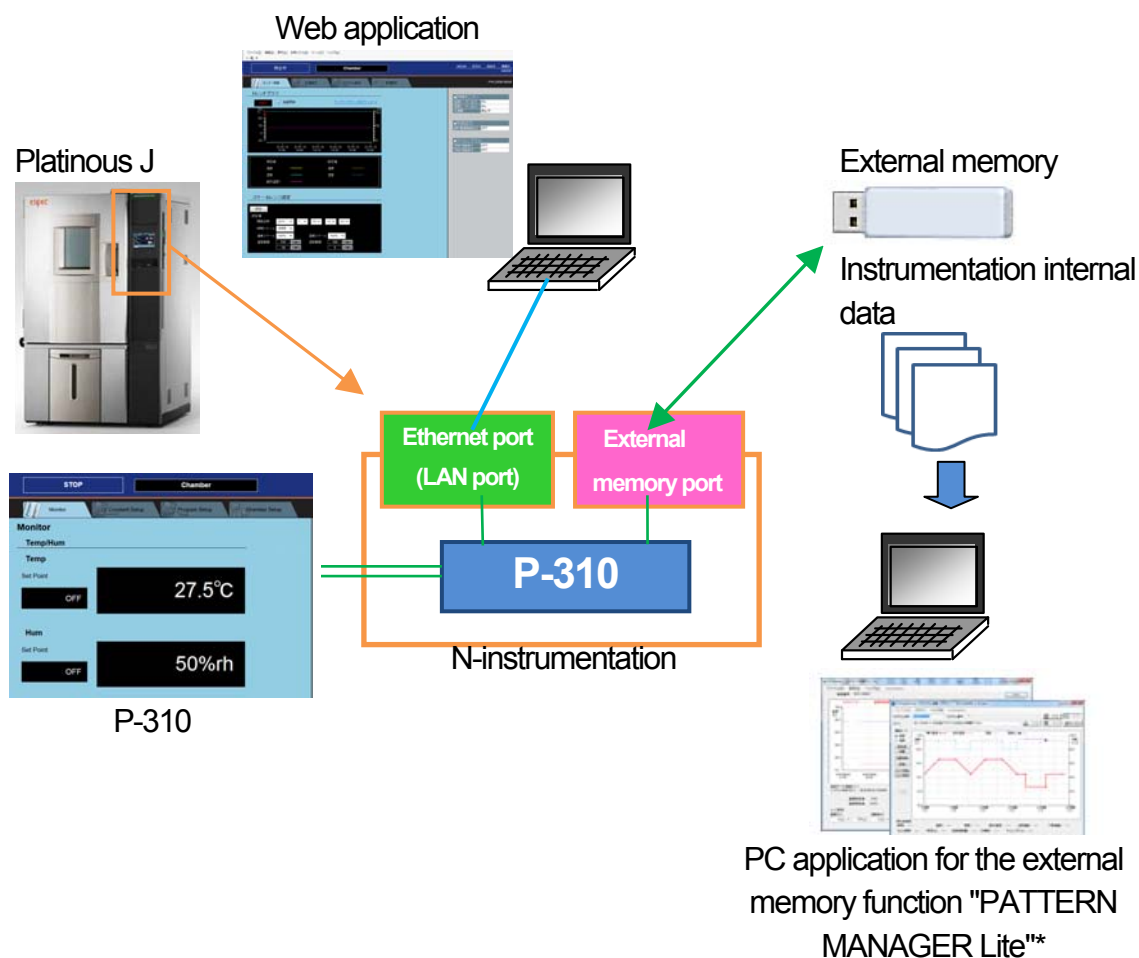
Name		Description
User's manual	Installation guide	Describes how to bring in, move, and install the chamber.
	Basic guide	Describes the basic operations of the chamber. * For operations of options, read the contents of the appropriate option manual.
	Controller guide	Describes the operations of the controller. * For operations of options, read the contents of the appropriate option manual.
	Network guide	<ul style="list-style-type: none"> • Web application Describes how to use a web browser to monitor the chamber operation, configure settings, record data, and send email alerts. • Communication function (Ethernet)
	Option	Describes how to operate the optional equipment and functions.
	Circuit diagram	Electric circuit diagrams and parts lists of the product and options

Chapter 1 Function overview

This chapter provides an overview of the functions and describes the specifications and operation methods of the instrumentation.

N-instrumentation configuration

The N-instrumentation is network instrumentation equipped with P-310 controller functions (constant operation and program operation), network functions, and external memory functions.



* Available on ESPEC Test Navi, the reliability testing information website, so download and use this

P-310 controller:

Explained in this manual.

Web function:

See "Web application" in the user's manual network guide.

External memory function:

For details, see "Chapter 7 Using external memory."

■ P-310 characteristics

◆ Selectable operation styles

- You can select between different test operation and management styles to match the environment in which the chamber is used.
It is easy to prepare, set, monitor, analyze, and manage tests in any location and at any time.
⇒ See the Network guide.

◆ Improved ease of use thanks to easy operations

- Use the shortcut keys on the chamber screen.
You can display the favorites operating screen at any time in a stress-free manner.
(Quick access)
⇒ See "1.2.1 Common operations area" in this guide.

◆ Added functions provide even more improvements to ease of use

- Additional instrumentation functions can be downloaded over a network. (Add-ons)
⇒ See "Chapter 8 Add-ons/system updates" in this guide. Also see the Network guide.

◆ Support for daily management

- You can use ESPEC online support. (*)
This reduces the amount of work that you have to perform in chamber management when an error occurs, which leads to a decrease in downtime.

* A separate contract is required to use this service. (This service is not free of charge and is only available in Japan.)

1.1 Instrumentation organization

The organization of the instrumentation screen is shown in Figure 1.1.

Monitor	Temp/Hum	
	Details	
	Program	
	Ext Output	
	Trend Graph	

Constant Setup	No. 1	Equipment
		Time Signals
		High/Low Limit Setup
		Constant Test Name
		Option
	No. 2	(Same as No. 1)
	No. 3	(Same as No. 1)

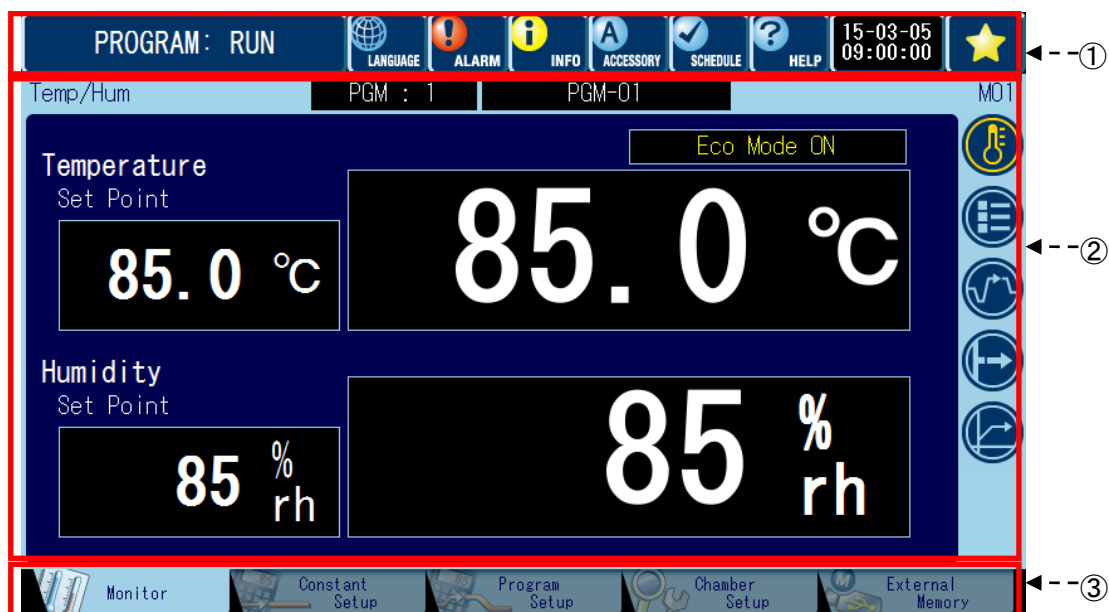
Program Setup	NEW PROFILE	
	EDIT	
	COPY	
	DELETE	
	VIEW	

Chamber Setup	Set Schedule	
	Set Sampling	
	Set Protection	
	Set Defrost (option)	
	Reminder/Alarm History	
	ROM Information	
	User Check List	
	Reminder	
	Reset Time Meter	
	Set Eco Mode	
	Add-ons / Updates History	
	Configuration	Set Communication
		Operation Process
		Control Attain Range
		Name Time Signals
		Display Setup
		Set Language
		Set Sound
		Set Date/Screensaver
		Register User Password
		Sensor Offset
		Set Chamber Detail
		Set Option
		Set Quick Access
		Service
	Set Back Trace	
	Accessory	
External Memory	Set Sampling Data Writing	
	Read/Write Program Pattern	
	Write Back Trace Data	
	Add-ons / System Updates	

Figure 1.1 Instrumentation overall configuration

1.2 Screen configuration

The instrumentation screen is composed of the following three areas.



	Name	Function/application
①	Common area	Displays and sets the operation state (operation), language setting, alarm, information, accessories, schedule,* help, date, and quick access.
②	Contents	Displays and sets the main menu screens. Use the icons on the side menu to switch between different sub screens.
③	Tabs	Displays various tabs of menu items.

* You can only enter schedule memos through Web application.

For details on how to enter schedule memos, see "Web application" in the "Network guide."

1.2.1 Common operations area




This area displays the status of the following functions as display functions and key functions.

	Icon	Function name	Display function	Function when key is pressed
①		Operation display area	Indicates the chamber operation state.	Displays the display operation screen.*
②		Set Language	None	Displays the screen for setting the language.
③		Alarm	Indicates that an alarm has occurred Blinks when an alarm occurs.	Displays the ALARM screen.*
④		Information	Indicates that information is available. Blinks when a reminder is available.	Displays the INFO and reminder screen.*
⑤		Accessory	None	Displays the ACCESSORY screen.* • This operation can also be performed from the Chamber Setup screen.
⑥		Schedule	Displays the timer scheduling state.	Displays the Set Timer screen.
⑦		Help	None	Displays the HELP screen. • When you press the HELP icon, the HELP screen (index) for the items on the currently displayed screen appears. * While the HELP screen is displayed, you cannot perform any other operations. Close the HELP screen.
⑧		Date and Time Display Area	Shows the current date and time.	Displays the Set Date/Screensaver screen.
⑨		Quick access	Displays the quick access menu.	Displays the Quick Access screen

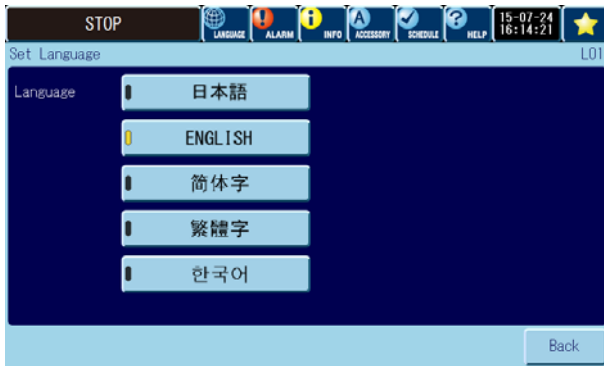
* Performing a ⑥ Schedule key or ⑧ Date and Time Display Area key operation while one of these screens is displayed will cause the message "Not available from this screen" to appear. Close the currently displayed screen, and then perform the desired operation.

Operation display area	STOP	
	CONSTANT	☞ For details, see "Chapter 4 Constant operation."*
	PROGRAM: RUN	☞ For details, see "Chapter 5 Program operation."*
	PROGRAM: PAUSE	
	Hold Last Program	
	Remote Operation	For details on remote operation, see the "Option guide /interface."
	Remote Pause	
	Hold Last Remote Operation	
	Eco Operation Display Function	The background color changes and the eco operation is displayed when the equipment is running in eco operation. You can set eco operation from the Chamber Setup screen. (This is not available on the PHP.)

* For details about using a web browser to monitor, configure the settings of, and operate the chamber, see "Network guide: Web application."

Set Language


Set the controller's display language.
Select the language, and then press [Back].



Alarm



Displays the alarm output status of the equipment.

There are two types of notifications issued by the equipment.

Alarm: This is issued when the equipment detects an abnormality in the equipment and the equipment stops operation. However, if backup operation is enabled, the equipment continues to operate as much as possible.

Warning: This is issued when the equipment detects a minor abnormality in the equipment and the equipment continues to operate. However, there are warnings that cause the chamber to stop operating.

If an alarm occurs, the Alarm screen is displayed automatically, the ALARM icon blinks, and a buzzer sounds.

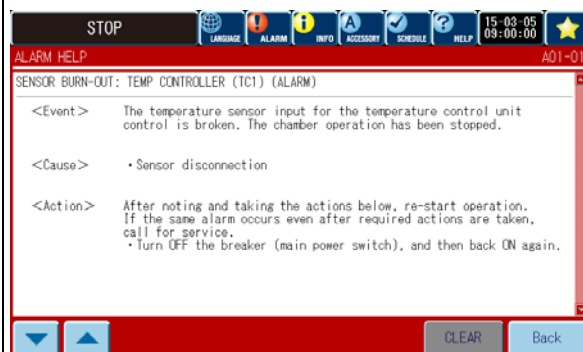
On the alarm screen, press [Stop Beep] to stop the buzzer.

Pressing an alarm displays the ALARM HELP (details) screen.



See the Basic guide "6.5 List of alarms."

For details on the buzzer sound setting, see "1.7 Setting the buzzer sounds."



If you press [How to Turn OFF Power Breaker], the position of and instructions for turning off the breaker (main power switch) will be displayed.

[CLEAR] key on the ALARM HELP screen

If you eliminate the cause of the alarm while the alarm is occurring and the equipment has stopped operating, the equipment returns to normal operation automatically. The event remains in the Alarm screen's history, so press [CLEAR] when you want to erase the history display.

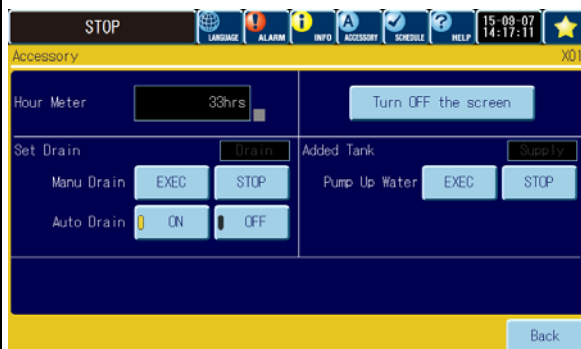
ACCESSORY



Press this icon to display the screen for viewing the hour meter, turning off the screen, setting drainage, and adding a tank (option).

You can display the Accessory screen from the Chamber Setup tab.

Accessory screen



The timer can be configured to turn off the screen and reduce brightness. See "1.8 Setting the date and the screen."

Hour meter:

Displays the total operation time.

During accumulation, the square ■ blinks in the lower-right corner of the frame.

Turn OFF the screen:

Press this key to turn off the screen.

Press the screen to turn it back on again.

Set Drain (temperature and humidity type):

Set whether to automatically drain water from the humidifying tray and wick pan. You can also manually start and stop draining.

Setting Auto Drain to [ON] will cause water to be drained automatically in accordance with the operation state.

(The factory default setting is [ON].)

To drain water manually, press [EXEC]. To stop draining, press [STOP].

During drainage, [Drain] lights up.

See "2.4.4 Drainage function (temperature and humidity type)" and "5.2.2 Program editing procedure: Step details."

Added Tank (when equipped with the additional water supply tank option):

Press [EXEC] next to "Pump Up Water" to start supplying water to the additional tank.

The pump stops automatically when the additional tank is full.

To stop supplying water to the tank part way through the operation, press [STOP].

Notice

If the chamber operates at a high temperature with Auto Drain set to [OFF], the water in the humidifying tray may evaporate, possibly resulting in high humidity in the chamber. Normally keep auto drainage enabled ([ON]).

Information



When chamber information that the user needs to be notified of is available, this icon blinks in yellow. Press this icon to display the Information screen. When there is no longer any chamber information to notify the operator of, the information is automatically deleted and the icon stops blinking.

Information screen



Press an information item or reminder to display its explanation and the action to be taken.

Take the appropriate action in accordance with the information on the screen.

Information	Description and Required action
Defrosting in progress	Defrosting is in progress so temperature and humidity are unstable. Remove the frost that has accumulated on the cooler.
Backup operation in progress	A backup operation was triggered by a problem in the humidifier system or refrigeration system. Performance standards may not be met during backup operation.
Door open	The door open state was detected. Check the state of the door.
Humidifier water refreshing in progress	Humidifier refreshing is in progress so temperature and humidity are unstable. The humidifying tray is being drained of the debris and impurities that have accumulated there.
Ref in Preparation	The refrigerator is preparing to start. Wait for 5 to 15 minutes. The preparations will be completed automatically.
Reminder No. 3 to Reminder No. 6	The specified time has elapsed. Press the confirmation key to display the execution confirmation screen. Press [YES] to record the confirmation date in the reminder report and delete the information notification.

Continued on the next page

Information



Continued from the previous page

Information	Description and Required action
Clean Condenser Filter	<p>It is time to clean the condenser filter. For details on how to perform the cleaning, see "Cleaning Condenser Filter" under "User Check List" on the Chamber Setup screen or see the user's manual.</p> <p>Press the confirmation key to display the execution confirmation screen. Press [YES] to record the confirmation date in the reminder report and delete the information notification.</p>
Clean Strainer	<p>It is time to clean the strainer. For details on how to perform the cleaning, see "Clean Cooling Water Strainer" under "User Check List" on the Chamber Setup screen or see the user's manual.</p> <p>Press the confirmation key to display the execution confirmation screen. Press [YES] to record the confirmation date in the reminder report and delete the information notification.</p>
Check Hum Tray	<p>It is time for the periodic inspection of the humidifying tray water level. For details on how to perform the inspection, see "Check Water Level of Hum Tray/Regulator" under "User Check List" on the Chamber Setup screen or see the user's manual.</p> <p>Press the confirmation key to display the execution confirmation screen. Press [YES] to record the confirmation date in the reminder report and delete the information notification.</p>
Clean Hum Tray	<p>It is time to clean the humidifying tray. For details on how to perform the cleaning, see "Clean Hum Tray" under "User Check List" on the Chamber Setup screen or see the user's manual.</p> <p>Press the confirmation key to display the execution confirmation screen. Press [YES] to record the confirmation date in the reminder report and delete the information notification.</p>

Continued on the next page

Information



Continued from the previous page

Information	Description and Required action
Simple Fluorocarbon Inspection	<p>It is time to perform a simple inspection as prescribed by the Fluorocarbon Emissions Control Law.</p> <p>Perform the simple inspection and record its results.</p> <p>Keep a separate history of the simple fluorocarbon inspections for each product and manage each record until you dispose of the product.</p> <p>Simple inspection details as recommended by ESPEC</p> <p>Check the machine for abnormal noises and vibrations; for external damage, corrosion, and oil leaks; and for normal operation.</p> <p>Press the confirmation key to display the execution confirmation screen.</p> <p>Press [YES] to record the confirmation date in the reminder report and delete the information notification.</p> <p>* CAUTION</p> <p>Do not use the reminder report to record the results of the simple fluorocarbon inspection. Instead, use a record table that you have prepared.</p> <p>When the reminder report is updated, the past data is lost.</p> <p>Also, the reminder report data may be lost due to chamber malfunctions.</p>

SCHEDULE



The timer functions (start timer, end timer, and quick timer) can be configured, set, and canceled, and schedule memos can be displayed.

When the timer is set, the icon lights in blue.

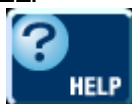
Set Timer screen



☞ For the setting method, see "6.2 Setting schedules."

For details on how to enter schedule memos, see "Web application" in the "Network guide."


HELP






Press this icon to display the HELP screen.
Press an index item to display its explanation.

HELP screen



 returns to the previously displayed HELP screen.

Switch the page with  and .

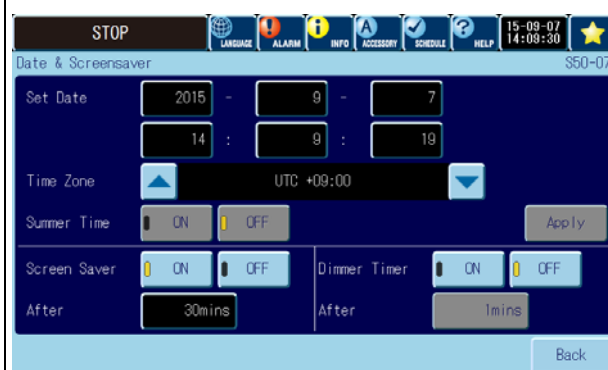
 closes the HELP screen and returns to the previous screen.

 returns to the index.

Date and time display

15-04-22
13:32:40

Displays the present date and time.
Press this part of the screen to display the Date & Screensaver screen.



For the setting method, see "1.8 Setting the date and the screen."

Quick access



Displays the quick access menu.
Also, the [Set Quick Access] key is displayed on this screen.



For the setting method, see "Chapter 6 Chamber setup."





1.2.2 Tab area

Monitor, Constant Setup, Program Setup, Chamber Setup, and External Memory can be selected from the tabs at the bottom of the screen.



Monitor	This tab allows you to check the status of the chamber. The items that can be monitored differ depending on the operation state.	☞ For details, see "Chapter 4 Constant operation" and "Chapter 5 Program operation."
Constant Setup	This is the function for performing constant value operation. Three patterns can be set.	☞ For details, see "Chapter 4 Constant operation."
Program Setup	This is the function for performing program operation. For programs, up to 40 patterns with up to 99 steps each can be set.	☞ For details, see "Chapter 5 Program operation."
Chamber Setup	Used to set or check the management functions required for operation: schedule setup, sampling setup, protection setup, defrosting setup, time meter reset, reminder/alarm history, ROM information, user check list, configuration, eco mode setup, add-ons/updates history, back trace setup, and accessories.	☞ For details, see "Chapter 6 Chamber setup."
External Memory	This is the function for writing the data stored in the internal memory to external memory and for reading the data stored on external memory to the internal memory. The following four functions are available. <ul style="list-style-type: none"> • Set Sampling Data Writing • Read/Write Program Pattern • Write Back Trace Data • Add-ons / System updates 	☞ For details, see "7.1 External memory."

1.2.3 Instrumentation power switch area


<p>External memory lamp</p> 	<p>Displays the status of the external memory device</p>	<p>☞ For details, see "7.1 External memory."</p>
<p>Communication lamp</p> 	<p>Blinks during communication</p>	<p>Blinks during Ethernet communication; when a communication connection is established through the RS-485, RS-232C, or GPIB (option) function; and when Web function is in use</p>
<p>Timer lamp</p> 	<p>Lights up when the timer is set</p>	
<p>Instrumentation power switch</p> 	<p>When the primary power supply is off: Off</p> <p>When the primary power supply is on: On (orange) (when receiving electricity)</p> <p>When the instrumentation screen power supply is on: Lit (green)</p> <p>When the screen is off: Blinks (green)</p>	

1.3 Turning the power on/off

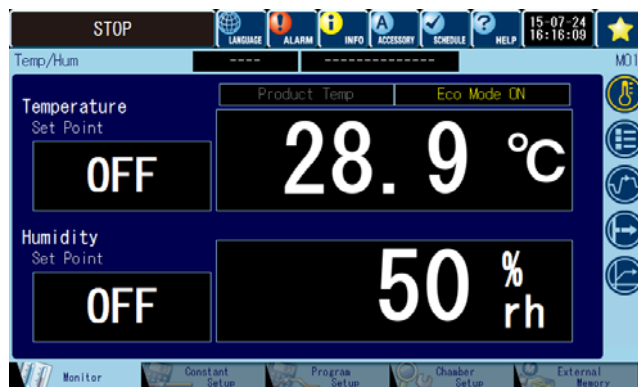
1.3.1 Turning on the power

Turn on the chamber's power supply with the following procedure.

<Procedure>

- 1) Turn on the circuit breaker of the instrumentation.
- 2) Check that the lamp of the instrumentation power switch  lights up (in orange), and then press the instrumentation power switch.
After the opening screen appears, the monitor information (temperature and humidity) is displayed.

<Temperature, humidity>




- 3) Press a tab to move to the desired screen.

◆ Reference ◆

- When the circuit breaker of the equipment is turned on, all LEDs of the operation lamp, lamps, and switches will light for a few tens of seconds.
- If you are using the function for displaying quick access on startup, the Quick Access screen will appear after startup.

1.3.2 Turning off the power

<Procedure>

- 1) Press the instrumentation power switch  to display the execution confirmation screen. Press [YES].



Notice

- **Note that pressing the instrumentation power switch during operation and selecting [YES] will suspend the test and turn off the power of the instrumentation.**
- **Operations during startup**

This chamber is equipped with flash memory as a recording medium in order to save sampling data and email settings.
A characteristic of flash memory is that there is a risk of data corruption if the power is cut while memory is being accessed.
This chamber checks the flash memory data on startup. For details on recovering the data, see "Note" on the following page.
- **Screen system maintenance**

This chamber has a mechanism for automatically restarting the instrumentation display unit in order to perform maintenance on the screen system. Only the display unit is restarted. Even if this is performed during testing, operations continue.
- **Chamber/system protection**

Do not repeatedly turn the breaker (main power switch) on and then immediately turn it off. Also, do not turn off the breaker (main power switch) during startup (when the Booting screen is displayed).
Before turning the breaker (main power switch) off, check that "Booting" and "ALARM" are not displayed on the controller's screen for at least 20 seconds after the breaker (main power switch) is turned on.

◆ Note ◆

• Data protection

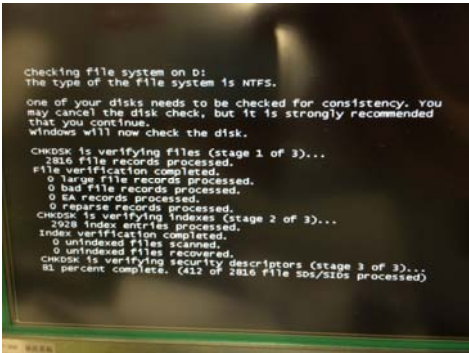
If the breaker (main power switch) is repeatedly turned on and off in short intervals, the internal memory (recording medium) may no longer be recognized or the recorded data may be corrupted.

Periodically write the recorded sampling data to external memory.

For details on the writing procedure, see "7.2 Configuring sampling writing settings."

• Alarm display during startup

If one of the messages below is displayed on the controller screen when the chamber is starting up or if the keys related to saving data and recording cannot be used after starting up, check the alarm report.

Screen message or status	Details and action to take
"Operation suspended due to a display unit connection failure."	⇒ This is the initial communication error. Call for service.
	⇒ The chamber is checking the files. After this, the startup screen will appear. Do not turn the circuit breaker (main power switch) off until the monitor screen appears. If the data cannot be repaired, the alarm "STORAGE MEDIUM UNRECOGNIZED (WARNING)" will occur after the chamber starts. You can operate the chamber, but you will not be able to use the save, write, and download functions for recorded data. Contact your distributor or ESPEC.
<p><Controller screen operations></p> <ul style="list-style-type: none"> • Set Sampling Data Writing screen <ul style="list-style-type: none"> - Pressing the [EXEC] key next to Int Memory Data Output has no effect. • Write Back Trace Data screen <ul style="list-style-type: none"> - You cannot record back trace data. - Pressing the [EXEC] key next to Manual Trigger has no effect. - You cannot write data to the external memory device. • System Updates screen <ul style="list-style-type: none"> - Pressing the [Update] key has no effect. <p><Web application screen operations></p> <ul style="list-style-type: none"> • Writing back trace data to an external memory device: Pressing the [Save] key has no effect. • You cannot download back trace data. 	⇒ After the chamber starts, check the alarm report from the Chamber Setup screen. If the alarm report contains an occurrence of "STORAGE MEDIUM UNRECOGNIZED (WARNING)", you will be able to operate the chamber, but the functions for saving, writing, and downloading recorded data will not operate properly. Contact your distributor or ESPEC.

1.4 Touch panel keys

This section describes the primary keys displayed on the touch panel.

◆ Reference ◆

- Handling the touch panel with a pointed or hard substance may damage the touch panel and cause malfunctions. Be sure to use your fingers to operate the touch panel.
- Do not press the touch panel in two or more places at the same time. Doing so may cause malfunctions.

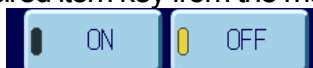
1.4.1 Keys used for moving to the next process

Key name	Usage
YES	Press this key to execute an operation. Be sure to check the message on the screen before pressing this key.
NO	Press this key to cancel an operation. The current operation will be canceled and you will return to the previous operation.
SAVE	Press these keys to update the data. A confirmation screen will be displayed.
END	
Apply	
QUIT	Press this key to cancel a data update. A confirmation screen will be displayed.
Back	Press these keys to close the open screen and return to the previous screen.
Cancel	

1.4.2 Keys used to select from multiple items

Press the desired item key from the multiple items that make up the setting.

Example:



The item that is set is highlighted in yellow.

1.4.3 Keys displayed on the character input screen

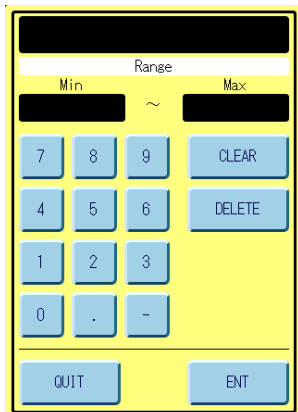
- [CLR] : Clears the value displayed in the frame.
- [DEL] : Deletes the value at the cursor position.
- [QUIT] : Discards input values, exits input, and returns to the previous screen.
- [ENT] : Sets input values, exits input, and returns to the previous screen.
- [KANJI] : Press this key to change the mode from alphanumeric input to kana input.
- [Alphanumeric] : Press this key to change the mode from kana input to alphanumeric input.
- [SPACE] : Enters a space.
- [CAPS] : Press this key to switch between upper case and lower case input.
- (Note) When the character input screen is displayed, keys other than those for the input screen cannot be used.

◆ Reference ◆

- Regarding the usage of the [KANJI] key
If you use Japanese kana characters in a name, and you then change the display language, kana characters may not be displayed correctly on the keyboard screen that is used to change the name.
(This may occur for constant pattern names, program names, and time signal names.)

1.4.4 Numeric keypad

Numeric keypad popup screen



CLEAR: Clears all characters in the character display area.

DELETE: Deletes the last character that was entered

ENT: Confirms the entered numbers and closes the numeric keypad.

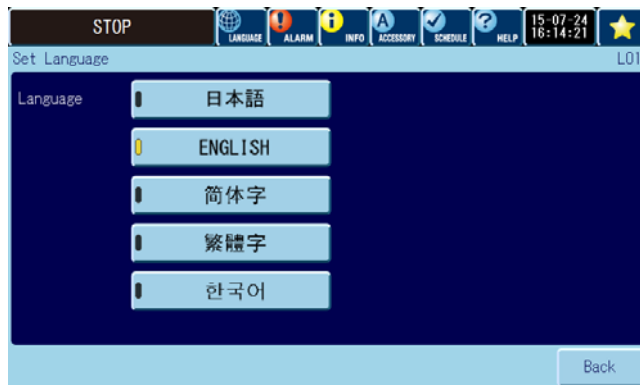
QUIT: Cancels the entered numbers and closes the numeric keypad.

1.5 Setting the language

Select the display language.

The text will be displayed using the language you select.

You can set the language to Japanese, English, Chinese (simplified), Chinese (traditional), or Korean.

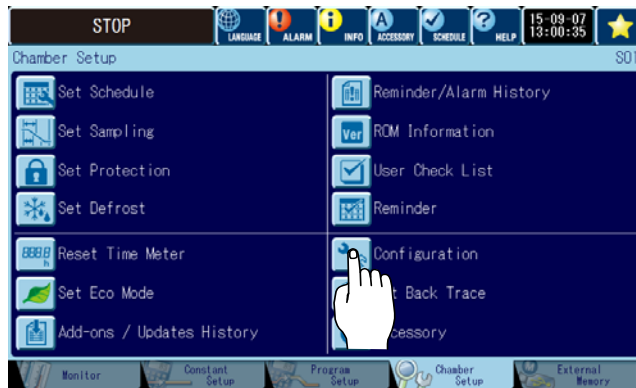


1.6 Setting screens

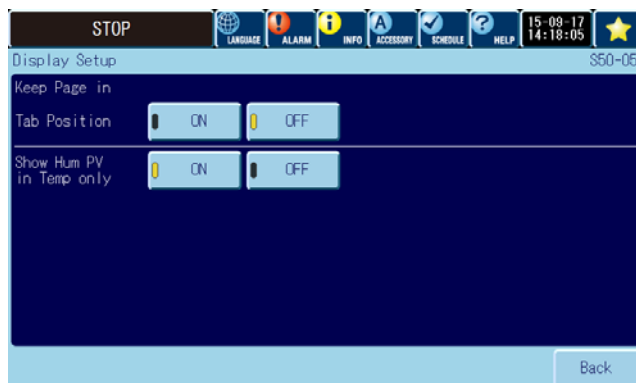
Use the procedure in this section to specify the display method to be used when the Monitor or Program Setup tab is selected and to specify the process value display (temperature/humidity type) to be used when humidity control is off.

<Procedure>

- 1) Press [Configuration] on the Chamber Setup tab.



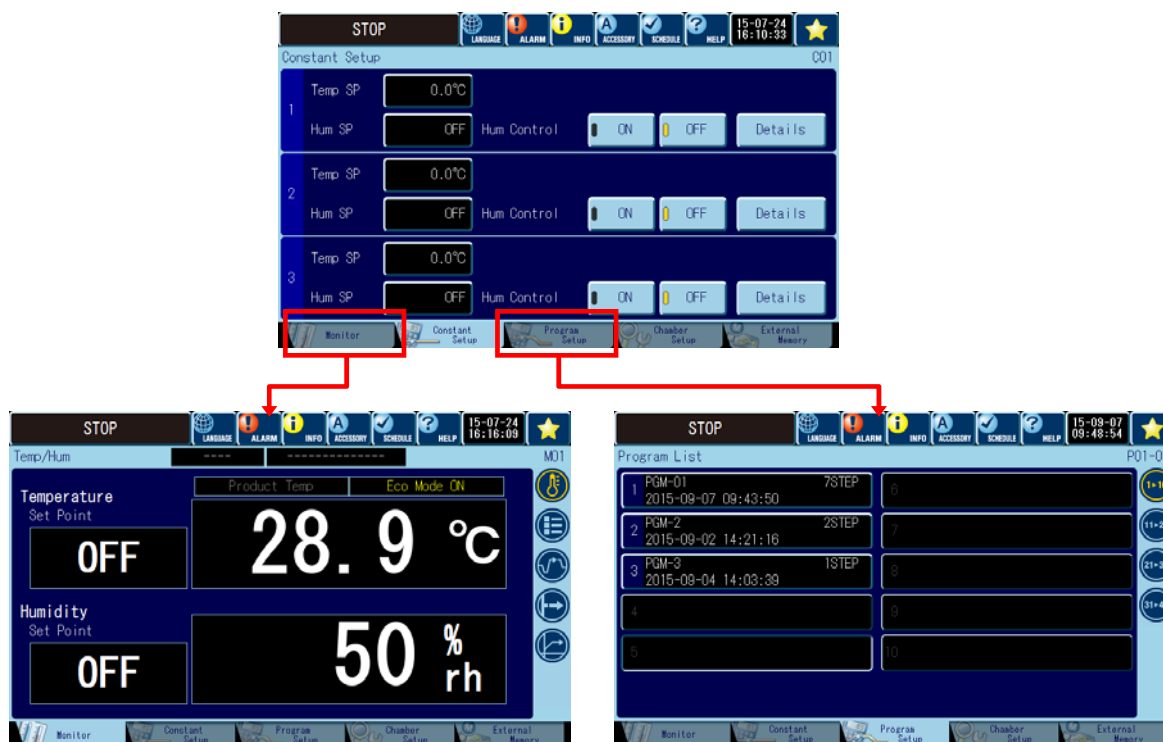
- 2) Press [Display Setup] on the Configuration screen.



■ Tab function (Keep Tab Position)

This function saves the previous screen that was selected on the Monitor or Program Setup screen. The default value is ON.

- Example of screen transition when [OFF] is selected:
When the screen is changed from the Constant Setup screen to the Monitor screen, [Temp/Hum] is displayed.
When the screen is changed from the Constant Setup screen to the Program Setup screen, Program List (1 to 10) is displayed.



- Example of screen transition when [ON] is selected
When the screen is changed from the Constant Setup screen to the Monitor screen, the last screen displayed on the Monitor screen is displayed.
When the screen is changed from the Constant Setup screen to the Program Setup screen, the last screen displayed on the Program Setup screen is displayed.

For example, if [Details] on the Monitor screen was displayed before the transition, the screen returns to [Details] on the Monitor screen.

If Program List (21 to 30) on the Program Setup screen was displayed, the screen returns to Program Setup 21 to 30.



■ Process value display when humidity control is off

Set whether or not the humidity process value should be displayed when humidity control is off.

When [ON] is selected, the humidity process value is displayed regardless of the humidity control setup.

When [OFF] is selected, the humidity process value is displayed as "—" when humidity control is off.

1.7 Setting the buzzer sounds

Turn buzzers on or off for alarms, warnings, and key touch operations and set the volume of the buzzers.

Press [Set Sound] on the Configuration screen.

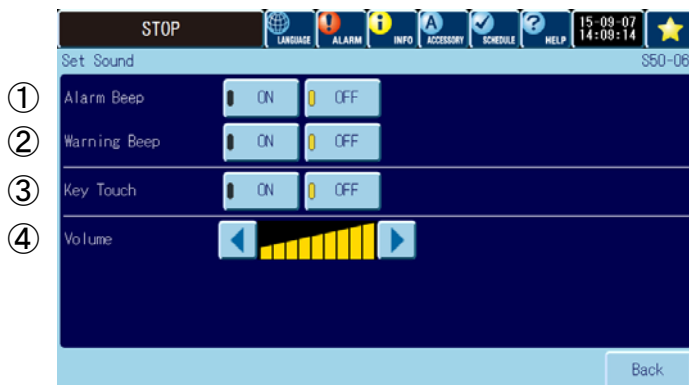


Table 1.1 Buzzer sound settings

①	Alarm Beep	Enable/disable the alarm buzzer.
②	Warning Beep	Enable/disable the warning buzzer.
③	Key Touch	Enable/disable the key touch sound.
④	Volume	Set the buzzer volume. * The default setting is the maximum value.

CAUTION

⊘

Keep the buzzer sound on whenever possible to prevent any delay in the detection of an alarm or warning.

Alarms and warnings are only indicated by a blinking red operation lamp and an on-screen warning when the buzzer sound is turned off. They are not indicated by sounding an alert.

!

Set the buzzer volume in accordance with the ambient environment. Lowering the buzzer volume level affects the volume of both the key touch sound and the buzzer for indicating alarms and warnings.

1.8 Setting the date and the screen

Set the date and the screen saver and dimmer timers.

Press [Set Date/Screensaver] on the Configuration screen.

The Date & Screensaver screen can also be displayed by pressing the date and time section in the common operations area.

If a password has been registered, enter the password.

