

HITACHI Constant Temperature (and Humidity) Units

LCD Touch Panel Operation Manual

Model

Constant Temperature and Humidity Units

EC-15MHP(S),MHHP(S),HHP(S)
EC-25MHP(S),MHHP(S),HHP(S)
EC-45MHP(S),MHHP(S),HHP(S)
EC-85MHP(S),MHHP(S),HHP(S)
EC-105MHP(S),MHHP(S),HHP(S)
EC-35LHP(S),LHHP(S)
EC-85LHP(S),LHHP(S)
EC-45HHP-NF(S)
EC-85HHP-NF(S)

Constant Temperature Units

EC-15MTP(S),MTHP(S),HTP(S)
EC-25MTP(S),MTHP(S),HTP(S)
EC-45MTP(S),MTHP(S),HTP(S)
EC-85MTP(S),MTHP(S),HTP(S)
EC-105MTP(S),MTHP(S),HTP(S)
EC-35LTP(S),LTHP(S)
EC-85 LTP(S),LTHP(S)
EC-45HTP-NF(S)
EC-85HTP-NF(S)

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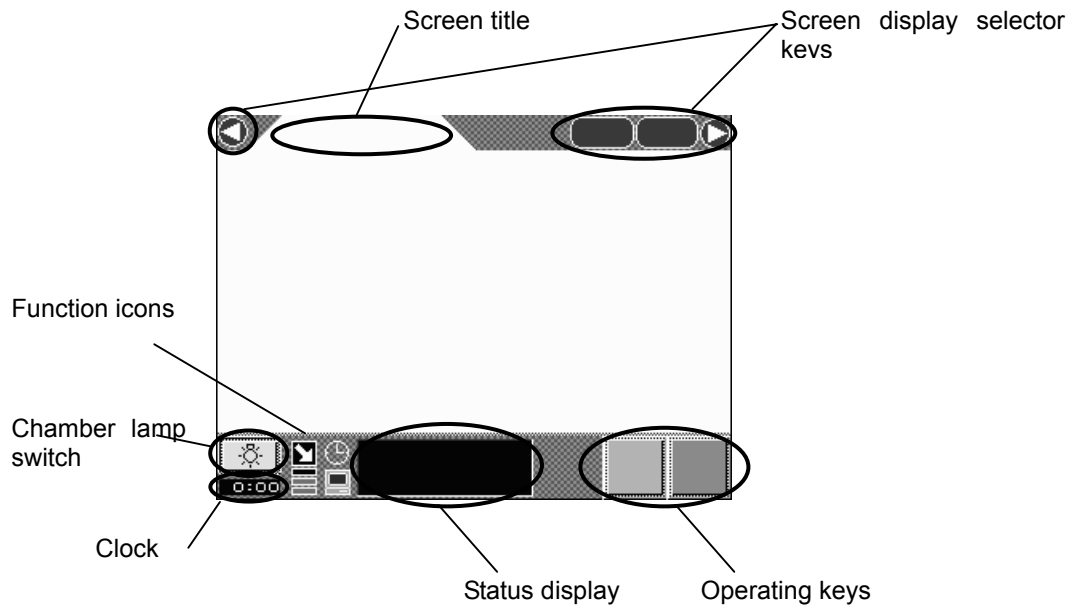
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This chapter provides an explanation of the display and operating procedure of the LCD touch panel of the constant-temperature (constant-humidity) chamber.

1. Composition of LCD Touch Panel

(1) Display Composition

The display composition of the LCD touch panel is shown in the drawing below.



■ Screen Title

Indicates the title of the screen currently displayed.

■ Screen selector keys

Indicates keys for displaying the next page or previous page of pages covering multiple screens, and keys for returning to the previously displayed screen (these are not displayed on all screens).

■ Clock

Indicates the current time.

■ Chamber lamp switch













It is ON/OFF switch of the lamp. Whenever the switch is pushed, becomes ON/OFF.

The lamp is turned off automatically at 10 minutes after lights.

■Function Icons

These icons indicate the function for controlling unit operation.

These icons indicate the function for controlling unit operation. The meanings of the icons are shown below. Refer to section **6 entitled Unit Settings** for further details.

 : Communicating	 : Timer programmed		
 : Economy	 : Normal	 : Powerful	 : Refrigerating unit stop
 : Stable	 : 0 time rise	 : 0 time fall	
 : Rising gradient	 : Lowering gradient	 : Program Combination running	

■Status Display

Indicates the unit status. The following are displayed for unit status.

Fixed-condition operation:	Displayed during fixed-condition operation.
Programmed condition operation:	Displayed during programmed condition operation.
Hold:	Displayed when holding during programmed condition operation.
Collect refrigerant:	Displayed when collecting refrigerant for unit shutdown processing.
Fan delay	Displayed during fan delay operation.
Stop:	Displayed when the unit is stopped.

■Operating Keys

These keys indicate keys for starting and stopping the unit as well as performing unit operations other than starting and stopping.

Run key: This key is for starting the unit. It is only displayed on the fixed data and program data screens when the unit is stopped.

Stop key: This key is for stopping the unit. It is displayed on all screens while the unit is running.

Special keys: These keys are for performing operations other than starting and stopping.

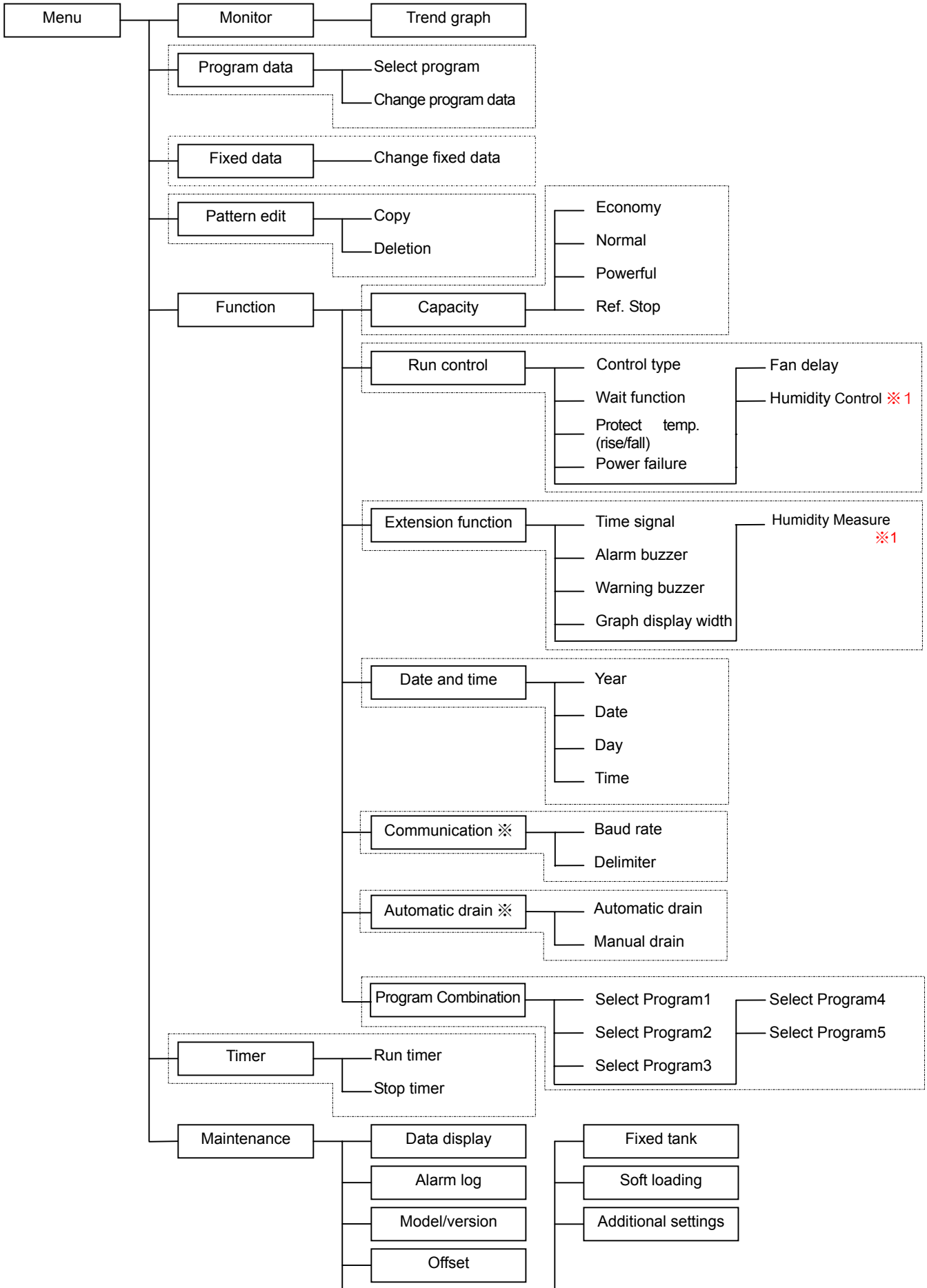
They are displayed on all screens. The following operating keys are set for the special keys.

Refer to section **9 entitled Special Operations** for further details.

(HOLD , JUMP , COMBINATION)

(2) Screen Composition

The following indicates the screen composition of the LCD touch panel.

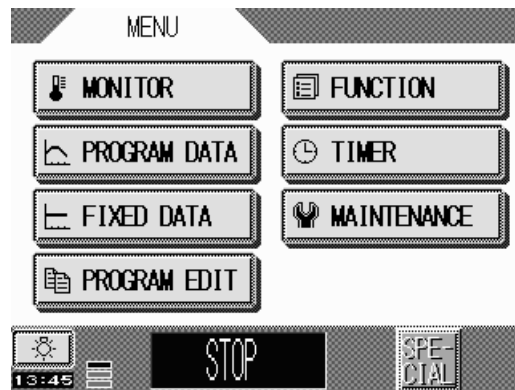


The following provides an explanation of each screen.

※:Option Function

2. Menu Screen

The menu screen is for displaying each screen. Each screen is displayed when the respective key is pressed.



■ **MONITOR** Key

This key displays the monitor screen for displaying the measured temperature, set temperature and so forth of the testing chamber.

■ **PROGRAM DATA** key

This key displays the program data screen for selecting the test program for testing or set the test program.

■ **FIXED DATA** key

This key displays the fixed data screen for fixed-condition testing.

■ **PROGRAM EDIT** Key

This key displays the program edit screen for copying or deleting test programs.

■ **FUNCTION** key

This key displays the menu screen for displaying each of the function screens for setting unit functions.

■ **TIMER** key

This key displays the timer screen for timer programming.

■ **MAINTENANCE** key

This key displays the menu screen for displaying information relating to unit maintenance.

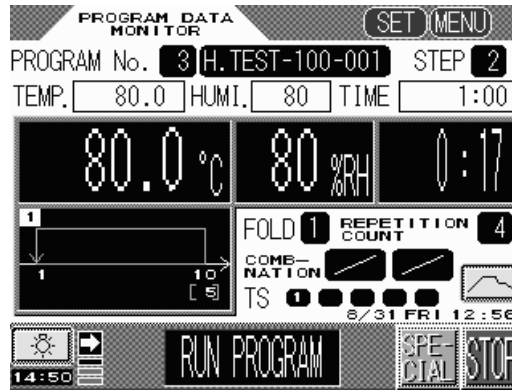
3. Monitor Screen

(1) Monitor Screen

There are two types of monitor screens consisting of the program monitor screen and the fixed monitor screen, and are displayed during their respective operations. In addition, the monitor screen of the previous round of operation is displayed when the unit is stopped.

◆Program Monitor Screen

This displays monitoring and setting information relating to programmed operation.



■ MENU key

This displays the menu screen.

■ SET key

This displays the program data screen.

■ Program No.

This displays the program number and name for performing testing (or when stopped) or during testing.

■ Step

This displays the number of the step currently being executed.

■ Scheduled End Time

This displays the time when testing is scheduled to end.

When you set repetition "99", this displays the time when repetition part started.

■ Set Temperature, Set Humidity and Set Time

This displays the set temperature, set humidity and set time of the step currently being executed.

■ Measured Temperature, Measured Humidity and Remaining Measuring Time

This displays the current measured temperature, measured humidity and remaining measuring time.

The remaining monitoring time is displayed as "0:00" when the unit is stopped.

■ Repeat Mode

This displays a graph of the repeat mode for the program number currently being run.

■ No. of Repetition

This displays the current number of repetition currently being executed in the repeat mode.

■ No. of Repetitions Remaining

This displays the number of repetition remaining from the current repetition being executed in the repeat mode.

When you set repetition "99", this displays only "99".

■ Program Combination

Combination



A: The repeat value of the program number during execution. (Measurement)

B: The repeat value of the program number during execution. (Setting)

C: The whole repetition value. (Measurement)

D: The whole repetition value. (Setting)

■ Time Signal


This displays the time signal set for the step currently being executed.


■  Key


This displays a trend graph of measured temperatures in the testing chamber.


■ Arrow Keys     


These keys display the temperature control status of the step currently being executed.

 : The set temperature has been reached and is stable

 : The temperature rises at 0 time (maximum capacity)

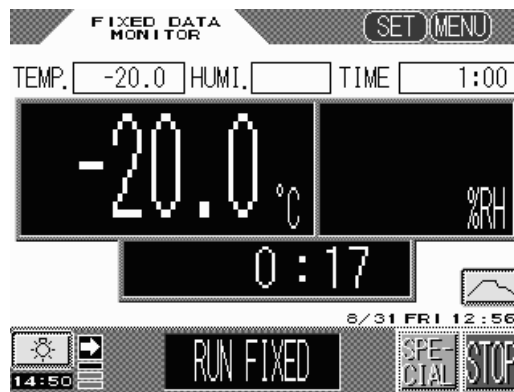
 : The temperature rises over a set amount of time (gradient control)

 : The temperature falls at 0 time (maximum capacity)

 : The temperature falls over a set amount of time (gradient control)

◆ Fixed Data Monitor Screen

This displays monitoring and setting information relating to fixed-condition operation.



■ **MENU** key

This displays the menu screen.

■ **SET** key

This displays the fixed data screen.

■ Scheduled End Time

This displays the time when testing is scheduled to end.

■ Set Temperature, Set Humidity and Set Time

This displays the set temperature, set humidity and set time of the fixed-condition operation currently being executed.

■ Measured Temperature, Measured Humidity and Remaining Measuring Time

This displays the current measured temperature, measured humidity and remaining measuring time.

The remaining monitoring time is displayed as "0:00" when the unit is stopped.

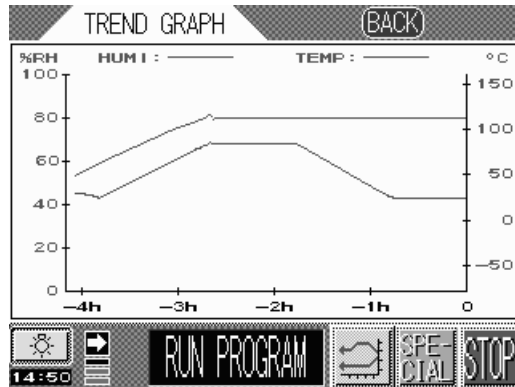
■  key

This displays a trend graph of measured temperatures in the testing chamber.

(2) Trend Graph Screen

The trend graph screen is displayed when the  key on the monitor screen is pressed.

The trend graph screen displays a trend graph of measured temperatures in the testing chamber. The display can be scrolled when displaying sampled data. (Temperature sampling starts automatically after the power is turned on.)