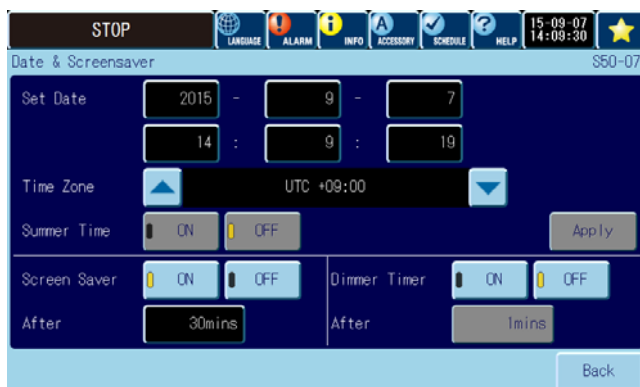


Table 1.3 Date and screen saver settings

①	Set Date	<p>Set the date.</p> <p>Set the year, month, day, hour, minute, and second.</p> <p>Press Apply to confirm the settings when finished.</p> <table><tr><td></td><td>Input range</td></tr><tr><td>Year</td><td>2010 to 2037</td></tr><tr><td>Month</td><td>1 to 12</td></tr><tr><td>Day</td><td>1 to 31</td></tr><tr><td>Hour</td><td>00 to 23</td></tr><tr><td>Minute</td><td>00 to 59</td></tr><tr><td>Second</td><td>00 to 59</td></tr></table>		Input range	Year	2010 to 2037	Month	1 to 12	Day	1 to 31	Hour	00 to 23	Minute	00 to 59	Second	00 to 59
	Input range															
Year	2010 to 2037															
Month	1 to 12															
Day	1 to 31															
Hour	00 to 23															
Minute	00 to 59															
Second	00 to 59															
②	Time Zone	<p>Set the time zone for the area where the chamber is installed.</p> <p>The default time zone is "UTC +09:00."</p> <p>Use the list to select a "Time Zone" item, and then press Apply.</p> <p>An execution confirmation message will be displayed. Press Yes.</p>														

Continued on the next page

Continued from the previous page

③	Summer Time	Set this to "ON" to enable daylight savings time. The time zone and daylight savings time settings are used when sending emails and setting the time by way of SNTP over the Internet.
④	Screen Saver	Select ON or OFF for the screen saver timer. If key operations are not performed for a certain period of time, the backlight is turned off. Time setting: 1 to 59 minutes
⑤	Dimmer Timer	Select ON or OFF for the dimmer timer. If key operations are not performed for a certain period of time, the brightness of the backlight is lowered. Time setting: 1 to 59 minutes

◆ Reference ◆

- The time accuracy is within 60 seconds per month.
Because the clock used here is built into the instrumentation, we recommend that you periodically adjust the time.
- The input range for the day depends on the current month setting. Be sure to specify the month first, and then specify the day.
Example: If the current setting is March 31 and you change the month to February, the date will automatically change to February 28 because February does not have 31 days.
- The date and time cannot be changed in the following cases. To change the date and time in such cases, stop the ongoing operation, change the date and time, and then resume the operation.
 - Program operation in progress (including program pause and last program holding)
 - The timer is set ☞ For details, see "Chapter 6 Chamber setup."
 - Sample recording in progress ☞ For details, see "Chapter 7 Using external memory."
 - Save Data Ext Memory is set to [ON] ☞ For details, see "Chapter 7 Using external memory."
- To turn off the screen immediately, press the ACCESSORY icon, and then press [Turn OFF the screen].
- * If you want to temporarily turn the screen back on or temporarily cancel the brightness reduction, touch the screen.

Chapter 2 Preparing for operation

This chapter explains the preparation required for conducting tests and checking items. In addition, "2.4 Convenient functions" introduces the useful functions that this equipment has. Be sure to perform the operations in this chapter for each test.

2.1 Refrigerator warm up (except PHP)

◆ Note ◆

- This equipment is equipped with a heater for warming up the refrigerator. Turn on the circuit breaker one hour before the start of operation to energize the heater. If the test is started immediately after the circuit breaker is turned on, the initial temperature pull-down time may be lengthened. In addition, the refrigerator may be adversely affected.
- Do not turn on the circuit breaker again within five minutes after the circuit breaker is turned off. Doing so significantly shortens the life of the refrigerator.
- For up to 15 minutes after the circuit breaker is turned on or up to five minutes after the refrigerator stops, the refrigerator is carrying out operation preparations, so even if you start operation, the refrigerator will not start. When the refrigerator completes its operation preparations, it will automatically begin operating. While the refrigerator is carrying out operation preparations, "Ref in Preparation" is displayed on the Information screen.

Information	Date/Time	Reminder	Date
Ref in Preparation	2016-07-24 15:47:59		

2.2 Configuring specimen protection device settings

Protective devices are equipped to protect specimens against damage due to abnormally high temperatures.

2.2.1 Setting the overheat protector

Notice
<p>Be sure to configure the overheat protector appropriately for the specimen before conducting a test.</p> <p>Improperly configuring the overheat protector may cause the specimen to be damaged if the chamber malfunctions.</p> <p>☞ For configuration details, see "Basic guide - 1.4 Safety devices for specimen protection."</p> <p>The protector should be set before starting operation.</p> <p>Changing the setting during operation may cause a false alarm.</p> <p>Do not hold down the Δ (up) and ∇ (down) keys of the adjuster at the same time for five seconds or more.</p> <p>Doing so will enter maintenance mode, which displays the thermocouple range, temperature range, and warning mode settings of the adjuster. If these settings are changed, the chamber may malfunction or not operate even when the temperature setting is reached.</p> <p>If a change of setting error occurs, "Err" is displayed and the program returns to the setting display mode.</p>

Configure the overheat protector settings.

<Procedure>

- 1) From the setting display mode, press the Δ (up) or ∇ (down) key.
The current alarm setting is displayed and "A" is displayed in the display area.
- 2) Specify the desired temperature.
Each time that you press the Δ (up) or ∇ (down) key (for about 0.5 second), the temperature is increased (reduced) by 1°C.
If you press and hold the key for approximately two seconds or more, the ones digit is set to zero and the value is increased (reduced) by 10°C.
- 3) Leave the device as it is without pressing Δ (up) or ∇ (down) for five seconds or more to set the specified temperature. If the temperature is set normally, the chamber returns to the setting display mode.
(If key operations are not performed for about five seconds or more, the specified temperature is set.)

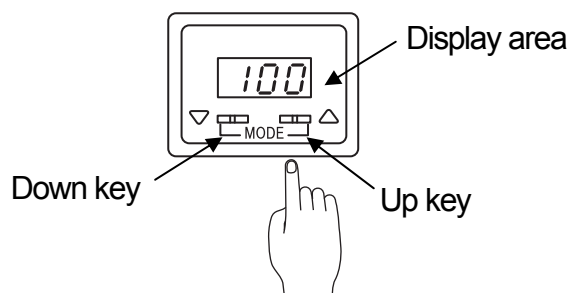


Fig 2.1 Overheat protector

Table 2.1 Alarm settings and safety actions

Safety devices and functions			Setting (value that meets the following conditions)	Safety action	Remarks
Overheat protector			<ul style="list-style-type: none"> Set temperature of test area +20°C At or below the specimen's heat-resistance temperature 	<ul style="list-style-type: none"> Alarm indication Buzzer sound^{*1} Heater control stops Humidifier control stops 	
Built-in to the temperature and humidity controller	Temperature alarm	Absolute upper limit value	<ul style="list-style-type: none"> Set temperature of test area +15°C At or below the specimen's heat-resistance temperature 110°C or lower (160°C or lower for the 150°C specifications) 	<ul style="list-style-type: none"> Alarm indication Buzzer sound^{*1} Heater control stops Humidifier control stops (not available on temperature-only chambers)	—
		Absolute lower limit value	<ul style="list-style-type: none"> Set temperature of test area -5°C or lower At or above the specimen's cold-resistance temperature The setting lower limit temperatures are characteristic to the different chambers. PR/PDR/PCR -25°C PL/PU/PDL -45°C PSL/PG -75°C PHP 0°C	<ul style="list-style-type: none"> Refrigerator stops Air circulator stops Specimen power supply control terminal interrupted 	
		Upper deviation limit	+10°C	<ul style="list-style-type: none"> Alarm indication Buzzer sound^{*1} Heater control stops Humidifier control stops (not available on temperature-only chambers)	
	Humidity alarm (not available on temperature-only chambers)	Absolute upper limit value	<ul style="list-style-type: none"> Set humidity of test area +10%rh or higher At or below the upper limit humidity allowable for the specimen 	<ul style="list-style-type: none"> Alarm indication Buzzer sound^{*1} Humidifier control stops 	When the test area temperature returns to within the range of the upper and lower limit settings, the alarm is canceled automatically.
		Absolute lower limit value	<ul style="list-style-type: none"> Set humidity of test area -10%rh or lower At or above the lower limit humidity allowable for the specimen 	<ul style="list-style-type: none"> Alarm indication Buzzer sound^{*1} Heater control stops Humidifier control stops 	

*1: Can be enabled or disabled.

Table 2.2 Alarm setting range (constant setting)

Model	Temperature (°C)		Humidity (%rh)	
	Absolute upper limit	Absolute lower limit	Absolute upper limit	Absolute lower limit
PR	Constant temperature setting to 110.0	-30.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PL	Constant temperature setting to 110.0	-50.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PSL	Constant temperature setting to 110.0	-80.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PHP	Constant temperature setting to 110.0	-5.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PDR	Constant temperature setting to 110.0	-30.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PDL	Constant temperature setting to 110.0	-50.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PCR	Constant temperature setting to 110.0	-30.0 to constant temperature setting	Constant humidity setting to 100	0 to constant humidity setting
PU	Constant temperature setting to 110.0	-50.0 to constant temperature setting	—	—
PG	Constant temperature setting to 110.0	-80.0 to constant temperature setting	—	—

Table 2.3 Alarm setting range (program setting)

Model	Temperature (°C)		Humidity (%rh)	
	Absolute upper limit	Absolute lower limit	Absolute upper limit	Absolute lower limit
PR	Program step temperature setting to 110.0	-30.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PL	Program step temperature setting to 110.0	-50.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PSL	Program step temperature setting to 110.0	-80.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PHP	Program step temperature setting to 110.0	-50.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PDR	Program step temperature setting to 110.0	-30.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PDL	Program step temperature setting to 110.0	-50.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PCR	Program step temperature setting to 110.0	-30.0 to program step temperature setting	Program step humidity setting to 100	0 to program step humidity setting
PU	Program step temperature setting to 110.0	-50.0 to program step temperature setting	—	—
PG	Program step temperature setting to 110.0	-80.0 to program step temperature setting	—	—

2.3 Configuring temperature (and humidity) absolute upper/lower limit settings

Notice

Be sure to appropriately set absolute upper/lower temperature (and humidity) limits for the specimen before conducting a test.

Improperly setting the absolute upper/lower temperature (and humidity) limits may cause the specimen to be damaged if the equipment malfunctions.

☞ For configuration details, see "Basic guide - 1.4 Safety devices for specimen protection."

■ Absolute upper/lower limit for temperature (humidity) and upper deviation limit for temperature

Abs High and Abs Low:

The judgment values used for performing a safety action in the test area.

These criteria are independent of the test area temperature (humidity) setting, and are fixed even when the test area temperature (humidity) setting is changed. If the chamber detects a safety action, it raises an alarm and stops.

Upper Dev:

The judgment value used for performing a safety action for the specimen.

Change this setting depending on the test specimen. This is the temperature relative to the test area temperature setting. When the temperature setting of the test area is changed, the upper deviation limit changes accordingly. If the chamber detects a safety action, it issues an alarm and stops the heater (humidifier). The chamber returns to normal control when the test area temperature falls below the temperature setting.

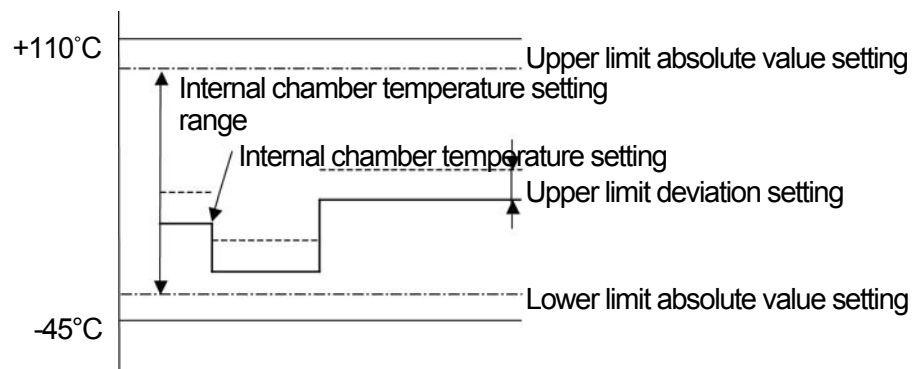


Fig. 2.2 Upper/lower limit temperature alarm setting

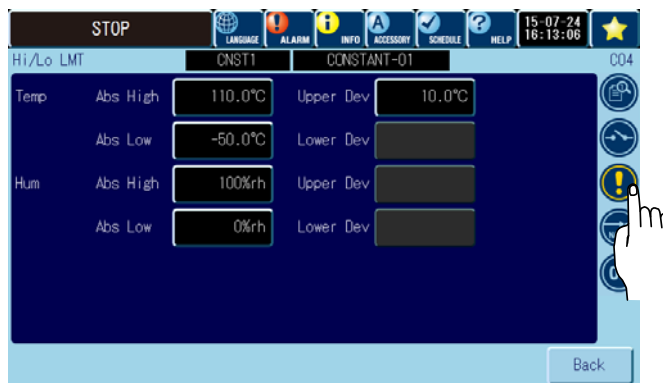
This section explains the configuration method in constant setup.

<Procedure>

- 1) Press [Details] on the Constant Setup screen.



- 2) Press the alarm setup icon on the Constant Setup screen to display the Hi/Lo LMT screen.



- 3) Configure the settings for the upper and lower limits of the test area temperature and humidity.

☞ For the configuration method in program setup, see "5.4.4 Entering upper/lower limit settings."

2.4 Convenient functions

2.4.1 Automatic/manual switching of refrigeration capacity (except PHP)

The refrigeration capacity setting has automatic control and manual control settings. For normal operation, leave the refrigeration capacity setting set to Auto.

Automatic control	Refrigeration capacity is automatically and optimally controlled in accordance with the temperature (& humidity) setting.
Manual control	Refrigeration capacity is raised and lowered manually using the arrow keys.

<Procedure>

- 1) This section explains the configuration method in constant setup. Press [Details] on the Constant Setup screen.



- 2) The Equipment screen is displayed. In ordinary circumstances, select Auto. The refrigeration capacity can also be controlled manually. When you select [Manual] next to Refrigeration, press the manual setting icons to set the value from STOP to the maximum value. When you make settings manually, the more parts that light up in yellow, the greater the capacity.



☞ For the configuration method in program setup, see "5.2.2 Program editing procedure - Step details."

Notice

If the refrigeration capacity is insufficient for the specimen and the test pattern, set the refrigeration capacity manually.

If you continue to perform operations with the refrigeration capacity fixed, you may not be able to maintain control or power consumption may increase because of excessive or insufficient capacity.

2.4.2 Using time signals

Time signals are used to control external equipment in steps during program operation as shown below.

- Supplying power to the specimen only in certain steps during program operation.
- Turning off the power at the same time as the end of operation.
- Making a lamp light up when data is measured.

☞ For how to continue powering the specimen during program operation, see "Basic guide - 4.2 Powering a specimen (only when powering a specimen)."

Notice

Time signal output is not turned off when a chamber error occurs.

To turn off time signal output when a chamber error occurs, use this in combination with the specimen power supply control terminal.

2.4.3 Humidifier delay control

In this function, humidity control starts after the test area temperature reaches the temperature setting (within the temperature attainment range and equal to or longer than the temperature holding time).

Humidity control starts with the following timing.

■ When the test area temperature is higher than the temperature setting

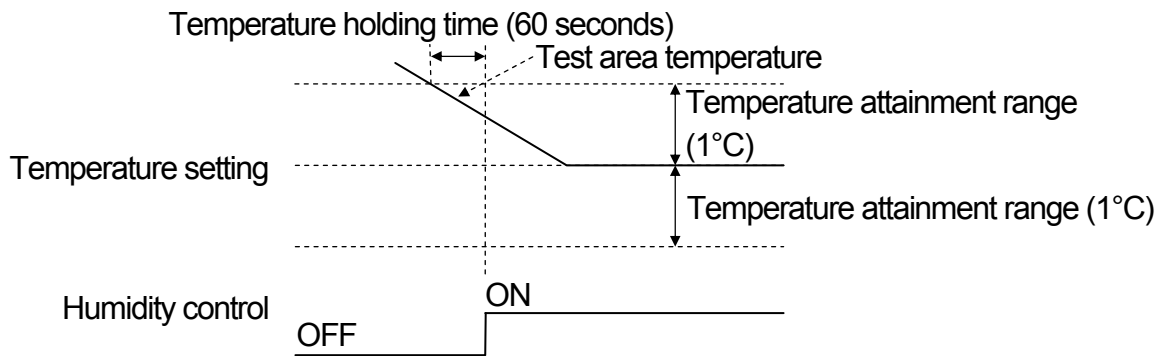


Figure 2.3 Humidifier delay control example 1

■ When the test area temperature is lower than the temperature setting

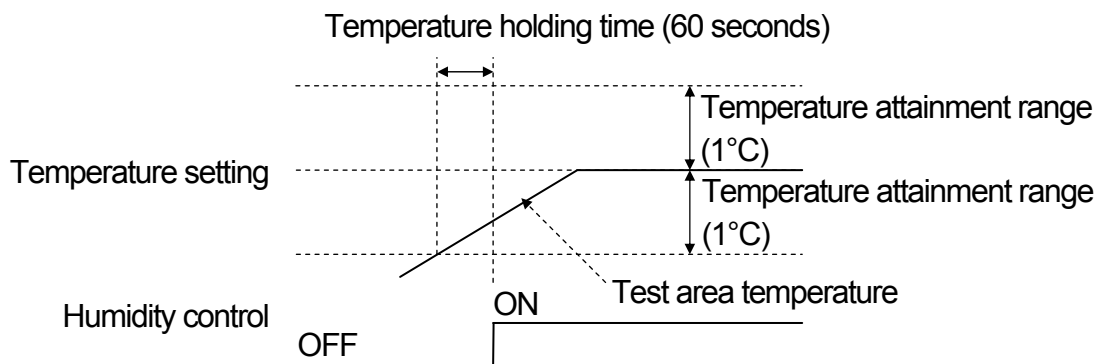


Figure 2.4 Humidifier delay control example 2

◆ Reference ◆

- The temperature attainment range in the humidifier delay control function is preset to 1°C, and the temperature holding time is preset to 60 seconds. These cannot be changed.
- Even if [Control Attain Range] on the Configuration screen is changed, this change is not applied to the operation of this function.

- When conducting a test of electronic components, make certain that condensation does not form on the specimen.

Condensation occurs when the surface temperature of the specimen is lower than the dew-point temperature of the air in the test area.

To avoid condensation on the specimen, it is necessary to perform temperature-only operation in advance, and then to start the temperature and humidity operation after the surface temperature of the specimen becomes the same as the temperature in the test area.

Condensation can also be avoided by using humidifier delay control.

If the temperature and humidity in the test area is 85°C and 85%rh, the dew-point temperature of the air in the test area is 80.9°C. Therefore, condensation occurs if the surface temperature of the specimen is less than 80.9°C. The table below shows the relation between temperature/humidity and dew-point temperature.

Table 2.4 Dew-point temperature

Dry-bulb temperature (°C)	Relative humidity (%rh)	Dew-point temperature (°C)
60	85	56.5
70	85	66.3
	90	67.7
85	85	80.9
	90	82.3

For a program example that can be used to avoid condensation on the specimen, see "5.9 Starting/ending or pausing/resuming operation."

For humidifier delay control, select ON or OFF for humidifier delay control in [Set Chamber Detail] on the Configuration screen. After humidity control starts, if the temperature within the test area exceeds or falls below the temperature setting by 3°C or more, humidifier delay control will start again.

2.4.4 Drainage function (temperature and humidity type)

The following functions are available for draining the humidifying tray and wick pan.

- Auto Drain: Automatically drains water in accordance with the operation state.
- Manu Drain: Drains water when [EXEC] next to Manu Drain is pressed.
- Program step drain: Water is drained at the beginning of program steps whose Auto Drain is set to [ON].

For automatic drainage and manual drainage, see "1.2.1 Common operations area" - "Set Drain (temperature and humidity type)."

For details on program step draining, see "5.2.2 Program editing procedure - Step details."

The amount of drainage is about 1.2L per drainage cycle on chambers of Type 1 to Type 3 and about 2.4L on a chamber of Type 4.

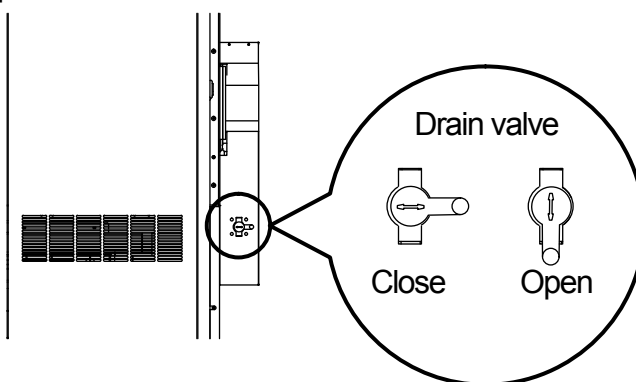
Table 2.5 Drainage function

Auto Drain	ON	Drains the humidifying tray and wick pan according to the operation state. When switching from temperature and humidity operation to temperature operation When the temperature setting is lower than 0°C or higher than 100 °C and humidity control is set to [ON] (Drainage is performed because this is temperature operation.) (PDL, PDR only) The small humidifying tray is not drained.	Configure this setting on the Accessory screen. ☞ See "1.2.1 Common operations area" - "Set Drain (temperature and humidity type)."
	OFF	Water is not automatically drained from the humidifying tray and the wick pan.	
DRN (program step drain)	ON	Water is drained from the humidifying tray at the beginning of program steps whose DRN is set to [ON]. (Water is not drained from the wick pan.)	Settings are configured with the Program Setup screen. ☞ For information about settings, see "5.2.2 Program editing procedure - Step details" - "Drainage setting (temperature and humidity type)."
	OFF	Water is not drained at the beginning of program steps.	
Manu Drain	EXEC	Drains water from the humidifying tray and the wick pan. Draining ends in about 2 minutes and stops automatically. When Auto Drain is set to [ON], if you manually drain the water during humidity operation, water is supplied again. (PDL, PDR only) The small humidifying tray is not drained.	Execute this function from the Accessory screen. ☞ See "1.2.1 Common operations area" - "Set Drain (temperature and humidity type)."
	STOP	Stops manual drainage.	

Notice

- If the chamber operates at a high temperature with Auto Drain set to [OFF], the water in the humidifying tray may evaporate, possibly resulting in high humidity in the chamber. This may also cause a delay in reaching the temperature setting.

Water in the small humidifying tray (water level regulator) is not drained by the drainage function (only for the PDL and PDR). Drain the water inside the water level regulator by opening the drain valve of the small humidifier protection box. Close the valve after drainage is complete.



- If program step draining is set to [ON] for every temperature and humidity operation step, temperature control may fluctuate during the transition to each step.

◆ Reference ◆

- Program step draining can be used to drain water that condenses inside the chamber and for other purposes.
 <Usage example> If program step draining is set to [ON], the water in the humidifying tray will be drained after a long low-temperature operation. This eliminates the need to manually drain the water.
 <Application example> If you want to replace the water in the humidifying tray at specific times, you can set program step draining to [ON] so that after the water is drained, water is automatically supplied at the beginning of temperature and humidity control operation.
- Even when Auto Drain is set to [OFF], if program step draining is set to [ON], water will be drained from the humidifying tray at the beginning of the relevant steps. Check the drain setting of each program step.
- Even when program step draining is set to [OFF], if Auto Drain is set to [ON], water will be drained in accordance with the operation status. Check the drain setting on the Accessory screen.

Chapter 3 Chamber monitor

This chapter describes the content displayed on the monitor screens.

3.1 Chamber monitor display

Press the Monitor tab to display the chamber monitor.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed. Use these screens to monitor the detailed operation state of the chamber.

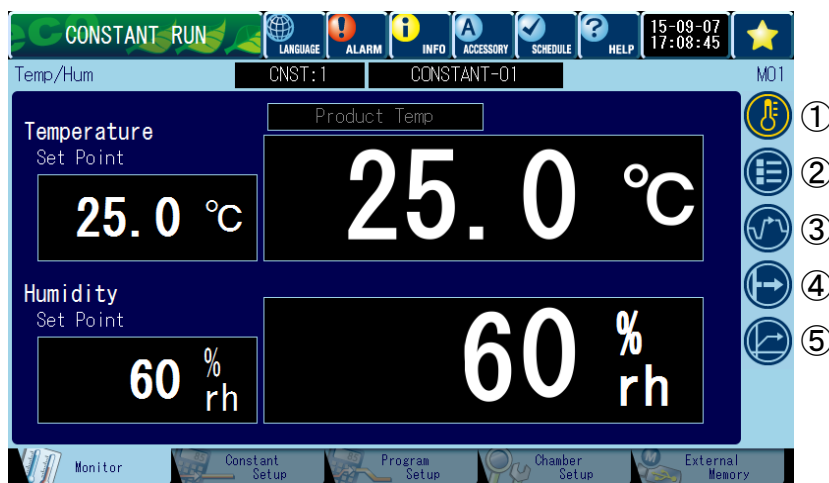


Table 3.1 Side menu (chamber monitor)

	Icon	Slide label	Screen
①		Temp/Hum	Displays the overall state of the chamber and the settings and process values of the temperature and humidity.
②		Details	Displays the status and setting details of the test area.
③		Program	Displays the details of the program pattern that is in operation.
④		Ext Output	Displays the output status of the external output and time signal contact signals. Time signals are only output during operation.
⑤		Trend Graph	Displays the test area settings and process values as a trend graph.

◆ Reference ◆

You can display the trend graph from the Main Monitor screen or from quick access.

3.2 Temperature/humidity

This screen allows you to monitor test area temperature and humidity.

Temp/Hum screen

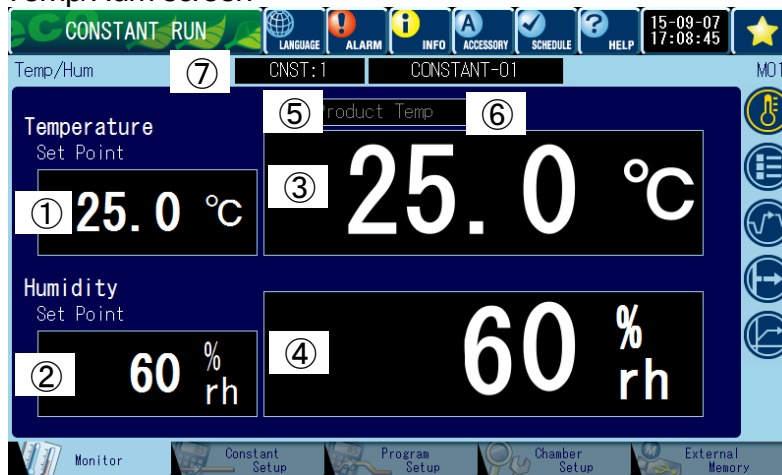


Table 3.2 Temperature/humidity

	Displayed content
①	Displays the control temperature setting
②	Displays the test chamber humidity setting
③	Displays the test area measurement temperature
④	Displays the test area measurement humidity
⑤	Displays that the chamber is being controlled by the specimen temperature*
⑥	Displays that the eco operation setting is enabled
⑦	When the chamber is in operation, displays the constant operation number or the program number and name

* This is only displayed when the appropriate option is installed.

◆ Reference ◆

Monitor information display

1) Setting

Displays "OFF" when operation is stopped

2) Process value

"----" is displayed when the measured temperature value is invalid.*

"----" is displayed when the measured humidity value is invalid.*

"----" is also displayed if settings are configured to hide the process value when humidity control is OFF.

☞ See "1.6 Setting screens."

* Invalid conditions

Temperature: When the dry-bulb sensor is disconnected

Humidity: When the wet-bulb sensor is disconnected

When the process value is less than 0%rh or exceeds 100%rh

3.3 Details

This screen allows you to monitor the temperature and humidity settings, process values, and the status of outputs.

Press the  (details) icon.

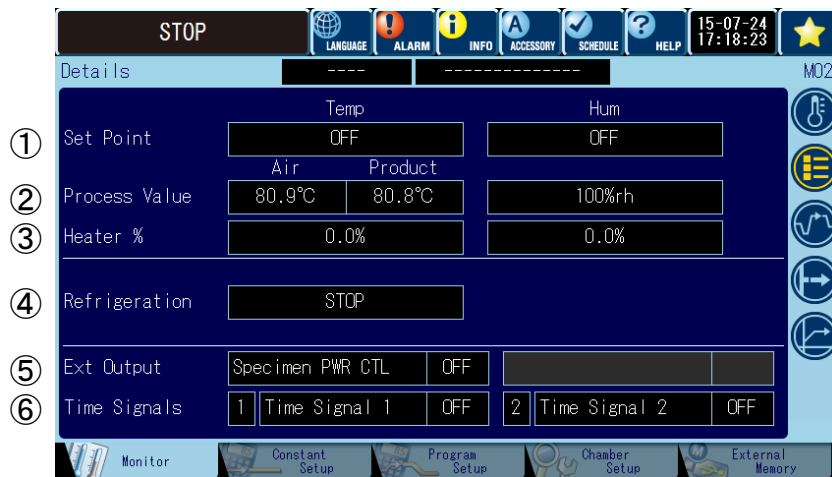


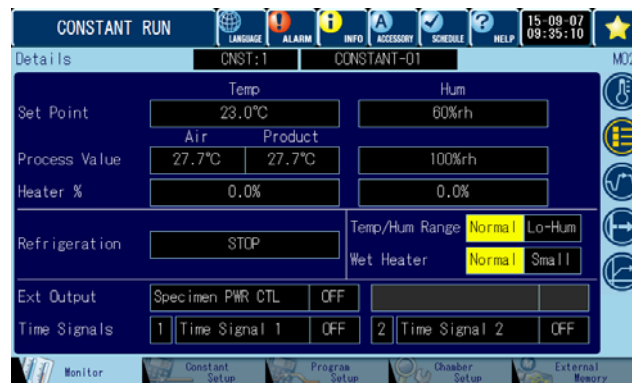
Table 3.3 Details

		Displayed content
①	Set Point	Displays the current control target values
②	Process Value*	Displays the current process values in the test area
③	Heater %	Temp: Displays the output value of the heater Hum: Displays the output value of the wet heater
④	Refrigeration*	Displays the operation status of the refrigerator (RUNNING/STOP/DEFROST)
⑤	Ext Output	ON: When the output relay contact is short circuited OFF: When the output relay contact is open, displays the output state of the external output
⑥	Time Signals	Yellow: ON Black: OFF Displays the output status of the time signal contact signal

* The items that are displayed differ depending on the chamber model.

■ PDR or PDL

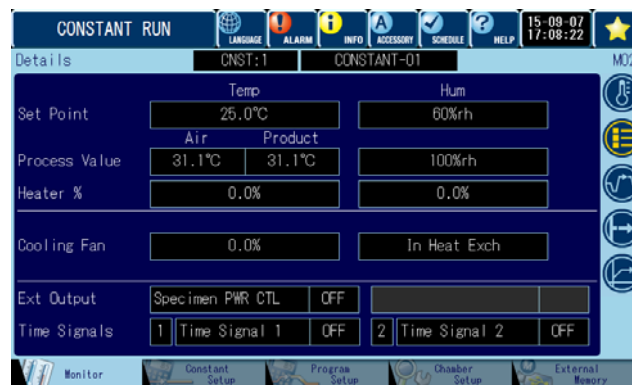
The current operation range and the type of wet heater that is currently in use are displayed.



■ PHP

The operation state of the cooling fan is displayed (0 to 100%, heat exchange being performed, or heat exchange stopped).

If the cooling fan is operating at 100%, you cannot increase the cooling any further.



◆ Reference ◆

If an option is not installed, the frame indicating its operation status is grayed out.

3.4 Program

This screen allows you to monitor detailed information about the pattern being run.

Press the  (program) icon.

Program operation details display screen

Step display frame

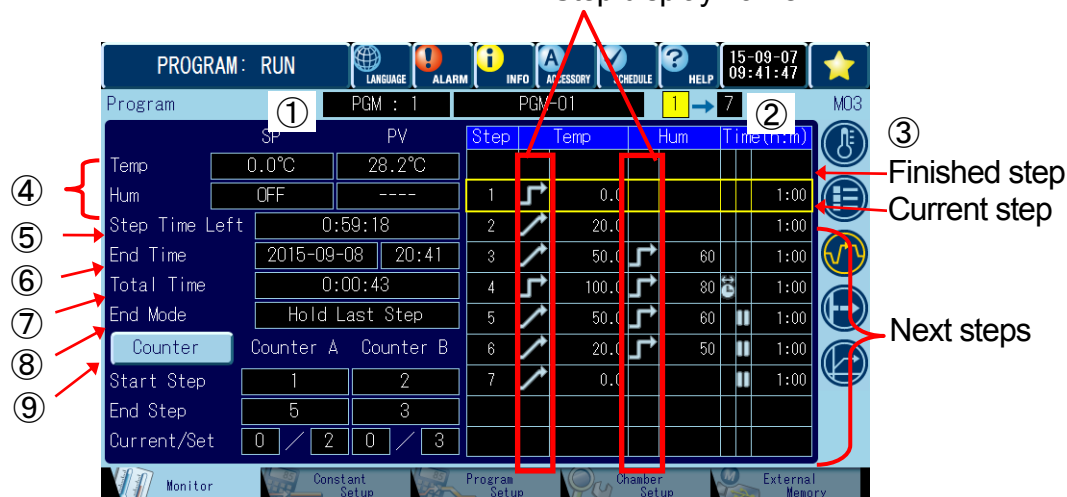



Table 3.4 Program monitor

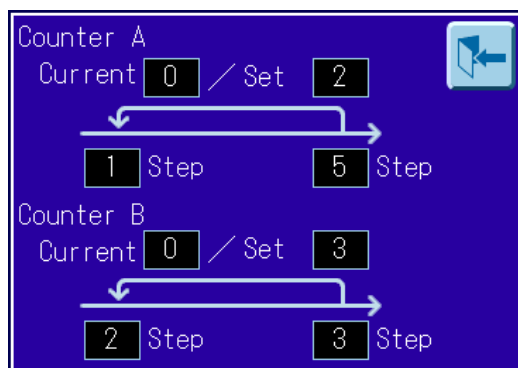
①	Displays the number and name of the program currently being run.
②	Displays the step number currently being run and the last step number.
③	Displays the step information. Top row: Displays the finished step. Nothing is displayed when the initial step is being run. Second row: Displays the step currently being run. It is displayed with a yellow frame.
④	Displays the settings and process values of the temperature/humidity of the step currently being run.
⑤	Displays the remaining time of the step currently being run. (Counts down)
⑥	Displays the programmed end time of the program currently being run. The following cases are not included in the programmed time. <ul style="list-style-type: none"> When soak time control is set to [ON] When the step currently being run is forcibly advanced to the next step * If the programmed operation end time exceeds 23:59:59 on December 31, 2099, [---] is displayed.
⑦	Displays the accumulated operating time of program operation. However, note that even if an alarm (warning) occurs or operation is paused, they are all accumulated in the Total Time.
⑧	Displays the end condition after the program ends. (Power OFF, Stop, CONSTANT, Hold Last Step, Start Next Program)

Continued on the next page

Continued from the previous page

Displays the status of the counter settings.
Press [Counter] to display the counter setting screen.
Close it with .

⑨




◆ Reference ◆

For the program number and step number when an alarm occurs, check the program operation details screen before turning the power switch off. The step number currently being run is not displayed when the power switch is turned off.

3.5 External output

This screen allows you to check the output status of the external output and time signal contact signals.

Time signals are only output during operation.

Press the  (external output) icon.



- ① Displays the names of the external outputs.

Standard accessory	Function
Specimen PWR CTL output	Used to supply power to the specimen in the test area when the equipment is operating normally.

* During defrosting, the output of the specimen power supply control terminal is turned off.

- ② Displays the output status of the external outputs.

ON: When the output relay contact is short circuited.

OFF: When the output relay contact is open.

- ③ Displays the names of the time signals (3 to 12 are options).

(If an option is not installed, it is displayed in gray. If the external output is not set to Time Signal 1, 1 is also displayed in gray.)

Table 3.5 Time signals

Accessory		Function
Time Signal 1	Standard	Contacts by which you can turn your external equipment on and off from the controller can be installed in the chamber.
Time Signal 2	Standard	

- ④ Displays the output status of the time signals.

ON: The relay contact of the output is short circuited.

OFF: The relay contact of the output is open.

◆ Reference ◆

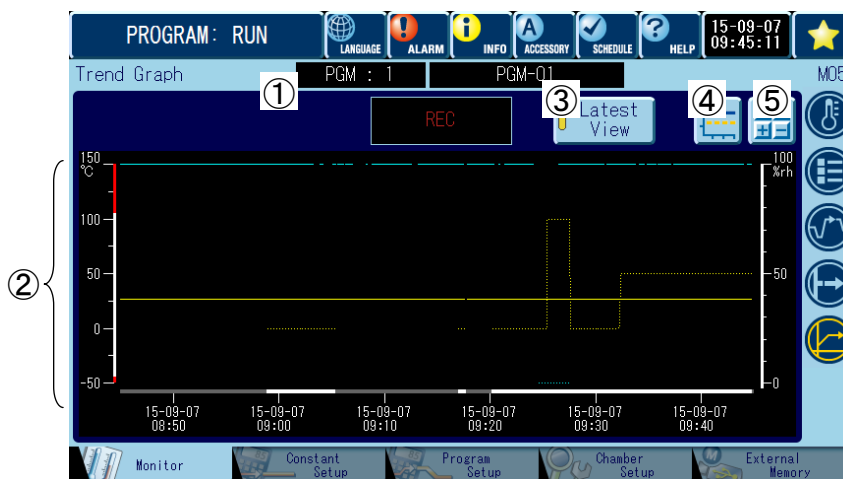
The names of time signals can be changed.



☞ For details, see "6.11.4 Registering (changing) names of time signals."

3.6 Trend graph

The trend graph displays the test area settings and process values as a graph.

Press the  (trend graph) icon.



①	Displays the number and name of the program currently being run or of the constant operation.
②	This is the graph display frame. The items displayed on the graph vary depending on the [Menu] setting on the Set Sampling screen. ☞ See "Table 3.6 Graph display conditions."
③	When you select [Latest View], the graph display is refreshed approximately once every 15 seconds to display the latest values regardless of the sampling cycle. When you change the display interval, automatic refreshing is canceled.
④	 : Display the line type and color of the graph. Press this icon again to return to the Trend Graph screen.
⑤	 : Shows or hides the scale setup keys at the bottom of the graph. You can change the temperature, humidity, or time axis by changing the scale settings.

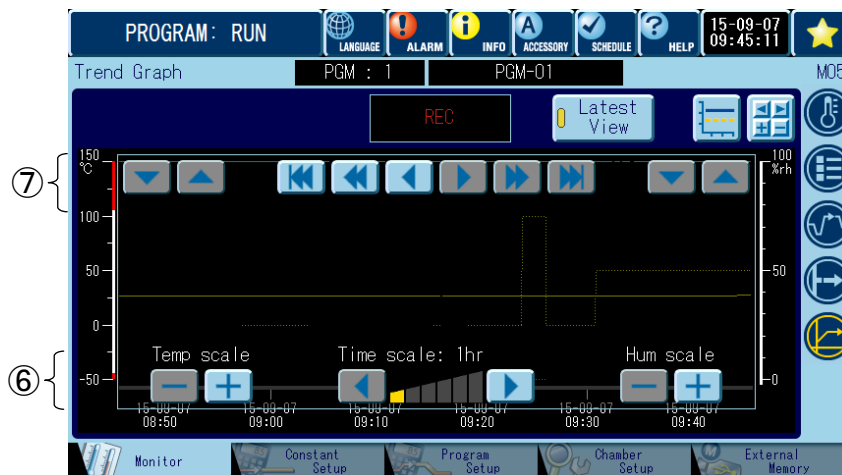
◆ Reference ◆

- You can also display the trend graph from quick access.
- If the memory capacity is exceeded, the oldest data is automatically erased to make room for writing the new data. ☞ For details, see "7.2 Configuring sampling writing settings."

Trend graph legend display screen (when ④ is pressed)



Trend graph display setup screen (when ⑤ is pressed)















⑥	  : Sets the time scale displayed on the screen. There are six types of time scales: one hour, 12 hours, one day, three days, six days, and 12 days.   : Zooms the displayed temperature or humidity scale.
⑦	Display position selection: You can shift the graph display position to the left and right.   : Jumps to the starting time (past) or the latest time of the graph.   : Scrolls forward and backward through the graph by one screen.   : Scrolls forward and backward through the graph by one scale division.   : Scrolls up and down through the scales of the temperature and humidity separately.

Table 3.6 Graph display conditions

- When [Menu] on the Set Sampling screen is set to "EXEC"

Operation state	Recordable item				
	Temperature		Humidity		
	Setting	Process value	Control	Setting	Process value
Operating	○	○	OFF	×	○
			ON	○	○
Standby	×	○	—	×	○

○: Show, ×: Hide

- When [Menu] on the Set Sampling screen is set to "Rec in Run"

	Recordable item				
Operation state	Temperature		Humidity		
	Setting	Process value	Control	Setting	Process value
Operating	○	○	OFF	×	○
			ON	○	○
Standby	Recording is stopped at the last recording time. When recording is stopped, updating of the trend graph is stopped regardless of the refresh setting. Recording resumes when the chamber is operating. The period during which recording is stopped is not displayed. See the sample screen.				

○: Show, ×: Hide

- When [Menu] on the Set Sampling screen is set to "STOP"

Operation state	Recordable item				
	Temperature		Humidity		
	Setting	Process value	Control	Setting	Process value
Operating	The chamber stops updating the trend graph at the final recording time. To resume updating, change [Menu] to "EXEC" or "Rec in Run" and start recording. The period during which recording is stopped is not displayed. See the sample screen.				
Standby					

*1 A temperature process value will not be displayed if it is invalid.

*2 A humidity process value will not be displayed if it is invalid.

☞ For displayed data settings, see "6.4 Sampling settings."

The displayed data can be copied to external memory.

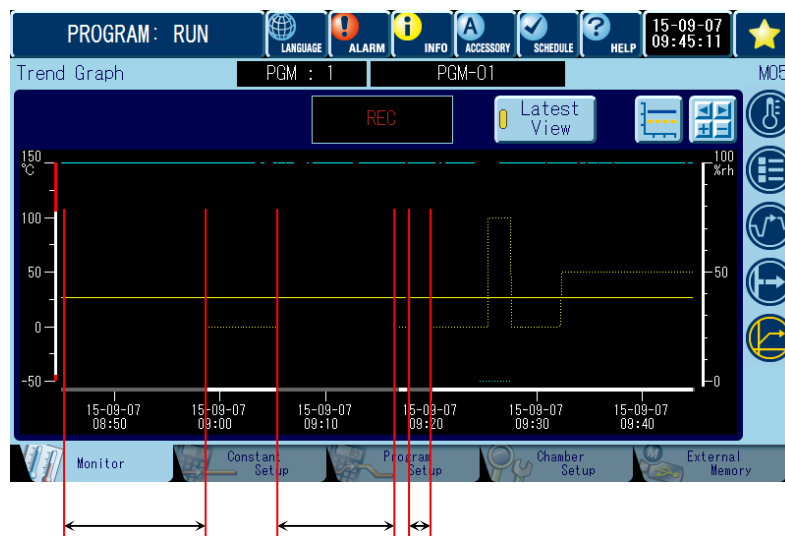
☞ See "7.2 Configuring sampling writing settings."

◆ Reference ◆

- The recorded data displayed in the graph is not erased even if the breaker (main power switch) is turned off (including momentary stops) because the data is backed up to the internal memory.
- To erase the recorded data, execute "Clear Data" on the Set Sampling screen or change [Item].

☞ See "6.4 Configuring sampling settings".

Sample screen



The graph data is not displayed for the interval in which sampling recording was stopped.

Chapter 4 Constant operation

This chapter explains the configuration method for performing constant operation and the method of starting and ending operation.

◆ Reference ◆

- You can configure, run, and monitor constant operation from a remote point by using Web function. For details, see the Network guide.
- You cannot use the configuration operations given in this chapter for programs for which [Prevent Data Update] is set to ON. See "Chapter 6 Chamber setup" - "6.5 Setting protection."

4.1 What is constant operation?

Constant operation is a method to set the chamber to a constant temperature and humidity and then to maintain the test area temperature and humidity at those values. This is called constant operation because the chamber operates with the settings at constant values.

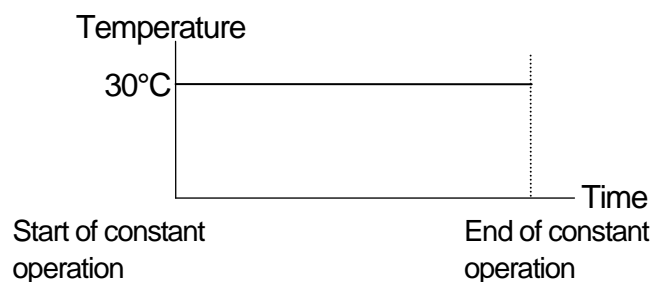


Figure 4.1 Example of constant operation

4.2 Entering the temperature and humidity

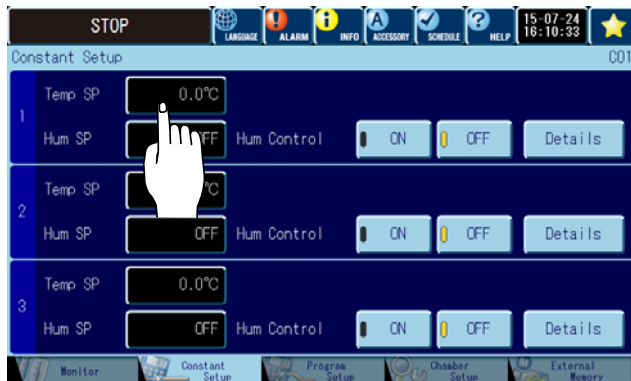
Set the control settings (temperature and humidity) for performing constant operation. Three types of constant operations, No. 1, No. 2, and No. 3, can be set.

<Procedure>

- 1) Press the Constant Setup tab to display the Constant Setup screen.



- 2) Enter the temperature setting for the constant operation number to set.
To set the temperature, press the value in [Temp SP]. The available temperature range is displayed on the popup screen. Enter a value and press [ENT].



The upper and lower limits of the input range are determined by the temperature range of the chamber and [Hi/Lo LMT] in [Details].

☞ For details, see "4.4 Entering upper/lower limit settings."

- 3) Enter the humidity setting. (Only for temperature and humidity types.)
To set the humidity, press the value in [Hum SP]. The available humidity range is displayed on the popup screen. Enter a value and press [ENT].

Turn humidity control operation on or off.

* If humidity control is set to OFF, the humidity setting is displayed as OFF. When humidity control is turned ON, the entered setting is displayed.

☞ When the (optional) specimen temperature control is ON, you cannot set the humidity control operation to ON.



◆ Reference ◆

Refer to section 5.11 for low-humidity operation. (PDL and PDR only)

- 4) To configure detailed settings, press [Details].

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

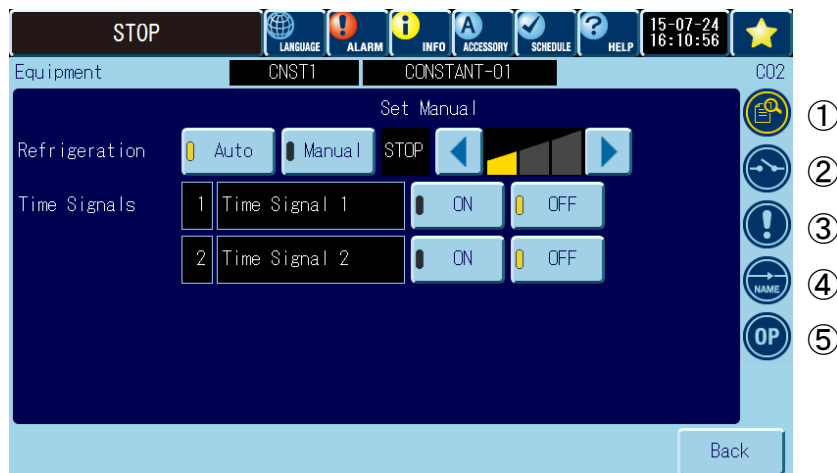


Table 4.1 Side menu (details)

	Icon	Slide label	Screen
①		Equipment	Turn the refrigeration control and time signals 1 and 2 (equipped as standard) on or off.
②		Time Signals	Turn time signals 3 to 12 (options) on or off.
③		High/Low Limit Setup	Enter the high/low limit settings.
④		Constant Test Name	Set the constant test name.
⑤		Option	Set the air flow and the specimen temperature details.

* The option icon is not displayed on chambers that do not have any options installed.

4.3 Entering equipment settings

Set the refrigeration and time signals.

4.3.1 Setting refrigeration (except PHP)

<Procedure>

- 1) Press [Details] to display the Equipment screen.



- 2) Though in normal circumstances the refrigerator is automatically controlled, its capacity can be controlled manually. To control the refrigerator manually, set its capacity. The more the yellow bars light up, the greater the capacity.

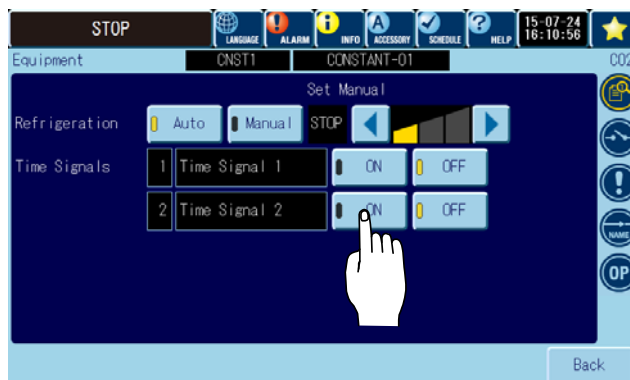


◆ Reference ◆

- For details on refrigerator settings, see "2.4.1 Automatic/manual switching of refrigeration capacity."
- When you want to change the mode from Auto to Manual during operation, set the capacity of the refrigerator, and then press [Manual]. When [Refrigeration] is changed from [Auto] to [Manual] with the manual setting set to [STOP], the refrigerator stops immediately. This may cause control to become uneven.
- When [Refrigeration] is set to [Auto], the manual setting is not reflected in the operation of the refrigerator.
- For the PDR and PDL, the wet heater selection is displayed on the screen. For details, see "5.11 Low-humidity control operation."

4.3.2 Time signals

Contacts by which you can turn your external equipment on and off with keys on the instrumentation can be installed in the chamber.



Standard equipment



With optional time signals

<Procedure>

- 1) Press Equipment or the time signals side menu icon on Details to display the screen for setting the time signals.

* If the options are not installed, the time signals cannot be set.

- 2) Set the time signal contacts to be output.
Set the desired time signals to [ON] or [OFF].

ON: The time signal is output.

OFF: The time signal is not output.

◆ Reference ◆

The names of time signals can be changed.

☞ For details, see "6.11.4 Registering (changing) names of time signals."

4.4 Entering upper/lower limit settings

The values set as the absolute upper and lower limit temperature values become the input range that can be set in constant setup and program setup. Press the setting key to display the screen for entering numeric values, and then enter the value on that screen.

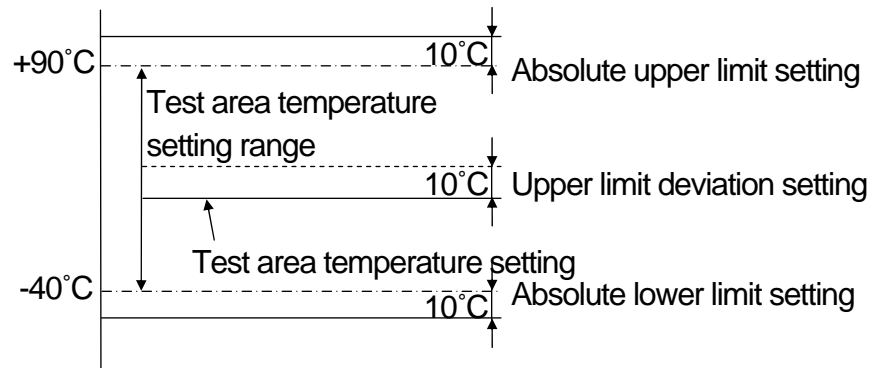


Figure. 4.2 Alarm conditions (temperature)

Abs High and Abs Low:

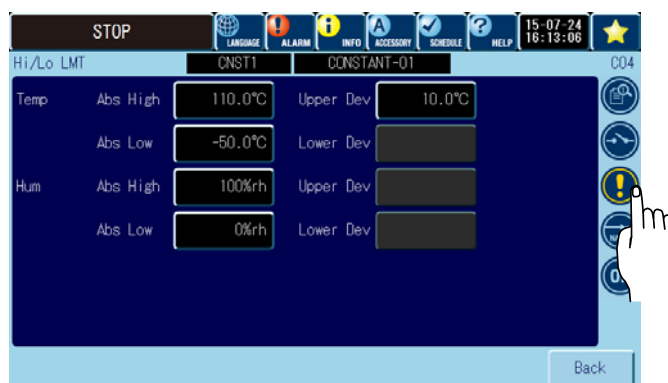
The judgment values used for performing a safety action in the test area. Set the values greater than the test area temperature setting by 10°C or more. If the chamber detects a safety action, it raises an alarm and stops.

Upper Dev:

The judgment value used for performing a safety action for the specimen. Change this setting depending on the test specimen. If the chamber detects a safety action, it raises an alarm and stops the heater (humidifier). The chamber returns to normal control when the test area temperature falls below the temperature setting.

<Procedure>

- 1) Press the alarm settings side menu icon on Details to display the Hi/Lo LMT screen.



- 2) Enter the upper and lower limit values for the test area temperature and humidity. Press the setting, enter a numeric value, and then press [ENT].
- 3) Enter the upper limit deviation alarm value for the test area temperature and humidity.
For details on the safety actions, see "2.2 Configuring specimen protection device settings."

4.5 Creating constant test names

The constant pattern names can be changed.

<Procedure>

- 1) Press the constant pattern name settings side menu icon on Details to display the Constant Test Name screen.
Press the constant test name, and then enter its new value.



You can enter up to 15 characters.



4.6 Setting options

Adjust the air flow and set the specimen temperature details.

☞ For details on adjusting the air flow and setting the specimen temperature details, see the Option guide.

- * Because these functions are all optional, functions that are not installed are not displayed.

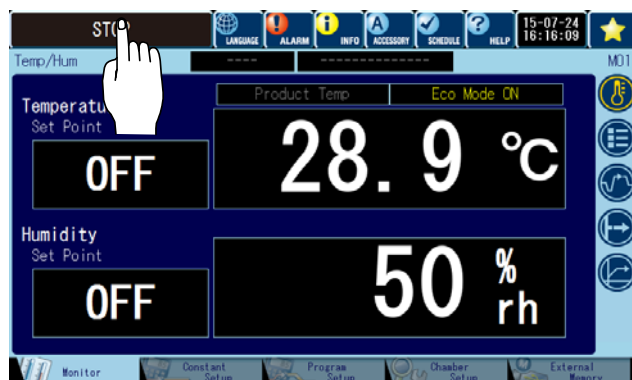
4.7 Starting/ending operation

Before starting operation, check that the following work has been correctly performed: "Chapter 2 Preparing for operation" - "2.1 Refrigerator warm up," "2.2 Configuring specimen protection device settings," and "2.3 Configuring temperature (and humidity) absolute upper/lower limit settings."

Also check the information icon.

Use the Operation Mode screen to start and stop operation.

Press the operation display area at the upper left of the screen to display the Operation Mode screen.



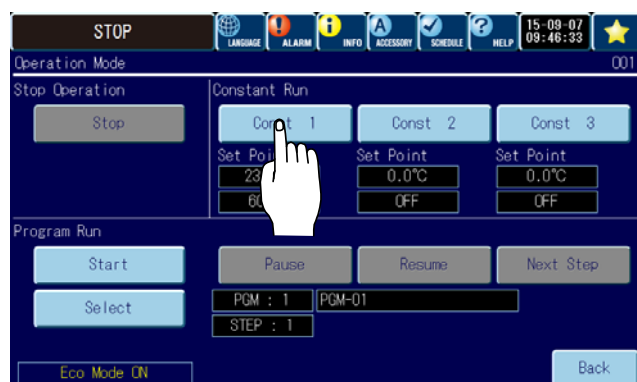
■ Operation selection precautions

When the SCHEDULE icon lights up, the timer is set. Check whether or not the timer will affect the operation that will be executed now.

4.7.1 Starting constant operation

<Procedure>

- 1) Press the [Const No.] for the operation you want to perform.
 - * Check the settings (temperature and humidity) displayed under [Const No.] and select the constant number you want to run.



- 2) A confirmation screen is displayed.



- [YES]: Starts operation and returns to the original screen.
"CONSTANT" is displayed in the operating display area.
- [NO]: Returns to the Operation Mode screen.

◆ Energy Saving Advice ◆

CHECK! If "Eco Mode ON" is displayed, the chamber operates in a way such that its power consumption is reduced. (excluding the PHP model)

• Eco operation setting

When "Set Eco Mode" is set to [On] on the Chamber Setup screen, "Eco Mode ON" is displayed in yellow on the Monitor screen and Operation Mode screen. During economy operation, the chamber operates in a way such that its power consumption is reduced.
(Chambers equipped with the DC inverter refrigeration circuit system option are not included.)

◆ Reference ◆

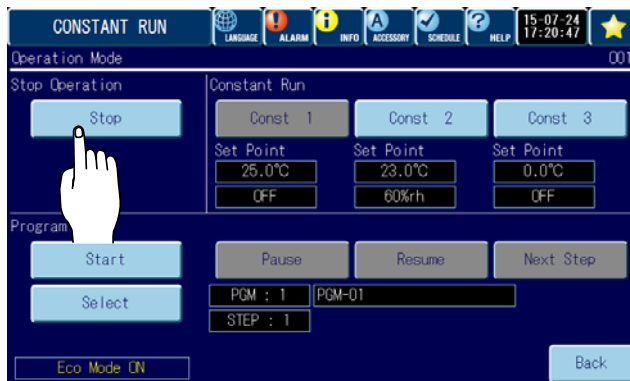
- Eco operation setting (excluding the PHP model)
Switching to and from the eco operation circuit may temporarily destabilize the measured temperature (or humidity).
☞ For details about the eco operation settings, see "6.12 Setting eco operation (except PHP)."
- On the Constant Setup screen, the frame color of the constant number in operation changes.



4.7.2 Ending constant operation

<Procedure>

- 1) Press [Stop] under Stop Operation.



- 2) A confirmation screen is displayed.



[YES]: Stops operation and returns to the original screen.
"STOP" is displayed in the operating display area.

[NO]: Returns to the operation mode screen without stopping operation.

- 3) Press the instrumentation power switch to also turn off the instrumentation screen.
- 4) If you will not use the chamber for a long time, turn off the circuit breaker as well.
If the circuit breaker is left on even after the instrumentation display section is turned off, the heater for warming up the refrigerator remains powered.
To save energy, turn off the circuit breaker when you will not use the chamber for a long time.

◆ Note ◆

Under certain ambient conditions, suddenly stopping operation following low-temperature operation can cause condensation to form on the chamber surface. In some cases, this can result in water leakage in the chamber installation location.
Restore the test area to room temperature before stopping operation.

Chapter 5 Program operation

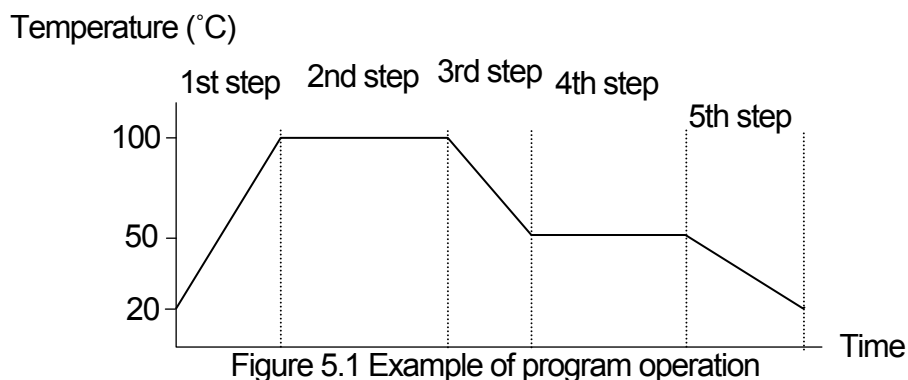
This chapter explains the configuration method for performing program operation, the method of starting and ending operation, and the displayed content on the monitors.

◆ Reference ◆

- You can configure, run, and monitor program operation from a remote point by using Web function. For details, see Web application in the Network guide.
- You cannot use the configuration operations given in this chapter for programs for which [Prevent Data Update] is set to ON. See "Chapter 6 Chamber setup" - "6.5 Setting protection."

5.1 What is program operation?

Program operation changes the settings of the temperature and humidity in the test area in accordance with the program that you create by combining temperature and humidity steps. For each program pattern, up to 99 steps of operation data can be registered. Time, temperature, humidity and ramp settings can be specified for each step, which allows for chamber operation that follows specific time control, as shown below.



5.2 Configuring program settings

Enter the temperature, humidity, and time setting for each step to create or edit an operation pattern.

* For programs, up to 40 patterns with up to 99 steps each can be created.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

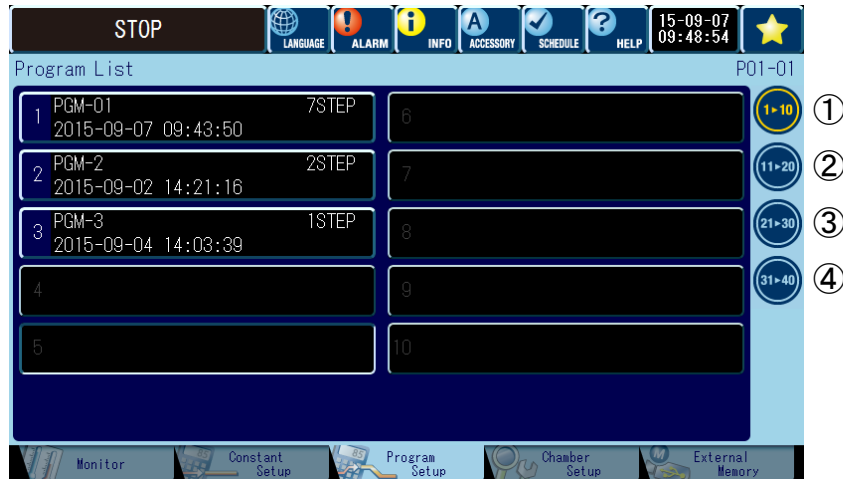


Table 5.1 Side menu (program setup)

	Icon	Slide label	Screen
①		1 to 10	Displays programs 1 to 10
②		11 to 20	Displays programs 11 to 20
③		21 to 30	Displays programs 21 to 30
④		31 to 40	Displays programs 31 to 40

5.2.1 Program editing procedure - Configuring step settings

<Procedure>

- 1) Press the Program Setup tab.

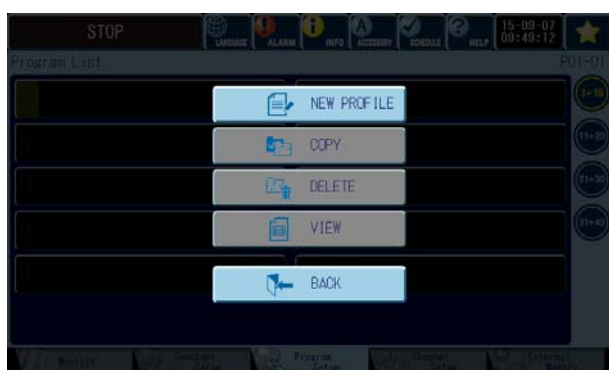
To create a new program, select an unregistered program number from the Program List.

If no programs are registered, no names are displayed in the Program List.

To edit a registered program, press the number of the program that you want to edit.

- * Depending on whether you create a new program or edit a registered program, the keys displayed on the program selection popup screen are different.

When a new program is selected



When a registered program is selected



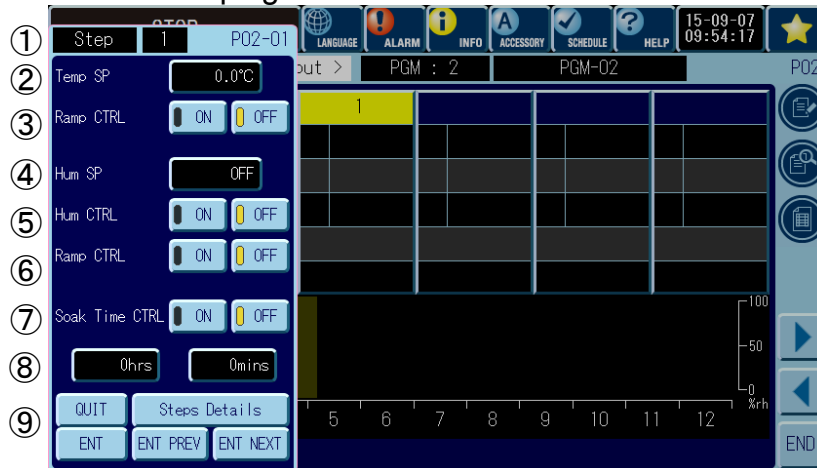
Table 5.2 Program selection popup screen

NEW PROFILE	Creates a new program.	
EDIT	Edits the selected program.	
COPY	Copies the selected program.	☞ For details, see "5.5 Copying operation patterns."
DELETE	Deletes the selected program.	☞ For details, see "5.6 Deleting operation patterns."
VIEW	Displays the temperature, humidity, time, and refrigerator for each step of the registered program as a list. Use this to check the details of the registered program. Note that you cannot use this to edit the settings.	☞ For details, see "5.7 Listing operation patterns."
BACK	Closes the program selection popup screen.	

- 2) When [NEW PROFILE] is selected, the Edit Step screen is displayed.
When a registered program is selected, the Edit Program screen appears.
Select the number of the step that you want to edit to display the Edit Step screen.

☞ For details regarding the Edit Program screen, see "5.2.3 Edit program screen display items."

When a new program is selected



When a registered program is selected



Press within the area of the step you want to edit.

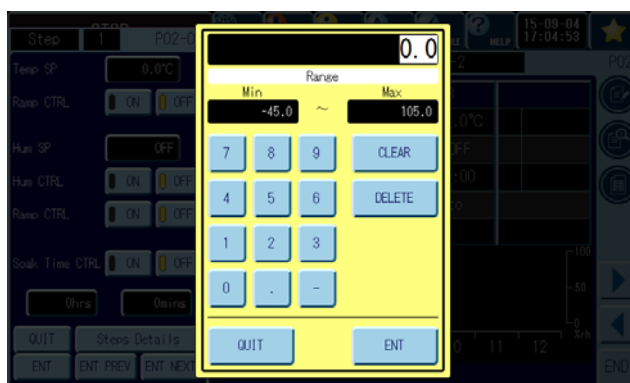
Table 5.3 shows items that can be edited on the Edit Step screen.

Table 5.3 Edit step items

①	Step	Displays the step number currently being edited.
②	Temp SP	Enter the temperature setting.
③	Ramp CTRL	Displays/sets the temperature ramp control status.
④	Hum SP	Enter the humidity setting.
⑤	Hum CTRL	Turns humidity control on or off.
⑥	Ramp CTRL	Displays/sets the humidity ramp control status.
⑦	Soak Time CTRL	Sets the timer for the operating time of the step.
⑧	hrs, mins	Sets the execution time of the step in hours and minutes separately.
⑨	QUIT	Cancels input.
	Steps Details	The details are split into "Equipment," "Time Signals," and "Option." Enable or disable draining and program pausing and select the refrigerator operation and the time signal output.
	ENT	Confirms the input values and ends the editing of the step.
	ENT PREV	Moves to the previous step after confirming the input values.
	ENT NEXT	Moves to the next step after confirming the input value. Each press of [ENT NEXT] copies the information registered on the Edit Step screen to the next step.

3) Enter the temperature setting.

Press the temperature setting value and enter the temperature. After entering the value, press [ENT].

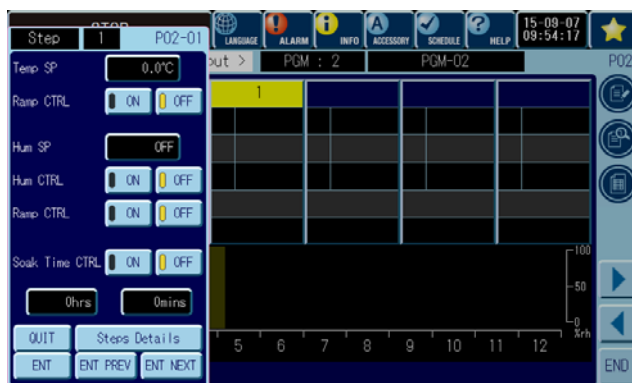


The upper and lower limits of the input range are determined by the temperature range of the chamber and [Hi/Lo LMT].

◆ Reference ◆

- For the upper and lower limits, the values entered in "5.4.4 Entering upper/lower limit settings" are reflected.
- Refer to section 5.11 for low-humidity operation. (PDL and PDR only)

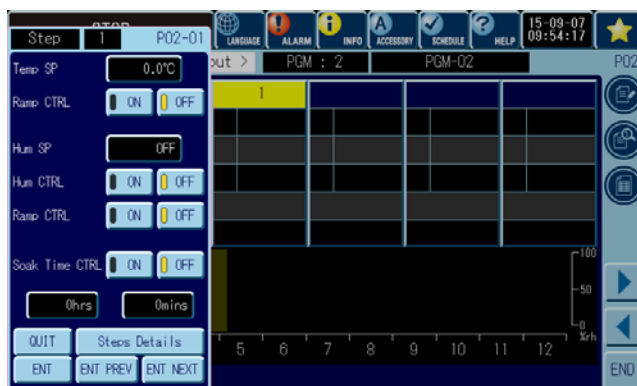
- 4) Enter the humidity setting.
Press the humidity setting value and enter the humidity. After entering the value, press [ENT].
* If [OFF] is selected for Hum Control in step 5, the value is not reflected in the settings even if it is applied.
- 5) Turn humidity control on or off.
Select [ON] or [OFF].
ON: Humidity control is performed.
OFF: Humidity control is not performed.
If you select OFF, [OFF] is displayed as the humidity setting.
* Humidity control operation is not performed if [ON] is selected for humidity control but the temperature setting is 0°C or lower or 100°C or higher on the Edit Step screen. In this case, temperature operation is performed.
When the (optional) specimen temperature control is ON, you cannot set the humidity control operation to ON.
- 6) Select temperature/humidity ramp control.
Select [ON] or [OFF] for [Ramp CTRL].
ON: Ramp control is performed from the setting of the previous step to that of this step.
OFF: The setting entered in this step is used.



◆ Reference ◆

- When you perform ramp control in step 1, select the start conditions (PV, SP) in the program start settings accessed with the program side menu icon on the Edit Program screen.
- * If you set the start condition to OFF, ramp control is not performed even if a setting is entered on the Edit Step screen.
- ☞ For details, see "5.4 Setting program details."
- When ramp control is [ON], it may be uneven in program operation if eco operation settings are enabled in the program.

- 7) Set the soak time control to maintain operation at the temperature and humidity settings.
Select [ON] or [OFF].
ON: Soak time control is performed.
OFF: Soak time control is not performed.



When ON: After the step operation starts, the chamber waits until the process value reaches the control attainment condition of the setting, and then starts counting the time (see "6.11.3 Configuring control attainment conditions"). Therefore, the time that the specimen is exposed to the temperature setting and humidity setting becomes the same as the time setting.
If soak time control is set to [ON], ramp control cannot be set to [ON].

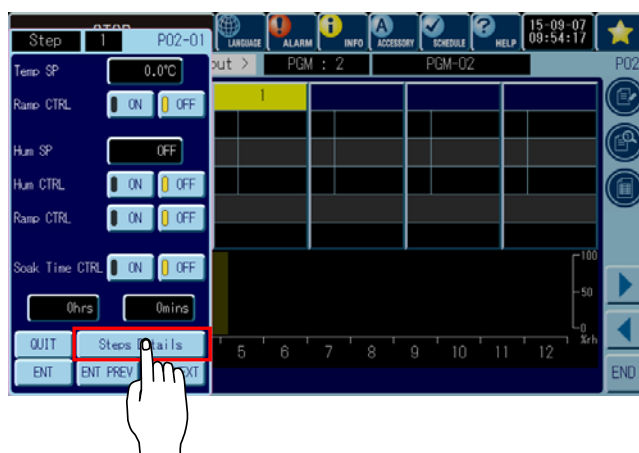
When OFF: The chamber starts counting the time at the same time that step operation starts.

- 8) Set the time to execute the step.
The step execution time can be set in hours and minutes. (The maximum value is 9999 hours and 59 minutes)
- 9) After you finish setting the step, press [ENT NEXT] to move to the next step. If the next step has not been configured yet, the values of the previous step are copied to it. To return to the previous step, press [ENT PREV]. To end step entry, press [ENT] or [QUIT]. To configure detailed settings, press [Steps Details].

5.2.2 Program editing procedure - Step details

<Procedure>

- 1) To configure detailed settings, press [Steps Details] to display the Equipment screen. The detailed step setting items are as follows.
 - Equipment (DRN, Pause, Refrigeration, Time Signals)
 - Equipment (Wet heater; for PDR and PDL chamber models)
 - Time Signals (optional)
 - Option (air flow adjusting, specimen temperature control)



- 2) Set the draining.
If you set DRN to [ON], drainage is performed when the step starts. You can use this in situations such as when you want to drain the water that has condensed within the test area.

◆ Reference ◆

For details on performing draining on each step, see "2.4.4 Drainage function (temperature and humidity type)."

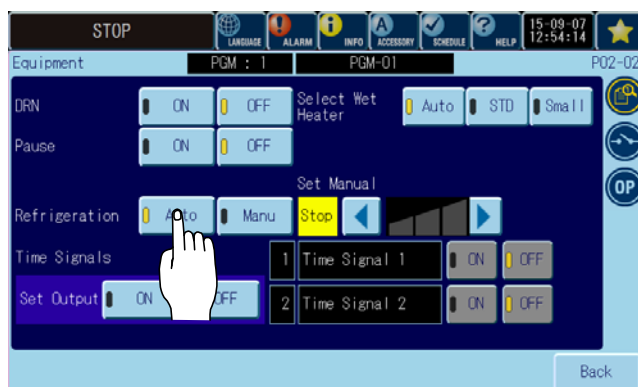
- 3) Set the pause function.
If you want to pause the chamber during the execution of the program, enable this function.
Select [ON] or [OFF] to configure this setting.
 - ON: Program execution is paused when the step ends.
 - OFF: The program is not paused. (Execution proceeds to the next step.)
- * For the pause operation when the door is open, see "6.11.2 Configuring operation settings for when the chamber is running."

◆ Reference ◆

To go to the next step after the program is paused, select [Resume] or [Next Step] on the Operation Mode screen.

For details, see "5.9 Starting/ending or pausing/resuming operation."

- 4) Set the refrigeration operation to [Auto] or [Manu] (except PHP).



Under normal conditions, set this to Auto.

To perform manual control, select a value under Set Manual.

The more the yellow bars light up, the greater the capacity.

◆ Reference ◆

When [Refrigeration] is set to [Auto], the manual setting is not reflected in the operation of the refrigerator.

You cannot change the refrigeration capacity during operation. Set the refrigeration capacity when you set the program prior to operation.

- 5) Set the time signal contacts. (Signals 3 to 12 are optional.)

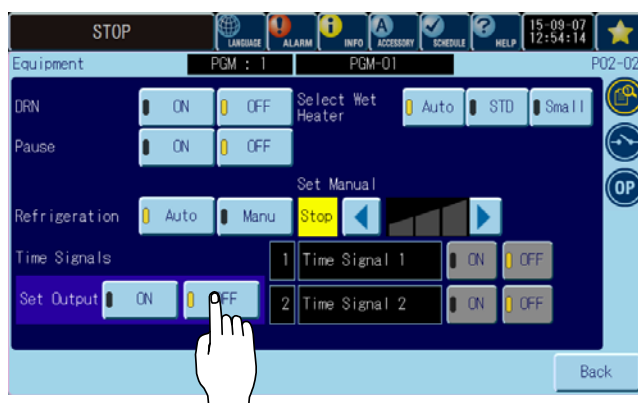
* If an option is not installed, its [Time Signals] key cannot be selected.

☞ For details, see "2.4.2 Using time signals."

Set [Set Output].

ON: When the step is executed, the time signal settings are enabled.

OFF: When the step is executed, signals are not output regardless of the time signal settings.



Set the desired time signals to [ON] or [OFF].

ON: The time signal is output.

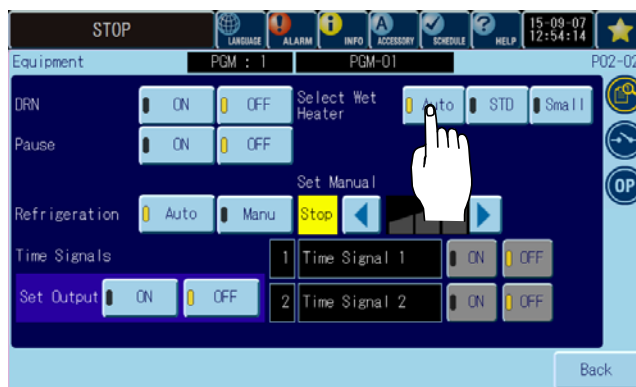
OFF: The time signal is not output.

◆ Reference ◆

You can assign names to time signals.

☞ See "6.11 Configuring maintenance settings" and "6.11.4 Registering (changing) names of time signals."

6) Select the wet heater (only for the PDR and PDL).



Auto: The wet heater is selected automatically according to the temperature area.

STD: Only the standard wet heater is used.

Small: Only the small wet heater is used.

In ordinary circumstances, set this to [Auto]. If humidity cannot be maintained due to factors such as the specimen's characteristics, select a wet heater.

After you finish configuring the settings, press [Back] to return to the Edit Step screen.

- 7) After you finish setting the step, press [ENT NEXT] to move to the next step. If the next step has not been configured yet, the values of the previous step are copied to it. To return to the previous step, press [ENT PREV]. To end step entry, press [ENT] or [QUIT].