■ **BACK** key


This displays the monitor screen.

■ Measured Test Temperature and Measured Test Humidity

The measured test temperature is displayed with solid red lines, while the measured test humidity is displayed with solid green lines.

◆ Previous Display Function

Graphs of previously sampled measured temperature (red) or measured humidity (green) values can be displayed.

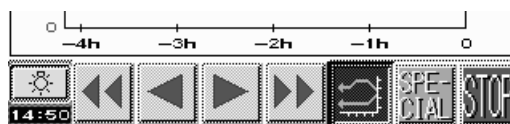
■  key



This key displays operating keys for display previous graphs, and the unit enters the previous display mode when this key is pressed.

Each time the  key is pressed, the  key is highlighted and operating keys  appear.

When the key is pressed again, the operating keys are no longer displayed and the previous display mode is canceled.


The operating keys can be used to scroll a graph and display previous graphs.



Note: Sampling continues at the sampling cycle during the previous graph display as well. When the highlighted  key is canceled and returned to the normal  key, the graph generated by sampling during the previous graph display is added to the display.

■  key

Scrolls the display by one page in the direction of previous trend graphs.

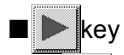
■  key

Scrolls the display by one increment in the direction of previous trend graphs each time it is pressed.



key

Scrolls the display by one page in the direction of new trend graphs.



key

Scrolls the display by one increment in the direction of new trend graphs each time it is pressed.

- Notes:
- Trend graphs have a predetermined sampling capacity, and when that capacity is reached, old data is sequentially discarded even though sampling continues.
 - Although previous graphs are saved even though the unit power supply is turned off, if the sampling capacity is reached as described above, old data is sequentially discarded.
 - Refer to part (3) on Extension Functions of section **6 entitled Unit Settings** for information on the sampling cycle (graph display width) and previous display time.

4. Test Settings

Testing can be performed by programmed operation and fixed-condition operation. The program data screen and fixed data screen are used as setting screens. The test temperature, test time and other parameters are set on these respective screens.

(1) Program Data Screen

Programmed operation can be performed by setting the temperature (humidity), time and repeat mode in 1-20 steps. Program nos. 33 through 45 are fixed test programs. Refer to the section entitled, "Internal Program List" for information on the contents of fixed test programs.

PROGRAM DATA				
3		H. TEST-100-001		
STEP	1	2	3	4
TEMP.(°C)	25.0	80.0	80.0	25.0
HUMI.(%RH)	60	80	80	80
TIME(h:m)	0:00	1:00	1:00	1:00
TIME SIGNAL	●	●	●	●

Program graphic display

■ **MENU** key

Displays the menu screen.

■ **MON** (monitor) key

Displays the program monitor screen.

■ key

Displays the program data screen for steps after steps 1 through 4.

■ key

Select the program.

■ **EDIT** key

Displays the keyboard which edits the program name .

■ Step **1** **2** **3** **4** . . . **19** **20** keys

Numeric keys are displayed for setting the test temperature, test humidity and test time of each step.

■ Time Signal key

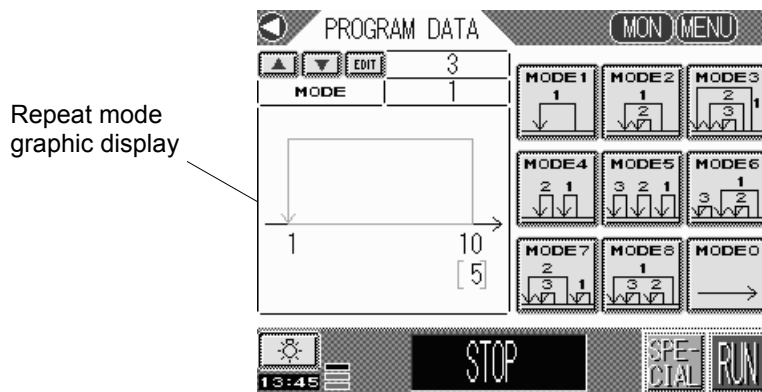
Displays setting keys for setting the time signal and last step.

■ Program Graphic Display

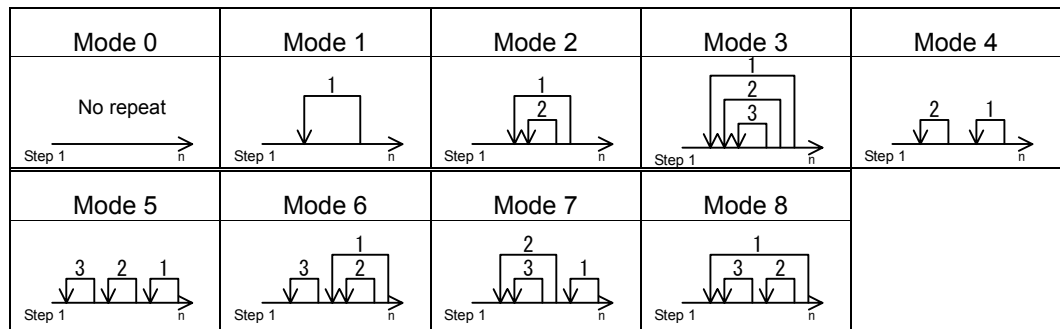
Provides a graphic display of each step of the test program currently set (displayed). Red is used to display temperature, while green is used to display humidity.

◆ Repeat Mode Data Screen

This screen is displayed when the repeat mode is set for the final parameter of the program data screen. This screen makes it possible to set the manner and number of times the set steps are to be repeated.



Repeat modes 0 through 8 are available for the repeat modes, and repetition is performed starting with the largest repetition shown in the diagram of the repetition mode.



■ **MENU** key

Displays the menu screen.

■ **MON** (monitor) key

Displays the program monitor screen.

■ key

Displays the program data screen for steps 17-20.

■ **PROGRAM** key

Numeric keys are displayed for entering settings (when stopped) or for displaying the program number during testing.

■ **MODE 1** **MODE 2** **MODE 3** . . . **MODE 8** **MODE 0** keys

Numeric displays are displayed for selecting the repeat mode and setting the first repeated step, last repeated step and number of repetitions.

■ Program Graphic Display

Provides a graphic display of the repeat mode of the test program currently set (displayed).

● Programming Procedure

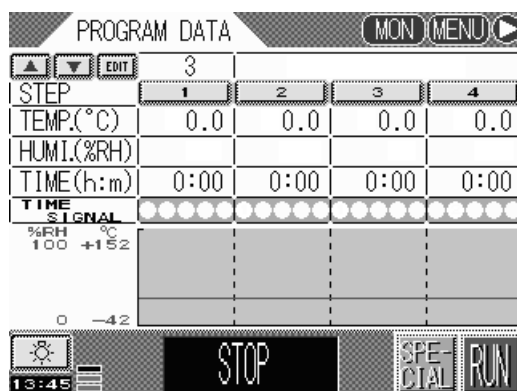
The following provides an explanation of the programming procedure for programmed operation.

(The example of inputting the program to page 61 has been described and give the reference, please)

- Notes:
- Program contents (temperature, humidity, time, time signal, last step and repeat mode) cannot be changed during operation.
 - Since programs nos. 33 through 45 are fixed test programs, their settings (temperature, humidity, time, time signal and repeat mode) cannot be changed.

① Setting (Selecting) Program Number

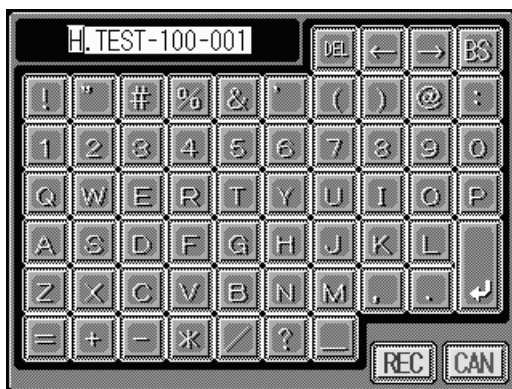
A program number is set for setting a program or operating the unit.



The program number in which the pattern is set is displayed pushing key.

② Setting Program Name

The program name is input on the program setting screen.



The program number in which the name is input is displayed, and the key is pushed. (When inputting the name of the program number currently displayed, change of a program number can be omitted.)

The keyboard for the program name input is displayed.

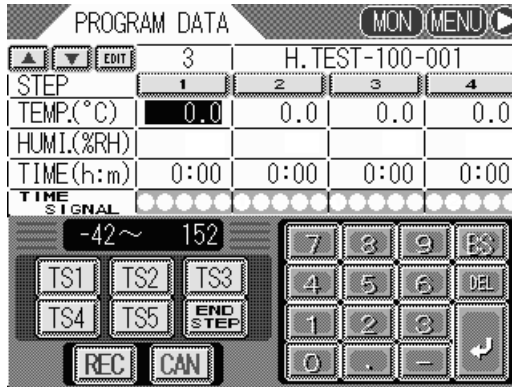
After inputting the program name, please push the key and the key. The keyboard for the program name input disappears.

The name input of the program number currently run cannot be performed. Even if the key is pushed, the keyboard for the program name input is not displayed.

Please push after inputting a program name, without forgetting the key and the key. If it forgets to push both, it cannot register correctly.

③ Setting Temperature, Humidity and Time of Each Step

Temperature, humidity and time are set for each step.



When a step key of **1** to **4** of the step for which values are to be entered is pressed, numeric keys are displayed. Enter the temperature, humidity and time with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the is pressed, a beeping error tone sounds and that number is not entered.

When the key is pressed after entering a proper value, the cursor moves to the next parameter.

Press the key to only move the cursor without changing the value.

The cursor moves within the current step in the order of temperature, humidity, time and then back to temperature each time the key is pressed.

After entering the desired values, do not forget to press the **REC** key. Entered values are not registered unless the **REC** key is pressed after they have been entered. The numeric keys are no longer displayed after values have been registered. Press the **CAN** key to discontinue entering values.

The numeric keys are no longer displayed and the entered value returns to its original setting.

Press the key to enter values for a step after step 4. Enter values when the data screen for the next step is displayed. Each time the key is pressed, the data screens are displayed for groups of four steps each in the manner of steps 5-8, steps 9-12, steps 13-16 and steps 17-20. Press the key to display a previous step.

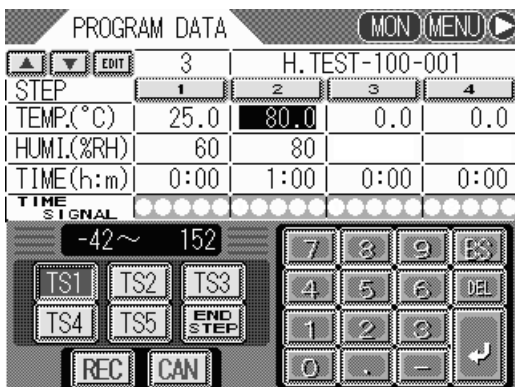
Notes: • The humidity cannot be set unless the control type on the operation control screen for programming units equipped with a humidity control function is set to "Constant temperature/constant humidity". (Refer to part (2) on "Operation Control" of section 6 entitled, "Unit Settings", for information on the operation control screen.)

• Enter a 0 when the humidity is not to be set.

④ Setting the Time Signal of Each Step

The time signal is set for each step.

The time signal is a function that switches on the contact of a time signal during the execution of each step by setting a time signal for that step.



Then a step key of **1** to **4** of the step for which values are to be entered is pressed, numeric keys are displayed. Enter the time signal with the numeric keys.

After selecting a time signal, do not forget to press the **REC** key. The selected time signal will not be registered unless the **REC** key is pressed. The setting keys are no longer displayed after a time signal has been registered.

The number of the selected time signal is displayed on the **TIME SIGNAL** key of the time signal when that time signal is registered **1**.

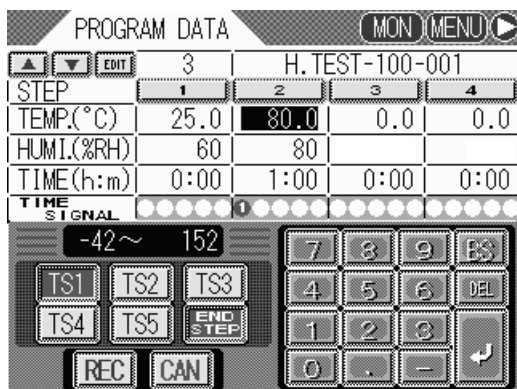
Press the **CAN** key to discontinue setting. The setting keys are no longer displayed and the selected time signal returns to its original setting.

Notes: • Normally only time signals 1 through 3 are set. In the case of using time signals 4 and 5, select "5 Points" for the time signal setting on the extension function screen of unit settings. In this case, please note that the contacts of the sample power supply and external alarm output are used as time signals. **(For further details, refer to part (3) on Extension Functions of section 6 entitled, "Unit Settings").**

• It is not necessary to set a time signal when time signals are not used.

⑤ Setting the Last Step

The last step is set.



When the **END STEP** key of the time signal of the last step is pressed, setting keys are displayed on the screen. Set the last step with the setting keys.

After selecting the last step, do not forget to press the **REC** key. The selected last step will not be registered unless the **REC** key is pressed. The setting keys are no longer displayed after the last step has been registered.


An "E" is displayed on the **TIME SIGNAL** key of the step set for the last step when that step is registered. **2**

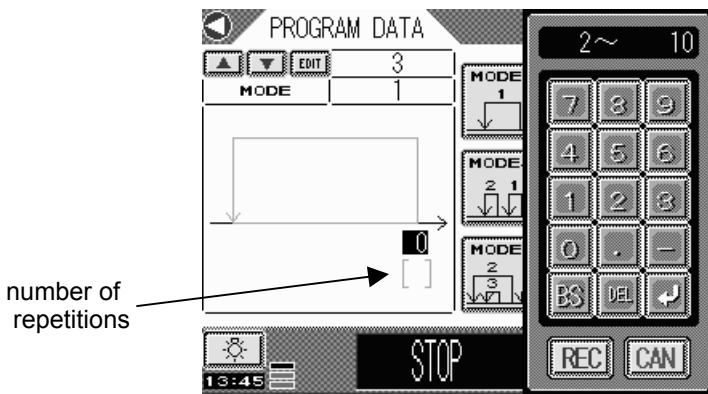
Press the **CAN** key to discontinue setting. The setting keys are no longer displayed and the selected last step returns to its original setting.

Note: The unit will not operate unless the last step has been set. A caution window is displayed when the **RUN** key is pressed if the last step has not been set.


⑥ Setting the Repeat Mode



The repeat mode is set.

Press the  key to display the repeat mode data screen.



When the **MODE** key of the repeat mode to be set is pressed, an illustration of the selected repeat mode and numeric keys are displayed. Set the first repeated step, last repeated step and number of repetitions with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the  is pressed, a beeping error tone sounds and that value is not entered.

When the  key is pressed after entering a proper value, the cursor moves to the next parameter. Press the  key to only move the cursor without changing the value.

After entering the desired value, do not forget to press the **REC** key. Entered values are not registered unless the **REC** key is pressed after they have been entered. The numeric keys are no longer displayed after values have been registered.

Press the **CAN** key to discontinue entering values. The numeric keys are no longer displayed and the entered value returns to its original setting.

Note: The input range for the number of repetitions is from 1 to 98. If a value of 99 is entered, operation is repeated continuously.