- ENT:** Confirms the values entered on the Edit Step screen, closes that screen, and returns to the Edit Program screen. (Does not go to the next step.)
- ENT NEXT:** Confirms the values entered on the Edit Step screen and goes to the next step.
- ENT PREV:** Confirms the values entered on the Edit Step screen and goes to the previous step.
- QUIT:** Discards the values entered on the Edit Step screen, closes that screen, and returns to the Edit Program screen. If you quit without pressing [ENT], [ENT NEXT], or [ENT PREV], the step settings being edited are discarded.

- 8) Check the entered results for the steps and press [END] to display the popup. To save, press [Save and Close]. To cancel saving, press [Cancel]. Press [Close Without Save] to discard the edited content and end program editing.

☞ To edit registered steps (insert, copy, delete), see "5.3 Editing steps."



For the program being run, the pattern editing and program details can be checked by using the edit function but they cannot be saved.

5.2.3 Edit program screen display items

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

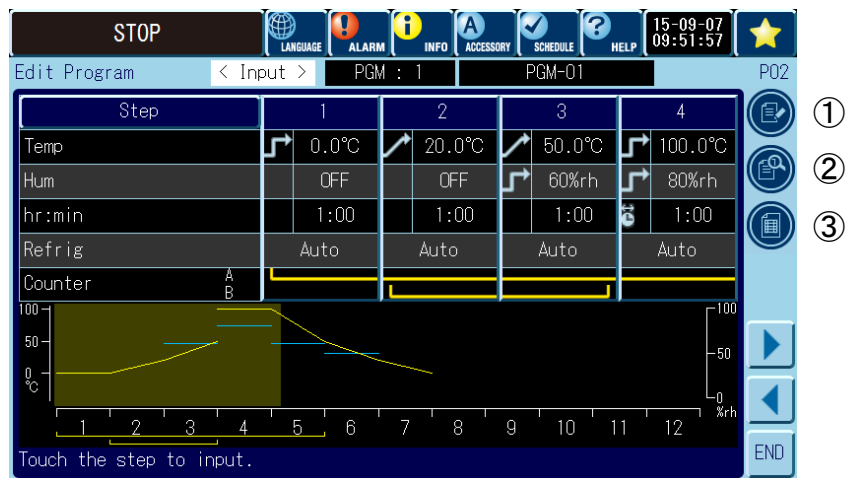


Table 5.4 Side menu (Edit Program)

	Icon	Slide label	Screen
①		Edit	Insert, copy, or delete a step.
②		Program details	Set the start condition, end condition, counter, alarm value, and program name.
③		List	Display the program details as a list.

Table 5.5 shows the items displayed on the Edit Program screen.

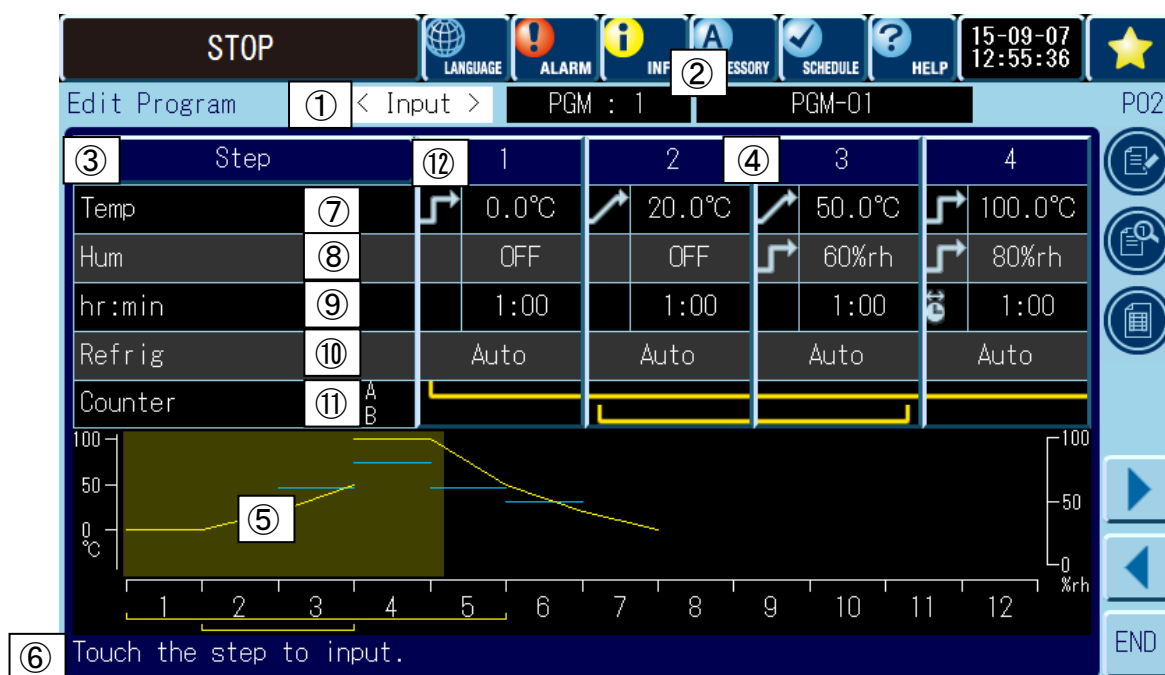






Table 5.5 Items displayed on the Edit Program screen

①	Edit mode display frame Displays Input, Insert, Delete, or Copy.
②	Displays the program number and program name of the program currently being edited.
③	Displays the step number.
④	Displays the step settings with four steps on one screen.
⑤	Displays the step settings as a graph. The yellow background in the graph is the step area that is currently being set.
⑥	Displays guidance.
⑦	Displays the temperature setting.
⑧	Displays the humidity setting. (Temperature and humidity type only)
⑨	Displays the execution time of the step.
⑩	Displays the refrigerator setting.
⑪	Displays steps set with the counter with a yellow line.
⑫	Icons displayed in steps: Temperature/humidity  : Ramp on  : Ramp off Hours:Minutes  : Soak time control ON  : Pause ON Bars displayed in steps (optional) Pink bars are displayed in steps in which specimen temperature control is set to ON.

5.2.4 Edit program screen keys

Table 5.6 shows the keys used on the Edit Program screen.

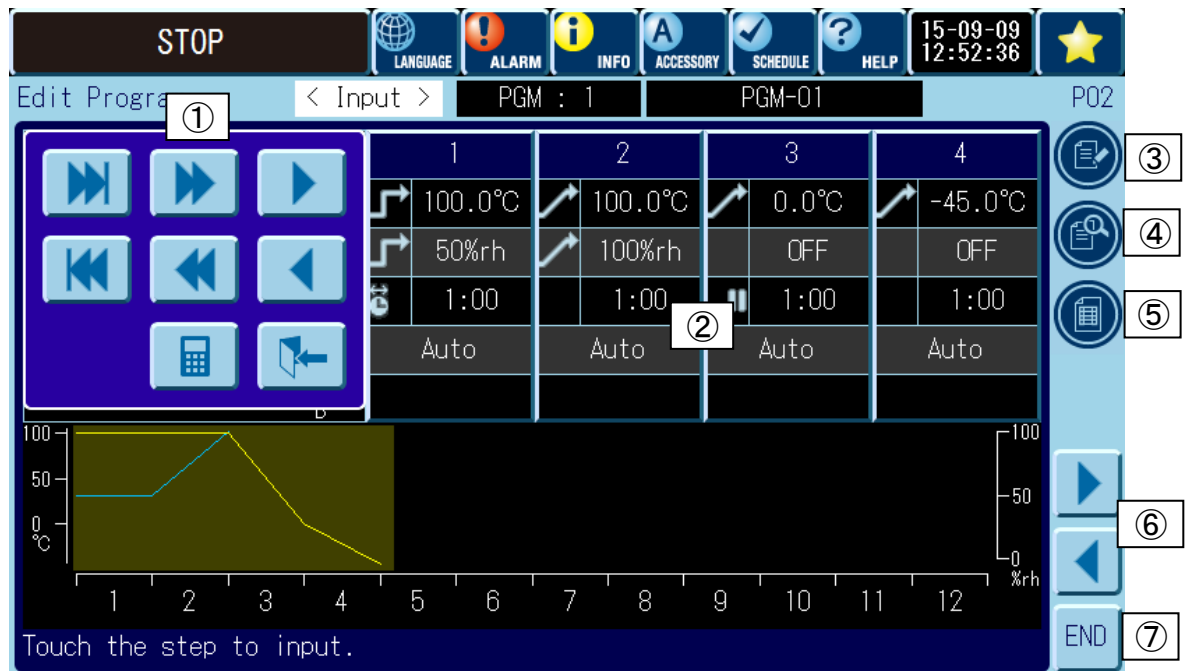




Table 5.6 Keys used on the Edit Program screen

①	<p>Press [Step] to display the popup screen.</p> <p> : Jumps to the start or end step. : Four steps backward or forward. : One step backward or forward. : Enter the step number that you want to jump to. : Closes the popup screen. </p>
②	Press this key to edit a step. The Edit Step screen is displayed.
③	<p>Press this icon to switch the edit mode. A popup screen is displayed.</p> <p> INSERT: Inserts a step. COPY: Inserts a step by copying the selected step. DELETE: Deletes the selected step. BACK: Returns to the Edit Program screen. </p>
④	<p>Press this icon to configure detailed program settings (start/end conditions, counters, alarm settings, and the program name).</p> <p> For details, see "5.4 Setting program details."</p>
⑤	<p>Press this icon when you want to check the created program as a list.</p> <p>The View Program screen is displayed.</p> <p> For details, see "5.7 Listing operation patterns."</p>

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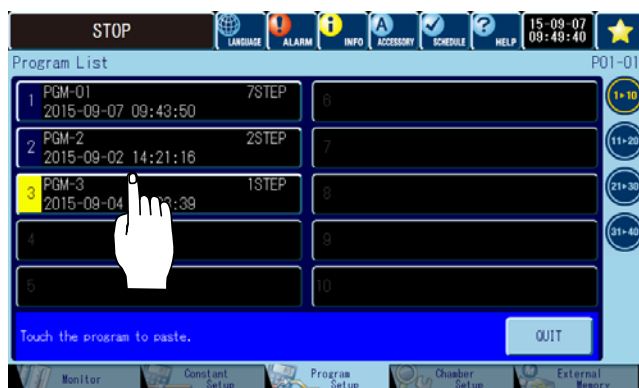
⑥	<p>Press these keys to go one step forward or backward.</p> <p> : Go one step backward.  : Go one step forward.</p>
⑦	<p>Press one of these keys to exit program editing.</p> <p>Save and Close: Saves the created program and returns to the Program List screen.</p> <p>Close Without Save: Discards the edited data and returns to the Program List screen.</p> <p>Cancel: Cancels saving and returns to the Edit Program screen.</p>

5.3 Editing steps

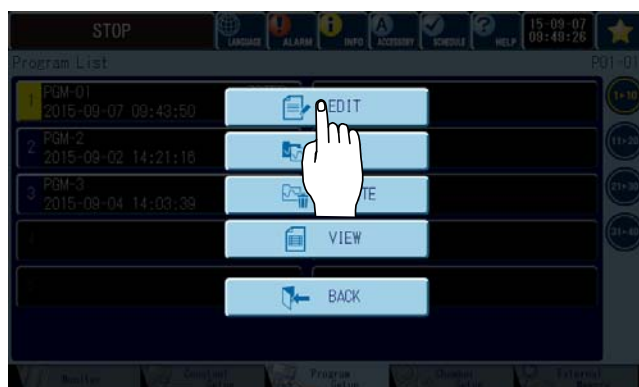
After an operation pattern has been created and registered, steps can be edited, inserted, copied, and deleted.

<Procedure>

- 1) Press the Program Setup tab and select the program number to edit from the program list.



- 2) Select [EDIT] from the popup list.



◆ Reference ◆

- After a step is inserted, copied, or deleted, always press [END] and press [Save and Close] in the popup display.
If you do not want to apply the changes to the program, press [Cancel]. Press [Close Without Save] to discard the edited content and end program editing. The edited data is discarded.



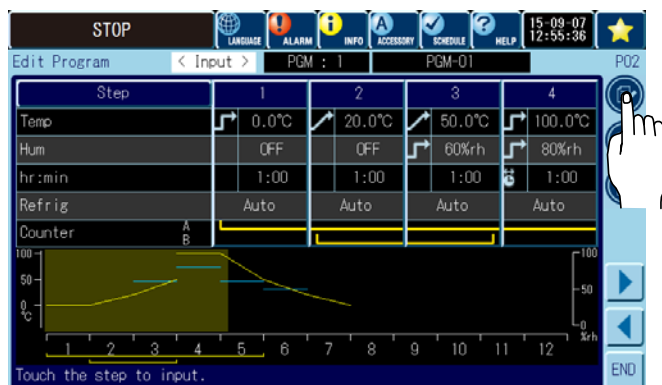
- For the program being run, pattern editing and program details can be checked using the edit function but they cannot be saved and the program cannot be deleted.

5.3.1 Inserting a step

Use the following procedure to insert a new step into the registered steps.

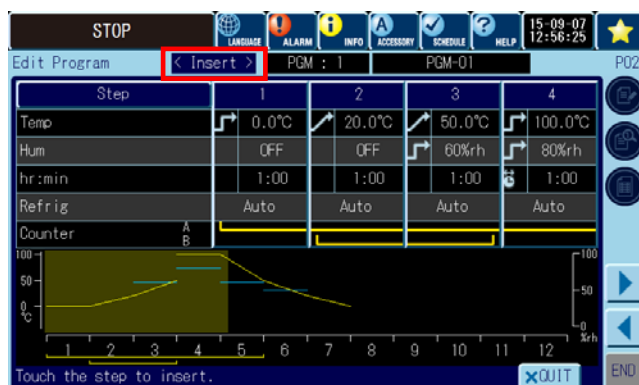
<Procedure>

- 1) Press the edit side menu icon to display the popup. Select [INSERT].



- 2) Check that the edit mode display frame has changed to <Insert>, and then specify the location to insert the step.

Example: To insert a new step between steps 1 and 2, press [2].



*You cannot insert steps in excess of the maximum allowable number of steps (99).

- 3) Selecting the inserted step displays the Edit Step screen.

The values to the left of the step that was selected in step 2 are displayed for the input values. Check these values and correct them as necessary.

To cancel operation after the Edit Step screen is displayed, press [ENT] to close the Edit Step screen.

Because the step has already been inserted at this point, remove unnecessary steps.

☞ For details, see "5.3.3 Deleting steps."

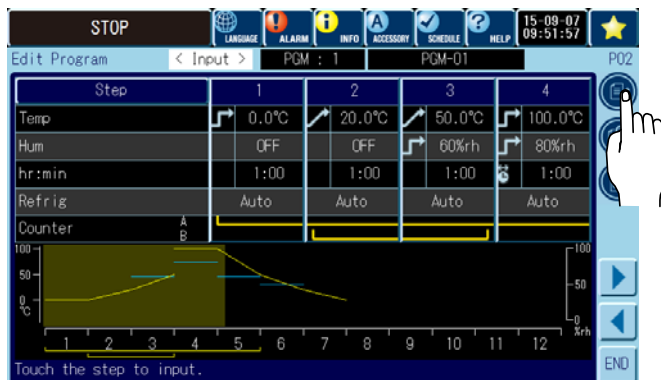


5.3.2 Copying steps

Use the following procedure to copy a step that has been input and insert it in the specified location. This moves the steps after it to the back.

<Procedure>

- 1) Press the edit side menu icon to pop up the editor screen shown below. Select [COPY].



Up to 49 steps can be copied at one time.

* You cannot copy steps in excess of the maximum allowable number of steps (99).

- 2) Select the first step number and the last step number to copy to specify the range of steps to copy.
* To insert only one step, press the same number.

- 3) Select the destination to copy the steps to.
* A destination between source steps cannot be selected.

To cancel copying, press [QUIT]. The program returns to the input mode.

- 4) A confirmation screen is displayed.

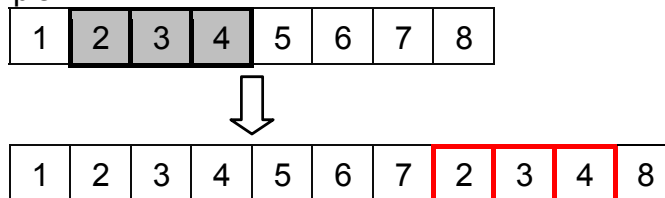


YES: Copies the selected steps and returns to the Edit Program screen.

NO: Returns to the destination step selection screen.

◆ Reference ◆

Example:



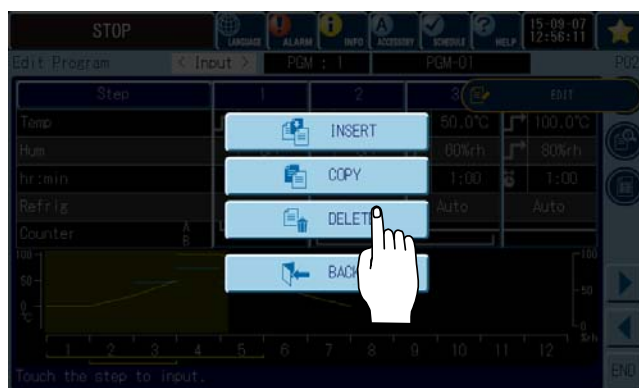
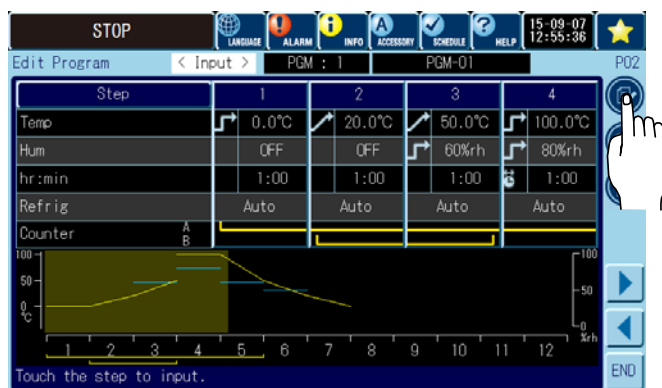
If steps 2 to 4 are selected and step 8 is specified as the destination, steps 2 to 4 are copied and inserted before step 8.

5.3.3 Deleting steps

Use the following procedure to delete steps that have been input.

<Procedure>

- 1) Press the edit side menu icon to pop up the editor screen shown below. Select [DELETE].



- 2) Select the first step number and the last step number to delete to specify the range of steps to delete.
To cancel deletion, press [QUIT]. The program returns to the input mode.
- 3) A confirmation screen is displayed.



- YES: Deletes the selected steps and returns to the Edit Program screen.
- NO: Returns to the screen where you selected the last step you wanted to delete (the previous screen).

5.4 Setting program details

With program details on the Edit Program screen, you can set the start/end conditions, counters, and alarm settings and change the program name.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

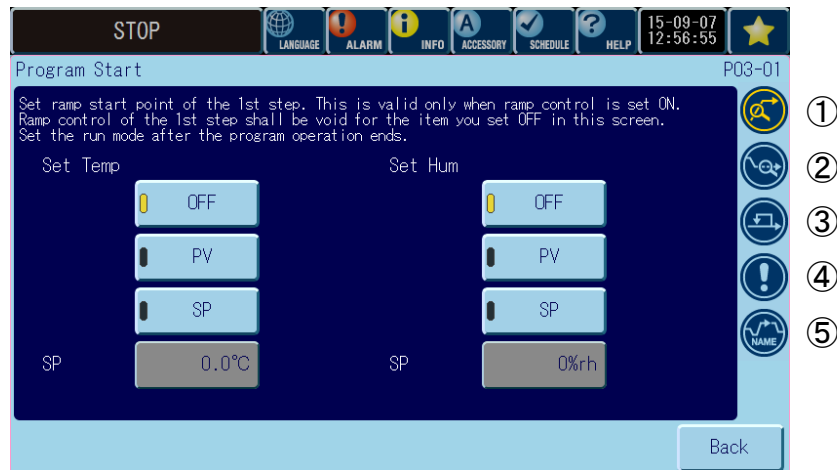
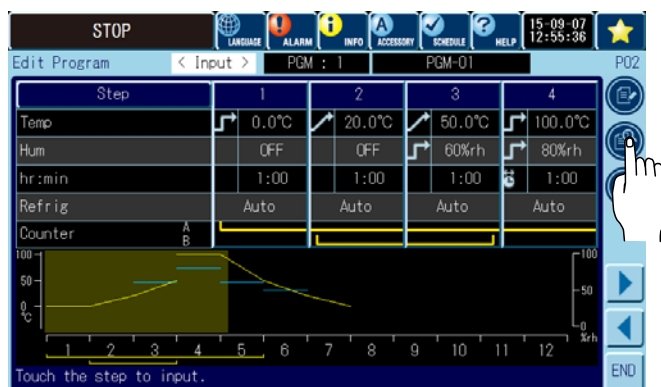


Table 5.7 Side menu (program details screen)

	Icon	Slide label	Screen
①		Set start conditions	Set the start conditions.
②		Set end condition	Set the end condition.
③		Counter settings	Configure the counters.
④		Alarm settings	Set the alarm values.
⑤		Program name setting	Set the program name.

Press the program details side menu icon.

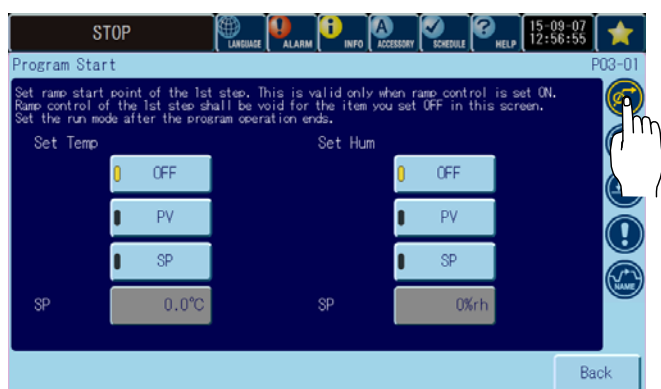


5.4.1 Setting start conditions

Configure the start conditions for operation.

<Procedure>

- 1) Press the set start conditions icon on the Program Details screen. Configure these settings when you want to perform ramp operation in step 1. Select PV (test area temperature/humidity) or SP (temperature/humidity) and set ramp control in step 1 to [ON].



PV: Select this when you want to start ramp control from the current test area temperature and humidity.

SP: Select this when you want to set arbitrary temperature and humidity values to start ramp control.

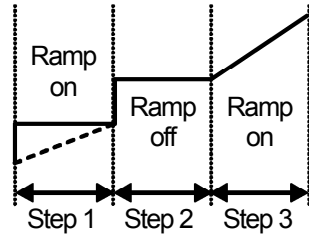
OFF: Disables the start temperature setting and start humidity setting.

2) When [SP] is selected, the start temperature and humidity can be changed.

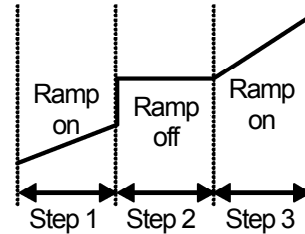
* Ramp operation controls temperature/humidity from the setting of the previous step to the setting of the current step at a constant slope.

• Start condition: OFF

• Start condition: PV or SP



If the start condition is not set, ramp operation is not performed for step 1.



If the start condition is set, ramp operation is performed from step 1.

In the following cases, ramp operation (temperature, humidity) is not performed.

- When the start condition (temperature, humidity) is set to [OFF] in step 1
- When humidity control in the previous step is set to [OFF] in ramp control (humidity)

5.4.2 Setting the end condition

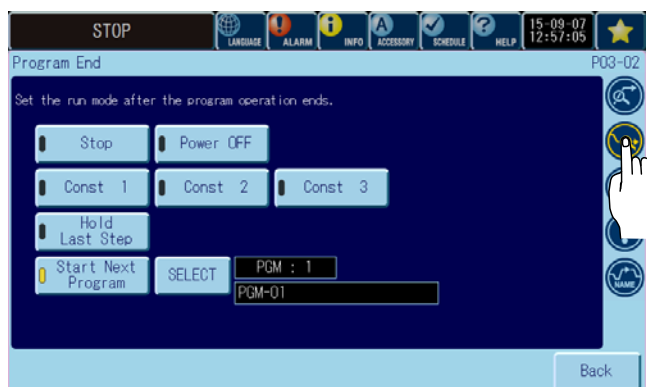
Use the following procedure to configure the chamber end condition after program operation ends.

Set the end condition in the following cases.

- When you want to turn off the power automatically when operation ends
- When you want to continuously perform program operation and constant operation

<Procedure>

- 1) Press the set end condition icon on the Program Details screen. Select one option for the operation end condition.



- Stop:** Maintains the operation stop state. (The instrumentation panel power remains on.)
- Power OFF:** Turns the instrumentation panel power off. (The primary power supply breaker of the equipment remains turned on.)
- Const 1, Const 2, Const 3:** After program operation ends, the chamber continues operation with constant operation No.1, No.2, or No.3.
- Hold Last Step:** The chamber maintains the settings when the last step ended.
- Start Next Program:** After program operation is ended, another program is executed. For setup, see step 2.

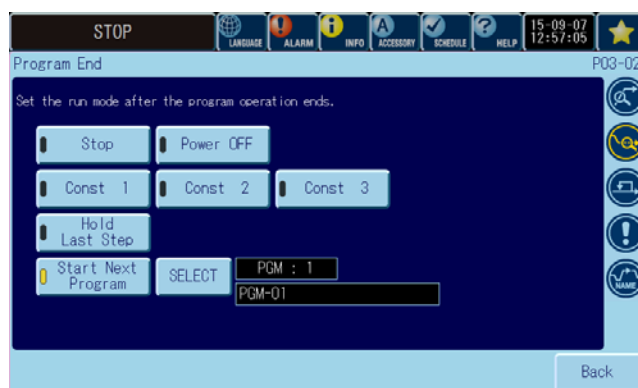
◆ Reference ◆

The default end condition is "Power OFF." If the end condition is not changed, the instrumentation panel is turned off after the end of the program and the temperature in the test area approaches the ambient temperature. Depending on the ambient temperature, the temperature may fall to near freezing in winter. If you want to maintain the temperature in the test area, select "Hold Last Step."

◆ Energy Saving Advice ◆

Test end condition setting

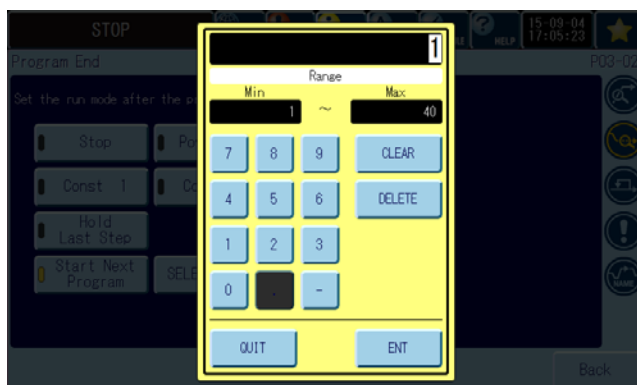
By selecting [Stop] or [Power OFF], the equipment is stopped after the test ends, thereby reducing power consumption.



Test condition settings

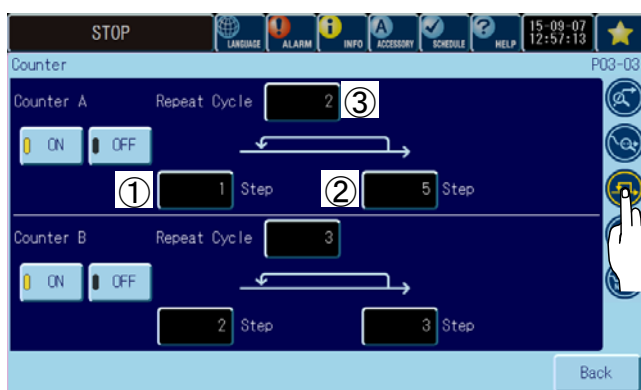
Review the test conditions to make sure there are no excess test condition settings, such as an unnecessary low humidity setting. This can reduce the power consumption of the dehumidifier and refrigerator.

- 2) Select the program.
Specify the program only when you select "Start Next Program" in step 1.
Press [SELECT] and enter the program number to be executed.
* An unregistered program number cannot be entered.



5.4.3 Counter setup

In the counter settings, you can specify the number of repetitions to loop steps. Configure the counter settings to loop one particular step or multiple steps.



- ① Repeating start step (The step to start from the second and subsequent repetitions.)
- ② Repeating end step
- ③ Repetitions

When the counter settings are configured

When execution reaches the repeating end step (②) the first time, it goes back to the repeating start step (①) and repeats the loop the specified number of times (③).

After the loop is repeated the specified number of times (③), execution advances to the next step following the repeating end step (②).

To loop steps that are not contiguous, input settings for both Counter A and Counter B.

Note the points below when configuring counter settings.

Repeating start step (①): $1 \leq \text{repeating start step (①)} < \text{number of registered steps}$

Repeating end step (②): $\text{repeating start step (①)} < \text{repeating end step (②)}$

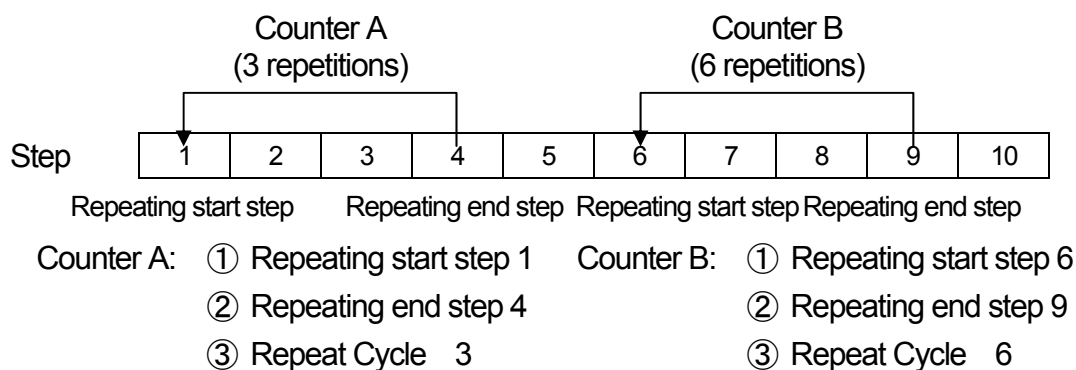
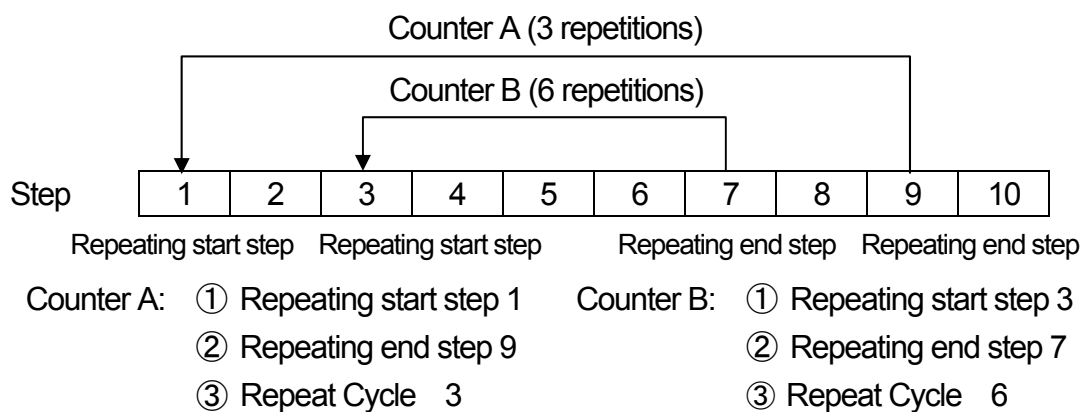
Number of repetitions: 1 to 999

◆ Reference ◆

The number of operations from the repeating start step (①) to the repeating end step (②) is (number of repetitions (③) + 1).

<Procedure>

- 1) Press the counter settings icon on the Program Details screen.
- 2) Configure Counter A. Press [ON], and then enter Repeat Cycle (③), the repeating start step (①), and the repeating end step (②).
When Counter B is also specified, set it in the same manner as Counter A.

◆ Reference ◆**Counter configuration example****• Example 1****• Example 2**

(Continued on the next page.)

5.4.4 Entering upper/lower limit settings

The values set as the absolute upper and lower limit temperature values become the input range that can be set in program setup. Press the setting key to display the screen for entering numeric values, and then enter the value on that screen.

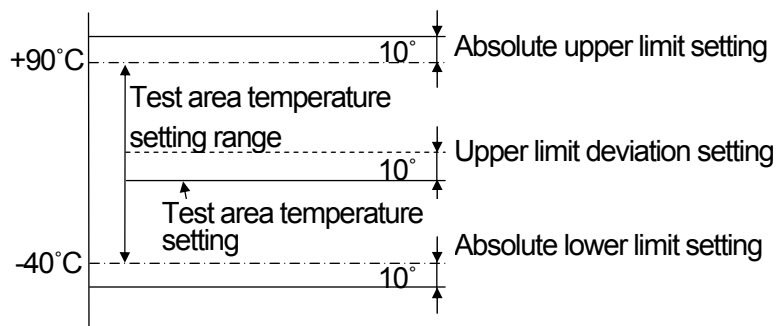


Figure 5.2 Alarm conditions (temperature)

Abs High and Abs Low:

The judgment values used for performing a safety action in the test area. Set the values greater than the test area temperature setting by 10°C or more. If the chamber detects a safety action, it raises an alarm and stops.

Upper Dev:

The judgment value used for performing a safety action for the specimen. Change this setting depending on the test specimen. If the chamber detects a safety action, it raises an alarm and stops the heater (humidifier).

The chamber returns to normal control when the test area temperature falls below the temperature setting.

<Procedure>

- 1) Press the alarm settings icon (Hi/Lo LMT) on the Program Details screen.



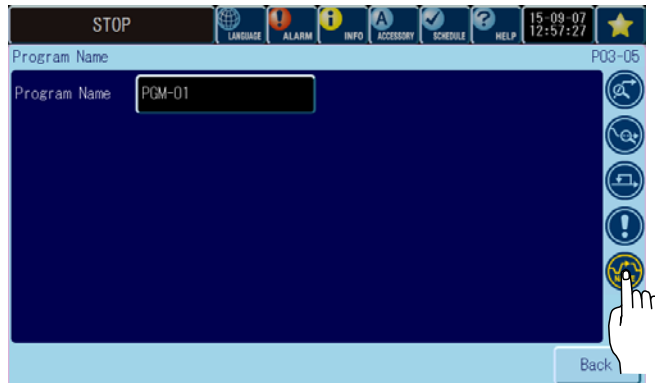
- 2) Enter the upper and lower limit values for the test area temperature and humidity. Press the setting, enter a numeric value, and then press [ENT].
- 3) Enter the upper limit deviation alarm value for the test area temperature and humidity. For details on the safety actions, see "2.2 Configuring specimen protection device settings."

5.4.5 Setting the program name

Assign the entered pattern a program name.

<Procedure>

- 1) Press the program name setting icon on the Program Details screen.



- 2) Press the program name to display the character input screen. Enter a name and press [ENT].
* You can enter up to 15 characters.



◆ Reference ◆

If the program name is not specified, the program name is set to "PGM-program number" automatically.

Example: PGM-06

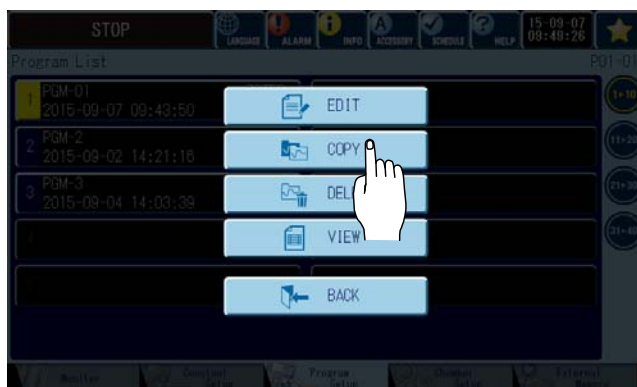
When you finish entering the detailed program settings, press [Back].
You are returned to the Edit Program screen.

5.5 Copying operation patterns

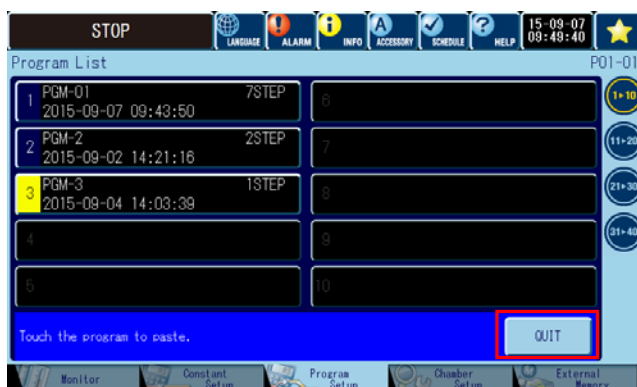
Use the following procedure to copy operation patterns that have been created and registered.

<Procedure>

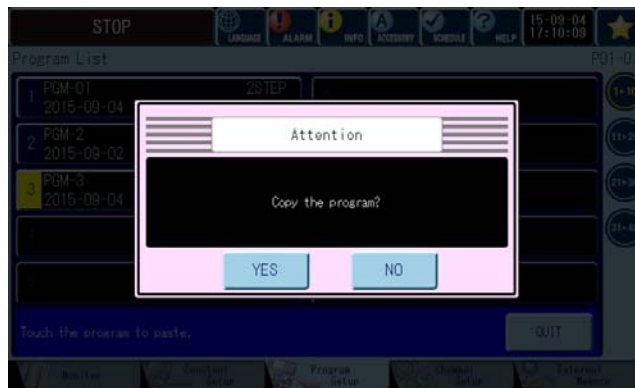
- 1) From the program list, press the number of the program you want to copy and select [COPY] from the popup screen.



- 2) Select the destination program number.
To cancel copying, press [QUIT].



3) A confirmation screen is displayed.



YES: Copies the selected program and returns to the program list.

NO: Returns to the program list.

◆ Reference ◆

A program cannot be copied to a program with the following statuses.

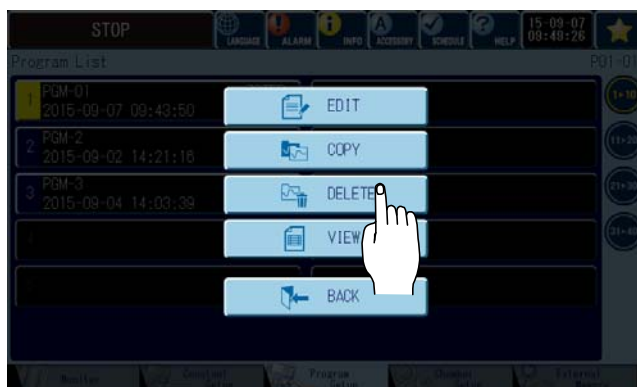
1. A program for which the start or quick timer is set
2. The program that is currently running
3. A program for which [Prevent Data Update] is set to ON

5.6 Deleting operation patterns

Use the following procedure to delete operation patterns that have been created and registered.

<Procedure>

- 1) From the program list, press the number of the program that you want to delete and select [DELETE] from the popup screen.



- 2) A confirmation screen is displayed.



- YES: Deletes the selected program and returns to the program list.
 NO: Returns to the program list.

◆ Reference ◆

Programs with the following statuses cannot be deleted.

1. A program for which the start or quick timer is set
2. A program set as the end condition
3. The program that is currently running
4. A program for which [Prevent Data Update] is set to ON

5.7 Listing operation patterns

You can use the following procedure to display as a list of steps a program pattern that has been created and registered.

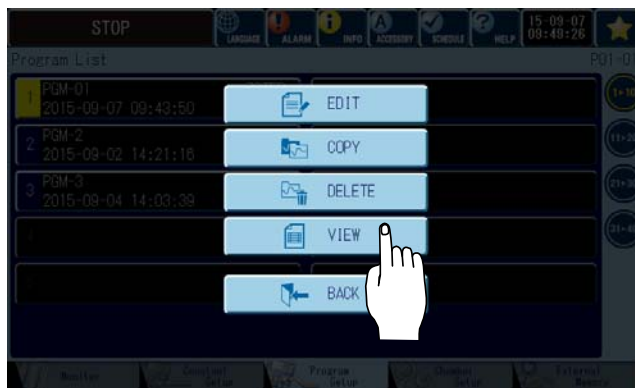
You can use this list to check the start and end conditions, counter settings, and alarm settings that were configured in "5.4 Setting program details."

The list can be displayed from both the program list and the Edit Program screen.

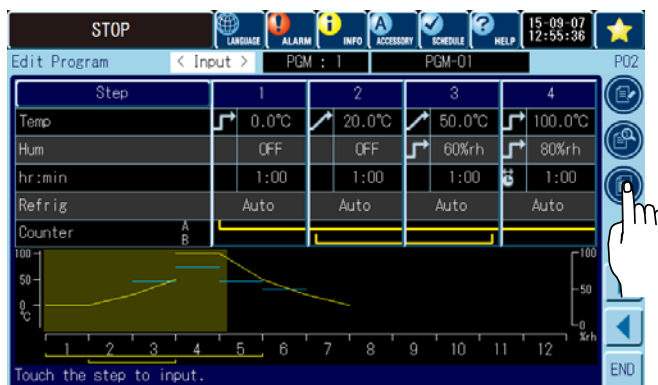
Data cannot be edited on the list screen.

<Procedure>

- 1) From the program list, select the number of the program to display as a list.
Select [EDIT] from the popup screen.
- * Selecting [VIEW] from the popup screen directly displays the View Program screen.



Select the list side menu icon on the Edit Program screen.



- 2) This displays the View Program screen.
View Program screen (PDR/PDL)

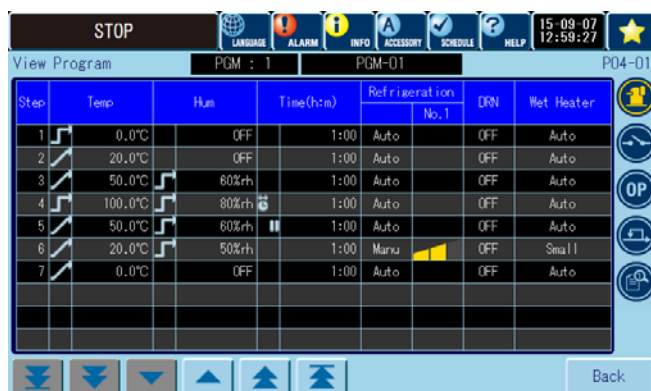


Table 5.8 Explanation of the operation keys

	Jumps to the start or end step.
	Scrolls up or down by 10 steps.
	Scrolls up or down by one step.
Back	If the list was displayed from the program list, you are returned to the Program List screen.
	If the list was displayed from the Edit Program screen, you are returned to the Edit Program screen.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.



Table 5.9 Side menu (View Program screen)

	Icon	Slide label	Screen
①		Refrigeration	Displays the refrigeration, drainage, and wet heater settings for each step.
②		Time signals	Displays the time signal settings for each step.
③		Options	Displays the air flow adjusting (option) and specimen temperature control (option) settings for each step.
④		Counter settings	Displays the counter settings.
⑤		Detailed program settings	Displays the detailed program settings.

* The option icon is displayed in gray on chambers that do not have any options installed.

- 3) Use the icons on the side menu to switch between different screens and check the settings that have been configured with program details on the Edit Program screen.

View Program - Refrigeration

Step	Temp	Hum	Time(hrs)	Refrigeration	DRN	Wet Heater
1	0.0°C	OFF	1:00	Auto	OFF	Auto
2	20.0°C	OFF	1:00	Auto	OFF	Auto
3	50.0°C	60%rh	1:00	Auto	OFF	Auto
4	100.0°C	80%rh	1:00	Auto	OFF	Auto
5	50.0°C	60%rh	1:00	Auto	OFF	Auto
6	20.0°C	50%rh	1:00	Manu	OFF	Small
7	0.0°C	OFF	1:00			

① Displays [Auto] or [Manu] for the refrigerator.

② When the refrigerator is set to manual, the refrigerator's manual setting is displayed.

When stopped: STOP

Other than STOP: The setting is displayed with a volume icon.

③ Displays the enabled/disabled status of draining. (Temperature and humidity type only)

④ Displays auto, standard, or small in accordance with the wet heater type. (Option, PDR/PDL only)

View Program - Time signals

Step	Temp	Hum	Time(hrs)	Time Signals
1	30.0°C	80%rh	1:00	1 2 3 4 5 6 7 8 9 10 11 12
2	50.0°C	OFF	1:00	
3	50.0°C	OFF	1:00	
4	100.0°C	OFF	1:00	
5	50.0°C	OFF	1:00	
6	0.0°C	OFF	1:00	
7	50.0°C	OFF	1:00	

Displays the settings for time signals 1 to 12.

Yellow: The time signal is set to ON.

Black: The time signal is set to OFF.

The signals that are not installed are displayed in gray.

View Program - Options

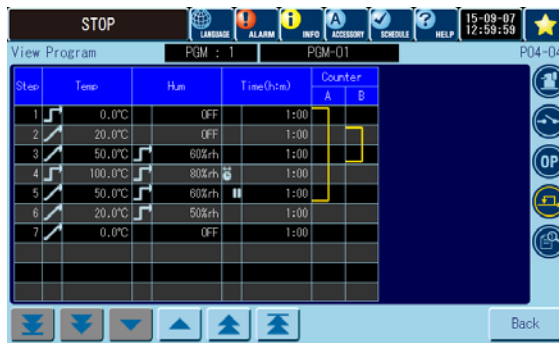
Step	Temp	Hum	Time(hrs)	Air Flow
1	0.0°C	OFF	1:00	
2	20.0°C	OFF	1:00	
3	50.0°C	60%rh	1:00	
4	100.0°C	80%rh	1:00	
5	50.0°C	60%rh	1:00	
6	20.0°C	50%rh	1:00	
7	0.0°C	OFF	1:00	

① The setting of each air circulator air flow is displayed with a volume icon.

② Displays whether specimen temperature control is on or off.

If an option is not installed, it is displayed in gray.

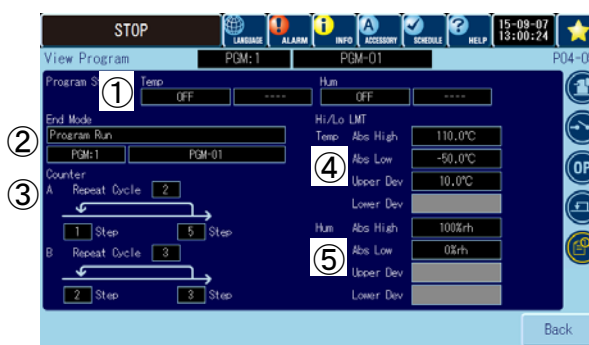
View Program - Counter settings



Counter A and B repeating end and repeating start steps are indicated by yellow lines.

Nothing is displayed here if counter settings are not configured. The number of repetitions is not displayed.

View Program – Detailed program settings



① Displays the start conditions.

② Displays the end condition. When the end condition is Start Next Program, the program number and name are shown.

③ Displays the counter settings.

④ Displays the temperature alarm settings. Items that are not detected are displayed in gray.

⑤ Displays the humidity alarm settings. Items that are not detected are displayed in gray.

5.8 Ending operation pattern input

Be sure to perform this operation after you finish entering an operation pattern.

- | | |
|-----------------------|---|
| [Save and Close]: | Saves the entered data and returns to the program list. The edited data is overwritten. |
| [Close Without Save]: | Cancels all the editing work, ends editing, and returns to the program list. |
| [Cancel]: | Returns to the Edit Program screen. |

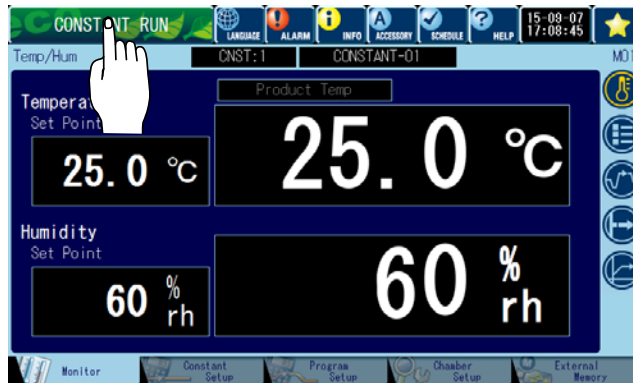
◆ Reference ◆

For the program being run, the pattern editing and program details can be checked by using the edit function but they cannot be saved.

5.9 Starting/ending or pausing/resuming operation

Before starting operation, check that the following work has been correctly performed: "Chapter 2 Preparing for operation" - "2.1 Refrigerator warm up," "2.2 Configuring specimen protection device settings," and "2.3 Configuring temperature (and humidity) absolute upper/lower limit settings." Also check that the information icon (on the Information tab) is displayed.

Operation is started/ended or paused/resumed from the Operation Mode screen. Press the operation display area at the upper left of the screen to display the Operation Mode screen.



■ Operation selection precautions

When the SCHEDULE icon lights up, the timer is set. Check whether or not the timer will affect the operation that will be executed now.

☞ For how to cancel the timer, see "6.2.1 Setting and canceling timers."

◆ Reference ◆

- Preventing condensation on the specimen

When testing specimens such as electronic components, you must ensure that condensation does not form on them.

Condensation occurs when the surface temperature of the specimen is lower than the dew-point temperature of the air in the test area.

To avoid condensation on the specimen, it is necessary to perform temperature-only operation in advance, and then to start the temperature and humidity operation after the surface temperature of the specimen becomes the same as the temperature in the test area.

Condensation can also be avoided by using humidifier delay control.

If the temperature and humidity in the test area is 85°C and 85%rh, the dew-point temperature of the air in the test area is 80.9°C. Therefore, condensation occurs if the surface temperature of the specimen is less than 80.9°C. The table below shows the relation between temperature/humidity and dew-point temperature.

Table 5.10 Dew-point temperature

Dry-bulb temperature (°C)	Relative humidity (%rh)	Dew-point temperature (°C)
60	85	56.5
70	85	66.3
	90	67.7
85	85	80.9
	90	82.3

- Example of a program that can be used to avoid condensation on the specimen

In this example, operation is performed in conditions ranging from 20°C and humidity OFF to 85°C and 85%rh.

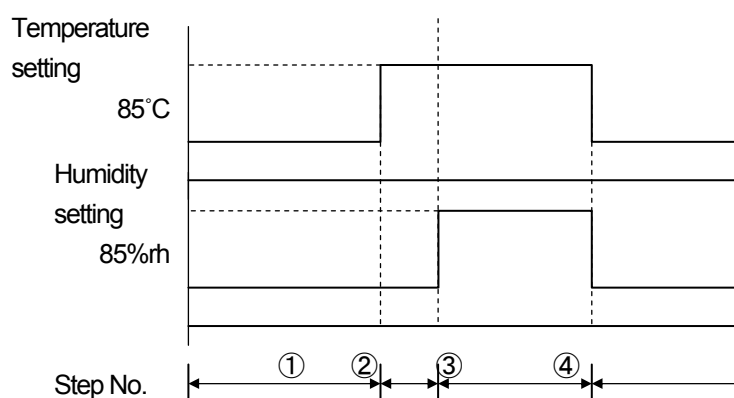


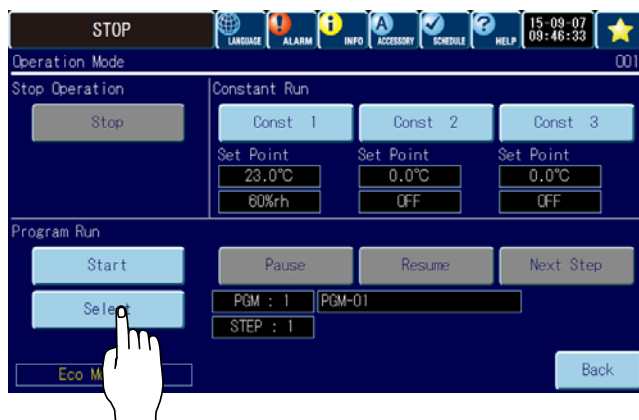
Figure 5.3 Example of a program to avoid condensation

- (1) In step 2, increase the temperature to 85°C. If the humidity is increased to 85%rh at the same time, the surface temperature of the specimen becomes lower than the dew-point temperature and condensation may occur. Therefore, control only the temperature to 85°C. The time during which step 2 should be performed differs depending on the heat capacity of the specimen. As a general guide, the time during which the temperature in the test area is stabilized at 85°C may be used.
- (2) In step 3, operate the chamber at 85°C and 85%rh. Though humidity control starts, condensation can be avoided because the surface temperature of the specimen is around 85°C.

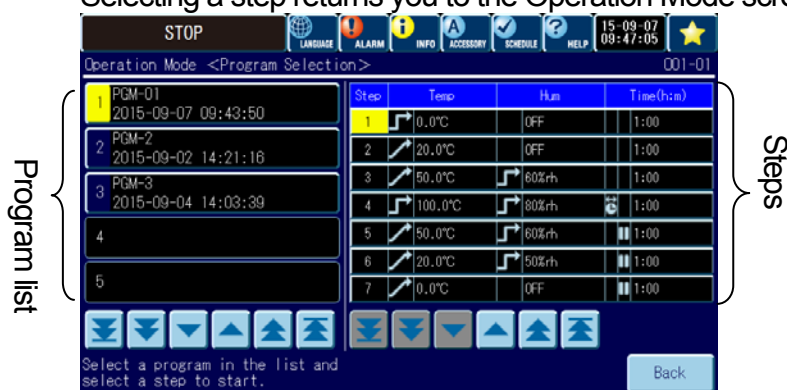
5.9.1 Starting program operation

<Procedure>

- 1) Press [Select] under Program Run to display the Operation Mode <Program Selection> screen.









- 2) Specify the program to run and the starting step.
When the program to run is selected, the steps registered in the program are displayed. Select the step to start.
Selecting a step returns you to the Operation Mode screen.



- * The selected items are displayed in yellow.
- * Program numbers that are not set cannot be selected.

Table 5.11 Scroll keys

	Program list display	Step display
 	Jumps to program number 1 or 40.	Jumps to the first or last step.
 	Scrolls up or down by five items.	Scrolls up or down by seven items.
 	Scrolls up or down by one item.	Scrolls up or down by one item.

3) Start operation.

Check the selected program name and starting step number, and then start operation.

Press [Start] and a confirmation screen is displayed.

[YES]: Starts operation and returns to the original screen.

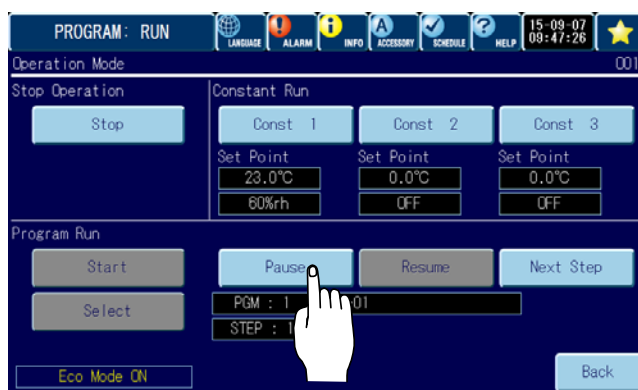
"PROGRAM: RUN" is displayed in the operation display area.

[NO]: Returns to the Operation Mode screen.

5.9.2 Pausing operation (during program operation only)

<Procedure>

1) Press [Pause] under Program Run.



2) A confirmation screen is displayed.

[YES]: Pauses operation and returns to the original screen.

"PROGRAM: PAUSE" is displayed in the operation display area and the operation lamp blinks.

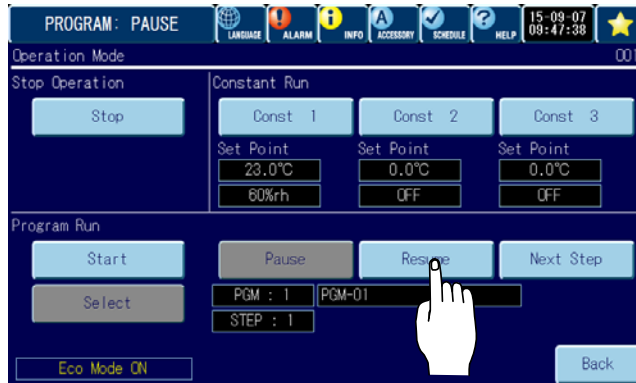
The operation timer is paused and the chamber maintains its operation state.

[NO]: Returns to the Operation Mode screen.

5.9.3 Resuming operation (only when program operation is paused)

<Procedure>

- 1) Press [Resume] under Program Run.



- 2) A confirmation screen is displayed.
 [YES]: Resumes operation of the paused program and returns to the original screen.
 [NO]: Returns to the Operation Mode screen.

5.9.4 Forcing the executing step to advance to the next step (only during program operation and when program operation is paused)

<Procedure>

- 1) Press [Next Step] under Program Run.

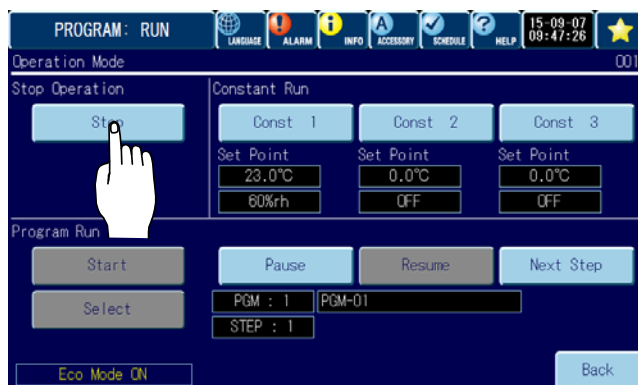


- 2) A confirmation screen is displayed.
 [YES]: Starts operation from the next step and returns to the original screen.
 [NO]: Returns to the Operation Mode screen.

5.9.5 Ending program operation

<Procedure>

- 1) Press [Stop] under Stop Operation.



- 2) A confirmation screen is displayed.



[YES]: Stops operation and returns to the original screen.
"STOP" is displayed in the operating display area.

[NO]: Returns to the operation mode screen without stopping operation.

- 3) Press the instrumentation power switch to also turn off the instrumentation screen.
- 4) If you will not use the chamber for a long time, turn off the circuit breaker as well.
If the circuit breaker is left on even after the instrumentation display section is turned off, the heater for warming up the refrigerator remains powered.
To save energy, turn off the circuit breaker when you will not use the chamber for a long time.

◆ Note ◆

Under certain ambient conditions, suddenly stopping operation following low-temperature operation can cause condensation to form on the chamber surface. In some cases, this can result in water leakage in the chamber installation location.

When ending operation, allow the test area to return to room temperature first before ending operation.

5.10 Low-humidity control operation (PDL and PDR)

5.10.1 Precautions during low-humidity control operation

You cannot change operation from a high-temperature area that exceeds 60°C to a low-humidity area.

First lower the test area temperature to 60°C or less, and then switch to low-humidity operation.

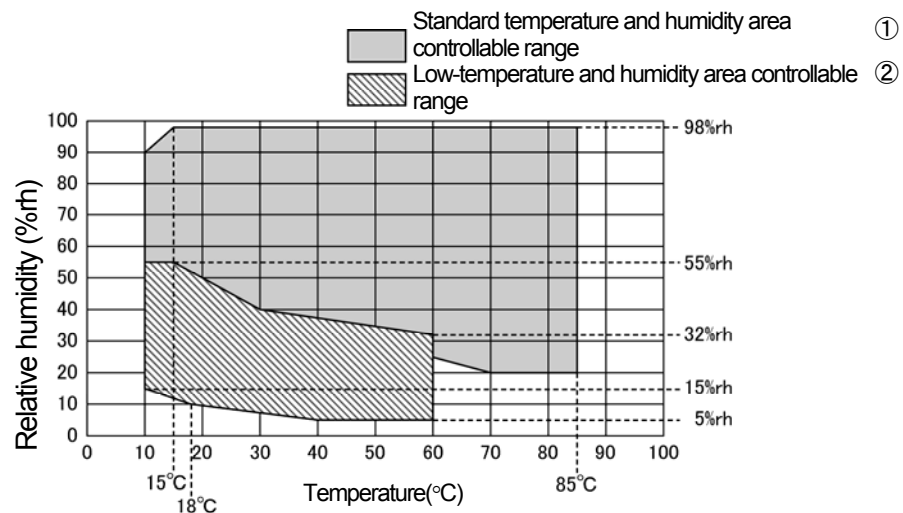
5.10.2 How to perform low-humidity control operation

During low-humidity operation, do not use the cooler inside the chamber. If you have to quickly change from a high-temperature area to a low-temperature, low-humidity area, first open the chamber door or use the cooler to lower the chamber temperature and then start low-humidity operation.

5.10.3 Area during low-humidity control operation

When the chamber is operated to attain a temperature in the range of +30°C to 40°C or lower, continuous operation may be limited due to the frost formed on the cooler (which works as a dehumidifier).

- ① Use the cooler (refrigerator) inside the chamber
- ② Use a cooler (which works as a dehumidifier)



5.10.4 Humidifying heater choice during low-humidity control operation

Either the standard humidifying heater or the small humidifying heater is selected automatically to control the low-humidity/temperature operation area as shown in the following figure. If control is uneven due to the ambient temperature and specimen load conditions, select the proper humidifying heater manually.

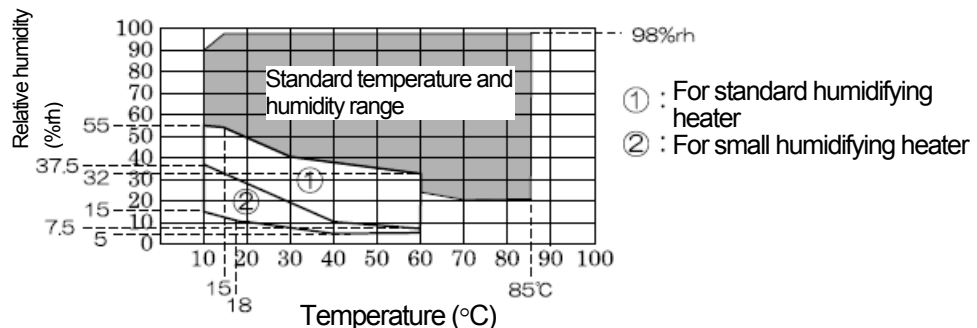


Figure 5.4 Humidifying heater operating ranges

The above ranges are based on a 25°C ambient temperature, no load, and no specimens in the chamber. The boundary line between subranges ① and ② will vary depending on the ambient temperature and load conditions. Therefore, select a humidifying heater according to the conditions of use.

◆ Note ◆

- Do not run programs that shift from the standard temperature and humidity range to the low humidity range.
However, it is possible to shift from the low humidity range to the standard temperature and humidity range.
The reason for this is because, in the former case, the temperature and humidity control cannot follow the program.
- In the low humidity range, do not run programs that shift from subrange ① to subrange ②.
However, it is possible to shift from subrange ② to subrange ①.
The reason for this is because, in the former case, the temperature and humidity control cannot follow the program.
- In the low humidity range, temperature and humidity ramp control cannot be used.
Be sure to allow sufficient time in each step for targets to be attained.
- When the chamber's cooler is used while running a continuous operation in the low humidity range, it is impossible to run the continuous operation because frost forms in the test area's cooler. Be sure to turn the chamber's cooler off and run the operation only using the dehumidifier (for the temperature and humidity control in the low humidity range).

◆ Reference ◆

- When operation is set to shift from subrange ① to subrange ② or from the standard temperature and humidity range to subrange ②, the standard humidifying tray is automatically drained and the small humidifying heater is turned on at the same time that the shift is made. The small humidifying heater is on even while the tray is being drained.
- When operation is set to shift from subrange ② to subrange ① or from subrange ② to the standard temperature and humidity range, water is automatically supplied to the standard humidifying tray at the same time that the shift is made.
The standard humidifying heater remains off for approximately the first 2 minutes following the shift.
Note that the small humidifying tray is not drained automatically.

Chapter 6 Chamber setup

This chapter describes configuration methods for the various control items.

6.1 Chamber setup organization

Chamber setup is where you configure the chamber settings and the operation (control) settings.

Table 6.1 shows the organization of chamber setup. You cannot select functions that the chamber is not equipped with or these functions will not be displayed.

Table 6.1 Chamber Setup organization

Set Schedule	Set Timer
	Schedule Memo
Set Sampling E(Settings for recording trend graph data)	Log Status
	Menu
	Clear Data
Set Protection (Settings for preventing malfunctions and limiting functionality)	Prevent Data Update
	Prevent Run CTRL Change
	Prevent Remote CTRL (general communication and LAN)
	LAN/Ext Memory Security
Set Defrost (option)	* See the Option guide.
Reminder/Alarm History	
ROM Information (serial number of the equipment and system [software and hardware] version information)	
User Check List	Primary Leakage Breaker Trip Test
	Overheat Protector Test
	Check Water Level of Hum Tray / Regulator
	Check and Replace Wick
	Clean Condenser Filter
	Clean Water Tank
	Clean Water Pump Filter
	Clean Hum Tray
	Clean Test Area
	Clean Electric and Water Circuit Area
	Replace Lamp
	Replace Fuses
	Clean Cooling Water Strainer(Water-Cooled)
Reminder	No.1 to No.6
Reset Time Meter	No.1, No.2, No.3

Continued on the next page

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Set Eco Mode		Economy Operation
Add-ons / Updates History		
Configuration	Set Communication	Options: Set RS-485 Interface, Set RS-232C Interface, Set GPIB Interface, Set LAN Set GPIB Interface Set LAN
	Operation Process (Settings for recovery after power failure and backup operation in the event that an alarm occurs)	Power Fail Recovery Setup
		Backup Mode
		Door Open Cond (Set Pause Action, TM to Open War)
	Control Attain Range (Settings for the range of the temperature [humidity] and time to judge that the temperature [humidity] setting has been attained)	Attain Range
		Attain Time
	Name Time Signals (3 to 12 are options)	Time Signal 1 to Time Signal 12
	Display Setup	Keep Page in Tab Position (display hold function)
		Show Hum PV in Temp only
	Set Language	Language
	Set Sound	Alarm Beep
		Warning Beep
		Key Touch
		Volume
	Set Date/Screensaver	Set Date, Time Zone, Summer Time
		Screen Saver, After
		Dimmer Timer, After
	Register User Password	Set Password
	Sensor Offset (Correction of sensor input values for the sensors that measure temperature and humidity)	Adj Val, PV
	Set Chamber Detail (Continuous wick water supply setting, etc.)	Frequency
		Wick Water Cont-Supply
		Auto Refresh Hum Tray
		Hum Delay
	Set Option	* See the Option guide.
	Set Quick Access	
	Service (unavailable)	

Continued on the next page

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Set Back Trace	Back Trace, Log Status, Manual Trigger, Scope, Mode Set File Set Out
Accessory	Hour Meter, Turn OFF the screen, Set Drain, Added Tank (option)

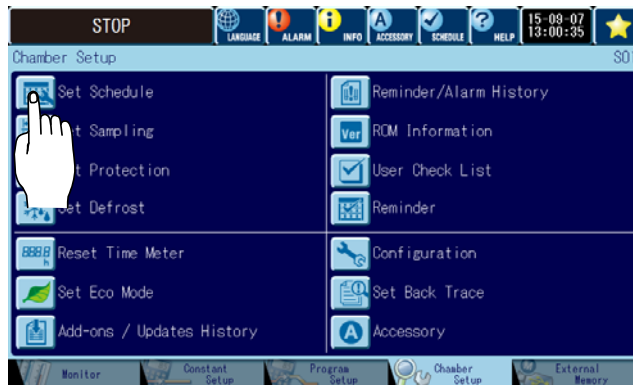
6.2 Setting schedules

Use the following procedure to schedule (set) or cancel the start, end, and quick timers.

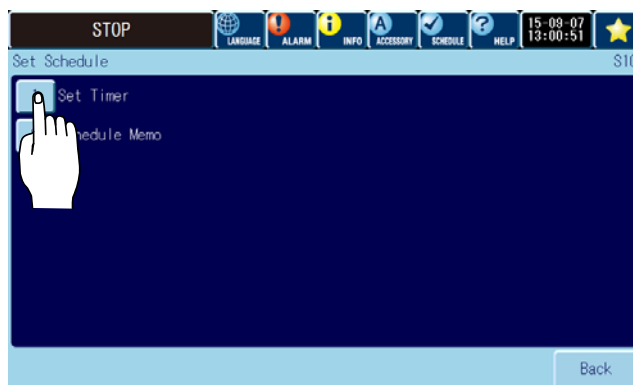
6.2.1 Setting and canceling timers

<Procedure>

- 1) Press the "SCHEDULE" icon or press the Chamber Setup tab, and then press [Set Schedule] on the Chamber Setup screen.



- 2) Select [Set Timer]. The Set Timer screen is displayed.



- ① Press [ON] for the timer to schedule.

- ② Press [OFF] for the timer to cancel.



When a timer is set, the icon lights up.

Timer scheduled



3) When the timer is executed

One Time: The timer schedule is canceled automatically.

Weekly, Everyday: The timer is executed until the schedule is canceled.

The quick timer turns [OFF] after the specified time has been reached.

Notice

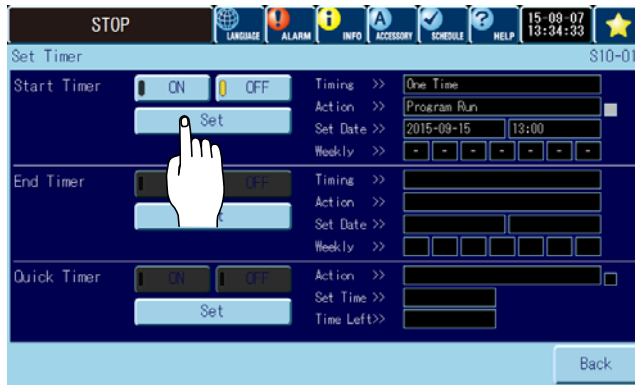
- **A timer schedule is set by saving the timer settings.**
If there is no need to set a timer, be sure to set it to [OFF].
- **When a timer is scheduled, the timer settings have priority in regard to starting and stopping operation.**
 - Start Timer: The scheduled operation starts even if another operation is being performed.
 - End Timer: If the end timer [STOP] is set, the power is turned on when the timer setting time is reached even if the instrumentation panel is turned off.
 - Quick Timer: The scheduled operating mode starts/stops even if another operation is being executed.
- **If the execution times of multiple timers overlap, timers are judged according to the sequence below and only the final timer in the sequence is executed.**
Quick timer → Start timer → End timer
In addition, if a timer is set to [One Time], the timer schedule is canceled even if the timer itself is not executed.

6.2.2 Setting the timer start conditions

The chamber will start operating at the date and time set in advance.
The timer can be configured to execute one time, weekly, or every day.

<Procedure>

- 1) Press [Set] for the start timer.



- 2) Configure the timing, run mode, date, time, and day of the week settings.

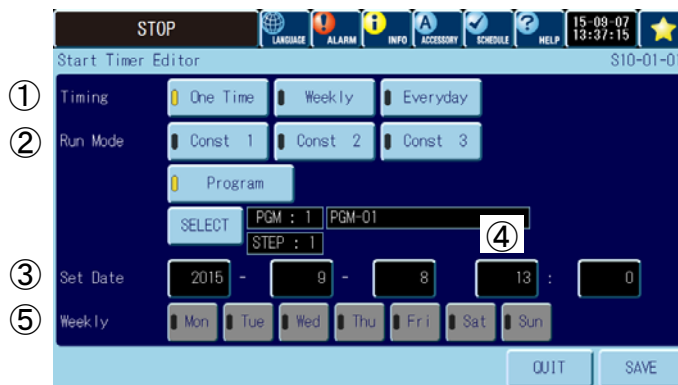
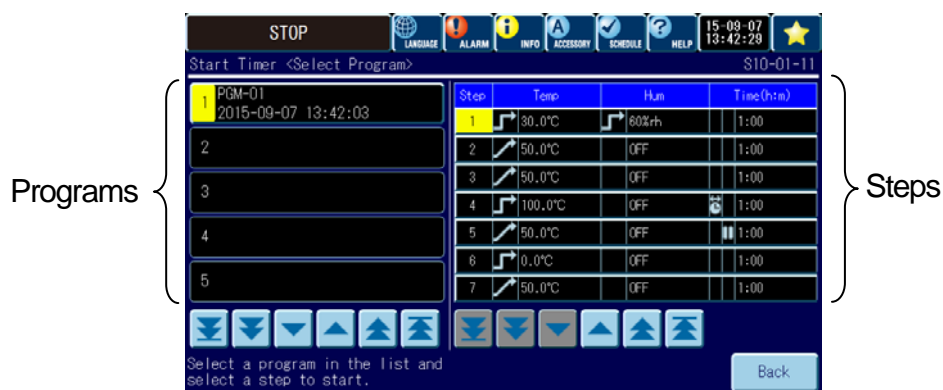


Table 6.2 Start timer settings

①	Timing	Select one of the options below.	
		One Time	Operation is performed only once at the specified time on the specified date. ⇒ Set the date and time.
		Weekly	Operation starts every week at the same time on the same day of the week. ⇒ Set the day of the week and time.
		Everyday	Operation starts every day at the same time. ⇒ Set the time.
②	Run Mode	Select one of the options below.	
		Constant operation	Select Const 1, Const 2, or Const 3.
		Program	Press [SELECT] and select the program and the starting step.
③	Set Date	Specify the date. Specify a date when [One Time] is selected for [Timing].	
④	Date and time setting	Specify the date and time. Specify the date and time for all [Timing] modes.	
⑤	Weekly	Specify the day of the week. Specify the day of the week when [Weekly] is selected for [Timing].	

<Select Program> screen



☞ For the icons displayed in these steps, see "5.2.3 Edit program screen display items."

- 3) When you finish configuring the settings, press [SAVE].

A confirmation screen is displayed.

YES: The settings are registered and you are returned to the Set Timer screen.

NO: The settings are not registered and you are returned to the Start Timer Editor screen.

Pressing [QUIT] displays a confirmation screen asking if you want to discard the edited settings.

YES: The settings are not registered and you are returned to the Set Timer screen.

NO: You are returned to the Start Timer Editor screen.

- * Saving settings causes the timer to be scheduled.
To cancel a scheduled timer, press [OFF].

◆ Reference ◆

- If you set the time in the past and attempt to save the timer, the message "You set the time in the past" is displayed. Correct the time.
- When the timer is set, the power is turned on and operation starts when the start time is reached, even if the instrumentation panel is turned off.
- If [One Time] is selected, the start timer is turned [OFF] after the specified time is reached.

6.2.3 Setting the end timer

The chamber will stop operating at the date and time set in advance.
The timer can be configured to execute one time, weekly, or every day.

<Procedure>

- 1) Press [Set] for the end timer.



- 2) Configure the timing, run mode, date, time, and day of the week settings.

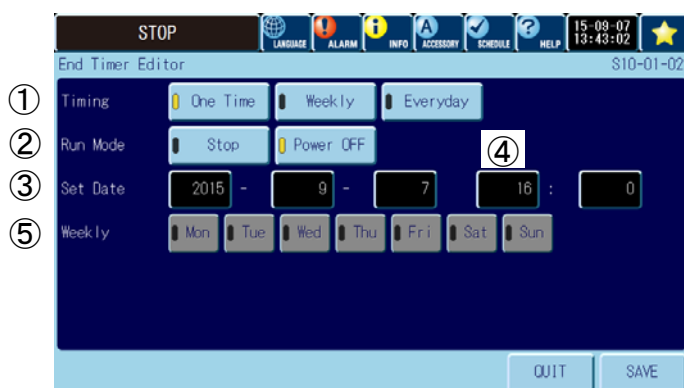


Table 6.3 End timer settings

①	Timing	Select one of the options below.	
		One Time	Operation ends at the specified date and time. ⇒ Set the date and time.
		Weekly	Operation ends every week at the same time on the same day of the week. ⇒ Set the day of the week and time.
		Everyday	Operation ends at the same time every day. ⇒ Set the time.
②	Run Mode	Select one of the options below.	
		Stop	Stops operation.
		Power OFF	Turns off the power of the instrumentation panel. However, the circuit breaker is kept on.
③	Set Date	Specify the date. Specify a date when [One Time] is selected for [Timing].	
④	Date and time setting	Specify the date and time. Specify the date and time for all [Timing] modes.	
⑤	Weekly	Specify the day of the week. Specify the day of the week when [Weekly] is selected for [Timing].	

- 3) When you finish configuring the settings, press [SAVE].

A confirmation screen is displayed.

YES: The settings are registered and you are returned to the Set Timer screen.

NO: The settings are not registered and you are returned to the End Timer Editor screen.

Pressing [QUIT] displays a confirmation screen asking if you want to discard the edited settings.

YES: The settings are not registered and you are returned to the Set Timer screen.

NO: You are returned to the End Timer Editor screen.

- * Saving settings causes the timer to be scheduled.
To cancel a scheduled timer, press [OFF].

◆ Reference ◆

- If you set the time in the past and attempt to save the timer, the message "You set the time in the past" is displayed. Correct the time.
- If [One Time] is selected, the end timer is turned [OFF] after the specified time is reached.

6.2.4 Setting the quick timer

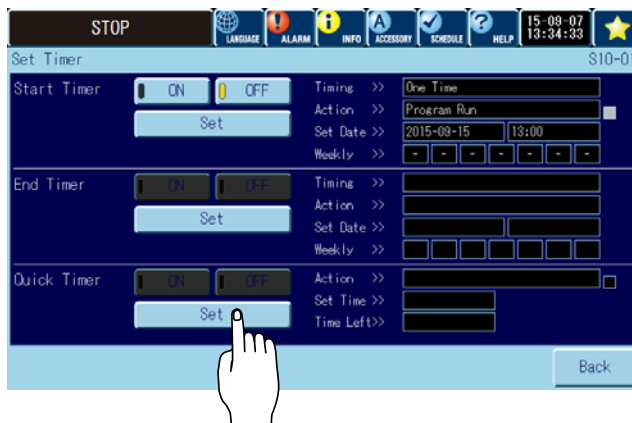
Use quick timer when you want to start/end operation after a certain amount of time from the current time.

To start operation: Set the operation start time and select constant operation (Const 1, Const 2, or Const 3) or program operation.

To end the operation: Set the operation end time and set the end status to Stop or Power OFF.

<Procedure>

- 1) Press [Set] for the quick timer.



- 2) Set the operating mode and the time.