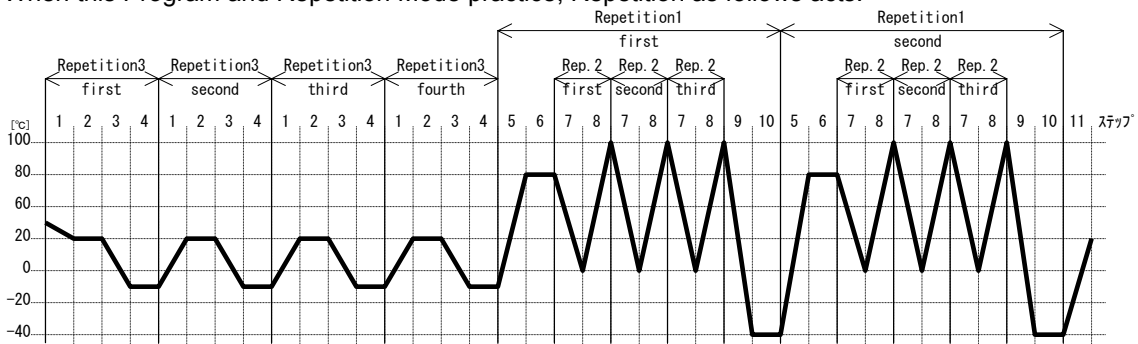
When you need over 99 repetitions, choose Repetition Mode including double or triple repetition part.

The number of repetitions is the number of executing repetition part. If the number of repetitions is "2", the unit execute repetition part twice.

Example of A Repetition Pattern

STEP	1	2	3	4	5	6	7	8	9	10	11	Repetition Mode : 6
Temp.	20.0	20.0	-10.0	-10.0	80.0	80.0	0.0	100.0	-40.0	-40.0	20.0	
Hum.												
TIME	0:00	0:30	0:00	0:30	0:00	0:30	0:00	0:00	0:00	0:30	0:00	
TIME-SIG.											END	




When this Program and Repetition Mode practice, Repetition as follows acts.



(2) Fixed Data Screen

Settings are made on this screen for performing testing by operating at a fixed temperature (humidity).

FIXED DATA		MON (MENU)
ITEM	SETTING	MONITOR
TEMP.(°C)	-20.0	33.9
HUMI.(%RH)		
TIME(h:m)	1:00	0:00

 13:45		STOP		RUN
---	---	------	--	-----

■ **MENU** key

Displays the menu screen.

■ **MON** (monitor) key

Displays the fixed monitor screen.

■ **SETTING** key

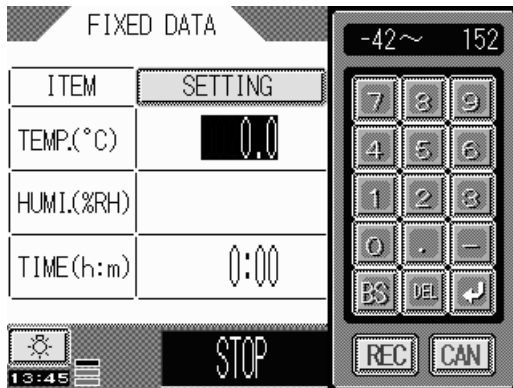
Displays numeric keys for setting temperature, humidity and time.

● Fixed Data Setting Procedure


The following provides an explanation of the setting procedure for fixed - condition operation.


Note: Temperature, humidity and time can be changed during fixed-condition operation.


① Setting Temperature, Humidity and Time




When the **SETTING** key is pressed, numeric keys are displayed. Enter the temperature, humidity and time with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the  is pressed, a beeping error tone sounds and that number is not entered.

When the  key is pressed after entering a proper value, the cursor moves to the next parameter.

Press the  key to only move the cursor without changing the value.

The cursor moves in the order of temperature, humidity, time and then back to temperature each time the  key is pressed.

After entering the desired values, do not forget to press the **REC** key. Entered values are not registered unless the **REC** key is pressed after they have been entered. The numeric keys are no longer displayed after values have been registered.

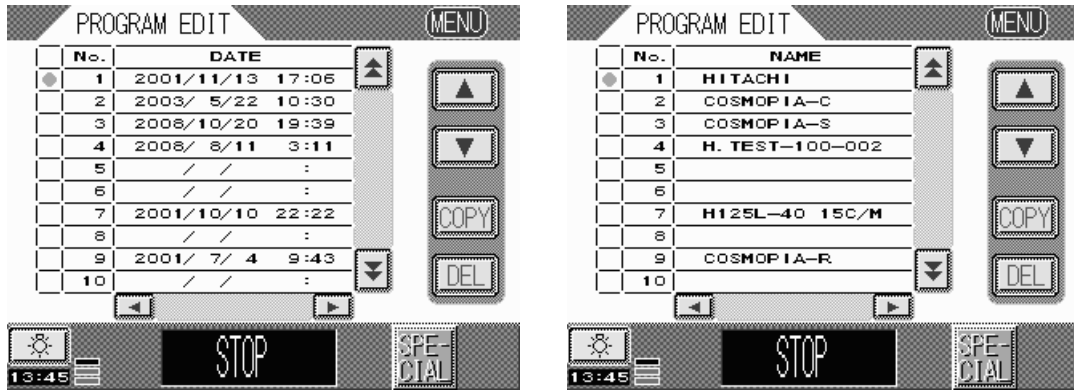
Press the **CAN** key to discontinue entering values. The numeric keys are no longer displayed and the entered value returns to its original setting.

Notes: • The humidity cannot be set unless the control type on the operation control screen for programming units equipped with a humidity control function is set to "Constant temperature/constant humidity". (Refer to part (2) on "Operation Control" of section 6 entitled, "Unit Settings", for information on the operation control screen.)

- Enter a 0 when the humidity is not to be set.

5. Test Program Editing

Test programs that have already been registered can be copied or deleted.



- **MENU** key

Displays the menu screen.

- **COPY** key

Used to determine the copy destination and execute copying.

- **DEL** key

Used to execute deletion.

- **▲ ▼** key

Used to select the copy source, copy destination or the number of the program to be deleted.

The lamp ● on the screen lights (yellow) and moves up or down each time the **▲ ▼** keys are pressed.

The program number where the lamp is lit (yellow) is the selected program.

- **▲ ▼** keys

Used to display test programs other than the displayed test program.

- Registration Date

Displays the time and date on which the test program was registered.

- Program name

Displays the name of program.

●Copy

A previously registered test program is copied to another program number.

Note: Programs cannot be copied to fixed program nos. 33 through 45.

The following provides an explanation of the copying procedure.

- Select the copy destination and then press **COPY**. The lamp of the selected test program number changes to green.
- Select the copy source and then press **COPY**. A confirmation window is displayed.



- In the case of copying, press the **OK** key. The date and time when the program was copied to the test program of the copy destination are displayed.
- In the case of discontinuing copying, press **CAN**. The lamp of the selected program number goes out.

●Deletion

A previously registered test program is deleted.

Note: Test program nos. 33 through 45 cannot be deleted.

The following provides an explanation of the deletion procedure.

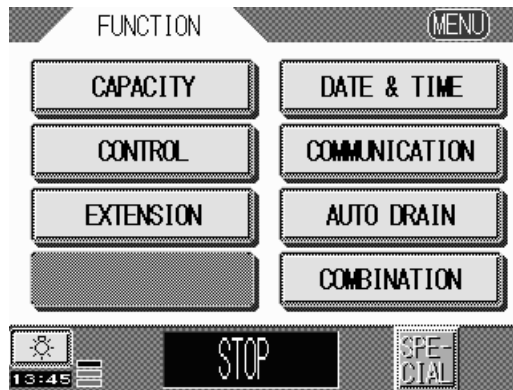
- Select the program to be deleted and then press the **DEL** key. A confirmation window is displayed.



- In the case of deleting, press the **OK** key. The registration date and time of the deleted test program changes to 0.
- In the case of discontinuing deletion, press the **CAN** key.

6. Unit Settings

The function screen is displayed for making various unit settings. Pressing any of the keys displays the corresponding screen.



■ **MENU** key

Displays the menu screen.

■ **CAPACITY** key

Displays the capacity screen for setting the unit capacity during the test cycle.

■ **CONTROL** key

Displays the control screen for setting control parameters during the test cycle.

■ **EXTENSION** key

Displays the extension screen for setting extension functions of the unit.

■ **DATE & TIME** key

Displays the date & time screen for setting the date, day and time.

■ **COMMUNICATION** key

Displays the communication screen for making external communication settings.

Note: This operation is only available on units equipped with the optional external communication function.

■ **AUTO DRAIN** key (Only for the option specification)

Displays the auto drain screen.

Note: Only the machine for the option

■ **COMBINATION** key

Displays the control screen for setting the Program Combination,

(1) Capacity

This is used to set the unit capacity during the test cycle.




■ **MENU** key

Displays the menu screen.

■ **BACK** key


Displays the function screen.

■ **ECONOMY** key

This lowers the unit capacity. Select this key when there are few test pieces or when the test pieces do not generate heat. When Economy is selected, the  function status icon is displayed on the bottom of the screen.


■ **NORMAL** key

This is the standard capacity of the unit.

When Normal is selected, the  function status icon is displayed on the bottom of the screen.

■ **POWERFUL** key

This increases the unit capacity. Select this key when there are a large number of test pieces or when the test pieces generate heat.

When Powerful is selected, the  function status icon is displayed on the bottom of the screen.

■ **REF. STOP** key

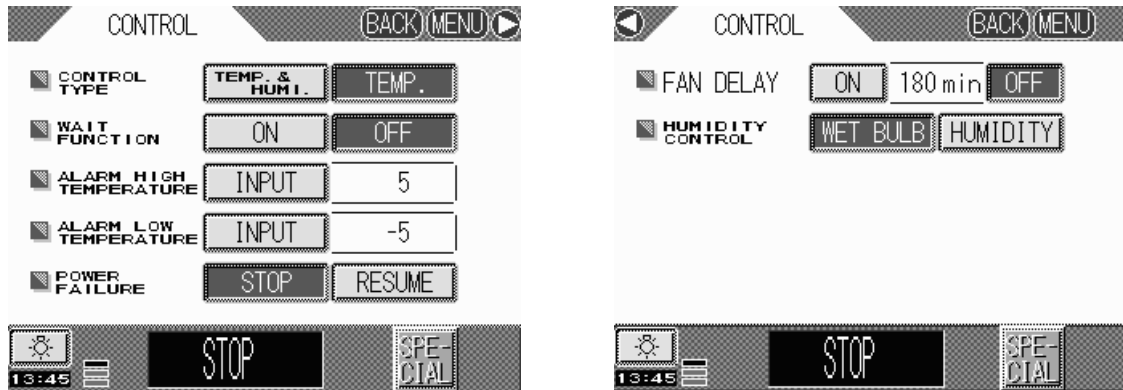
This stops the refrigerating unit regardless of the test temperature and humidity.



It is possible to use to execute conservation of energy even a little by the fixed value drive at the high temperature etc.

When Ref. Stop is selected, the  function status icon is displayed on the bottom of the screen.

(2) Control

This is used to set control parameters during the test cycle.



- **MENU** key
Displays the menu screen.
- **BACK** key
Displays the function screen.
-  key
Displays the second control screen.
-  key
Displays the first control screen.
- **TEMP. & HUMI.** and **TEMP.** key
These are used to select the control type.
- **ON** and **OFF** key
These are used to select the wait function and fan delay.
- **INPUT** key
This is used to set the alarm high temperature and alarm low temperature functions, defrosting cycle, off cycle defrosting and temperature rise defrosting.
- **STOP** and **RESUME** key
These are used to select the operation following a power failure.
- **WET BULB** key: Humidity is controlled by the measuring wet bulb temperature.
HUMIDITY key: Humidity is controlled by the measuring relative humidity.

Note: Only the machine for the option

Note: Settings cannot be changed during operation except for fan delay.

●Control Type

The control type can be switched with the constant temperature/constant humidity control bath (units equipped with humidity control).

TEMP. & HUMI. : The unit is controlled as a constant temperature/constant humidity bath, and humidity is controlled.

TEMP : The unit is controlled as a constant temperature bath, and humidity is not controlled.

Notes: • Humidity cannot be set when Temp. has been selected.

• Temp. & Humi. cannot be selected if the unit is a constant temperature bath.

●Wait Function

This determines when programmed operation is to move to the next step based on an assessment of the measured testing chamber temperature and humidity reaching the set temperature and humidity.

ON : Operation proceeds to the next step if the measured testing chamber temperature and humidity have reached the ranges of $\pm 0.3^{\circ}\text{C}$ and $\pm 2\%$ RH relative to the set test temperature and humidity when a set amount of test time has elapsed.

Notes: • This function is only available during programmed operation.

• In the case humidity has been set for testing, operation only proceeds to the next step after both the measured temperature and measured humidity have reached the predetermined ranges.

• In the case 0 minutes has been set for the step, operation proceeds to the next step as soon as the measured temperature is within the predetermined range of the set temperature.

OFF : Operation proceeds to the next step when the set test time has elapsed regardless of the set test temperature and set test humidity.

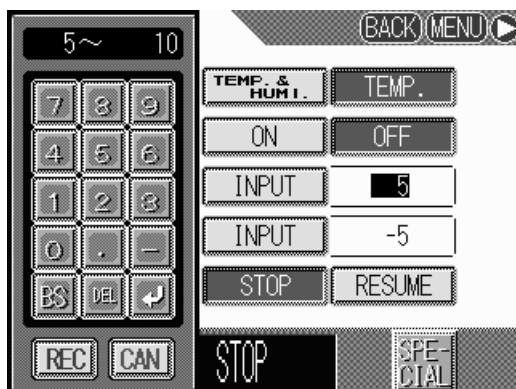
Note: • In the case 0 minutes has been set for the step, that step is skipped and operation proceeds to the next step.

● Alarm High Temperature and Alarm Low Temperature

These functions are for protecting test samples in the testing chamber.

Unit operation is interrupted when the testing chamber temperature rises excessively or falls excessively during testing.

Alarm High Temperature **INPUT** : This is used to set the temperature rise alarm temperature. (set temperature range +5~+10°C). The operation of the unit is interrupted when the testing chamber temperature > high testing temperature + temperature rise alarm temperature.



When the **INPUT** key is pressed, numeric keys are displayed. Enter the temperature rise alarm temperature with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the **↵** is pressed, a beeping error tone sounds and that number is not entered.

After entering the desired value, do not forget to press the **REC** key.

Entered values are not registered unless the **REC** key is pressed after they have been entered.

The numeric keys are no longer displayed after a value has been registered.

Press the **CAN** key to discontinue entry. The numeric keys are no longer displayed and the entered value returns to its original setting.

Alarm Low Temperature **INPUT** : This is used to set the temperature drop alarm temperature. (set temperature range -5~-10°C). The operation of the unit is interrupted when the testing chamber temperature < low testing temperature + temperature drop alarm temperature.



When the **INPUT** key is pressed, numeric keys are displayed. Enter the temperature drop alarm temperature with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the **↵** is pressed, a beeping error tone sounds and that number is not entered.

After entering the desired value, do not forget to press the **REC** key.

Entered values are not registered unless the **REC** key is pressed after they have been entered.

The numeric keys are no longer displayed after a value has been registered.

Press the **CAN** key to discontinue entry. The numeric keys are no longer displayed and the entered value returns to its original setting.

Note:The range of 0-40°C in set temperature in attention :· overtemperature rise degree and temperature of supercooling both cannot be set.

● Power Failure

Operation of the unit after power has been restored can be selected following a power failure of excessive duration (2 seconds or more).

STOP : The unit stops after power is restored.

RESUME : The unit continues to operate after the power failure in the same manner as before the power failure.

After the power has been restored, a message is displayed to inform the operator that a power failure has occurred and that operation has been resumed following the power failure. (The content of operation has been described to page 62 and refer, please)

- Notes:
- In the case of selecting **RESUME**, check whether the power supply and cooling water supply (in the case of water cooling) used for the unit have an automatic resume function following a power failure similar to that of this unit.
 - In the case of a momentary power failure (of less than 2 seconds duration), operation is resumed after the power has been restored regardless of the selection for power failure. Consequently, check whether the power supply and cooling water supply (in the case of water cooling) used for the unit have an automatic resume function following a power failure similar to that of the this unit. In addition, a message is displayed to inform the operator that a power failure has occurred and that operation has been resumed following the power failure in the same manner as power failures of 2 seconds or more.




● Fan Delay

This can be used to delay the fan in the testing chamber from turning off and enable it to continue to operate even after testing has been completed or the unit has been turned off. This function is convenient for preventing the condensation of moisture on test pieces after having performed testing set to a high temperature.



When the **ON** key is pressed, numeric keys are displayed. Enter the fan delay time with the numeric keys.

Enter a value that is within the input range (1~240 minutes) displayed above the numeric keys. If a value is entered that is outside this range and the  is pressed, a beeping error tone sounds and that number is not entered.

After entering the desired value, do not forget to press the **REC** key.

Entered values are not registered unless the **REC** key is pressed after they have been entered.

The numeric keys are **ON** longer displayed after a value has been registered.

Press the **CAN** key to discontinue entry. The numeric keys are no longer displayed and the entered value returns to its original setting.

Notes: • "Fan delay" is displayed for the unit status during operation of fan delay.

- When desiring to turn off the fan during operation of fan delay, press the **OFF** key. The fan will stop when this key is pressed.

● Humidity Control (Only the machine for the option)

This select the wet bulb temperature or the relative humidity at the humidity control .



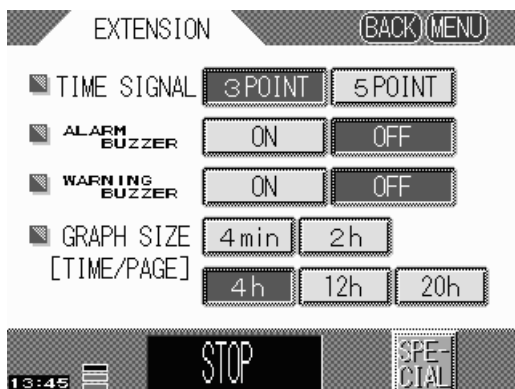
WET BULB : Humidity is controlled by the measuring wet bulb temperature. (Only

HUMIDITY : Humidity is controlled by the measuring relative humidity.

Notes: • **WET BULB** is effective when the option specification. (Option of humidity senspr.)

(3) Extension Functions

This is used to set extension functions of the unit.



- **MENU** key
Displays the menu screen.
- **BACK** key
Displays the function screen.
- **3 POINT** and **5 POINT** keys
These are used to select the number of outputs of the time signal.
- **ON** and **OFF** keys
These are used to set the alarm buzzer and the warning buzzer.
- **4min** **2h** **4h** **12h** and **20h** key
These are used to select the display axis of the trend graph.
- **TEMP.SENSOR** and **HUMI.SENSOR** keys
These are used to select the Humidity measurement.

Note: These settings cannot be changed during operation.

● Time Signal

The number of outputs of the time signal can be changed.

The time signal is a function that switches on the contact of a time signal during the execution of each step of the program by setting a time signal for that step.

3 POINT : The number of time signal outputs is set to 3.

5 POINT : The number of time signal outputs is set to 5.

Note: Please note that when the number of time signal outputs is set to 5, the contacts of the sample power supply and external alarm output are used as time signals.

● Alarm Buzzer

When the ON key is selected, the buzzer can be made to sound when a problem occurs in the unit
Select the OFF key when the buzzer is not to sound.

● Warning Buzzer

When the ON key is selected, the buzzer can be made to sound when a warning has occurred in the unit.
Select the OFF key when the buzzer is not to sound.

● Graph Display Width

This can be used to set the display width of one page of the trend graph. Increasing the display width allows sampling to be performed for a long period of time.

Display width/page	Sampling cycle	Maximum sampling time
4 min. 10 sec.	1 sec.	4 hr. 10 min.
2 min. 05 sec.	30 sec.	125 hr.
4 hr. 10 min.	1 min.	250 hr.
12 hr. 30 min.	3 min.	750 hr.
20 hr. 50 min.	5 min.	1250 hr.

● Humidity Monitor

This selects the sensor for the humidity measurement.

TEMP. SENSOR : Relative humidity is measured with the temperature sensor of dry bulb and the temperature sensor of wet bulb.

HUMI. SENSOR : Relative humidity is measured with the humidity sensor.

Notes: • Humidity monitor is effective when the option specification.(Option of humidity sensor.)

(4) Setting the Date and Time

The year, date, day and time are set.



- Year

This is used to set the year. Enter the last two digits of the year.

- Date

This is used to set the date.


- Day

This is used to set the day. Enter the appropriate value.

- Time

This is used to set the time. Enter the time based on a 24-hour clock.

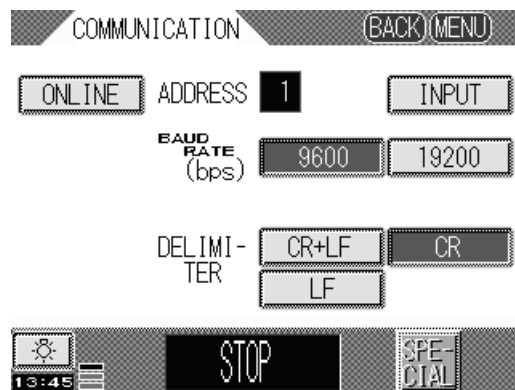
Note: Do not forget to press the **REC** key after entering values.

Values will not be registered unless the  key and **REC** key are pressed. The function screen is displayed after values have been registered.

Press the **CAN** key to discontinue entry of values. Entry of values is interrupted and the function screen is displayed.

(5) Communication (Only for the option specification)

This is used to set communication functions of the unit.



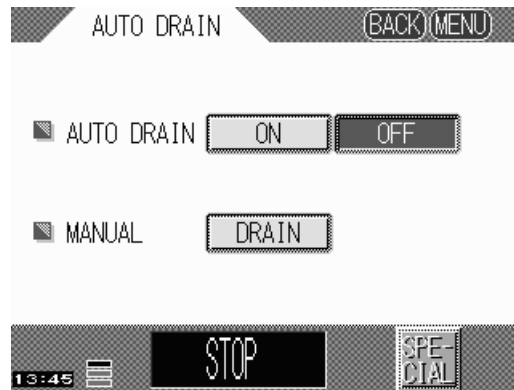
- **MENU** key
Displays the menu screen.
- **BACK** key
Displays the function screen.
- **ADDRESS** key
This is used to set the address of the unit.
- **9600** and **19200** key
These are used to select the baud rate.
- **CR+LF** **CR** **LF** key
These are used to select the delimiter.
- **ONLINE** key
This is used to start / stop of communication.

Note: ·When the baud rate and the delimiter of the unit and communications equipment is different, it is not possible to communicate.

- ONLINE** key cannot be selected during operation.
- Communication sets is effective with the option specification only.
- The address cannot be used. Please set the address to "1".
- When **ONLINE** key is ON, the operation of run/ stop etc cannot be done on the LCD screen.

(6) Auto Drain (Only for the option specification)

Pure water in the humidifier pan can be drained automatically during operation outside the humidity control range and when the unit is stopped. In addition, water can also be drained manually.



■ **ON** and **OFF** keys

These are used to set automatic draining.

■ **DRAIN** key

This used when draining water manually.

● Automatic Draining

When the **ON** key is selected, pure water in the humidifier pan can be drained automatically during operation outside the humidity control range and when the unit is stopped.

When the **OFF** key is selected, the automatic drain function is turned off, and pure water is not drained from the humidifier pan.

● Manual Draining

Pure water can be drained from the humidifier pan manually when the **DRAIN** key is pressed when the **ON** key is selected for Auto Drain while the unit is stopped.

When the **DRAIN** key is pressed, a confirmation window is displayed. Press the **OK** key when desiring to drain the water. The confirmation window is no longer displayed and draining begins. When desiring to not to drain the water, press the **CAN** key. The confirmation window will no longer be displayed and water will not be drained.

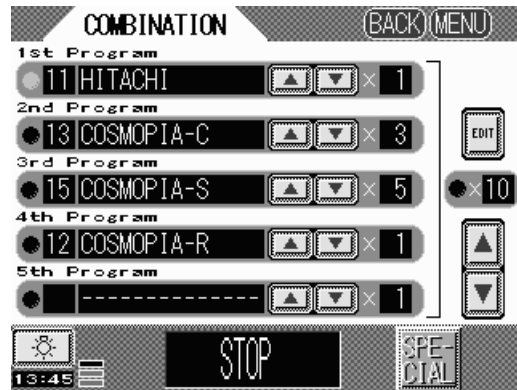
When desiring to interrupt draining during manual draining, select the **OFF** key of Auto Drain. Draining of water will stop. When desiring to resume draining, select the **ON** key of Auto **DRAIN** and then press the Drain key.

Notes: Check that a drain pipe is connected to the drain port on the back of the unit and that the pipe is not clogged before operating the unit.

Since the automatic drain function drains pure water from the humidifier pan during operation outside the humidity control range and when the unit is stopped, the amount of pure water consumed increases.

(7) Program Combination

"PROGRAM COMBINATION RUNNING FUNCTION" is the function which runs more than 2 programs continuously (combination). It can combine a maximum of five programs.



■ **MENU** key

Displays the menu screen.

■ **BACK** key

Displays the unit setting screen.

■  key

These are used to select programs.

■  key


These are used to move the cursor.

■  key


Displays the ten-key screen.


● Method of setting program combination.

The program combination is set on the program combination screen of the FUNCTION menu.



1. The part where a yellow cursor  lights up can be set.

Please push the  key and move a cursor.

2. Please push the  key and choose the program number.

3. The repeat count is input. Please push the  key.

The numeric keypad for 'repeat count input' is displayed.

4. After inputting 'repeat count', please push the  key and the  key. The numeric keypad for 'repeat count input' disappears.

5. Please set up other combination numbers according to a similar procedure.

6. Please set up the whole repeat count.



● Example of a program combination setup.


Push **COMBINATION** key on the Special screen after setting the Program Combination.

Detail explanations are written in "9-3 Combination".

Notes: The combination function currently run cannot be edited.

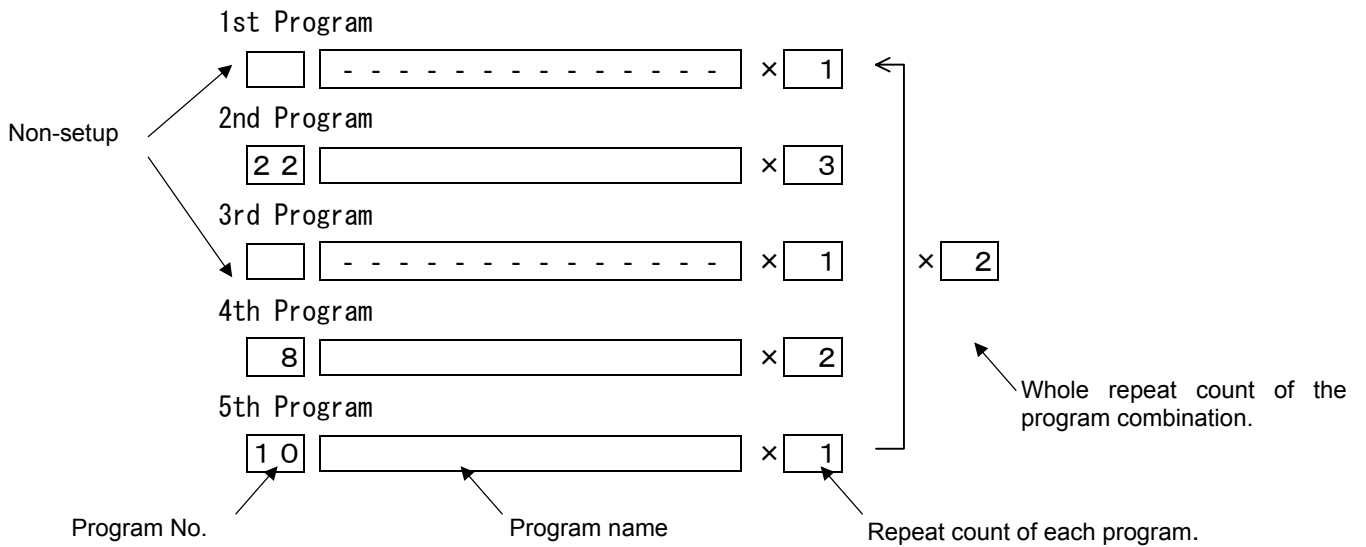
The setting range of the Repeat count of each program and the whole Repeat count is 1-99 times.

Please push after inputting a program name, without forgetting the  key and the  key. If it forgets to push both, it cannot register correctly.

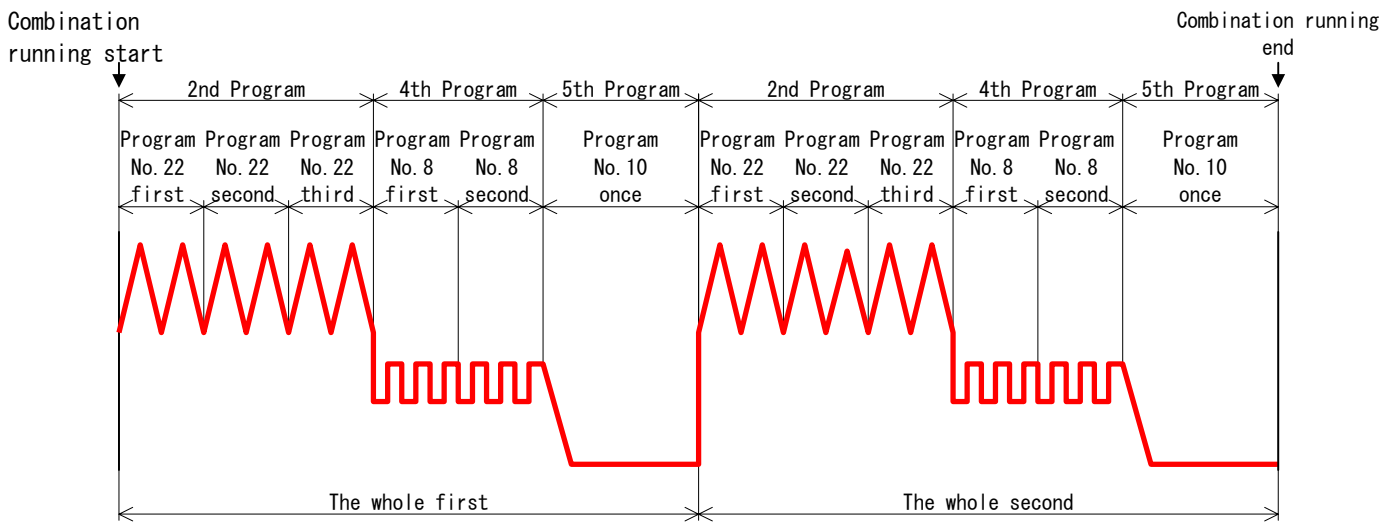
When you do not set up combination, please make it .