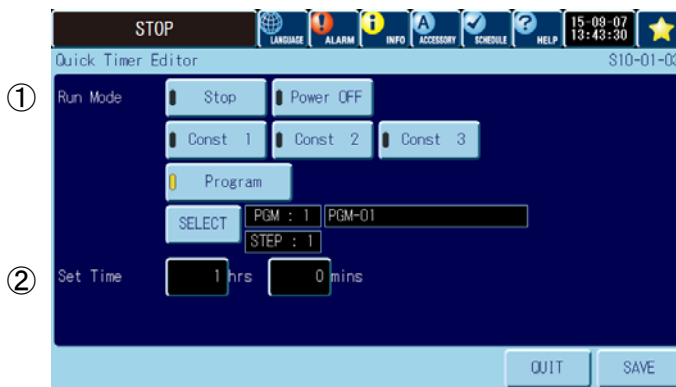


Table 6.4 Quick timer settings

①	Run Mode	To start operation, select one of the following items.	
		Const 1 to Const 3	Starts the selected constant operation.
		Program	Press [SELECT] and select the program and the step.
		To end the operation, select one of the following items.	
		Stop	Stops operation.
		Power OFF	Turns off the power of the instrumentation panel. However, the circuit breaker is kept on.
②	Set Time	Set how much time from now operation will begin. Input range: hours [0 to 9999], minutes [0 to 59].	

- 3) When you finish configuring the settings, press [SAVE].

A confirmation screen is displayed.

YES: The settings are registered and you are returned to the Set Timer screen.

NO: The settings are not registered and you are returned to the Quick Timer Editor screen.

Pressing [QUIT] displays a confirmation screen asking if you want to discard the edited settings.

YES: The settings are not registered and you are returned to the Set Timer screen.

NO: You are returned to the Quick Timer Editor screen.

- * Saving settings causes the timer to be scheduled.
To cancel a scheduled timer, press [OFF].

◆ Reference ◆

- The quick timer turns [OFF] after the specified time has been reached.
- When the timer is set, the power is turned on and operation starts when the start time is reached, even if the instrumentation panel is turned off.

6.3 Schedule memo

This screen displays notes such as plans to use the chamber (schedule memos).

You can only enter schedule memos through Web application.

For details on how to enter schedule memos, see "Web application" in the "Network guide."

Schedule Memo		
No.1	2015-10-01 ~ 2015-10-05	Test A Procedure 1-1
No.2	2015-11-23 ~ 2015-11-27	Test B Procedure 1-2
No.3		
No.4		
No.5		

Back

6.4 Sampling settings

Configure these settings to record data for the trend graph that is displayed on Monitor.
The data set in sampling is reflected on the trend graph.
Press [Set Sampling] on the Chamber Setup screen.



Table 6.5 Sampling settings

①	Log Status	Displays the present log status. (REC, STOP)
②	Menu	Set the recording condition. EXEC: Data is recorded regardless of the operation status such as operating, stop, and power off. Rec in Run: Data is recorded while the chamber is running in constant operation, program operation, and remote operation. STOP: Stops recording.
③	Item	Set the item to be recorded. You can select temperature, humidity, or temperature/humidity. When specimen temperature control (optional) is installed, Product can be selected.
④	Cycle	Select the recording cycle from 1sec, 5sec, 10sec, 30sec, 1min, or 5min.
⑤	Approx Dur	Displays the maximum recording time for the internal memory. * If the maximum recording time of the internal memory is exceeded, recorded data will be deleted starting with the oldest data.
⑥	Clear Data	Clears the data recorded in internal memory.

After you change the [Menu], [Item], or [Cycle] setting, press the Apply key.
If you press [Back] without first pressing the Apply key, the settings will not be applied.
If you change [Item] setting, the recorded data will be deleted.*
Data cannot be cleared during recording. Set [Log Status] to [STOPPED].

◆ Reference ◆

- Depending on the recording conditions, the internal memory can save data for the recording time listed in the following table.

Item and recording time

Cycle	Temp	Hum	Temp/Hum
1sec	Approx. 5 days and 1 hour	Approx. 5 days and 1 hour	Approx. 3 days and 19 hours
5sec	Approx. 25 days and 6 hours	Approx. 25 days and 6 hours	Approx. 18 days and 23 hours
10sec	Approx. 50 days and 13 hours	Approx. 50 days and 13 hours	Approx. 37 days and 22 hours
30sec	Approx. 151 days and 16 hours	Approx. 151 days and 16 hours	Approx. 113 days and 18 hours
1min	Approx. 303 days and 9 hours	Approx. 303 days and 9 hours	Approx. 227 days and 13 hours
5min	Approx. 1517 days	Approx. 1517 days	Approx. 1137 days and 18 hours

* The recording time also changes if items are added such as the specimen temperature and options.

- We recommend that you output or copy recorded data to external memory by using Set Sampling Data Writing for External Memory.

☞ For details, see "7.1 External memory" and "7.2 Configuring sampling writing settings."

- If [Save Data Ext Memory] is set to [ON], [Item] and [Cycle] in Set Sampling cannot be changed. Set [Save Data Ext Memory] to [OFF] before changing the settings in Set Sampling.
- You can use external memory to extend the maximum recording time.
(The extended recording time depends on how much space remains on the external memory.)
- The trend graph display is based on the Set Sampling settings.
☞ For details, see "3.6 Trend graph."

* Changes to the sampling settings

- If a Set Sampling setting is changed and applied during recording, the data recorded to internal memory is erased. If you require the data recorded up to that point, first write that data to external memory, and then change the settings.
☞ For details, see "7.2 Configuring sampling writing settings."

6.5 Setting protection

By setting protection, you can prevent erroneous operations during setup and when setting operation. You can also limit the functionality of the chamber. Configure the protection settings as required.

Press [Set Protection] on the Chamber Setup screen.

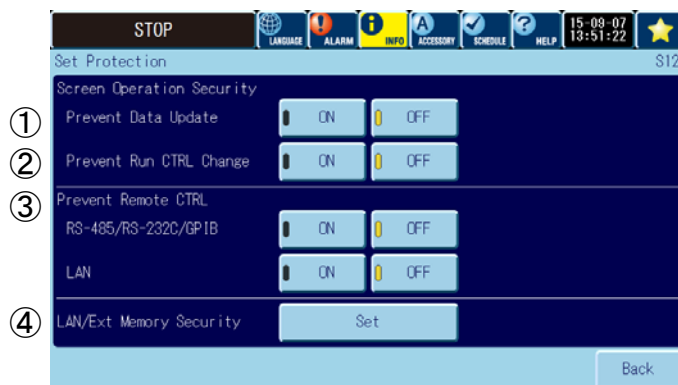


Table 6.6 Protection settings

		When protection is set to [ON]
①	Prevent Data Update	Disables all operations related to configuring settings.
②	Prevent Run CTRL Change	Disables key operations on the Operation Mode screen and the operation of turning off the power of the instrumentation panel.
③	Prevent Remote CTRL RS-485/RS-232C/GPIB	Disables changes to data and requests to change the operation state via RS-485, RS-232C, and GPIB.
	Prevent Remote CTRL LAN	Disables changes to data and requests to change the operation state via LAN.

		Setting details
④	LAN/Ext Memory Security	<p>You can limit the usage of the LAN feature and of external memory.</p> <p>(1) Screen Password Register a password to prevent unauthorized changes to the settings on this screen.</p>

		Setting details
④	LAN/Ext Memory Security	<p>(2) LAN Use If you will not use Web function through a LAN, select [Disable]. The settings on the PC communications setup screen and the IP address setup screen will both be displayed in gray, and you will not be able to configure these settings. The default setting is [Enable].</p> <p>(3) Ext Memory If you will not use the external memory function, select [Disable]. Alternatively, you can set an access password that must be entered to use the external memory function. * Even if you select [Disable], you can still record back trace data.</p>

**CAUTION**

When performing operations in the test area or around the chamber, always ensure that the chamber is not remotely operated over the LAN or other communication interface.

If there is any possibility the chamber will be remotely operated, take necessary precautions such as turning remote operation protection on.

During chamber operations, sudden operation of the test area can result in injury.



Ensure that the chamber clearly displays it is being operated from a remote location, and also properly notify the operator.

Notice**Using the external memory and back traces**

Even if [Disable] is selected for external memory, back trace data can be recorded. If you are using the Online Diagnostics Service, set external memory to [Enable] to output back trace data. Regardless of whether you are using the Online Diagnostics Service, restart recording.

◆ Reference ◆

If you perform an operation that has been protected, the "Protection is ON" confirmation screen is displayed.

- If the breaker is turned on when operation protection (Prevent Run CTRL Change) is [ON], only the power switch of the instrumentation can be turned on.
- If an alarm occurs, Prevent Data Update, Prevent Run CTRL Change, and Prevent Remote CTRL are canceled automatically in order to allow emergency stop of the chamber and to change settings. However, because of information security, the screen password for the Set LAN/Ext Memory Security screen, LAN usage permission, external memory usage permission, and the access password are not canceled.

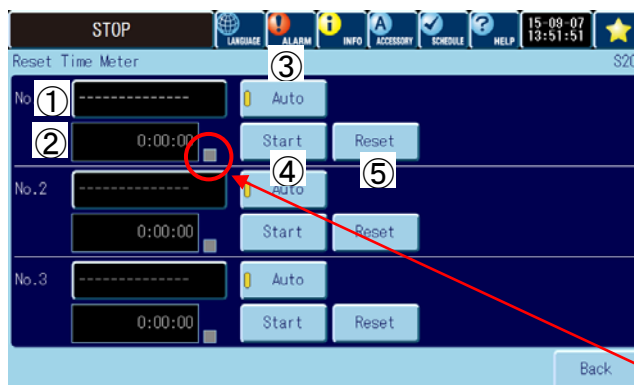
6.6 Reset time meter

There are three time meters, and each can be set to auto, start, stop, or reset. When auto is selected, counting (accumulating) is performed only during operation.

* Unavailable time meters are grayed out.

By using the reset time meter, it is possible to count the operating time and to count the stress application time for each specimen in the test area. These time meters are used to control the operating time, to turn on the power for specimen, and to apply voltage. The counted (accumulated) time can be reset.

Press [Reset Time Meter] on the Chamber Setup screen.



This part blinks in yellow while the time meter is counting.

Table 6.7 Reset time meter settings

①	A name can be assigned to each timer meter. * You can enter up to 15 characters.	
②	Displays the count (accumulated) time.	
③		[Auto (yellow LED: ON)]: Automatic counting (accumulation) is only performed during operation.* [Auto (yellow LED: OFF)]: Counts (accumulates) manually regardless of the chamber operation state.
④		During automatic counting (accumulation), this pauses the counting. When counting is paused, this key changes to the [Resume] key.
		During automatic counting (accumulation), this resumes counting. During counting, this key changes to the [Pause] key.
		Starts manual counting (accumulation). This key changes to [STOP] while counting (accumulation) is in progress.
		Stops manual counting (accumulation). This key changes to [Start] while counting is stopped.
⑤		Resets the counted (accumulated) time.

*

The term "during operation" includes constant operation, program operation, paused program operation, holding of the last program, remote operation, paused remote operation, and holding of the last remote operation. The time meter continues counting even if the instrumentation panel is off.

◆ Reference ◆

Each reset time meter operates independently, so they can be used for individual specimens.

6.7 Displaying the reminder/alarm report

6.7.1 Reminder report

This chamber is equipped with a function that displays on the Information screen reminders of when it is time to perform an inspection and other reminders that you have set. This section explains how to display the history of the reminders that have already been presented to the user.

For details on the reminder function, see "6.10 Reminder."

Press [Reminder/Alarm History] on the Chamber Setup screen. The Reminder Report screen is displayed.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

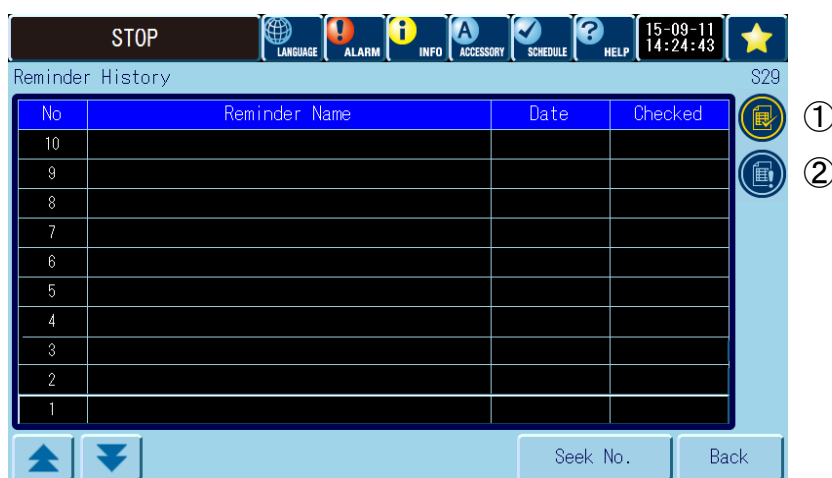




Table 6.8 Side menu (Reminder Report screen)

	Icon	Slide label	Screen
①		Reminder Report	Displays the reminder report.
②		Alarm Report	Displays the alarm report.



Table 6.9 Reminder Report display items

①	No	Displays the history number (1 to 50). Displays the reminders that have occurred up to now in descending order. 10 items are displayed per screen.
②	Reminder	Displays the name of the reminder that has occurred. Press the name of a reminder to display the Reminder Report HELP screen.
③	Date (occurrence)	Displays the date when the reminder occurred.
④	Date (confirmation)	Displays the date when the reminder was confirmed on the Information screen.
⑤		Use these to select the page to be displayed.
⑥		Enter a number to jump directly to the corresponding reminder.

◆ Reference ◆

The reminder report stores a maximum of 50 reminders that occurred. If an attempt is made to register an item when there are already 50 items in the report, the oldest item will be deleted to make room for the new one.

6.7.2 Alarm report

Use this function to check the history of alarms and warnings that have occurred. It can be used to perform maintenance management of the equipment and to analyze the cause of trouble.

Press the Alarm Report icon.
The alarm report is displayed.

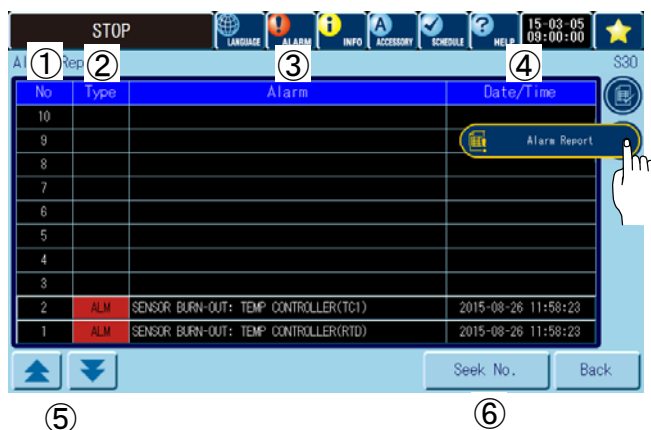
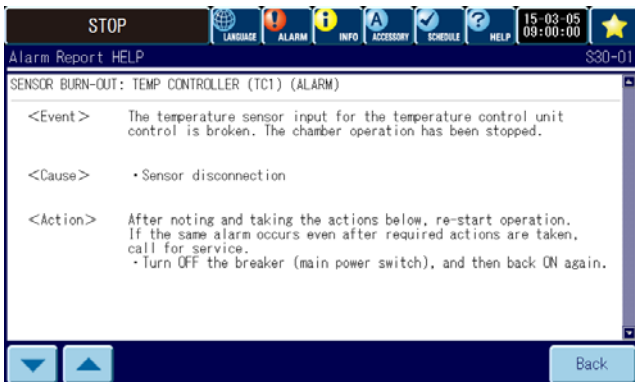




Table 6.10 Alarm Report display items

①	No	Displays the history number (1 to 100). Displays the alarms that have occurred up to now in descending order. 10 items are displayed per screen.
②	Type	Displays ALM or WRN.
③	Alarm	Displays the name of the alarm or warning that has occurred. Press the name of an alarm to display the Alarm Report HELP screen. 
④	Date/Time	Displays the date and time when the alarm or warning occurred.
⑤		Use these to select the page to be displayed.
⑥		Enter a number to jump directly to the corresponding alarm or warning.

◆ Reference ◆

The alarm report stores a maximum of 100 alarms and warnings that occurred. If an attempt is made to register an item when there are already 100 items in the report, the oldest item will be deleted to make room for the new one.

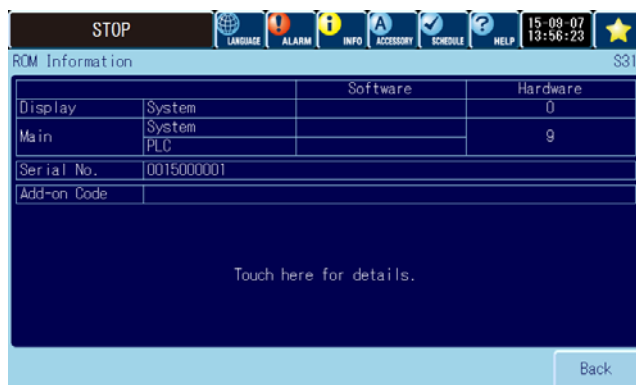
6.8 Displaying the version information

You can check the serial number of the chamber and the version of the instrumentation. In ROM Information, the information about the software and hardware installed on the units that constitute the instrumentation is displayed.

Press [ROM Information] on the Chamber Setup screen.

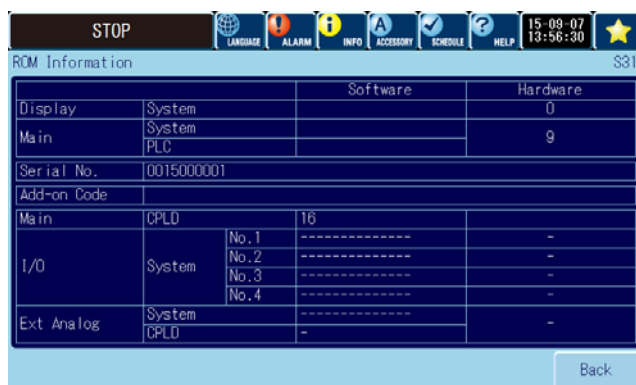
The serial number of the chamber and the system (software, hardware) version information are displayed.

ROM Information screen



- * Press the blank area at the bottom of the screen to display all of the version information for the units that constitute the instrumentation.

ROM Information + details screen



◆ Reference ◆

- When you make a service call, you may be asked to check the version information.
- To download software for add-ons/system updating, you need to check the serial number.

6.9 Viewing the periodic inspection items

Check the detailed information on the items that require periodic maintenance and inspection.

Press [User Check List] on the Chamber Setup screen.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

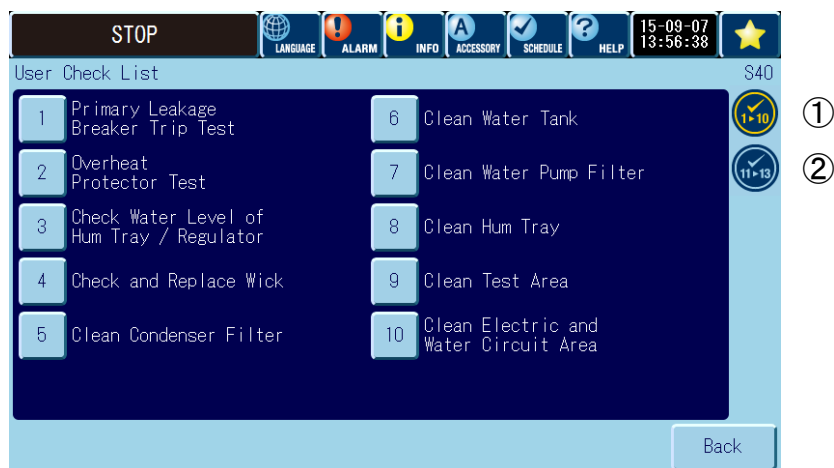


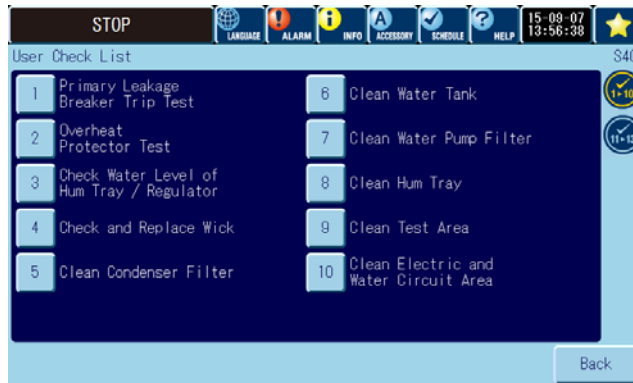
Table 6.11 Side menu (Reminder Report screen)

	Icon	Slide label	Screen
①		1 to 10	Displays numbers 1 to 10 of the User Check List.
②		11 to 13	Displays numbers 11 to 13 of the User Check List.

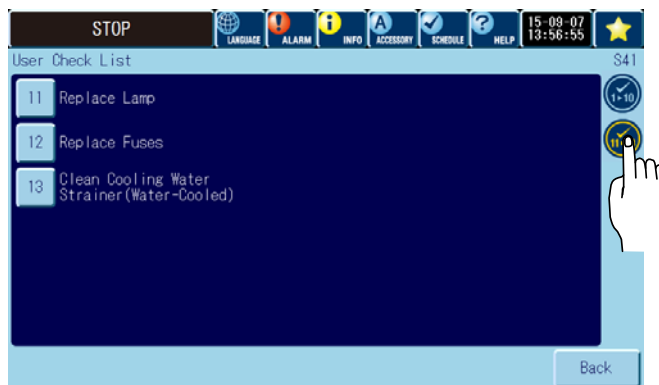
Pressing a number displays the inspection method of the item.

- * For the details about the inspection methods, see "Basic guide - Chapter 5 Maintenance and inspection."

- Page 1



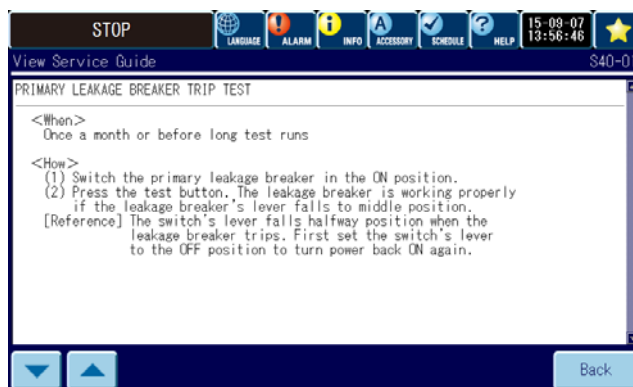
- Page 2



[User Check List]

1. Primary Leakage Breaker Trip Test
2. Overheat Protector Test
3. Check Water Level of Hum Tray / Regulator
4. Check and Replace Wick
5. Clean Condenser Filter
6. Clean Water Tank
7. Clean Water Pump Filter
8. Clean Hum Tray
9. Clean Test Area
10. Clean Electric and Water Circuit Area
11. Replace Lamp
12. Replace Fuses
13. Clean Cooling Water Strainer(Water-Cooled)

Pressing the item number displays the View Service Guide screen. This screen displays the inspection time and its details.



6.10 Reminder

Reminder periodically displays the inspection time for the condenser filter and humidifying tray on the Information screen. There are also user reminder settings that allow you to set your own reminder notification.

Press [Reminder] on the Chamber Setup screen. The Reminder screen is displayed.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

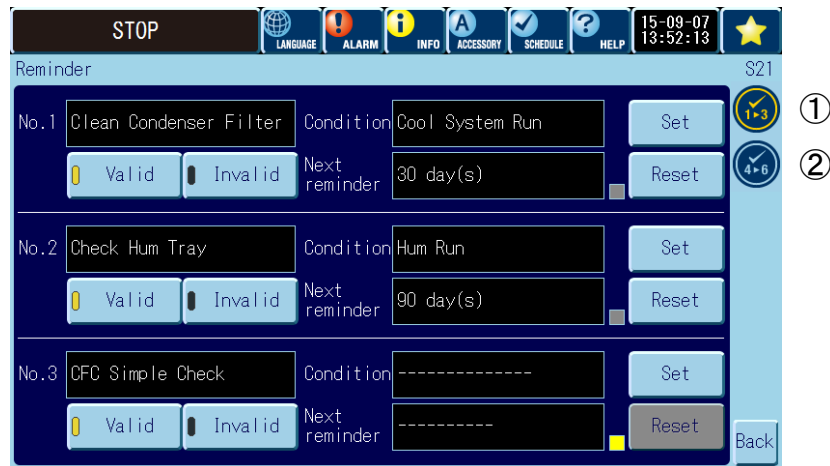


Table 6.12 Side menu (Reminder screen)

	Icon	Slide label	Screen
①		1 to 3	Displays No.1 to No.3.
②		4 to 6	Displays No.4 to No.6.

Reminder settings

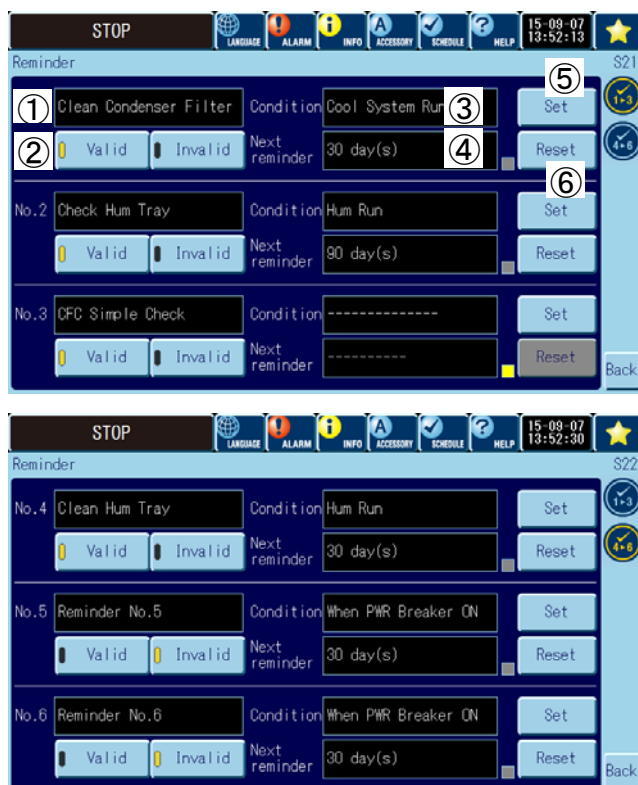


Table 6.13 Reminder display items

①	Displays the name of the reminder.
②	When you select [Valid], a reminder is displayed on the Information screen at the specified time.
③	Displays the counting condition for the time/period.
④	Displays the period until the next reminder. When counting, the box to the right of Next reminder blinks in yellow.
⑤	Displays the Set Reminder screen for the reminder.
⑥	Resets the count of the time/period.

To set the details of a reminder, press [Set].

*You cannot change details that have been set by the manufacturer in advance.



Table 6.14 Reminder settings

①	Enter up to 18 alphanumeric characters for the reminder details.
②	Set the reminder mode.
③	<p>Set the counting condition for the time/period.</p> <p>1: When PWR Breaker ON Sets the condition as when the breaker is turned on.</p> <p>2: When Run Sets the condition as when the chamber is operating in constant or program operation.</p> <p>3: When Ref Run Sets the condition as when the cooling system is running.</p> <p>4: In Hum Run Sets the condition as when humidity control is being performed.</p>
④	When you have selected [Period] for ②, set the period until the reminder is displayed.
⑤	When you have selected [Set Date] for ②, set the date.
⑥	<p>Set whether to display the reminder periodically.</p> <p>If you set [Repeat] to [ON], the reminder will repeatedly be displayed once per month with the start date as the reference.</p>

Reminder notification on the Information screen



Table 6.15 Reminder details and conditions

Reminder*	Notification condition*
Simple Fluorocarbon Inspection	You can specify the date.
Clean Condenser Filter	When Ref Run
Check Hum Tray	In Hum Run
Clean Hum Tray	In Hum Run
Clean Condenser	When Ref Run
Clean Strainer	When Ref Run
Reminder No.3 to Reminder No.6	One of the conditions below can be selected. 1: When PWR Breaker ON 2: When Run 3: When Ref Run 4: In Hum Run

*The displayed items and the conditions that you can select vary depending on the chamber type and its equipped functions.

6.11. Configuring maintenance settings

The configuration screen is for configuring operation, screen, sound, and advanced settings while the chamber is running.

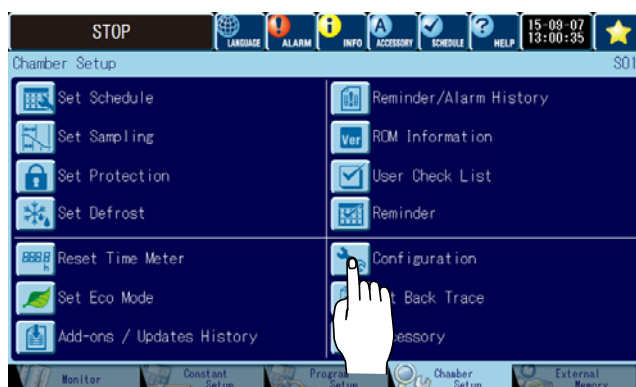
Press [Configuration] on the Chamber Setup screen.

◆ Reference ◆

You can register a user password for accessing Configuration.

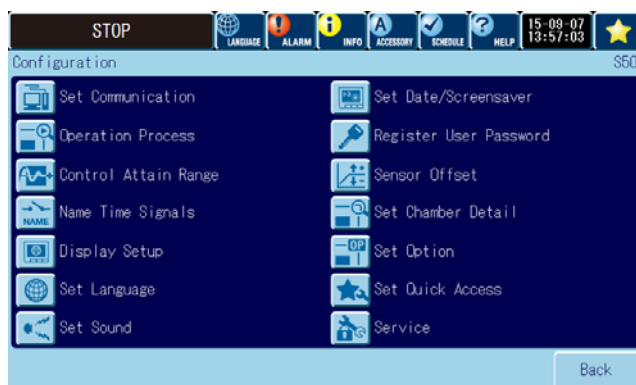
☞ For details on registering a user password, see "6.11.5 Registering (changing) the user password."

If you have already registered a password, enter the password.



The Configuration screen appears.

For the settings on each screen, see 6.11.1 and subsequent sections.



[Configuration items]

Set Communication

Operation Process

Control Attain Range

Name Time Signals

Display Setup

Set Language

Set Sound

Set Date/Screensaver

Register User Password

Sensor Offset

Set Chamber Detail

Set Option

Set Quick Access

Service

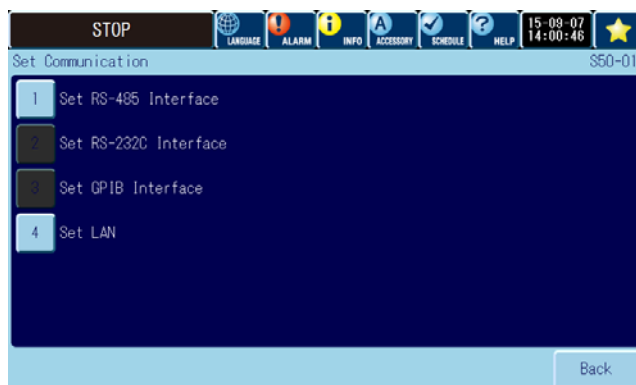
6.11.1 Configuring communication settings

Use the information in this section to configure the communication function. The chamber is standard-equipped with a LAN interface.

RS-485, RS-232C, and GPIB interfaces are optional.

Press [Set Communication] on the Configuration screen.

Only the installed communication methods can be selected.



■ Set LAN screen

You can monitor the chamber, configure constant settings, configure program settings, change the operation, and send alarm email by using Web application from a web browser when the chamber is connected to a network.

To connect the chamber to an internal LAN, prepare a static IP address.

◆ Note ◆

To connect multiple chambers to the same network, be sure to set a unique IP address for each chamber to prevent unintended operation of the wrong chamber.

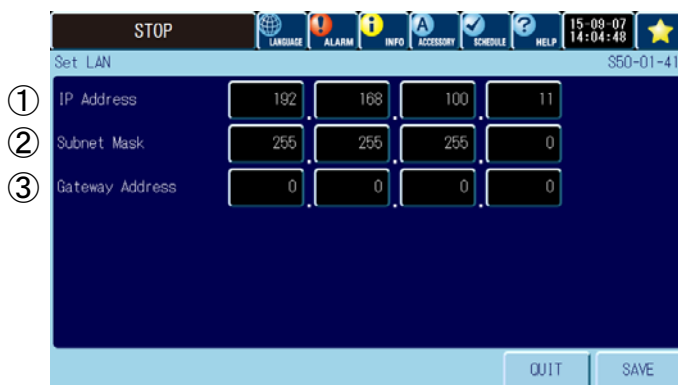


Table 6.16 LAN settings

		When connecting to an internal network	When connecting the chamber to a PC in a one-to-one configuration
①	IP Address	Enter the prepared IP address.	192.168.100.11
②	Subnet Mask	Enter the prepared subnet mask.	255.255.255.0
③	Gateway Address	Enter the prepared gateway address (when necessary).	

* Using the chamber while it is connected to a PC in a one-to-one configuration
 Fix your PC's IP address to "192.168.100.1," set the subnet mask to "255.255.255.0," and then enter "http://192.168.100.11" in your browser's address bar to connect to the device.

If you change the address, press the [SAVE] key.

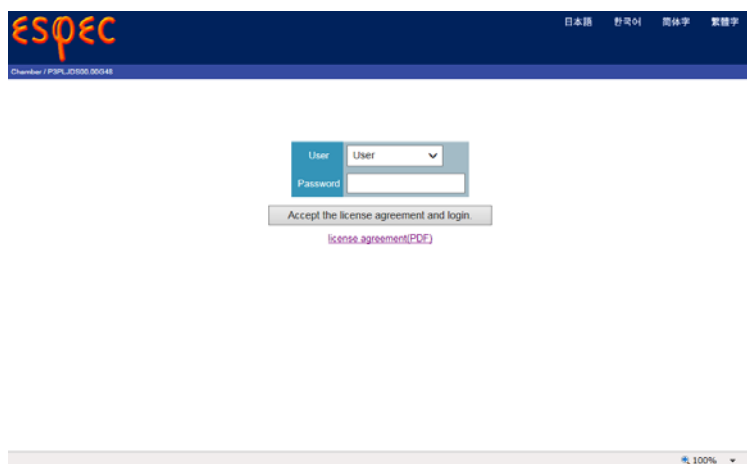
After the confirmation screen is displayed, it takes about one minute for the Web application IP address to change.

☞ For details on how to use the chamber from a web browser, see "Web application" in the "Network guide."

Use a LAN cable to connect the LAN port of the PC and the Ethernet port (LAN port), and then start the browser on the PC.

Enter the set IP address in your browser's address bar to display the initial screen of Web application.

Example: When using Internet Explorer 10



■ Set RS-485 Interface screen

① Address: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

② Baud Rate: 4800, 9600, 19200

③ Parity: None, Odd, Even

④ Data Bits: 8bit, 7bit

⑤ Delimiter: CR, LF

⑥ Stop Bits: 1bit, 2bit

⑦ Protocol: STD, OLD

⑧ Echo Back: ON, OFF

Buttons: QUIT, SAVE

Table 6.17 RS-485 settings

①	Address	Specify an address number from 1 to 16. The address number is assigned to identify the chamber. Make sure not to assign the same address number to two different chambers.
②	Baud Rate	Select 4800, 9600, or 19200.
③	Parity	Select None, Odd, or Even.
④	Data Bits	Select 8bit or 7bit.
⑤	Delimiter	Select CR and/or LF.
⑥	Stop Bits	Select 1bit or 2bit.
⑦	Protocol	Select STD or OLD.
⑧	Echo Back	Select ON or OFF (valid only when OLD is selected for Protocol).

■ Set RS-232C Interface screen

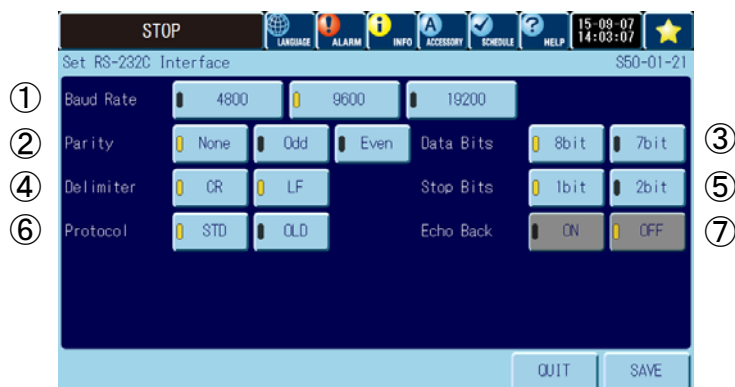


Table 6.18 RS-232C settings

①	Baud Rate	Select 4800, 9600, or 19200.
②	Parity	Select None, Odd, or Even.
③	Data Bits	Select 8bit or 7bit.
④	Delimiter	Select CR and/or LF.
⑤	Stop Bits	Select 1bit or 2bit.
⑥	Protocol	Select STD or OLD.
⑦	Echo Back	Select ON or OFF (valid only when OLD is selected for Protocol).

■ Set GPIB Interface screen

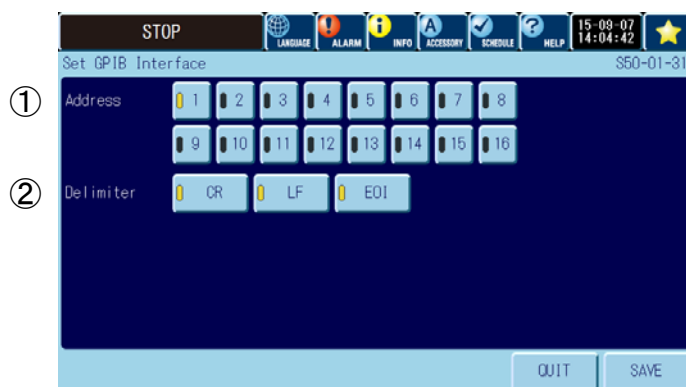


Table 6.19 GPIB settings

①	Address	Specify an address number from 1 to 16. The address number is assigned to identify the chamber. Make sure not to assign the same address number to two different chambers.
②	Delimiter	Select CR, LF, or EOI (multiple items may be selected).

6.11.2 Configuring operation settings for when the chamber is running

Configure the settings for the recovery method following a power failure during operation, for backup operation when an alarm occurs, and for the operation when the door opens when the chamber is running.

Press [Operation Process] on the Configuration screen.

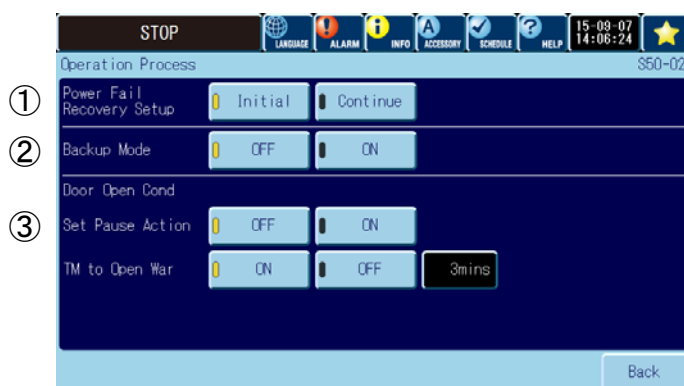


Table 6.20 Operation process settings

①	Power Fail Recovery Setup		<p>Set the recovery action of the chamber after a power failure occurs.</p> <p>[Initial]: After a power failure recovery, the chamber returns to its initial state (in which the circuit breaker is turned on) regardless of the operation state before the occurrence of the power failure.</p> <p>[Continue]: Following the power failure recovery, the chamber maintains the operation state that was in use before the power failure.</p>
②	Backup Mode		<p>Set backup operation so that the operation state is maintained as much as possible in the event of a chamber alarm (humidifier or refrigerator abnormality) by switching to temperature operation or switching to a normally functioning refrigerator in order to prevent damage to specimens.</p> <p>* During backup operation, the ALARM icon blinks. There are cases where the guaranteed performance standards may not be met during backup operation. "Backup operation is being performed" is displayed as chamber information on the Information screen.</p> <p>* If Backup Mode is set to [OFF], the chamber stops if a malfunction occurs.</p> <p>☞ For details on operation, see "Basic guide, 6.4 Backup operation," and for alarms, see "Basic guide, 6.5 List of alarms."</p>
③	Door Open Cond	Set Pause Action	<p>Set the pause operation that is performed when the door is opened.</p> <p>[ON]: Stops the air circulator temporarily when the chamber door is opened during operation. (Program operation time continues to elapse.) When the chamber door is closed, the air circulator will resume operation.</p> <p>[OFF]: The operation of the air circular continues regardless of whether or not the door is open.</p>
		TM to Open War	<p>[ON]: Set the time from when the door is opened to when the alarm is issued.</p> <p>[OFF]: Disables the "CHAMBER DOOR OPEN" alarm function. The alarm does not activate and there is no buzzer sound.</p>

**CAUTION**

If you select [OFF] for Set Pause Action under Door Open Cond and open the chamber door during operation, open the door slowly.