A non-set up combination number is disregarded and carries out the next setting program.

But when only one program is set up, the program combination running is not executed.

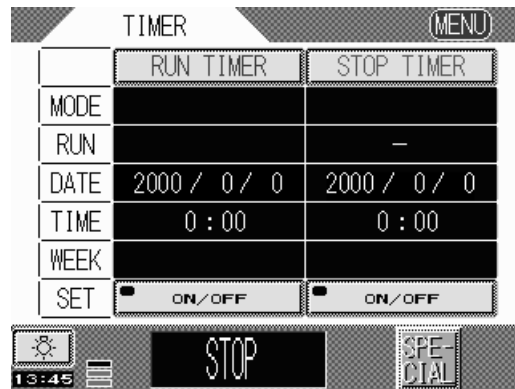


When the above-mentioned is set, the unit will execute the following combination running.



7. Timer Programming

This is used to set operation and stopping of the unit at predetermined times by programming with a timer.



- **MENU** key

Displays the menu screen.

- **RUN TIMER** and **STOP TIMER** key

These display the run timer and stop timer screens.

- **ON / OFF** keys

These are used to enable setting of the run timer and stop timer.

- Run Timer

The set programmed operation or fixed-condition operation begins on the set date, time and day.

The run timer has three modes.

Mode	Description
Once	Operates once at the specified date and time.
Daily	Operates daily at the specified time.
Weekly	Operates weekly at the same time on the specified day.

Notes: • Check unit installation, drain pipe as well as supply of the primary power supply, air and cooling water (for units having water cooling specifications only) prior to starting operation with the run timer.

- In the case the power failure operation (refer to part (2) on Operation Control of section 6 entitled, "Unit Settings") is set to "Resume", check whether the power supply, air supply and cooling water supply (in the case of water cooling) used for the unit have an automatic resume function following a power failure similar to that of this unit before starting operation with the run timer.

- Stop Timer

Operation stops on the set date, time and day. The stop timer has three modes.

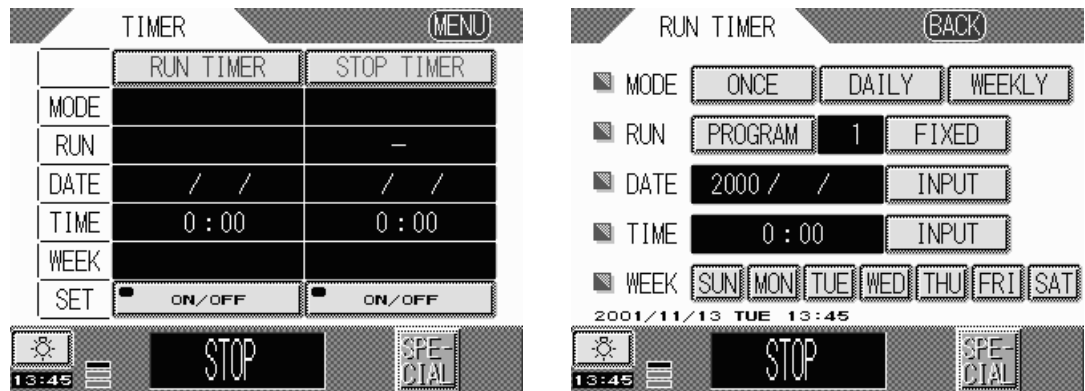
Mode	Description
Once	Stops once at the specified date and time.
Daily	Stops daily at the specified time.
Weekly	Stops weekly at the same time on the specified day.

◆ Setting the Run Timer

The following indicates the procedure for setting the run timer.


When the **RUN TIMER** key is pressed on the timer screen, the screen for setting the run timer is displayed.

Settings can be made from the run timer screen. The following indicates the setting procedure.




The Run Timer screen is displayed when the **RUN TIMER** key is pressed.


(1) Once Mode

- Select the **ONCE** key for the mode.
- In the case of programmed operation, press the **PROGRAM** key, and then enter the program number with the numeric keys.
- In the case of fixed-condition operation, select the **FIXED** key.
- When the **INPUT** key is pressed for the date, numeric keys are displayed. Enter the date on which the unit is to be operated.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be operated.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the run timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.


Notes: • Although the unit can be timer programmed when the date has been set to a past date, it will not operate. Check the current date and reset the date properly.

- Set programmed operation and fixed-condition before setting the timer.
- After entering the desired value, do not forget to press the **REC** key. Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.


(2) Daily Mode

- Select the **DAILY** key for the mode.
- In the case of programmed operation, press the **PROGRAM** key, and then enter the program number with the numeric keys.
- In the case of fixed-condition operation, select the **FIXED** key.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be operated.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the run timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.


Notes: • Set programmed operation and fixed-condition before setting the timer.

- After entering the desired value, do not forget to press the **REC** key. Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.

(3) Weekly Mode

- Select the **WEEKLY** key for the mode.
- In the case of programmed operation, press the **PROGRAM** key, and then enter the program number with the numeric keys.
- In the case of fixed-condition operation, select the **FIXED** key.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be operated.
- Select the **SUN** through **SAT** keys for the day on which the unit is to be operated. More than one day can be selected.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the run timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.

Notes: • Set programmed operation and fixed-condition before setting the timer.

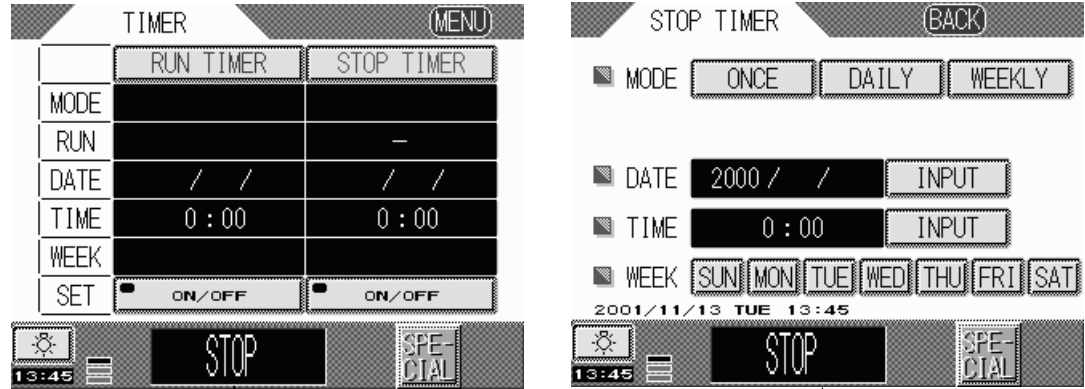
- After entering the desired value, do not forget to press the **REC** key. Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.

◆Setting the Stop Timer

The following indicates the procedure for setting the stop timer.


When the **STOP TIMER** key is pressed on the timer screen, the screen for setting the stop timer is displayed.

Settings can be made from the stop timer screen. The following indicates the setting procedure.




The Stop Timer screen is displayed when the **STOP TIMER** key is pressed.


(1) Once Mode

- Select the **ONCE** key for the mode.
- When the **INPUT** key is pressed for the date, numeric keys are displayed. Enter the date on which the unit is to be stopped.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be stopped.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the stop timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.


Notes: • Although the unit can be timer programmed when the date has been set to a past date, it will not stop. Check the current date and reset the date properly.

- After entering the desired value, do not forget to press the **REC** key. Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.


(2) Daily Mode

- Select the **DAILY** key for the mode.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be stopped.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the stop timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.


Note: • After entering the desired value, do not forget to press the **REC** key.

Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.

(3) Weekly Mode

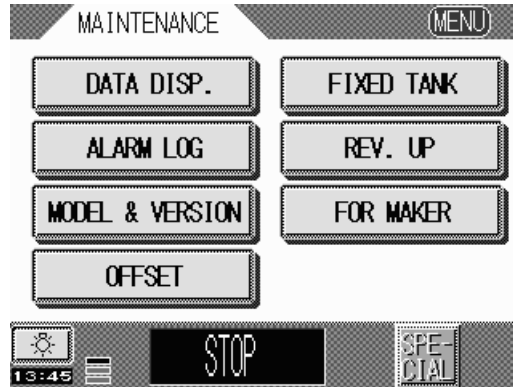
- Select the **WEEKLY** key for the mode.
- When the **INPUT** key is pressed for the time, numeric keys are displayed. Enter the time at which the unit is to be stopped.
- Select the **SUN** through **SAT** day keys for the day on which the unit is to be stopped. More than one day can be selected.
- Press the **BACK** key to display the timer screen.
- Check the settings on the timer screen and then press the **ON / OFF** key of the stop timer. When the **ON/OFF** key is pressed, the  function status icon is displayed on the bottom of the screen, and timer programming is enabled. The timer is canceled when the **ON/OFF** key is pressed again.

Note: • After entering the desired value, do not forget to press the **REC** key.

Entered values are not registered unless the  key and the **REC** key are pressed after they have been entered.

8. Maintenance

This menu screen is for displaying screens that display information relating to unit maintenance.



- **MENU** key
Displays the menu screen.
- **DATA DISP.** key
Displays a screen for displaying the control status of the unit.
- **ALARM LOG** key
Displays a screen for displaying errors (alarm codes) that have occurred in the past.
- **MODEL & VERSION** key
Displays a screen for displaying the model of the unit and the version of the control software.
- **OFFSET** key
Displays a screen for adding and subtracting correction values for measured dry bulb temperature and wet bulb temperature.
- **FIXED TANK** key
Displays a screen for confirming the water level of the fixed tank as well as supplying water to and draining water from the fixed tank manually.
- **REV. UP** key
Displays a screen for loading unit software. This cannot be used by the user.
- **FOR MAKER** key
Displays a screen for entering a password in order to display the For Maker screen. This cannot be used by the user.

Note: The user is unable to change manufacturer settings.

Operation, functions and performance of the unit are not guaranteed if settings have been changed by a person other than manufacturer service personnel.

(1) Data Display

This displays the control status of the unit.

ITEM	TARGET	DATA
DISCHARGE GAS(°C)	0.0	25.0
CONDENSATION (°C)	—	25.0
EVAPORATION (°C)	0.0	25.0
MAIN EXPV.	—	0
INJECTION EXPV.	—	0
CONDENSATION FAN	—	—

DB. 25.0 °C HUMI. 100 %RH WB. 25.0 °C

13:45 STOP SPECIAL

Data Display 1

ITEM	TARGET	DATA
EVAPORATION2 (°C)	0.0	25.0
MAIN EXPV.2	—	0
COMPRESSOR2	—	OFF

DB. 25.0 °C HUMI. 100 %RH WB. 25.0 °C

13:45 STOP SPECIAL

Data Display 2

■ **MENU** key

Displays the menu screen.

■ **BACK** key

Displays the maintenance menu.

■ key

Displays the next screen.

■ key

Displays the previous screen.

ITEM	DATA
HEATING OUT (%)	0
HUMIDIFYING OUT (%)	0
POWER SUPPLY VOLTAGE (V)	200
POWER SUPPLY FREQUENCY (Hz)	60
INVERTER FREQUENCY (Hz)	0
HOUR METER (h)	8

DB. 25.0 °C HUMI. 100 %RH WB. 25.0 °C

13:45 STOP SPECIAL

Data Display 3

● Discharge Gas Temperature

Displays the target value and measured value.

● Condensation Temperature

Displays the target value and measured value.

● Evaporation Temperature

Displays the target value and measured value.

● Main Expansion Valve Pulses

Displays the opening (number of pulses) of the expansion valve that controls the evaporation temperature.

● Condenser Fan Control

Displays the condenser fan control (Hi/Lo)

- Evaporation Temperature 2
Displays the target value and measured value. (Low temperature type only)

- Main Expansion Valve Pulses 2
Displays the opening (number of pulses) of the expansion valve that controls the evaporation temperature. (Low temperature type only)

- Compressor 2
Displays whether the compressor of cycle 2 is operating.

- Heating Heater Output
Displays the output of the heating heater.

- Humidifying Heater Output
Displays the output of the humidifying heater.

- Power Supply Voltage
Displays the primary side power supply voltage supplied to the unit.

- Power Supply Frequency
Displays the frequency of the primary side power supply supplied to the unit.

- Inverter Frequency
Displays the inverter output frequency for cycle 1.

- Cumulative Operating Time
Displays the total number of hours the unit has been operated.
(The reset function is not provided)

(2) Alarm Log

This displays the alarm codes of errors that have occurred in the past along with their dates and times.

Logs can be displayed for a maximum of 100 alarm codes. When the number of alarm codes retained in the alarm log exceeds 100, the oldest alarm code is deleted from the log. The newest alarm code is stored as log no. 1.

The explanations of Alarm Code are written in “11. Alarm Codes, Descriptions and Corrective Actions” (page 51)



- **MENU** key

Displays the menu screen.

- **BACK** key

Displays the maintenance screen.

- key

Displays the log of the previous page (previous 10 alarm codes).

- key

Displays the log of the next page (next 10 alarm codes).

Note: Alarm Log is stored Information Code, also.

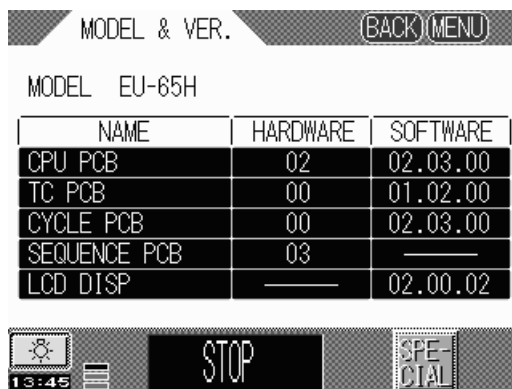
Information Code is different from Alarm Code, and informs you of event what might occur the unit trouble or aggravate the operational environment.

Below is Information Codes and their substance.

Information Code	Substance
I84	A momentary power failure of less than one second has occurred
I85	A momentary power failure of less than two second has occurred.
I86	A power failure of more than two second has occurred.

(3) Model and Version Display

This displays the model of the unit, hardware version of the control board and version of the control software.



- **MENU** key

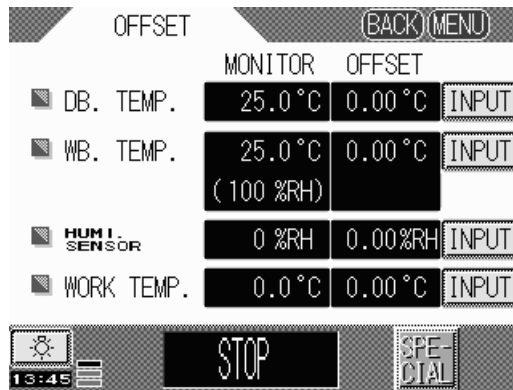
Displays the menu screen.

- **BACK** key

Displays the maintenance screen.

(4) Offset

This adds and subtracts correction (-2.00 ~ +2.00) values for measured dry bulb temperature and wet bulb temperature.



■ **MENU** key

Displays the menu screen.

■ **BACK** key

Displays the maintenance screen.

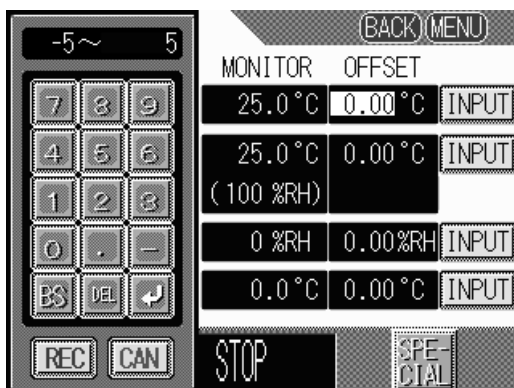
■ **INPUT** key

Displays numeric keys for entering correction values for dry bulb temperature and wet bulb temperature.


- Notes:
- The offset settings do not constitute calibration. When calibration is required, please contact the dealer where the unit was purchased or a service center.
 - When offset settings have been made, performance may deviated from the calibration guaranteed by the manufacturer.

● Entry of Correction Values

Values are entered for correcting the dry bulb temperature or wet bulb temperature.



Numeric keys are displayed when the **INPUT** key is pressed. Set the correction value for the dry bulb temperature or wet bulb temperature with the numeric keys.

Enter a value that is within the input range displayed above the numeric keys. If a value is entered that is outside this range and the  is pressed, a beeping error tone sounds and that number is not entered.

After entering the desired value, do not forget to press the  key and the **REC** key.

Entered values are not registered unless the **REC** key is pressed after they have been entered.

The numeric keys are no longer displayed after a value has been registered.

Press the **CAN** key to discontinue value entry. The numeric keys are no longer displayed and the entered value returns to its original setting.

(5) Fixed Tank

The water level of the fixed tank can be confirmed, and water can be supplied or drained from the fixed tank manually.



■ **MENU** key

Displays the menu screen.

■ **BACK** key

Displays the maintenance screen.

■ **SUPPLY** key

Supplies water to the fixed tank. This can only be performed while the unit is running.

■ **DRAIN** key

Drains water from the fixed tank. This can only be performed while the unit is stopped.

● Procedure for Supplying Water

Water is supplied to the fixed tank while the unit is operating. Press the **SUPPLY** key.

A confirmation window is displayed. Press the **YES** key when ready. Water begins to be supplied to the fixed tank.

● Procedure for Draining Water

Water is drained from the fixed tank while the unit is stopped. Press the **DRAIN** key.

A confirmation window is displayed. Press the **YES** key when ready. Water begins to be drained from the fixed tank.

(6) Detailed Settings (For Maker)

When the **FOR MAKER** key is pressed on the maintenance screen, the password entry screen shown below is displayed. This screen is for entering a password for displaying the For Maker screen. This screen cannot be used by the user.

Press the **BACK** key or the **CAN** key. The maintenance screen is displayed.

Note: The user is unable to change manufacturer settings.

Operation, functions and performance of the unit are not guaranteed if settings have been changed by a person other than manufacturer service personnel.



■ **CAN** key

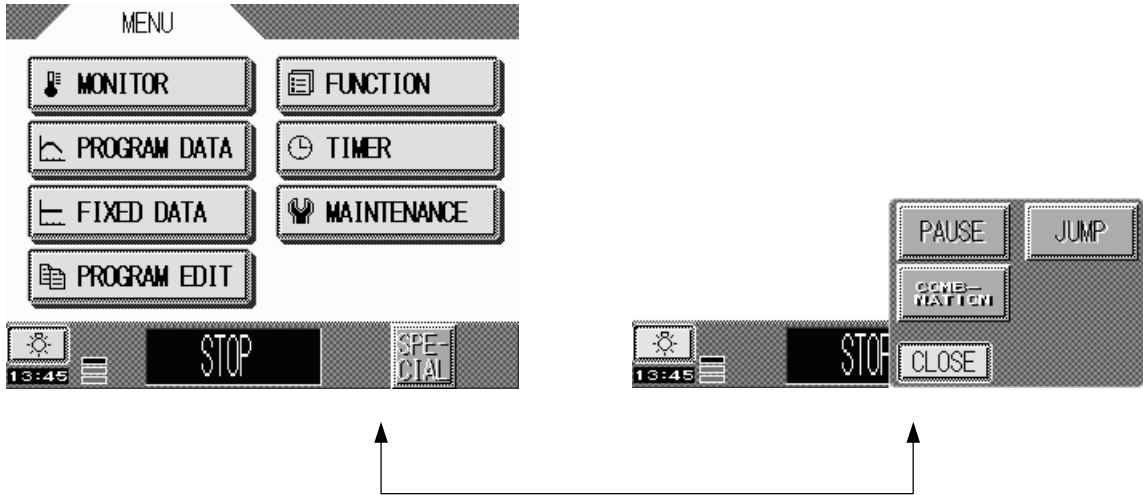
Interrupts password entry and displays the maintenance screen.

9. Special Operations

The following provides an explanation of the **SPECIAL** key displayed in the lower right corner of the screen.

Keys for performing operations other than running and stopping are set with the **SPECIAL** key.

When the **SPECIAL** key is pressed, the Special window is displayed in which various mode keys are arranged. Each of the operations is performed by pressing the respective mode key.



The Special window is displayed when the **SPECIAL** key is pressed.

The Special window is closed when the **CLOSE** key is pressed.

The following indicates the functions of each mode key:

PAUSE : Maintains the status of the unit at the current step when stable during programmed operation (test time is not counted).

JUMP : Jumps a step during programmed operation.

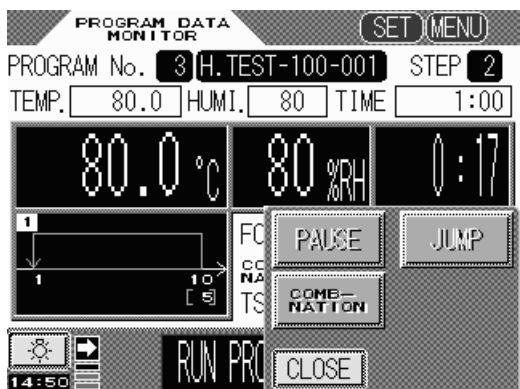
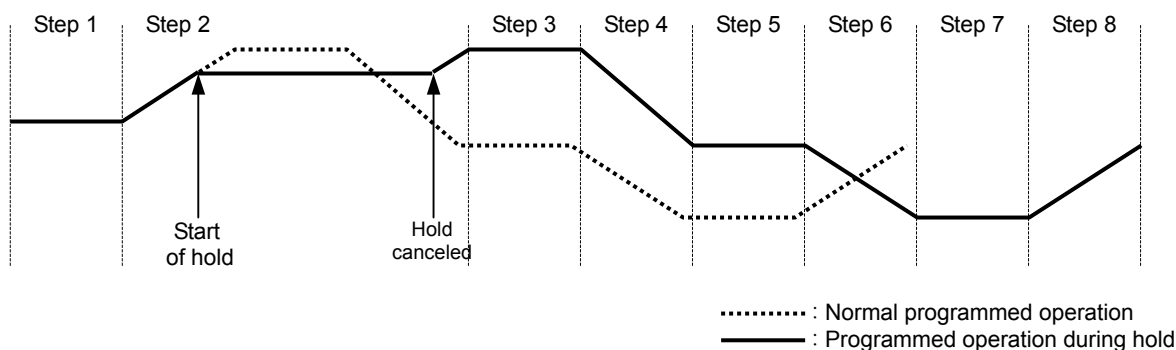
In addition, each mode key is enabled only at the times indicated with circles in the table below. A mode key does not operate when it is disabled even if it is pressed (indicated with an X in the table below).

Status \ Mode key	Stopped	Programmed operation	Fixed-condition operation	Collecting refrigerant	Holding	Defrosting
Hold	×	○	×	×	○	×
Jump	×	○	×	×	×	×

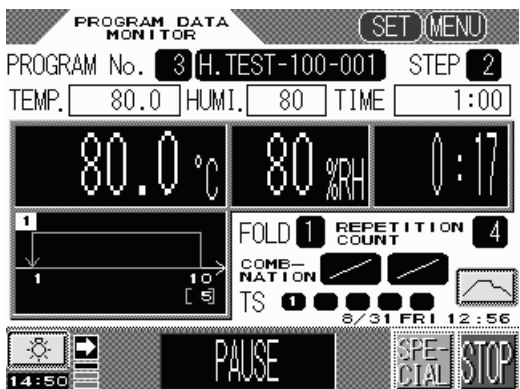
The following indicates the detailed operation of each mode key.

(1) Hold

The current status of the unit can be maintained during programmed operation.



Press the **SPECIAL** key during programmed operation. The Special window is displayed.



Press the **PAUSE** key in the Special window. The Special window is no longer displayed and "Holding" is displayed in the status display.

In the case of canceling hold, press the **SPECIAL** key and then press the **PAUSE** key in the Special window by following the same procedure.

"Programmed Operation" is displayed in the status display and programmed operation continues.

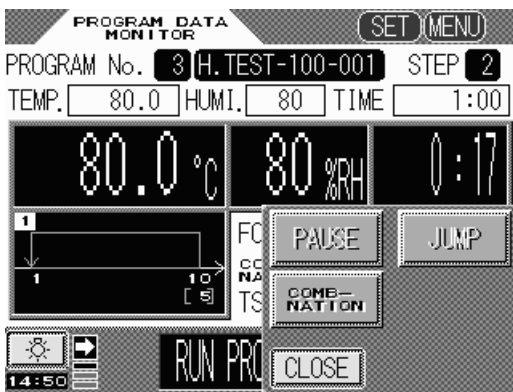
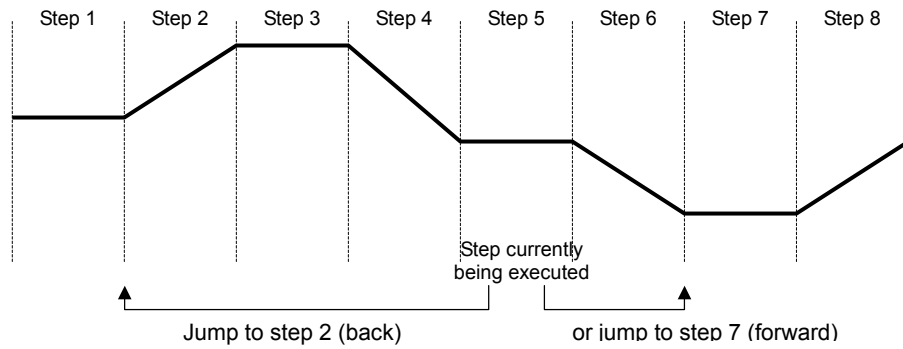
Notes: • During holding, counting of test time stops. Counting is resumed when hold is canceled.

- The **PAUSE** key can only be operated during programmed operation.

(2) Jump

This makes it possible to jump a step during programmed operation.

A set step can be jumped over or operation can be made to jump back to a completed step.



Press the **SPECIAL** key during programmed operation. The Special window is displayed.



Press the **JUMP** key in the Special window. The Special window is no longer displayed and the Jump window is displayed.

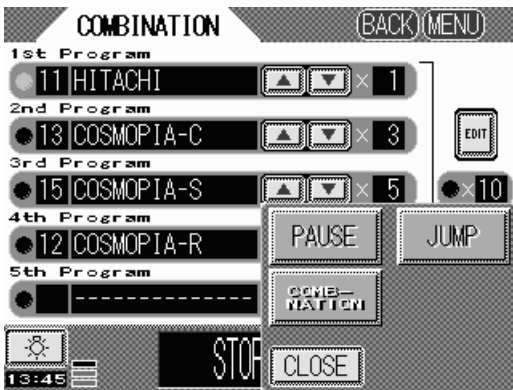
Note: The **START** key is only enabled during programmed operation.

Select the step where the jump is to start with the **◀** and **▶** keys. (It is also possible to return to a previous step.) After selecting the step, press the **REC** key. The Jump window is no longer displayed and the selected step is executed.

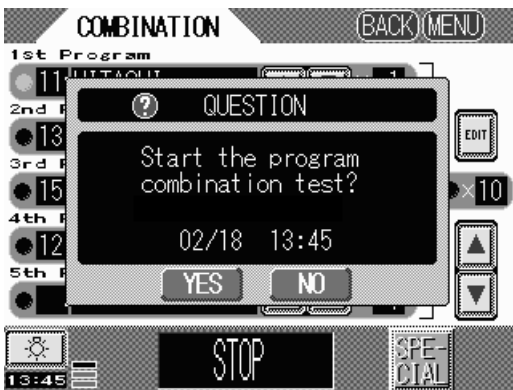
In the case of canceling the jump operation, press the **CAN** key. The Jump window is no longer displayed and operation continues from the step being executed.

(3) Combination

The current status of the unit can be maintained during programmed operation.

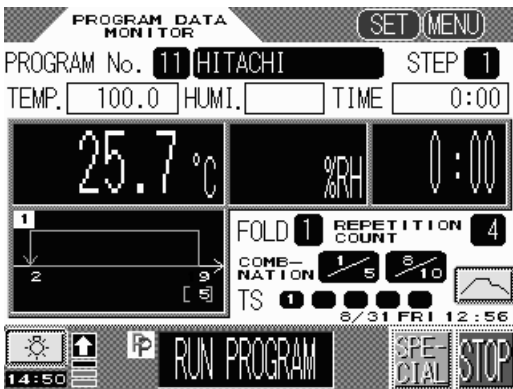


Press the **SPECIAL** key after setting the combination program.
The Special window is displayed.



In the case of running, press the **OK** key.

In the case of discontinuing, press the **CAN** key.



Displayed the function icon 『 P 』 during the program combination running.



The cursor of the currently running program blinks.

Note: Can't set the combination during the running.

1 0. Run, Stop and Test Completion Procedures

This section provides an explanation of the procedures test running, stopping and shutdown.

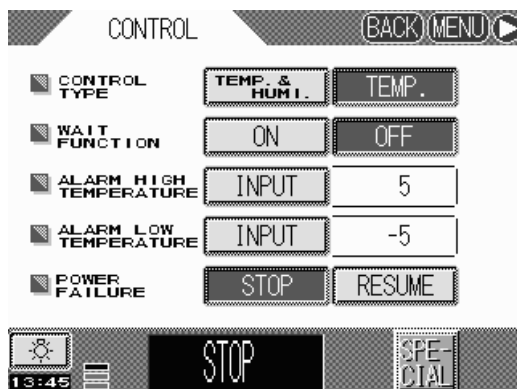
(1) Fixed-Condition Operation

The following provides an explanation of the operating procedure for fixed-condition operation.



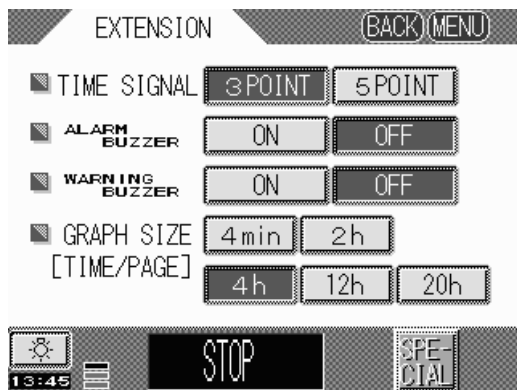
Set the operating mode.

Refer to part (1) on Capacity in section 6 entitled "Unit Settings" for a detailed description.