High temperature and high humidity air may blow out and cause burns.

6.11.3 Configuring control attainment conditions

Use the procedure below to configure settings for the attainment range and attainment time, which are used for judgment of whether or not the chamber has attained the temperature (humidity) setting.

The state where the process value falls within the judgment range of the setting for a fixed period or longer is regarded as having attained the setting.

The following functions show when the setting attainment judgment process is enabled.

- The soak time control of the program step
- Temperature attainment output (optional)
- Humidity attainment output (optional)

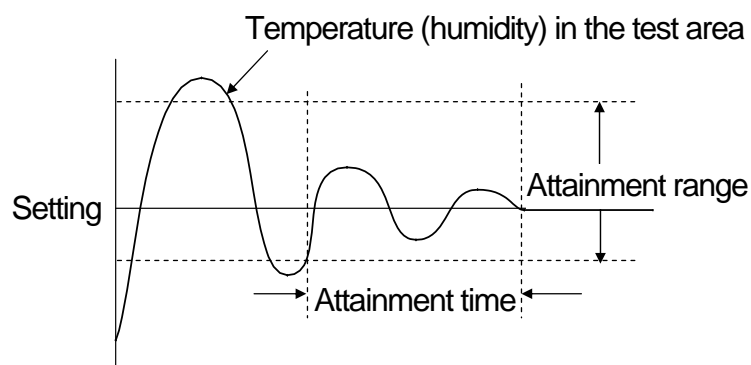
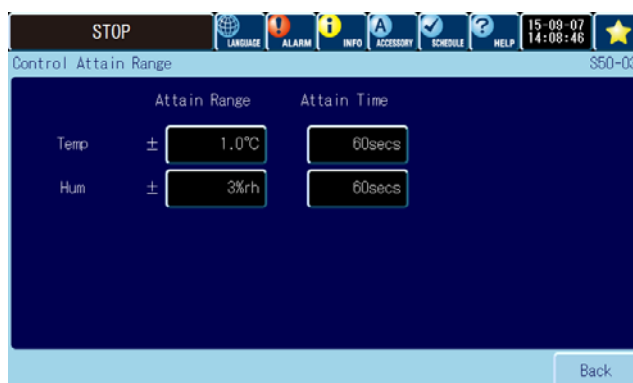


Figure 6.1 Temperature (humidity) attainment range settings

Press [Control Attain Range] on the Configuration screen.



<Procedure>

- 1) Set the attainment range (temperature, humidity).
Input ranges: Temperature 0.1°C to 3.0°C, humidity 1%rh to 5%rh
- 2) Set the attainment times.
Set the attainment times for temperature and humidity.
Input range: 0 to 9999 seconds
- 3) Set the attainment range and attainment time of the specimen temperature (only when the appropriate option is installed).
Input ranges: Temperature: 0.1°C to 3.0°C, 0 to 9999 seconds

6.11.4 Registering (changing) names of time signals

You can change the names of the time signals (3 to 12 are options) to any desired name.

Press [Name Time Signals] on the Configuration screen.



When the key of the time signal is pressed, the character input screen is displayed. Enter the signal name on this screen.

* Up to 15 characters may be entered.

☞ "Display Setup," "Set Sound," and "Set Date/Screensaver" are described in "Chapter 1 Function overview." See "1.6 Setting screens," "1.7 Setting the buzzer sounds," and "1.8 Setting the date and the screen."

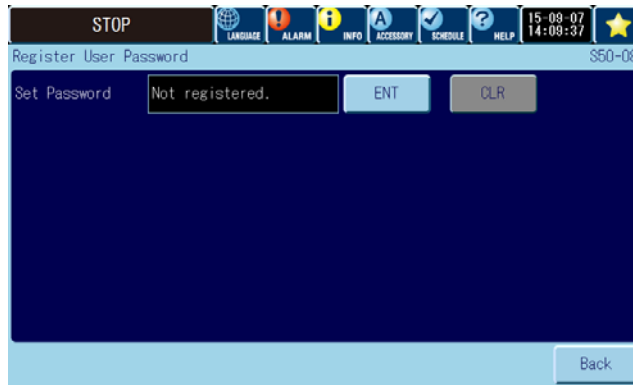
6.11.5 Registering (changing) the user password

Register a password to protect the settings configured in Configuration.

Once a password is registered, it needs to be input in order to access Configuration.

* If you do not have to protect the data that is set in Configuration, you do not have to register a password.

Press [Register User Password] on the Configuration screen.



Press [ENT], enter a four-digit number (1000 to 9999), and then press [EXE].
An asterisk (*) will be displayed for each digit you enter.

To clear the registered password, press [CLR].
"Not registered." will be displayed.

To change the password, press [ENT], and then register the new one.

◆ Reference ◆

Do not forget the password.
If you forget the password, contact ESPEC.

6.11.6 Adjusting the offset

Sensor offset values are used to correct the input values of the temperature (dry-bulb) sensor, humidity (wet-bulb) sensor, and specimen temperature control sensor (optional), which are used to measure the temperature and humidity in the test area.

The purpose of offset adjustment is to adjust the process values for already calibrated instruments, not to correct the control error.

In addition, the correction is reflected in all process values, such as the monitor screen, trend graph, and monitor output (optional output terminal for temperature recorder).

Press [Sensor Offset] on the Configuration screen.



Set the correction value of the offset adjustment.

Set the correction value to be added to or subtracted from the sensor in the range of $\pm 5^{\circ}\text{C}$.

After you enter the correction value, the value corrected for the sensor input value is displayed in PV.

◆ Reference ◆

If precise calibration is required, contact ESPEC.

6.11.7 Detailed chamber settings

Set the power supply frequency, continuous water supply to wick, automatic switching of humidification tray water, and humidifier delay.

Press [Set Chamber Detail] on the Configuration screen.

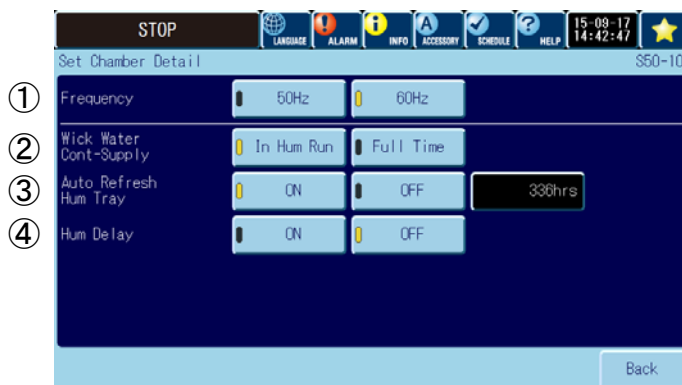


Table 6.21 Detailed chamber settings

①	Frequency	Set this according to the power supply frequency being used.
②	Wick Water Cont-Supply	<p>(Temperature and humidity type only) Set the continuous water supply to the wick. When operating a program with both temperature and humidity control, set the operation so that the wick is constantly supplied with water.</p> <p>* When water is supplied only for humidity operation and operation is switched from temperature operation to humidity operation, the wick may not absorb water and testing may not be able to continue.</p>
③	Auto Refresh Hum Tray	<p>(Temperature and humidity type only) The water in the humidifying tray may get dirty due to continuous operation. You can replace the water in the humidifying tray periodically. You can set the replacement interval in units of 1 hour (the default is 336 hours). If you select [ON], water is replaced automatically and periodically. In addition, replacement intervals may be set. Temperature and humidity control may fluctuate when you replace the water. If you select [OFF], water is not automatically replaced.</p>
④	Hum Delay	<p>(Temperature and humidity type only) If you select [ON], to prevent condensation, humidity control is performed after the temperature in the test area has attained the setting (attainment range: 1°C, attainment time: 60 seconds, attainment release range: 3°C).</p>

6.11.8 Option settings

See the Option guide for the following content.

Table 6.17 Option settings

Option name	Option setting	Reference
Temperature (humidity) recorder Temperature (humidity) recorder wiring Output terminal for recorder (temperature, humidity, and heater output)	Set Recorder	See the Option guide.
Internal power supply for applying voltage	Output of Internal Power Supply for Applying Voltage	
Specimen temperature control	Configuration of product (specimen) temperature control	
Continuous water supply Additional water supply tank	Set System	
Stability test specifications	Frost-free Stability Test	
Alarm output terminal	External Alarm Output	

These are only displayed when options are selected.

6.11.9 Configuring quick access settings

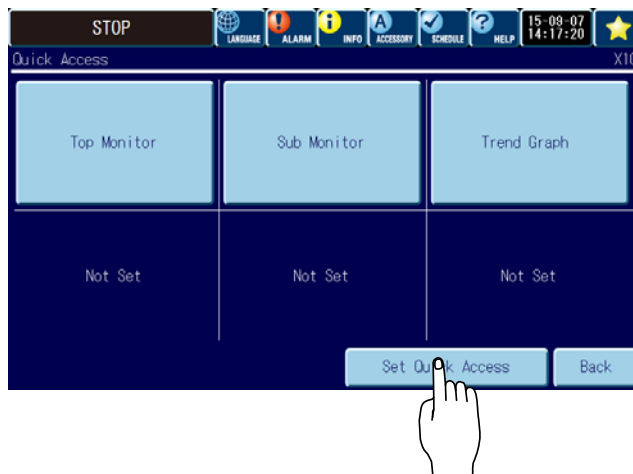
Keys that you frequently use can be registered as six shortcuts.

■ Press [Chamber Setup], [Configuration], and then press [Set Quick Access] to register the keys.

* Depending on their functions, some items cannot be registered.

<Procedure>

- 1) Press [Set Quick Access].



① Edit or delete registered keys.

② Set whether to display the Quick Access screen when the instrumentation turns on.

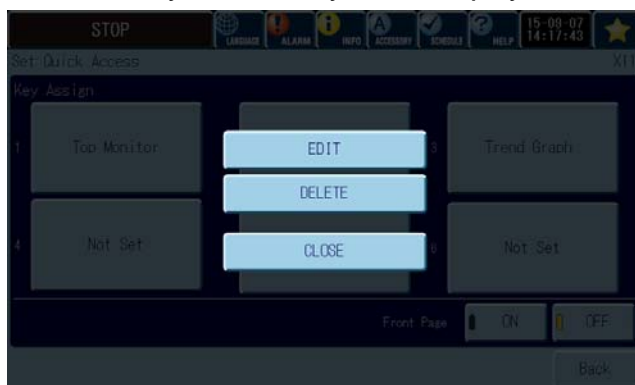
When [ON] is selected:

The Quick Access screen is displayed when the controller starts.

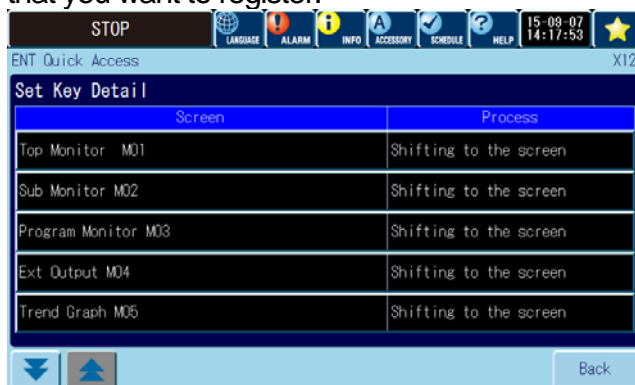
When [OFF] is selected:

The Monitor screen is displayed when the controller starts.

- 2) Press the key indicated by ① to display a menu for editing and deleting the key.

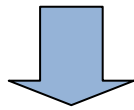
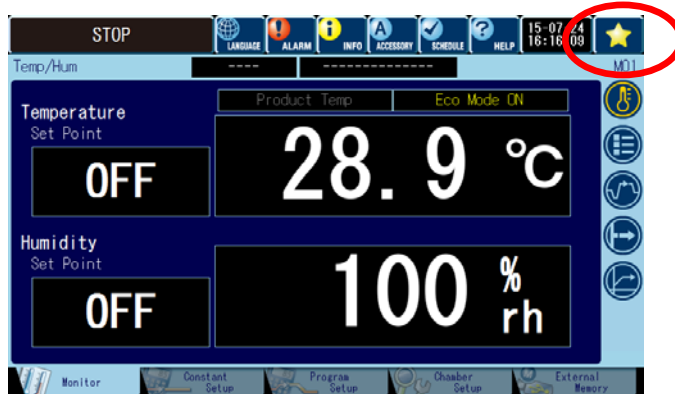


When you select [EDIT], the key's advanced settings are displayed. Select the key that you want to register.





Select [DELETE] to delete the registered key.

- You can display the Quick Access screen at any time by selecting the star key at the top of the screen.



6.11.10 Configuring service settings

Do not use the service settings. Service settings are used by ESPEC service technicians to adjust the chamber.

 CAUTION	
	<p>Do not use the service settings.</p> <p>Unauthorized changes to parameters and other settings may lead to accidents. These settings are used by ESPEC service technicians to adjust the chamber. ESPEC shall not be held liable for any accident or injury that may be incurred due to unauthorized changes to parameters or settings.</p>

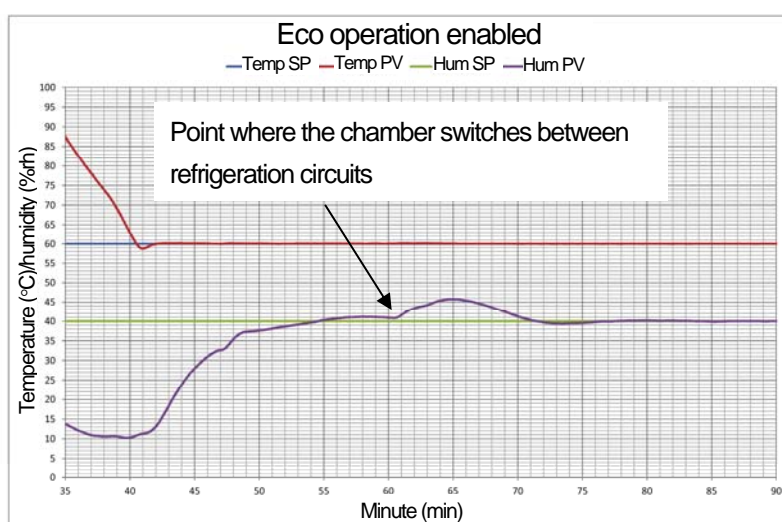
6.12 Setting eco operation (except PHP)

In the chamber's default settings, eco operation is set to "ON."

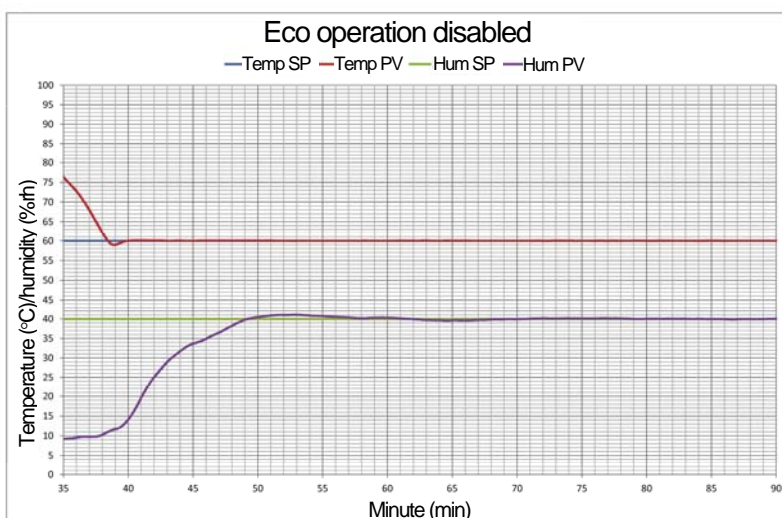
When eco operation is enabled, the chamber performs control with a focus on energy saving. For the PL/PSL/PDL-2/3/4, during chamber operation, the different refrigeration circuits are used to match the required refrigeration capacity. That is, when the required refrigeration capacity is large, the refrigeration circuit with large power consumption (the main refrigeration circuit) is used and when the required refrigeration capacity is small, the refrigeration circuit with small power consumption (the sub refrigeration circuit) is used. By exercising control through sequential switching between the refrigeration circuits, the chamber is able to achieve large energy savings.

The humidity may be disturbed when the chamber switches between refrigeration circuits.

- * The eco operation setting is not available on chambers equipped with the DC inverter refrigeration circuit system (option)



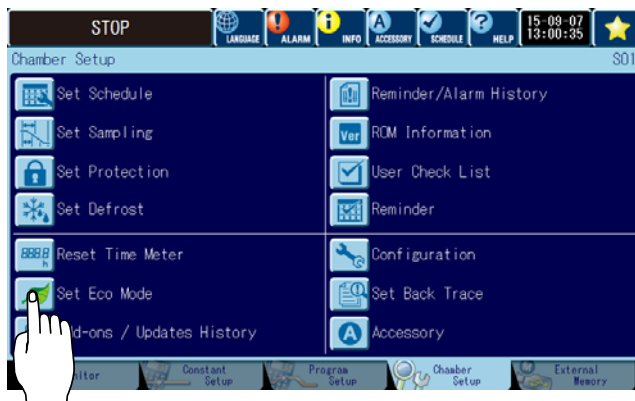
When eco operation is set to "OFF," the chamber stops switching between refrigeration circuits with the purpose of saving energy. As such, the humidity disturbances no longer occur, but the power consumption may be larger than it is when eco operation is enabled.



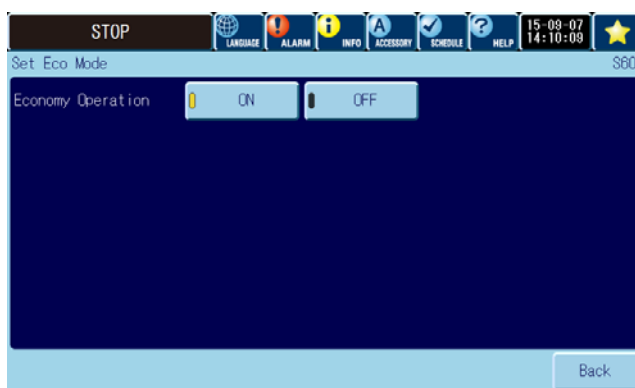
■ Eco operation setting method

<Procedure>

- 1) On the Chamber Setup screen, press [Set Eco Mode].



- 2) To enable eco operation, press [ON]. To disable eco operation, press [OFF].



The eco operation setting (enabled or disabled) is displayed on the Monitor screen and Operation Mode screen.



- ☞ The status of eco operation is shown in the operation display area. For details, see "1.2.1 Common operations area."

6.13 Back trace settings

☞ See "7.4 Setting and writing back traces."

6.14 Accessories

For operation details, see "1.2.1 Common operations area - Accessory."

6.15 Add-ons/system updates history

☞ For operation details, see "Chapter 8 Add-ons/system updates."

Chapter 7 Using external memory

This chapter describes how to use external memory in order to utilize the chamber's internal data.

7.1 External memory

This section explains the method of handling external memory, the method of transferring data between a chamber and a computer and between chambers, and the method of utilizing this function.

The data below can be used between a chamber and a computer and between chambers.

- Sampling data

The trend graph log recorded by the chamber can be displayed as a graph, printed, or converted to CSV format, and its rate of change can be displayed using a computer application.

- Program patterns

The program patterns edited with the chamber can be displayed as a graph, edited, and printed using a computer application. Edited programs can be saved back to the chamber.

It is also possible to copy the program pattern to another chamber.

◆ Reference ◆

The following URL is for a reliability testing information site for ESPEC Test Navi engineers.

<http://www.test-navi.com/eng/index.html>

You can download test patterns for major environment test standards from this site.

- Back trace data

The back trace data automatically recorded by the chamber is used in analyzing and diagnosing the causes of chamber malfunctions. By storing this back trace data on the request page of our official website, you can use the Online Diagnostics Service.

◆ Reference ◆

You can also limit the usage of the external memory function.

For details, see "6.5 Setting protection."

7.1.1 Handling external memory

With this chamber, handle external memory as described below. Note that improper handling of external memory may corrupt the data stored on it.

External memory is not included with the chamber. You need to purchase it separately. If unsupported external memory is connected to the chamber, the external memory lamp will not light up and the chamber will not be able to write data to the external memory.

External memory specifications

USB connector: Type A. Connection target: USB memory. Supported standard: USB 2.0 compliant.

Bus power: 500 mA or less. Memory capacity: Up to 32 GB (tested).

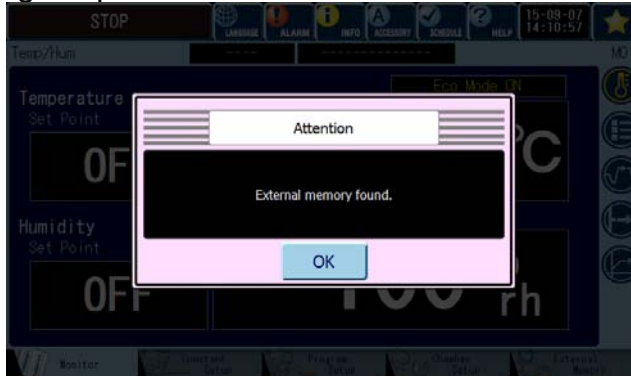
File format: FAT16/FAT32 format.

■ Inserting external memory

Insert an external memory device with the instrumentation panel turned on.

A confirmation screen is displayed after the external memory is recognized.

Press [OK] on the confirmation screen and check that the external memory lamp lights up.



■ Removing external memory

Perform this operation with the instrumentation panel turned on.

Press [Remove Ext Memory], check that the message "Remove the memory" is displayed, and then remove the external memory.

Notice

If you remove the external memory without pressing [Remove Ext Memory], data saved on the external memory may be corrupted.

■ Display of the external memory lamp

The external memory lamp has four types of displays: Off, On, Blinking, and Rapidly blinking.

Table 7.1 Display status of the external memory lamp

Display	Usage status	Description of operation and action to be taken
On	The external memory is recognized.	The external memory is recognized normally.
Blinking (once a second)	Accessing the external memory	
Off	External memory not connected	The external memory is not recognized.
	Connected to unsupported external memory	Connect to an external memory device that meets the specifications.
Rapidly blinking	Alarm (memory error)	<p>If the external memory is removed while data is being written to it, an alarm occurs (the lamp blinks rapidly) and data cannot be written. Take action in accordance with the confirmation message.</p> <p>☞ For details, see "7.1.2 Confirmation messages while using external memory."</p>

Notice

- Do not remove the external memory when the external memory lamp is lit or blinking.
- Remove the external memory by following the steps described in "Removing external memory."
- Connect only external memory to the external memory connection terminal. Connecting other devices may cause the chamber to malfunction.
Example: Hard disk, USB accessories such as a USB fan
- The chamber may not recognize external memory devices that are protected with security.
- Do not turn off the circuit breaker of the chamber.
Data saved on external memory may be corrupted.

◆ Reference ◆

If an external memory device is connected, the connected status continues even if the instrumentation power switch is turned off.

7.1.2 Confirmation messages while using external memory

When data is written to the external memory device in an incorrect way or when the external memory device is removed in an incorrect way, a confirmation message will be displayed on the screen.

When a confirmation message is displayed, perform the actions shown below.

Table 7.2 Confirmation messages when errors occur

Alarm	Message	External memory data storage setting*	Action to be taken
External memory removed alarm	ERROR(0010): External memory removed. Data was not saved.	ON	This message is displayed when the external memory is removed without pressing [Remove Ext Memory].
	ERROR(0011): External memory removed.	OFF	
External memory not recognized	ERROR(0012): External memory not recognized.	ON/OFF	This message is displayed when the inserted external memory could not be correctly recognized. This could be due to some external memory problem. Connect the external memory to a computer and check if it works properly.
No access to external memory	ERROR(0013): No access to external memory. Data was not saved.	ON	This message is displayed when data could not be written to external memory correctly. This could be due to some external memory problem. Connect the external memory to a computer and check if it works properly.
	ERROR(0014): No access to external memory.	OFF	
External memory is full	ERROR(0016): External memory full.	OFF	This message is displayed if there is not enough free space when an attempt is made to write to external memory. Delete some data from the external memory or replace the external memory with one that has more free space and save again.

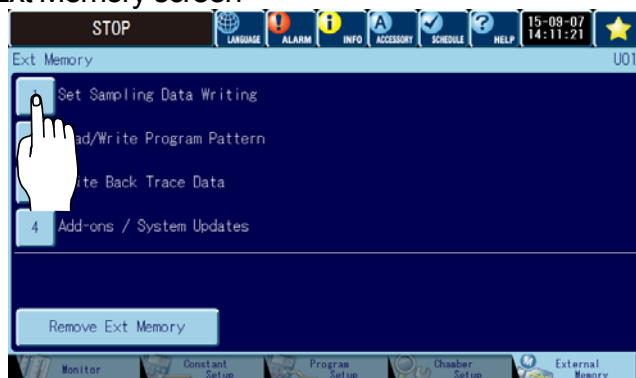
* When an alarm occurs, the external memory data storage setting is changed to [OFF]. Insert the external memory according to the correct procedure, and then set data saving to [ON] on the Set Sampling Data Writing screen.

7.2 Configuring sampling writing settings

7.2.1 Configuring sampling writing settings

Press the External Memory tab to display the Ext Memory screen, and then press [Set Sampling Data Writing].

Ext Memory screen



Press the [1] key to display the Set Sampling Data Writing screen.
If external memory is not inserted, [Remove Ext Memory] will be grayed out.

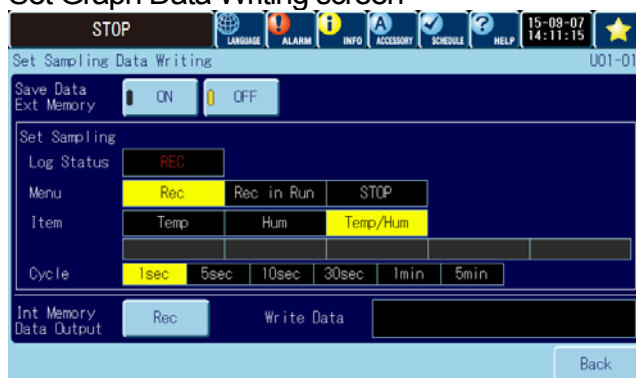
■ Recording data to external memory

When [Save Data Ext Memory] is set to [ON], internal data is continuously recorded to external memory.

When you want to remove the external memory, first change the setting to [OFF], then remove it.

If external memory is not inserted, ON and OFF are grayed out.

Set Graph Data Writing screen



■ Writing data stored in internal memory to external memory

When you want to output graph data saved to the internal memory, insert external memory into the chamber, and press [EXEC] next to [Int Memory Data Output]. As soon as you press [EXEC], data recorded in internal memory is collectively written to external memory. After the data is written, the saved file is displayed in [Write Data].

◆ Reference ◆

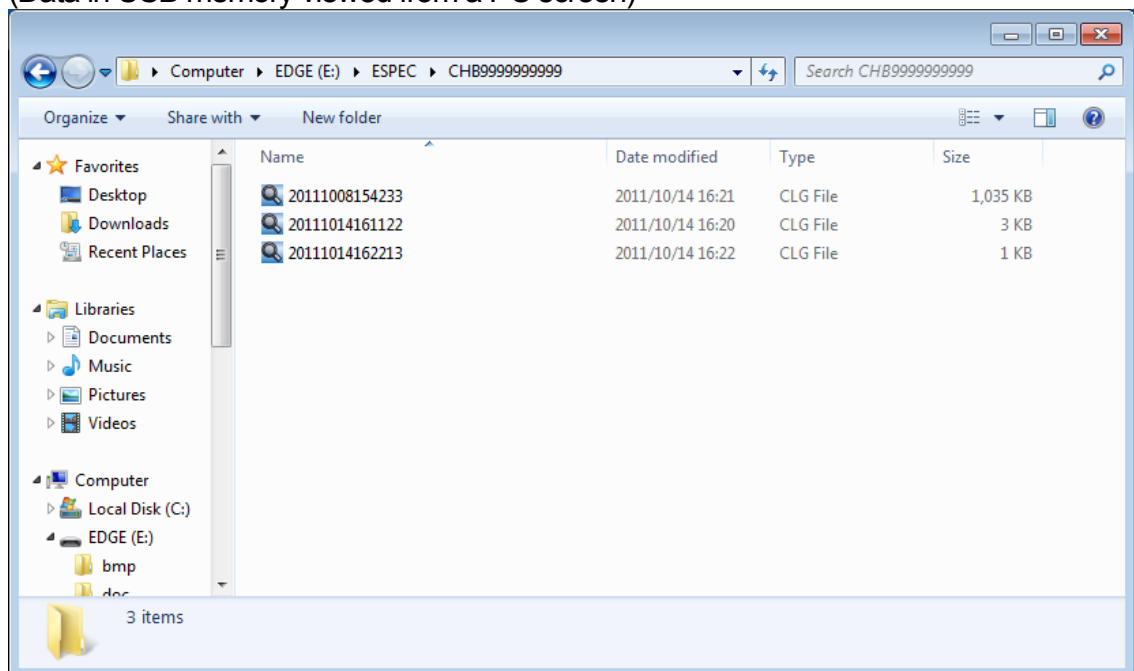
When [Save Data Ext Memory] is set to [ON]

- A separate file is created each day for the recorded data.
(A new file is created when the date changes at 00:00:00.)
- If the chamber is restarted during recording for a reason such as the power failing and being restored, a recorded data file starting at the restarted date and time is created.

■ Saving external memory data

In the external memory, files are stored as shown below.

(Data in USB memory viewed from a PC screen)



Folder configuration:

```

ESPEC
├── CHB serial number
│   └── Recording-started-date-YYYYMMDDHHMMSS.clg

```

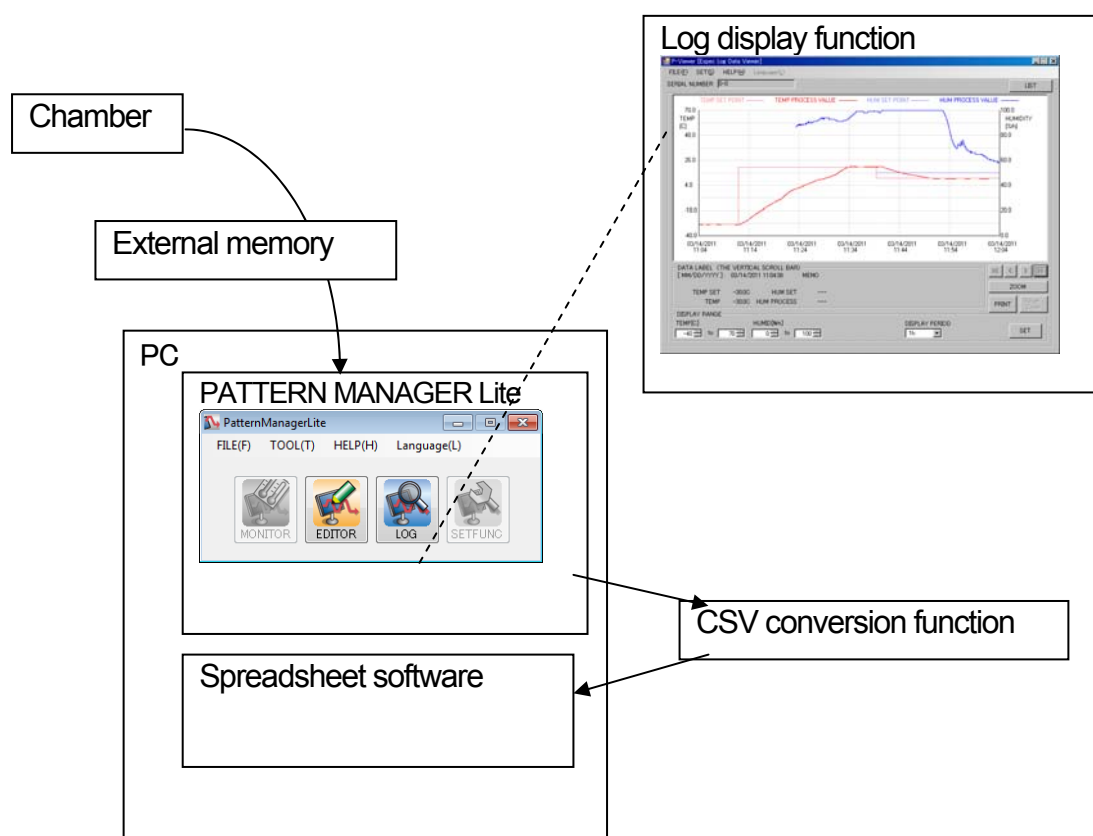
File size: Approximately 1 MB per file

7.2.2 Displaying, printing, and processing recorded data

PATTERN MANAGER Lite can be used to display recorded data saved to external memory as a graph, to print it, or to convert it to CSV format.

◆ Reference ◆

PATTERN MANAGER Lite can be downloaded from ESPEC Test Navi, the reliability testing information website (prior member registration is necessary). For details on installing and using the application, see the website.



PATTERN MANAGER Lite, a computer application, can be used to zoom the temperature (setting, process values) and humidity (setting, process values) by the time axis.

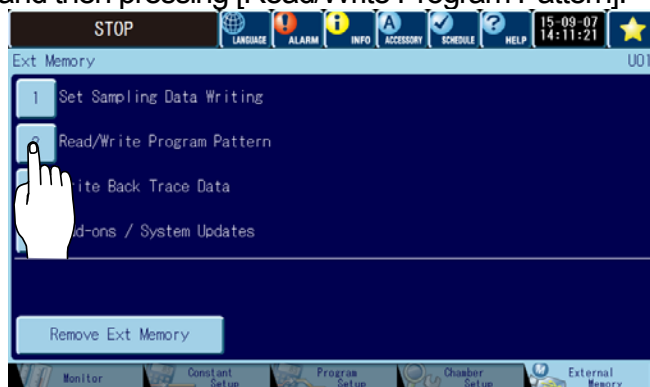
By storing a file in CSV format, you can process data with commercially available spreadsheet software.

7.3 Reading and writing program patterns

By saving a program pattern stored on the chamber to external memory, the pattern can be edited on a computer or copied to another chamber. A program pattern edited on a computer can also be saved to the chamber.

7.3.1 Usage method

A program pattern can be written to or read from external memory by inserting the external memory into the chamber, pressing the External Memory tab to display the Ext Memory screen, and then pressing [Read/Write Program Pattern].



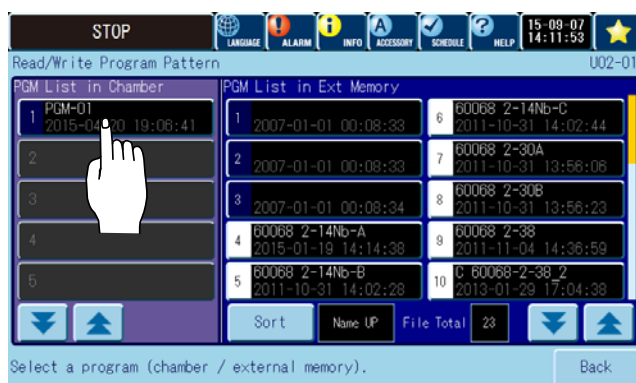
◆ Reference ◆

If the message "There are over 100 programs on the external memory." is displayed, use a computer to clean up the folder \ESPEC\CMN_DATA on the external memory or use a different external memory device.

■ Writing program patterns

To write a program pattern to external memory, press the desired program pattern under "PGM List in Chamber" on the left of the screen.

You can write up to 100 programs to an external memory device.



: Press to switch between the program pattern pages.

When you press a program pattern, a popup screen is displayed. Select what to write.



- [Profile]: Use when transferring program data between chambers with different temperature ranges and option settings. The items unique to the chamber are converted to the default values of the destination chamber.
- [All Items]: Use when transferring program data between chambers with the same temperature range and option settings. The program cannot be copied if even one setting is out of the specification range of the destination chamber.
- [Close]: Stops writing.

Press [Profile] or [All Items] to display the information of the program pattern to be written.

■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.



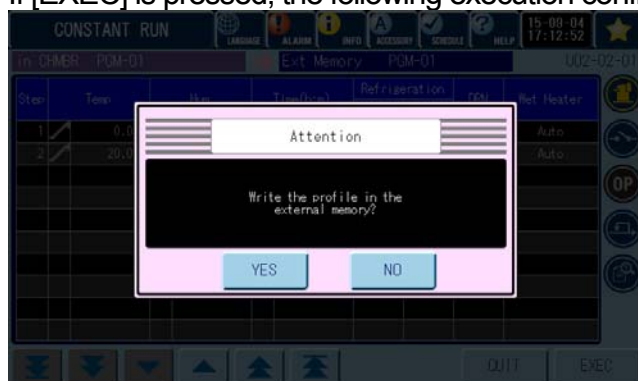
Table 7.3 Side menu (program pattern information screen)

	Icon	Slide label	Screen
①		Refrigeration	Displays the refrigeration, drainage, and wet heater settings for each step.
②		Time signals	Displays the time signal settings for each step.
③		Options	Displays the air flow adjusting (option) and specimen temperature control (option) settings for each step.
④		Counter settings	Displays the counter settings.
⑤		Detailed program settings	Displays the detailed program settings.

* The option icon is not displayed on chambers that do not have any options installed.

[EXEC]: Writes the program pattern to external memory.
 [QUIT]: Cancels writing and returns to the Read/Write Program Pattern screen.

If [EXEC] is pressed, the following execution confirmation screen is displayed.



[YES]: Executes writing to external memory.
 For the created file, the file name is the program name, and the date that the file was last modified is the same as the date of the program.
 [NO]: Returns to the information display screen without writing the data.

If a file with the same name exists on the external memory, you will be asked whether you want to overwrite the original file.



[YES]: Overwrites the file.
 [NO]: Returns to the information display screen without writing the data.