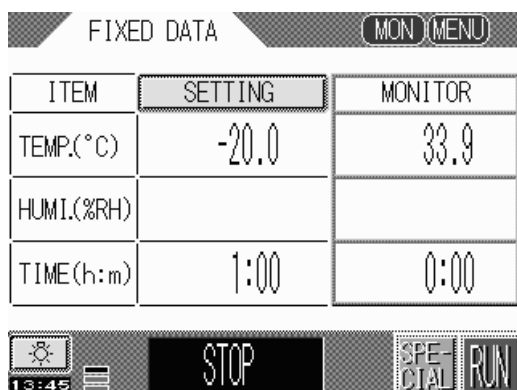
Set each of the parameters of operation control.

Refer to part (2) on Control in section 6 entitled "Unit Settings" for a detailed description.



Set each of the parameters for the extension functions.

Refer to part (3) on Extension Function in section 6 entitled "Unit Settings" for a detailed description.



Press the **FIXED DATA** key on the menu screen to display the fixed data screen.

Set the temperature (humidity) and time for testing.

Refer to section 4 entitled "Test Settings" for a detailed description.

When all settings have been completed, press the **RUN** key.

Note: The **RUN** key is only displayed on the fixed data and program data screens.



A confirmation window is displayed.

Press the **YES** key when ready.

In the case of not operating the unit, press the **NO** key.

The confirmation window is no longer displayed.

When the **YES** key of the confirmation window is pressed, the confirmation window is no longer displayed and the unit begins fixed-condition operation.

Note: • Check that unit installation and drain piping work have been completed, and that the primary side power supply, pure water (for humidity control) and cooling water (for water cooling specifications only) are being supplied before starting operation.

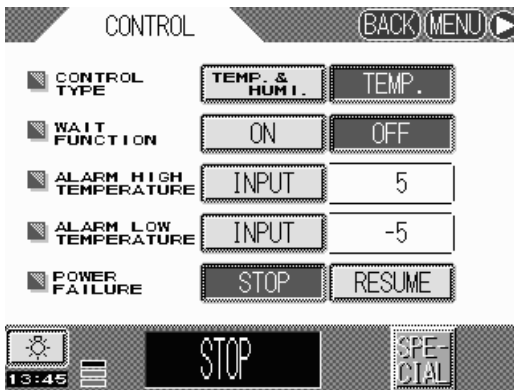
(2) Programmed Operation

The following provides an explanation of the operating procedure for programmed operation.



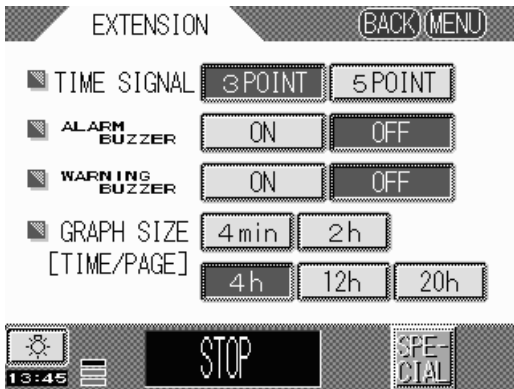
Set the operating mode.

Refer to part (1) on Capacity in section 6 entitled "Unit Settings" for a detailed description.



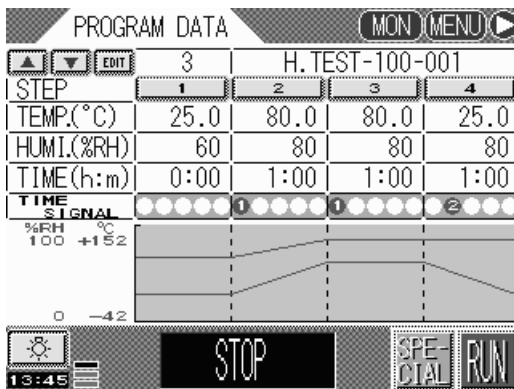
Set each of the parameters of operation control.

Refer to part (2) on Control in section 6 entitled "Unit Settings" for a detailed description.



Set each of the parameters for the extension functions.

Refer to part (3) on Extension Function in section 6 entitled "Unit Settings" for a detailed description.



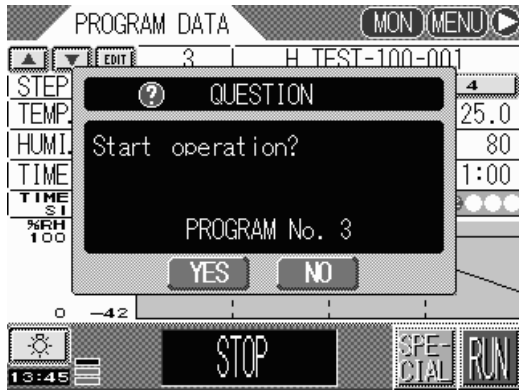
Press the **PROGRAM DATA** key on the menu screen to display the program data screen.

Set the program (temperature (humidity), time and repetitions) for performing testing.

Refer to section 4 entitled "Test Settings" for a detailed description.

When all settings have been completed, press the **RUN** key.

Note: The **RUN** key is only displayed on the fixed data and program data screens.

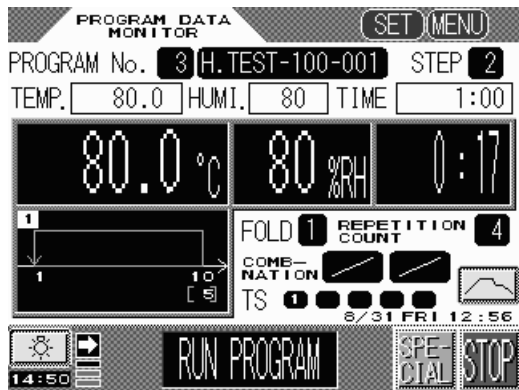


A confirmation window is displayed.

Press the **YES** key when ready.

In the case of not operating the unit, press the **NO** key.

The confirmation window is no longer displayed.

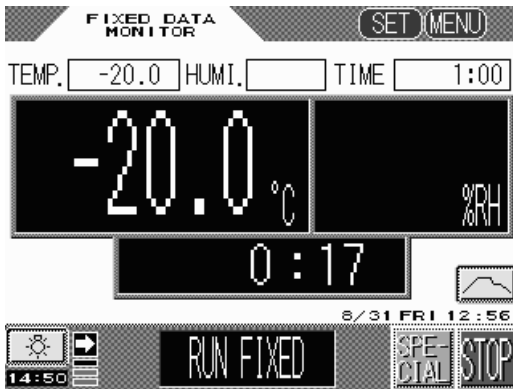


When the **YES** key of the confirmation window is pressed, the confirmation window is no longer displayed and the unit begins programmed operation.

Note: • Check that unit installation and drain piping work have been completed, and that the primary side power supply, pure water (for humidity control) and cooling water (for water cooling specifications only) are being supplied before starting operation.

(3) Stopping

The following provides an explanation of the operating procedure for interrupting operation during testing.



Press the **STOP** key.

Note: The **STOP** key is displayed on any screen provided the unit is running.

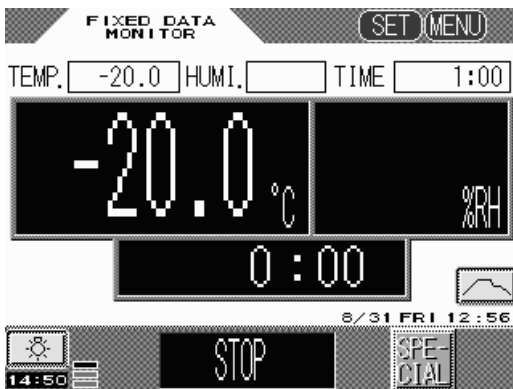


When the **STOP** key is pressed, a confirmation window is displayed.

In the case of stopping the unit, press the **YES** key.

In the case of not stopping the unit, press the **NO** key.

The confirmation window is no longer displayed and the unit continues to run.



When the **YES** key of the stop confirmation window is pressed, the **STOP** key is no longer displayed, and in the case the refrigerating unit is operating, the unit begins the refrigerant collection operation. "Collecting Refrigerant" is displayed in the status display at that time. When collection of refrigerant is completed, the unit stops and "Stopped" is displayed in the status display.

- Notes:
- In the case of stopping the unit while the refrigerating unit is operating, operation for collecting refrigerant within the evaporator is performed for about 10-30 seconds, after which the unit stops. Thus, the unit may not stop immediately even when the stop operation has been performed. Furthermore, while the unit is collecting refrigerant, "Collecting Refrigerant" is displayed in the unit status and a portion of the LED indicator lamp flashes (green), notifying the user that the unit is collecting refrigerant.
 - In the case the fan delay function is set to "ON", only the fan will continue to operate after the stop operation has been performed.
 - When the program drive is stopped on the way, and driven again,) becomes a drive from the first step.

(4) Test Completion Display

The following provides an explanation of the test completion display.



When testing is completed, a message window is displayed to notify the user that testing has ended.

This message window is no longer displayed when the **OK** key is pressed.

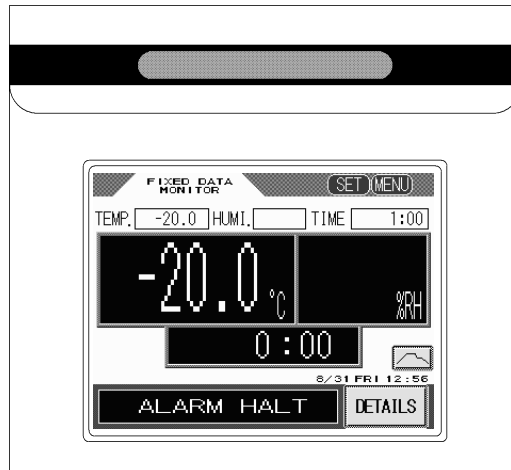
1 1 . Alarm Codes, Descriptions and Corrective Actions

This section provides an explanation of alarm displays and warning displays that occur during testing.

(1) Alarm Displays

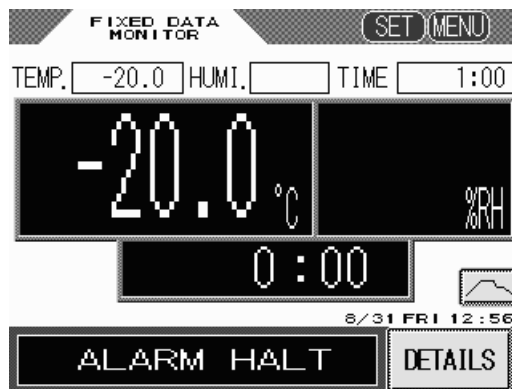
Unit operation is stopped when an error has occurred (been detected) in the unit during operation.

An indicator lamp on the unit instrument panel flashes in red. At this time, if the alarm buzzer is set to ON in the extension function settings, the buzzer sounds to notify the user that an alarm has occurred.



The display on the LCD touch panel is as shown below when an alarm occurs.

- ① When an alarm occurs, "Alarm Halt" and the **DETAILS** key are displayed at the bottom of the LCD touch panel.



- ②When the **DETAILS** key is pressed, a screen is displayed that displays the alarm code, a description of the error and corrective actions. In the case the alarm buzzer is sounding, the buzzer can be stopped by pressing the **DETAILS** key.



- ③Some of the screens on which the alarm code, error description and corrective actions are displayed contain a **RES** (Reset) key and some do not.
- In the case the screen does not contain a **RES** key, turn off the leakage breaker and remove the cause of the alarm in accordance with the corrective action.
 - In the case the screen contains a **RES** key, press the **RES** key and remove the cause of the alarm in accordance with the corrective action.

Refer to the List of Alarms of Table 1 for details regarding alarm codes, descriptions and corrective actions taken.

Note: Alarm displays (detection) are only displayed while the unit is running.

The following indicates alarm codes, their descriptions and corresponding corrective actions.

Table 1 List of Alarms

Alarm Code	Name of Alarm	Description	Corrective Actions
A 0 1	Refrigerating unit 1 high-pressure alarm	The high-pressure cutoff switch (63H) has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and check the ambient temperature and soiling of the condenser. • Contact a service representative if the alarm persists after resuming operation.
A 0 2	Refrigerating unit 2 high-pressure alarm	The high-pressure cutoff switch (63H) has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and check the ambient temperature and soiling of the condenser. • Contact a service representative if the alarm persists after resuming operation.
A 0 3	Dry bulb sensor alarm	The dry bulb sensor has become disconnected or short-circuited.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 0 4	Wet bulb sensor alarm	The wet bulb sensor has been disconnected or short-circuited.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 0 7	TC board setting alarm	The set temperature is outside the allowed range.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 0 8	Testing chamber temperature alarm	The temperature in the testing chamber has exceeded the temperature rise protection temperature.	<ul style="list-style-type: none"> • Press RES. The display returns to the menu screen. • Check the temperature rise protection temperature. • Contact a service representative if the alarm persists after resuming operation.
A 0 9	Testing chamber temperature alarm	The temperature in the testing chamber has exceeded the temperature fall protection temperature.	<ul style="list-style-type: none"> • Press RES. The display returns to the menu screen. • Check the temperature fall protection temperature. • Contact a service representative if the alarm persists after resuming operation.
A 1 6	Evaporation temperature thermistor alarm	The evaporation temperature thermistor (THM1) has been disconnected or short-circuited.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 1 7	Discharge temperature thermistor alarm	The discharge temperature thermistor (THM2) has been disconnected or short-circuited.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 1 9	Condensation temperature thermistor alarm	The condensation temperature thermistor (THM3) has been disconnected or short-circuited.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.

Alarm Code	Name of Alarm	Description	Corrective Actions
A 2 1	Discharge/condensation temperature difference alarm	The difference between the discharge temperature and condensation temperature is outside the allowable range.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 2 2	Discharge temperature alarm	The discharge temperature has exceeded the allowable value.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 2 3	Evaporation temperature alarm	The evaporation temperature is outside the allowable range.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 2 4	Condensation temperature alarm	The condensation temperature is outside the allowable range.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 2 5	Evaporation temperature alarm 2	Evaporation temperature 2 is outside the allowable range.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.

Alarm Code	Name of Alarm	Description	Corrective Actions
A 4 0	Inverter communication alarm	An error has occurred in communication with the inverter.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 1	Inverter alarm	An error has occurred in the internal system of the inverter.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 2	Inverter overload	The inverter overload protection function has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 3	Inverter overheating	The inverter overheating protection function has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 4	Inverter overvoltage	The inverter overvoltage protection function has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 5	Inverter overcurrent	The inverter overcurrent protection function has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 4 6	Inverter undervoltage	The inverter undervoltage protection function has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.