■ Storage directory in the external memory

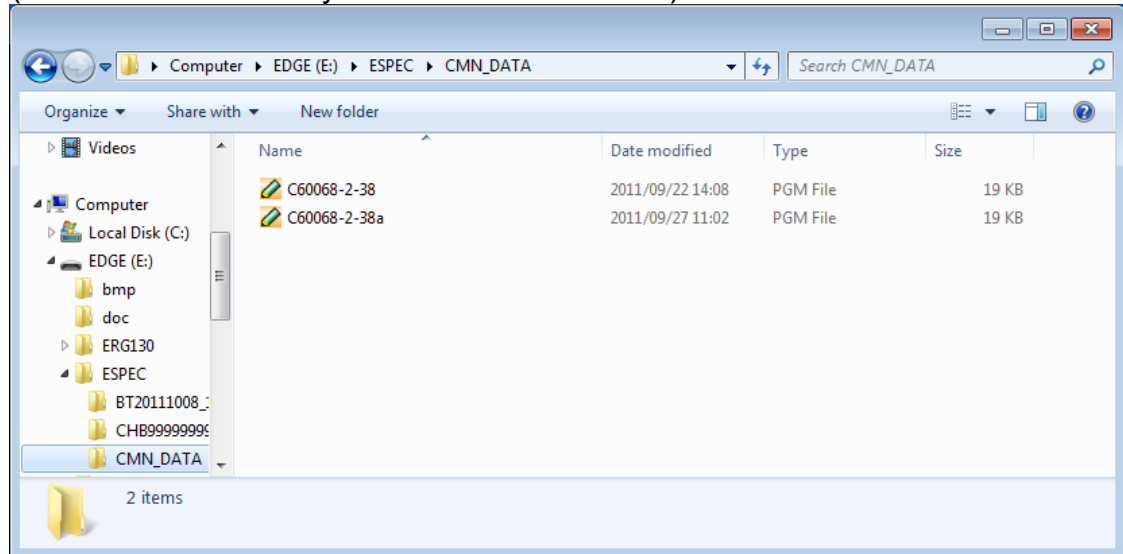
The written program patterns are stored in the directory below.

```

\ESPEC
└─ \CMN_DATA
  
```

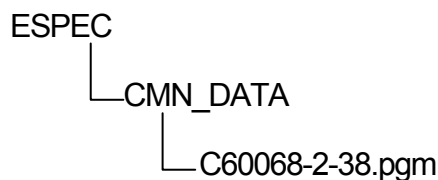
Written program patterns are stored in a folder (ESPEC\CMN_DATA) that is automatically created on external memory. The data is stored to a file with the file name program-pattern-name.pgm.

(Data in external memory viewed from a PC screen)



Folder configuration:

Example:



File size: Approximately 20 kB per file

- * To transfer a program stored on external memory to a chamber, put the applicable program file into the CMN_DATA folder.
Only files stored in the folder are displayed on the PGM List in Ext Memory screen.

■ Utilization of data

Program files saved on external memory can be displayed as a graph, printed, and converted into CSV format on a computer using PATTERN MANAGER Lite, a computer application.

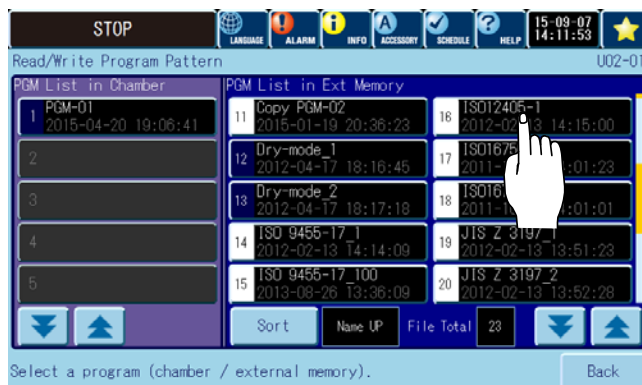
☞ See "7.3.2 Displaying, printing, and editing recorded data."

◆ Reference ◆

PATTERN MANAGER Lite can be downloaded from ESPEC Test Navi, the reliability testing information website (prior member registration is necessary). For details on installing and using the application, see the website.

■ Reading program patterns

To read a program pattern from external memory to the chamber, press the desired program under [PGM List in Ext Memory] on the right of the screen.



◆ Reference ◆

Color-coding of programs under PGM List in Ext Memory

The left side of each program name is color-coded to distinguish the following.

- Background: Blue: Enabled program (all items)
- White: Program whose enabled profile has been written
- Black: Disabled program (cannot be selected)

* Programs used for periodic inspections are displayed with a blue background and yellow characters.

Each time [Sort] is pressed, programs are sorted in the order below.

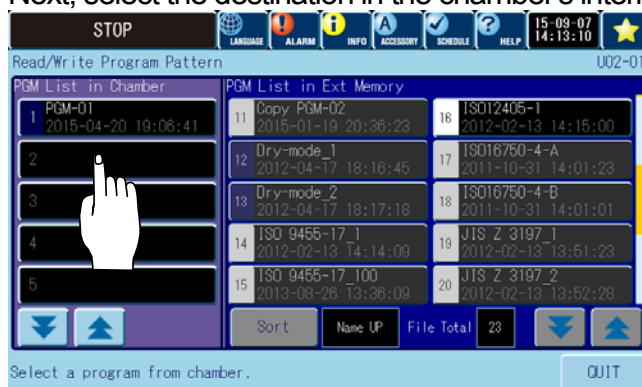
Ascending order of names → descending order of names →
ascending order of dates → descending order of dates



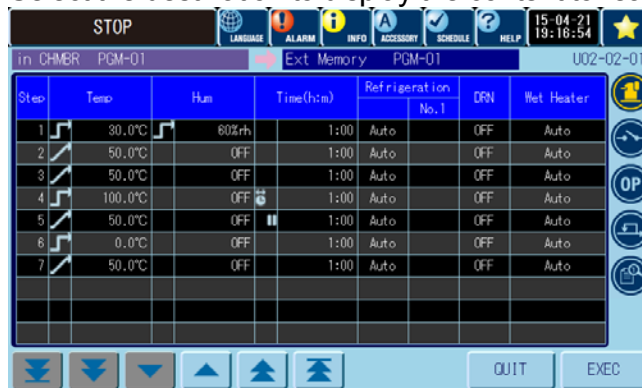
: Press to switch between the program pattern pages.

"PGM List in Ext Memory" displays the program pattern name that is saved in the file, not the actual file name.

Next, select the destination in the chamber's internal programs.



Select the destination to display the content to read and the program pattern.



Press the side menu icons to switch the program pattern information that is displayed.

[EXEC]: Reads from external memory.

[QUIT]: Cancels reading and returns to the Read/Write Program Pattern screen.

If [EXEC] is pressed, the following execution confirmation screen is displayed.



[YES]: Reads from the external memory.

[NO]: Returns to the information display screen.

■ Handling of files

When a program transferred from external memory to the chamber is written to external memory without being edited, the file name is not changed.

■ Program list dates

The dates displayed in the list of programs on the chamber and on external memory are the dates the programs were last modified.

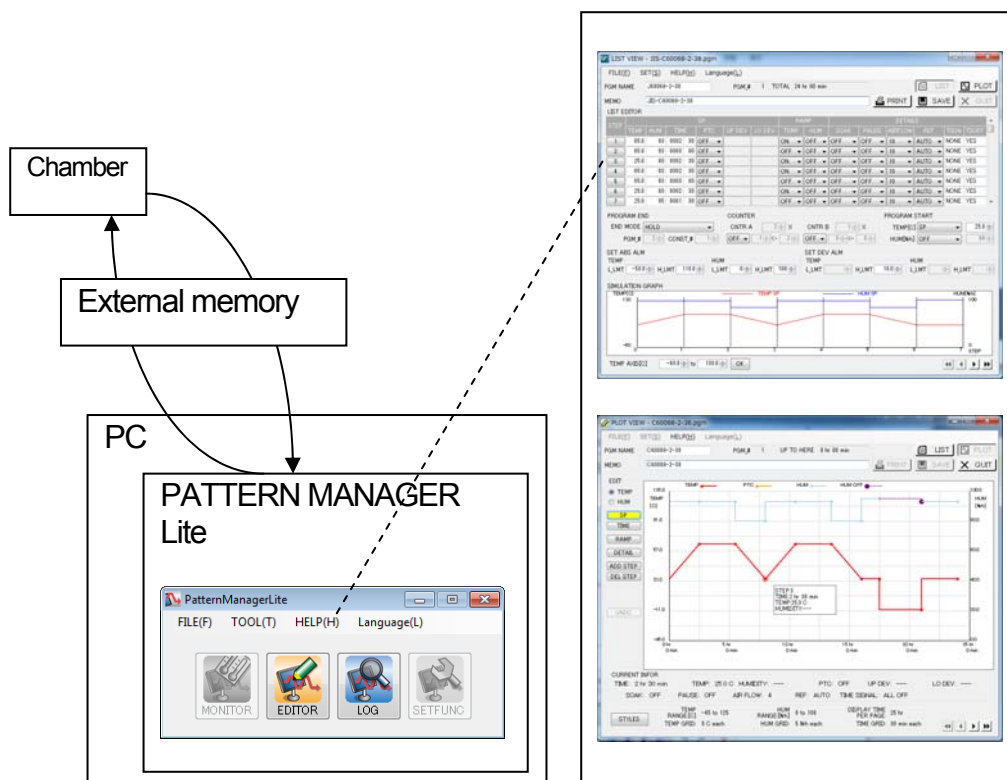
7.3.2 Displaying, printing, and editing recorded data

The recorded data saved to external memory is stored in binary format. You can use the viewer function of the PC application "PATTERN MANAGER Lite" to display, print, and edit recorded data.

◆ Reference ◆

PATTERN MANAGER Lite can be downloaded from ESPEC Test Navi, the reliability testing information website (prior member registration is necessary). For details on installing and using the application, see the website.

Recorded data editing overview



You can display the recorded data in a list and on a graph as well as print this data and edit its comments.

You can save the files to the PC.

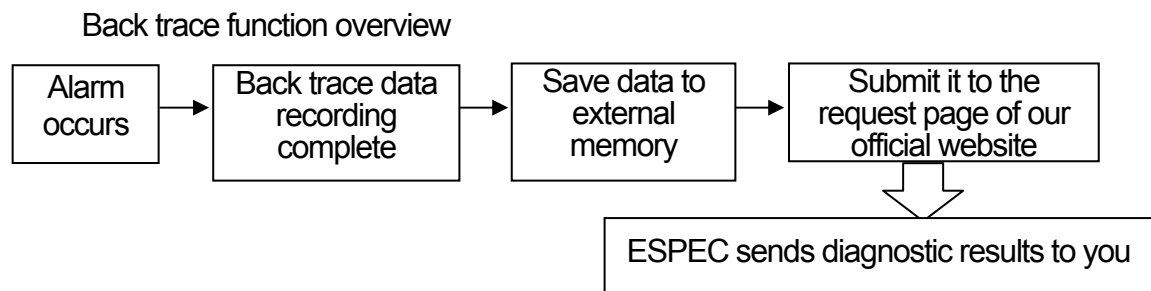
7.4 Setting and writing back traces

This chamber automatically records back trace data during operation.

Back trace data contains the temperature and humidity settings, temperature and humidity process values, and control value information for control items required to control the chamber. If an alarm occurs, the chamber automatically completes the recording of back trace data.

Our official website hosts the Online Diagnostics Service. To use the service, send your back trace data through the request page of our official website.

- * The Online Diagnostics Service is a service for analyzing the causes of failures by using the internal data (back trace data provided by the customer) of the chamber from directly before and after an alarm occurred and then sending the diagnosis results to the customer.



◆ Reference ◆

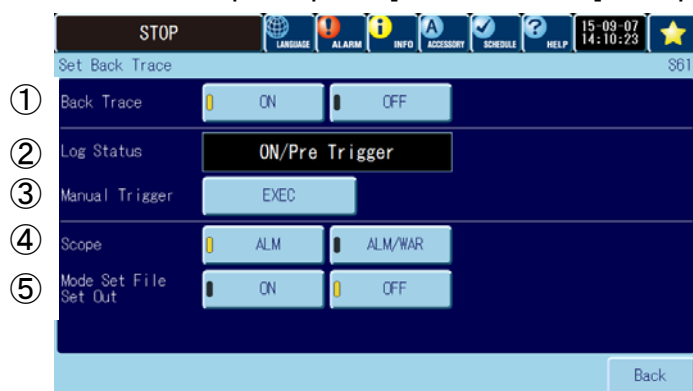
You can make use of ESPEC online support in the event that your chamber is defective. (A separate contract is required. This service is only available to customers in Japan.) With ESPEC online support, alarms generated during tests are detected by ESPEC, so ESPEC can communicate applicable information and required actions to you. This is a new style of service that makes it possible for you to resume testing as quickly as possible.

Until now, it was up to you to contact ESPEC when problems occur, but with ESPEC online support, ESPEC contacts you when necessary.

For inquiries and further details on this service, visit our official website.

7.4.1 Setup

On the Chamber Setup tab, press [Set Back Trace] to display the [Set Back Trace] screen.



①	Back Trace	Select ON or OFF for the back trace function. Select [ON] and the chamber automatically records back trace data during operation and automatically stops recording according to [Scope].
②	Log Status	Displays either STOP/OFF, ON/Pre Trigger, ON/Post Trigger, or Complete.
③	Manual Trigger	Press this key when you want to force recording to finish.
④	Scope	Select ALM or ALM/WAR. * Normally select [ALM].
⑤	Mode Set File Set Out	When [ON] is selected, program setup information is also saved when saving back trace data to external memory. All programs configured on the chamber are saved. To avoid disclosing a program to ESPEC, select [OFF].

◆ Reference ◆

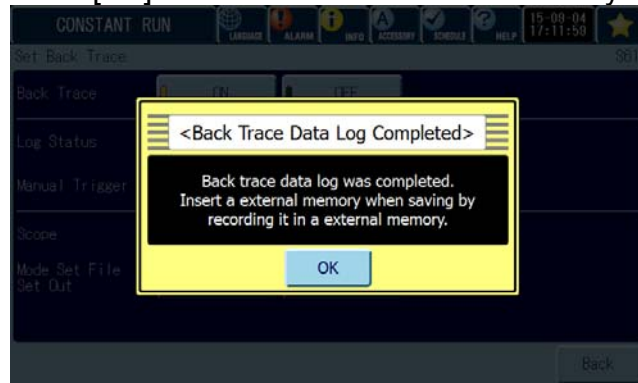
Changing back trace recording settings

Do not change the recording settings, as it may not be possible to analyze and diagnose the cause of a malfunction if an alarm occurs. If additional information must be recorded, ESPEC may ask you to change the recording settings.

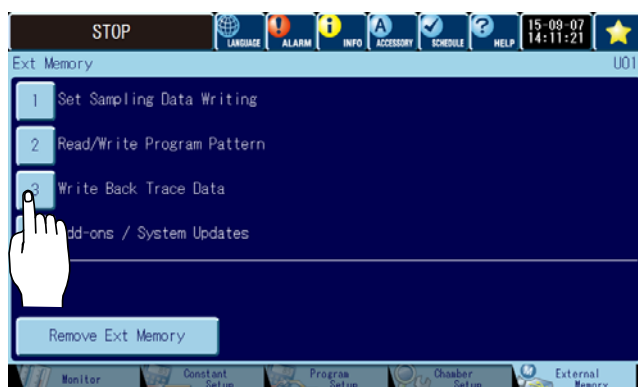
7.4.2 Writing

When one minute has passed since the occurrence of an alarm, back trace recording is stopped and the following screen is displayed.
The back trace recording restarts automatically.

Press [OK] to write the data to external memory.



Press [Write Back Trace Data] on the Ext Memory screen to write the data to the external memory.



■ Side menu

If you press a side menu icon, the title of the screen you will go to is displayed.

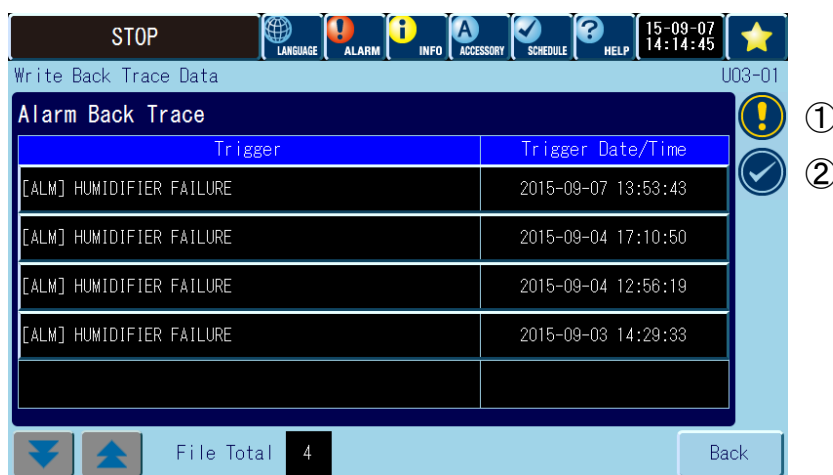
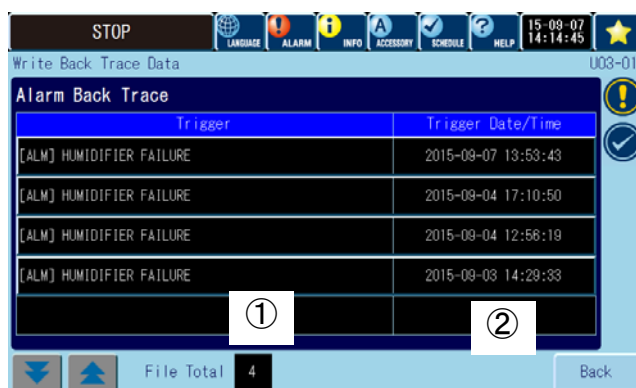


Table 7.4 Side menu (Write Back Trace Data screen)

	Icon	Slide label	Screen
①		Alarm	Displays the alarm back trace.
②		Periodic Inspection	Displays the periodic inspection back trace.



On the Write Back Trace Data screen, the five most recent back trace data entries that have completed recording are displayed. For each entry, you can view the [Trigger] and [Trigger Date/Time].

If you want to save the recorded data, insert external memory into the chamber, and then select the data you want to save from Alarm Back Trace.

Even if the recorded data is not saved, if the back trace setting is set to [ON], recording of back trace data is resumed automatically.

You can view the back trace recording status on the Chamber Setup - Set Back Trace screen.

■ Log Status

STOP/OFF, ON/Pre Trigger, ON/Post Trigger, or Complete

①	Trigger	The detection cause—ALM, WAR, or Manual Trigger—and the alarm name are displayed.
②	Trigger Date/Time	Displays the date and time the alarm was detected.

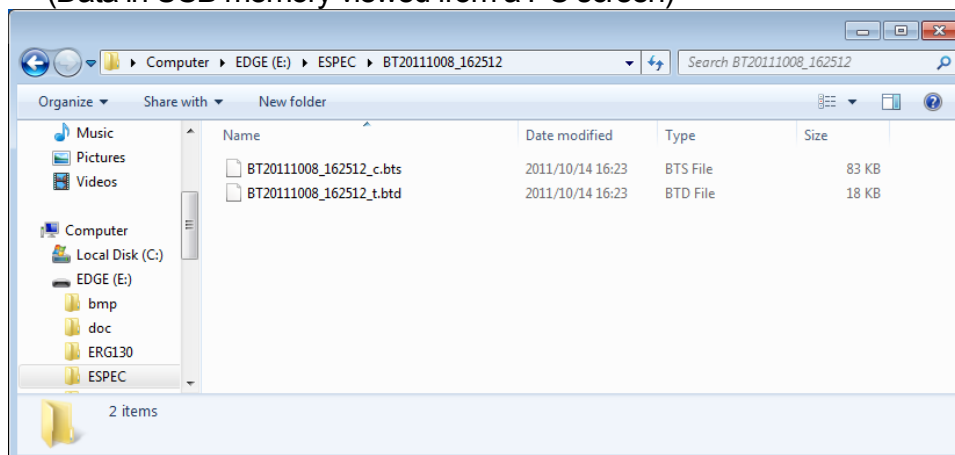
◆ Reference ◆

The Periodic Inspection side menu icon is not normally used.

■ External memory storage folders

A ZIP file is stored in the folder that is automatically created on external memory.

(Data in USB memory viewed from a PC screen)



Folder configuration

ESPEC

— CHB serial number

— BT[date and time alarm occurred (YYYYMMDD_HHMMSS)]

File size: Approximately 1 MB for the ZIP file

■ Created files

The ZIP file contains the following files.

Back trace data: Date and time alarm occurred-YYYYMMDD_HHMMSS_t.btd

Chamber settings and service information:

Date and time alarm occurred-YYYYMMDD_HHMMSS_c.bts

Operation settings information (constant and program setup):

Date and time alarm occurred-YYYYMMDD_HHMMSS_p.bts

■ Using the Online Diagnostics Service (available to overseas customers only)

You can request online diagnostics using the ESPEC Online Diagnostics Service from our official website.

Send the unzipped files using the request page of our official website.

<http://www.espec.co.jp/english/support/onlinediagnosticsservice.html>

ESPEC will send the diagnosis result to you.

◆ Reference ◆

- All constant operation and program operation data on the chamber is saved in the operation settings information.
If you cannot submit the operation settings information to us, send us the other two files.
- If you are limiting the use of external memory, you can configure back trace settings and record data, but you cannot output the back trace data files that are required by the Online Diagnostics Service.

7.5 Add-ons/system updates

Insert an external memory device into the chamber and press the External Memory tab to display the Add-ons / System Updates screen.

☞ For operation details, see "Chapter 8 Add-ons/system updates" and the "Network guide."

Chapter 8 Add-ons/system updates

8.1 What are system updates?

After purchasing the chamber, you can use system updates to add functionality and maintain the instrumentation in the optimal state to utilize services.

8.2 System update method

To update the system, contact ESPEC or your distributor.

8.3 Checking the update history

After updating the system, you can view the history on the instrumentation screen or with the add-ons/system update history in the chamber setup in Web application.

Chapter 9 Dry operation

To dry out the test area, perform operations as shown in the following procedure.

9.1 For temperature and humidity types

There is "Dry operation program pattern" in the Network in the operation manual on the included CD. You can download a dry operation program pattern.

After the test is completed, or before the next test starts, execute the dry operation program.

Alternatively, set the next program in the end condition to the dry operation program.

For details on loading the downloaded dry operation program pattern onto the chamber, see "7.3 Reading and writing program patterns."

<Procedure>

■ To use dry operation independently

- 1) On the Operation Mode screen, press [Select] under Program Run.
- 2) In the program list displayed on the Operation Mode <Program Selection> screen, select one of the following programs, and then press [CLOSE].

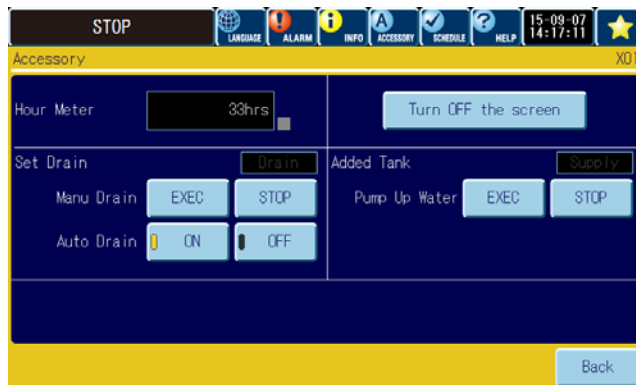
Dry-mode_1.pgm (for type 4 of the temperature and humidity type and the PSL-2)
Dry-mode_2.pgm (for types 1 to 3 of the temperature and humidity type)
- 3) Start operation from the Operation Mode screen.

■ To use the end condition settings to specify dry operation

- 1) On the Edit Program < Input > screen for the program that you want to edit, press the program details icon.
- 2) On the Program End screen, press [Start Next Program] then [SELECT].
- 3) Select the registration number of a dry operation program that you have registered in advance.

Dry-mode_1.pgm (for type 4 of the temperature and humidity type and the PSL-2)
Dry-mode_2.pgm (for types 1 to 3 of the temperature and humidity type)
- 4) Save the program that you have edited.

- 5) On the Accessory screen, under Set Drain, set Auto Drain to [ON].



- 6) On the Chamber Setup screen, press [Configuration] and then [Set Chamber Detail]. On the Set Chamber Detail screen, set Wick Water Cont-Supply to [In Hum Run].



- 7) Start operation from the Operation Mode screen.

Notice

If you specify the dry operation program as the next program in the end conditions, check the contents of the dry operation program before you use it to ensure that it will have no effect on the specimen.

◆ Note ◆

- During operation as needed, manually drain from the humidifying tray.

9.2 For temperature types

Stop the refrigerator, and operate the chamber in constant mode for approximately 60 minutes with the temperature set to 70°C or higher.

After operation is completed, open the test door slightly and operate in constant mode for approximately 15 minutes using the same setting.

<Procedure>

- 1) Check that the breaker is in the on position.
- 2) Press [Details] on the Constant Setup screen. Set refrigeration to [Manual], and then press [STOP].
- 3) Change settings so that the operation is not interrupted or an alarm generated if the chamber is run with the door opened slightly.
On the Chamber Setup screen, press [Configuration] and then [Operation Process]. Under Operation Process, set Door Open Cond to [OFF] and TM to Open War to [OFF].
- 4) Set the temperature of the test area to a constant setting of 70°C or more.
- 5) Start constant operation from the Operation Mode screen.
Run the chamber for about 60 minutes with the door closed, then for 15 minutes with the door slightly opened.

After purchasing the chamber, you can use system updates to add functionality and maintain the instrumentation in the optimal state to utilize services.

Appendix

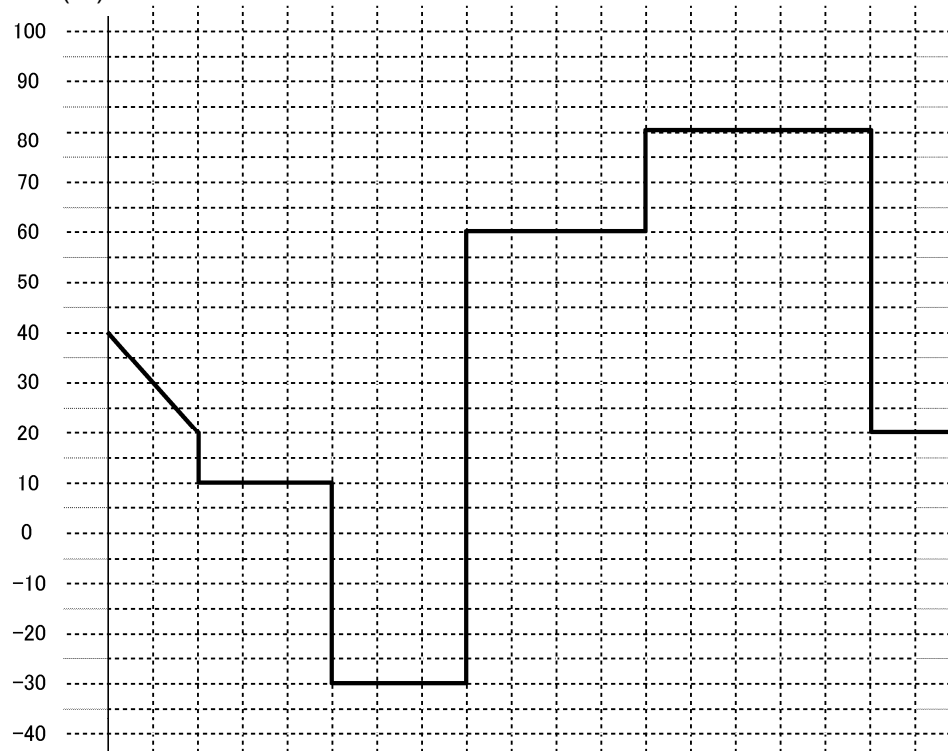
A Program setting example

Program creation sheet (description example)

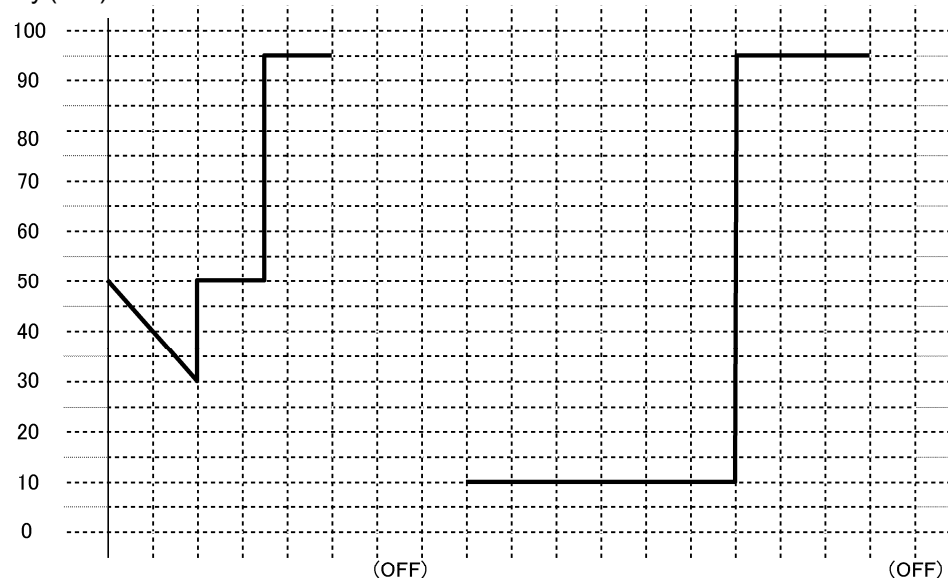
- When the ramp operation of the temperature and humidity exists in the first step

Program name PGM-01

Temperature (°C)



Humidity (%rh)



Time (h:min)
Step No.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1		2		3	4			5				6		7			8	

Program name PGM-01

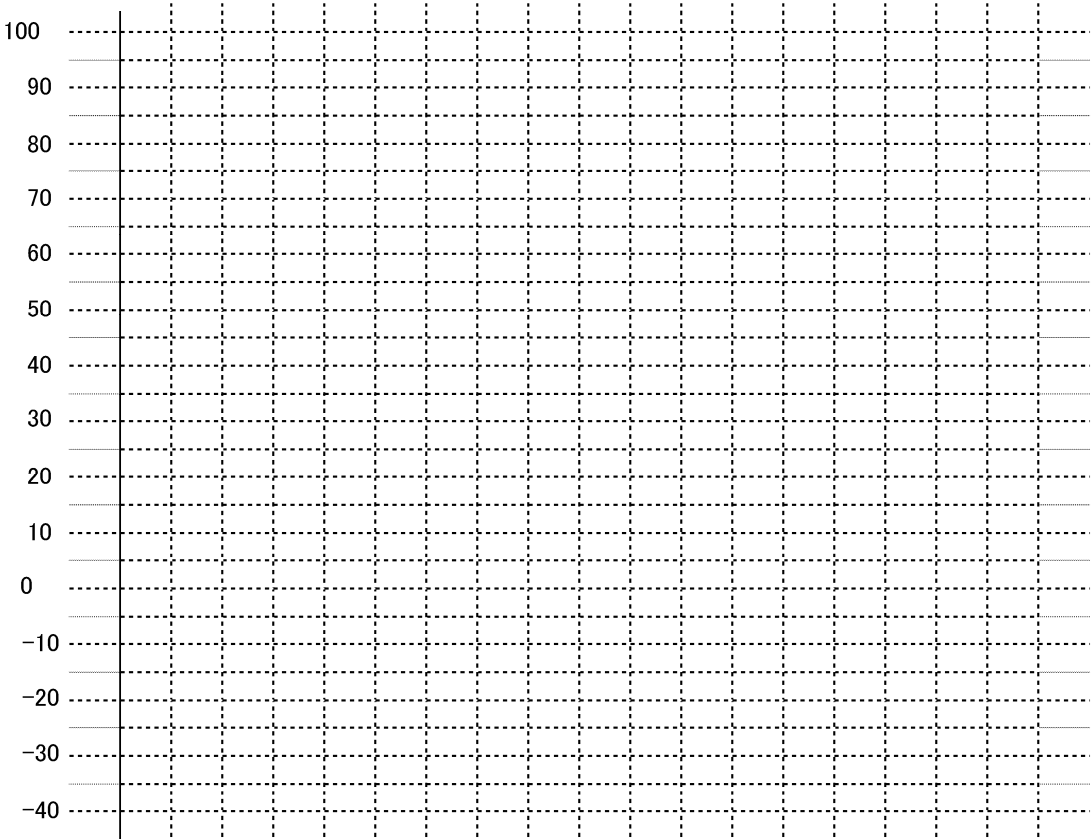
Step No.	Temperature (°C)		Humidity (%rh)		Time (h:min)	Soak time control	Refrigeration	Pause	Time signals		DRN
									1	2	
1	Ramp	20.0°C	Ramp	30%rh	2:00	OFF	Auto	OFF	●		OFF
2		10.0°C		50%rh	1:30	OFF	Auto	OFF		●	OFF
3		10.0°C		95%rh	1:30	OFF	Auto	OFF			OFF
4		-30.0°C		OFF	3:00	OFF	Auto	OFF			OFF
5		60.0°C		10%rh	4:00	OFF	Auto	OFF			OFF
6		80.0°C		10%rh	2:00	OFF	Auto	OFF			OFF
7		80.0°C		95%rh	3:00	OFF	Auto	OFF			OFF
8		20.0°C		50%rh	2:00	OFF	Auto	OFF			OFF
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

Processing at the end of operation	○Stop ○Power OFF: ○Constant Operation (No.1)(No.2)(No.3) ●Hold last step ○Operate next program No. (), Step ()	
Counter A	Repeating start step () Step ← Repeat cycle () Repeating end step ()	
Counter B	Repeating start step () Step ← Repeat cycle () Repeating end step ()	
Start setting (ramp operation)	1st step Start setting in ramp operation ○Process value ●Set point (°C)(%rh)	

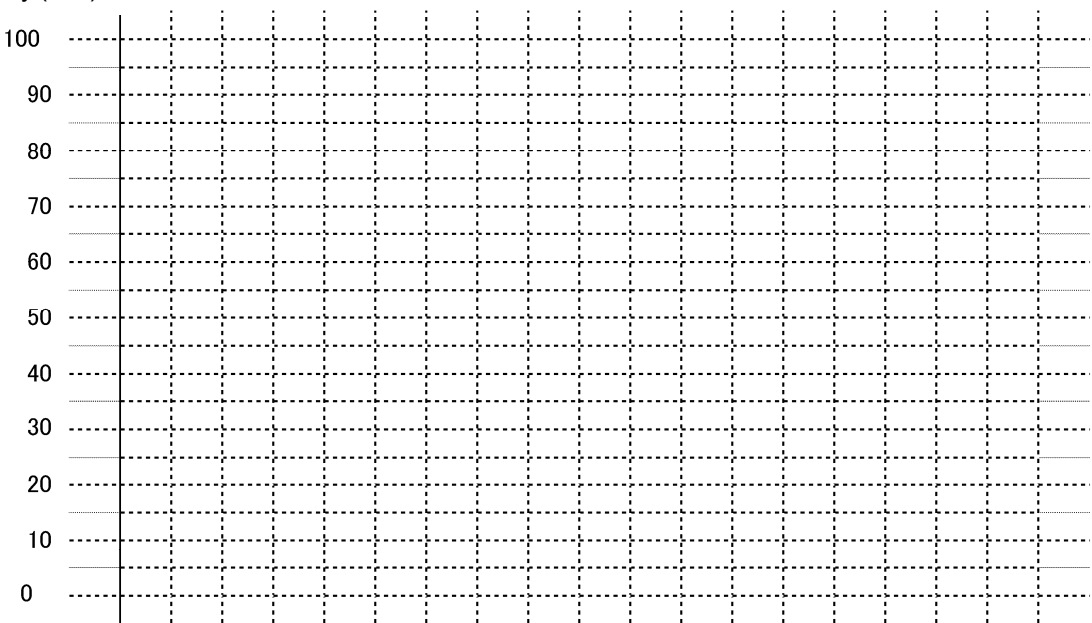
B Program creation sheet

Copy and use this page when creating a program.
Program name _____

Temperature (°C)



Humidity (%rh)



Time (h:min)

Step No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Program name PGM-01

Step No.	Temperature (°C)	Humidity (%rh)	Time (hhh:min)	Soak time control	Refrigeration	Pause	Time signals		DRN
							1	2	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Processing at the end of operation	<input type="checkbox"/> Stop <input type="checkbox"/> Power OFF: <input type="checkbox"/> Constant Operation (No.1)(No.2)(No.3) <input type="checkbox"/> Hold last step <input type="checkbox"/> Operate next program No. (), Step ()		
Counter A	Repeating start step () Step $\xleftarrow{\text{Repeat cycle ()}}$ Repeating end step () S		
Counter B	Repeating start step () Step $\xleftarrow{\text{Repeat cycle ()}}$ Repeating end step () S		
Start setting (ramp operation)	1st step Start setting in ramp operation <input type="checkbox"/> Process value <input type="checkbox"/> Set point (°C)(%rh)		

C Specification of instrumentation (P-310)

Table C.1 Specification of the instrumentation (P-310)

Item	Specification			Application
Display	7.0-inch LCD panel <ul style="list-style-type: none">TFT color LCD (VGA, back light half life period: 50,000h)Back light: LED back light typeBrightness: 600cd/m², Contrast ratio: 800:1			
AI input	0ch	RTD measurement (for 1-3, 7-14ch)	————	————
	1-3ch	Thermocouple (T) -100°C to 300°C	Measurement accuracy: ±0.3°C Display precision (full span): ±(0.07%FS + 1 digit) * Stationary environment (23 ± 5°C)	Dry-bulb temperature For specimen temperature control
	6ch	DC voltage input 1-5VDC	±0.1% (full span)	For humidity sensor
	7-14ch	Thermocouple (T) -100°C to 300°C	Measurement accuracy: ±0.4°C Display precision (full span): ±(0.08%FS + 1 digit) * Stationary environment (23 ± 5°C)	For refrigeration circuit
	16ch	RTD measurement (for 17ch)	————	————
	17ch	Thermocouple (T) -100°C to 300°C	Measurement accuracy: ±0.3°C Display precision (full span): ±(0.07%FS + 1 digit) * Stationary environment (23 ± 5°C)	For specimen temperature control (insulation type) (Optional)
AO output	High accuracy (Main)	Output voltage range: 1-5V, output accuracy: ±5mV or less Allowable load resistance: 5k ohm or more		Recorder output
	Middle accuracy (Main)	Output voltage range: 1-5V, output accuracy: ±25mV or less Allowable load resistance: 10k ohm or more		External equipment control
	High accuracy (Expansion analog board)	Output voltage range: 1-5V, output accuracy: ±5mV or less Allowable load resistance: 5k ohm or more		External equipment control (Optional)
DC output	Relay contact (I/O)	Contact rating: 250VAC, 3A		Time signals, etc.
General-purpose communication	RS-485	Four-wire (balance type) ESPEC specification Address: 1 to 16, communication speed: 4800/9600/19200bps		(Optional)
	RS-232	Unbalance type Communication speed: 4800/9600/19200bps		(Optional)
	GPIO	IEEE-488.1 compliant, Address: 1-16		(Optional)
Network functions	Interface Ethernet port (LAN port; 100baseTX)	Web function Protocol TCP/IP (HTTP, SMTP, IPv4) Supported browsers: Windows Internet Explorer 10 and 11 Communication function Protocol: TCP/IP One-to-one connection		Web application Monitor function, setup function, operation function, data recording function, chamber setup and configuration functions, and email notification function
External memory connection port	USB connector: Type A, Connection target: USB memory, Supported standard: USB2.0 compliant, Bus power: 500mA or less, Memory capacity: Up to 32 GB (tested), File format: FAT16/FAT32 format			For writing logs, writing/reading programs, and writing back traces
Installed pattern	Constant Operation	3 patterns (No. 1, 2, 3)		
	Program Mode	40 patterns (99 steps)		
Operation environment	Performance guaranteed environment	±23°C ± 5°C	30% to 90%rh (without condensation)	
	Operation guaranteed environment	0°C to +60°C	30% to 90%rh (without condensation)	
	Storage environment	-20°C to +70°C	20% to 95%rh (without condensation)	

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