Alarm Code	Name of Alarm	Description	Corrective Actions
A 5 1	Heater alarm	The heater temperature protection device (26H, FH) has been activated.	<ul style="list-style-type: none"> • Press RES. The display returns to the menu screen. • Contact a service representative if the alarm persists after resuming operation.
A 5 2	Humidifier alarm	The humidifier temperature protection device (26Hu) has been activated.	<ul style="list-style-type: none"> • Press RES. The display returns to the menu screen. • Contact a service representative if the alarm persists after resuming operation.
A 5 3	Chamber fan alarm	The chamber fan overload protection device (49FE) has been activated.	<ul style="list-style-type: none"> • Press RES. The display returns to the menu screen. • Contact a service representative if the alarm persists after resuming operation.
A 5 5	Compressor 1 overcurrent alarm	The chamber fan overload protection device (51C) has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and press the reset switch of the overcurrent protection device (51C) inside the control panel. • Check the ambient temperature and soiling of the condenser. • Contact a service representative if the alarm persists after resuming operation.
A 5 6	Compressor 2 overcurrent alarm	The chamber fan overload protection device (51C) has been activated.	<ul style="list-style-type: none"> • Turn off the leakage breaker and press the reset switch of the overcurrent protection device (51C) inside the control panel. • Check the ambient temperature and soiling of the condenser. • Contact a service representative if the alarm persists after resuming operation.
A 5 7	Heater fuse blown	The overcurrent protection fuse (F1) has blown.	<ul style="list-style-type: none"> • Turn off the leakage breaker and either replace the fuse (F1) inside the control panel or contact a service representative.
A 5 8	Humidifier fuse blown	The overcurrent protection fuse (F2) has blown.	<ul style="list-style-type: none"> • Turn off the leakage breaker and either replace the fuse (F2) inside the control panel or contact a service representative.
A 5 9	100V fuse blown	The protection fuse of the 100V circuit (EF1) has blown.	<ul style="list-style-type: none"> • Turn off the leakage breaker and either replace the fuse (EF1) of the sequence board (PWB5) inside the control panel or contact a service representative.
A 6 0	Board configuration alarm	There is an error in the board configuration.	<ul style="list-style-type: none"> • Turn off the leakage breaker and contact a service representative.
A 6 1	Inter-board communication alarm	There is a communication error between the CPU board and the LCD touch panel.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 6 2	Inter-board communication alarm	There is a communication error between the CPU board and the TC board.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 6 3	Inter-board communication alarm	There is a communication error between the CPU board and the cycle board.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.

Alarm Code	Name of Alarm	Description	Corrective Actions
A 6 4	Inter-board communication alarm	There is a communication error between the cycle board and the sequence board.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 6 5	DC12V power supply alarm	An error has been detected in the DC12V power supply.	<ul style="list-style-type: none"> • Turn off the leakage breaker and then turn it back on again after waiting at least 5 seconds. • Contact a service representative if the alarm persists after resuming operation.
A 7 0	Wick pan water supply alarm	An error has occurred that prevents water from being supplied to the wick pan.	<ul style="list-style-type: none"> • Turn off the leakage breaker and check the water in the wick pan and disconnection of hoses. • Contact a service representative if the alarm persists after resuming operation.
A 7 1	Humidifier pan water supply alarm	An error has occurred that prevents water from being supplied to the humidifier pan.	<ul style="list-style-type: none"> • Turn off the leakage breaker and check that the discharge valve is closed. In addition, check the water in the humidifier pan and disconnection of hoses. • Contact a service representative if the alarm persists after resuming operation.
A 7 2	Automatic water supply alarm (Only for the option specification)	An error has occurred in the automated supply of water.	<ul style="list-style-type: none"> • Turn off the leakage breaker and check the supply water pressure and disconnection of hoses. • Contact a service representative if the alarm persists after resuming operation.
A 8 0	Reversed phase alarm	A phase reversal has been detected in the power supply.	• Turn off the leakage breaker and check the phases of the power supply.
A 8 1	Missing phase alarm	A missing phase has been detected in the power supply.	• Turn off the leakage breaker and check each phase of the power supply.
A 8 2	Overvoltage alarm	The power supply voltage has exceeded ※ V.	• Turn off the leakage breaker and check the voltage of the power supply.

Note :

The power supply voltage	※
2 2 0 V	2 7 5 V
3 8 0 V	4 7 5 V

However, the screen display is displayed as 2 5 0 V.

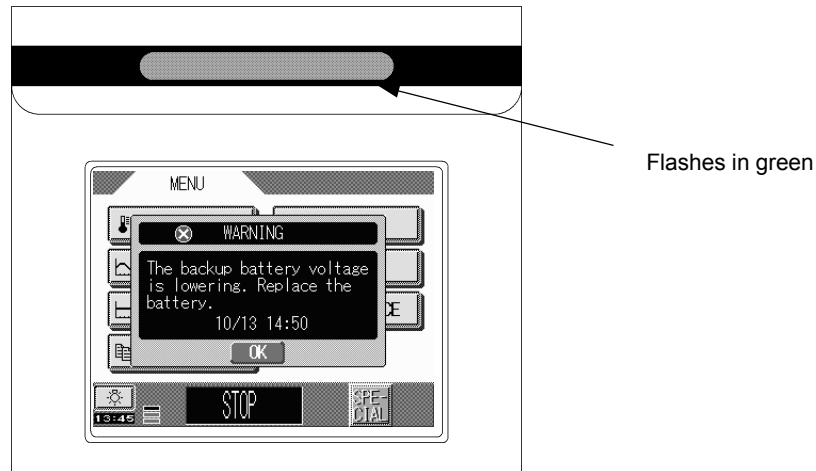
Below is Information Code and their substance.

Information Code	Code Name	Substance	Check Points
I84	THE INSTANT POWER FAILURE	A momentary power failure of less than one second has occurred	Check Power Supply. Confirm that other utility is normal. (Cooling water, Subsidiary units, Power supply of the Specimens Etc...)
I85	THE INSTANT POWER FAILURE	A momentary power failure of less than two second has occurred.	
I86	A LONG POWER FAILURE	A power failure of more than two second has occurred.	

Note: Information Code is not Alarm and informs you of event what might occur the unit trouble or aggravate the operational environment.

(2) Warning Displays

Warning displays refer to a function that notifies the user of a warning before an error occurs during the course of unit operation. When a warning occurs, an indicator lamp on the unit instrument panel flashes in green. At this time, if the alarm buzzer is set to ON in the extension function settings, the buzzer sounds to notify the user that a warning has occurred.



The display on the LCD touch panel is as shown below when a warning occurs.

- ① When a warning occurs, a Warning window is displayed in the center of the LCD touch panel.



- ② The Warning window is no longer displayed when the **OK** key is pressed. Although operation can be continued in the case the unit is running, an alarm may occur causing the unit to stop running depending on the type of warning.

If the warning buzzer is sounding, it can be stopped by pressing the **OK** key.

The following indicates a list of warning displays and their corresponding corrective actions.

Table 2 List of Warnings

Description	Corrective Action
Please replenish the water supply tank with pure water. Please push the 【OK】 after replenishes .	Please replenish the water supply tank with pure water. (Please replenish both of the product of applying 2 pieces in the water supply tank.)
The voltage of the data backup battery has dropped. Promptly replace the battery.	Replace the data backup battery on the control board installed inside the control panel.

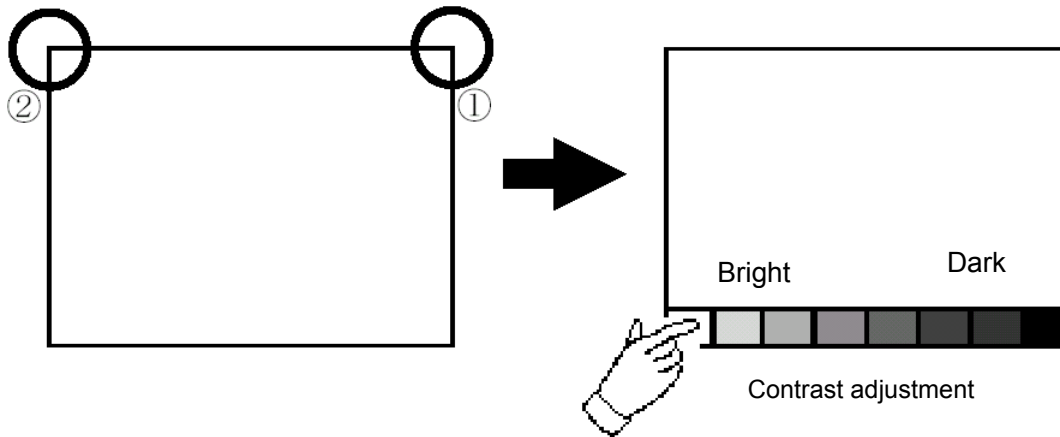
Note: Always make sure to turn off the leakage breaker when taking corrective actions in response to a warning display.

1 2. LCD Touch Panel Contrast and Brightness Adjustment

The following provides an explanation of the procedures for adjusting the contrast and brightness of the LCD touch panel.

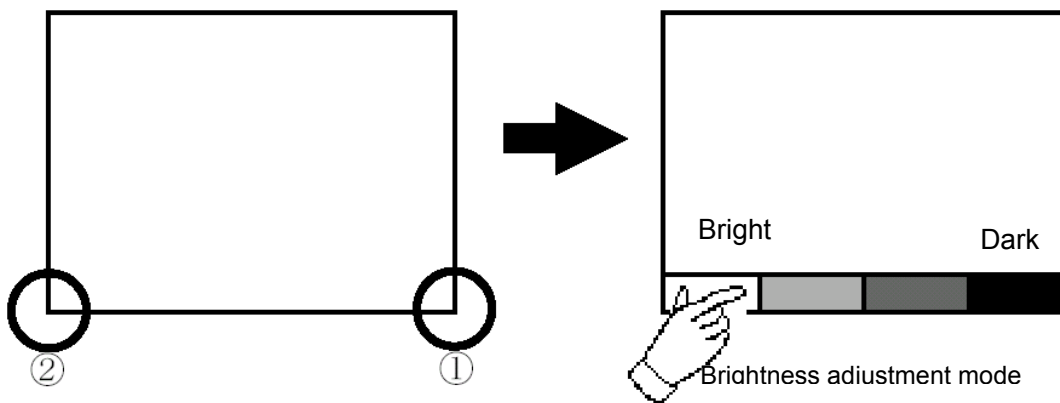
● Contrast adjustment

To enter the contrast adjustment mode, press the upper left corner (2) of the LCD touch panel while pressing the upper right corner (1).



● Brightness adjustment

To enter the brightness adjustment mode, press the lower left corner (2) of the LCD touch panel while pressing the lower right corner (1). Touching the left side of the display increases brightness, while touching the right side decreases brightness. Brightness can be selected from among one of four levels.



Amplification

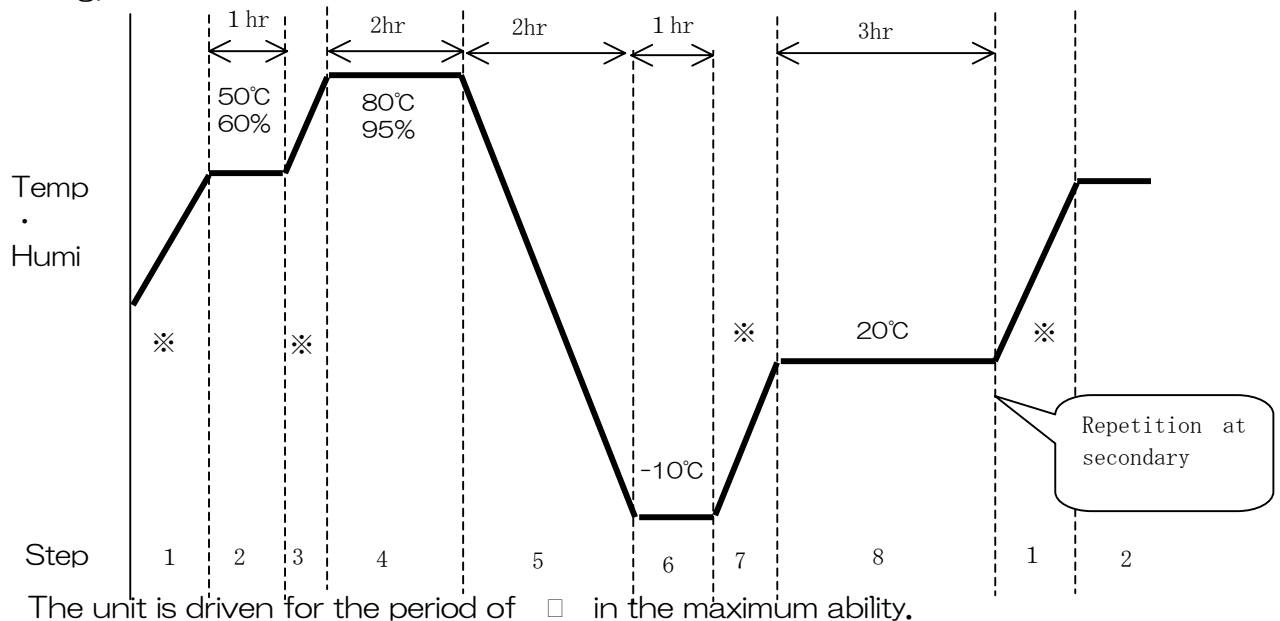
1. Example of program input data

1. 50□/60% for 1 hour
2. 80□/95% for 2 hour (time signal 2 ON)
3. Descent for 2 hour from 80□/95% to -10□
4. -10□ for 1 hour (time signal 1 ON)
5. 20□ for 3 hour

}

This content is executed five times.

When this test program is assumed to be an example, the test pattern becomes the following.



The content of the input data becomes the following.

Step	Temp	Humi	Time	time signal	Repetition	Content of drive
1	50	60	0.00		first step	Rises to 50□/60% by maximum ability.
2	50	60	1.00			Constant test with 50□/60%
3	80	95	0.00			Rises to 80□/95% by maximum ability
4	80	95	2.00	2		Constant with 80□/95%(time signal2 ON)
5	-10	0	2.00			Descent to -10□ for 2 hour.
6	-10	0	1.00	1		Constant test with -10□(time signal 1 ON)
7	20	0	0.00			Rises to 20□ by maximum ability.
8	20	0	3.00	E(end step)	last step	Constant test with 20□

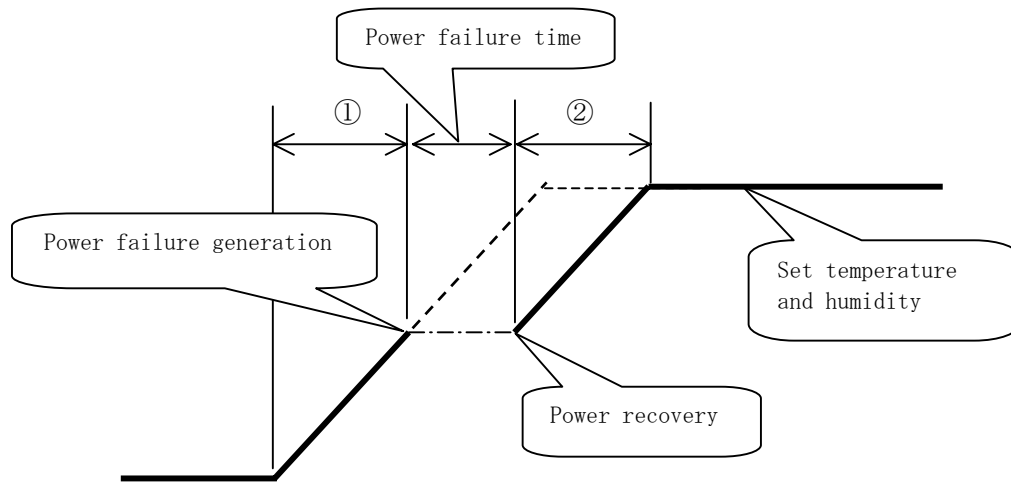
- Wait function is 「ON」.
- IF 0 hour are set, the rise and the descent time become the shortest.
- Execute the wiring connection to the signal terminal when use the time signal.
- Repetition: last step=8, first step=1, Repetition count=4
(Because the execution count is five, set number is four.)

[Note] The first step corresponds to the drive beginning, and the set time provides for the time which reaches the temperature and the humidity set in the first step from a present temperature and humidity. Therefore, the attainment time changes according to a present temperature and humidity.
Please set 0 hour to make the testing temperature/humidity condition early.
The unit shifts to the second step by driving in own maximum ability.

2. Power failure operation

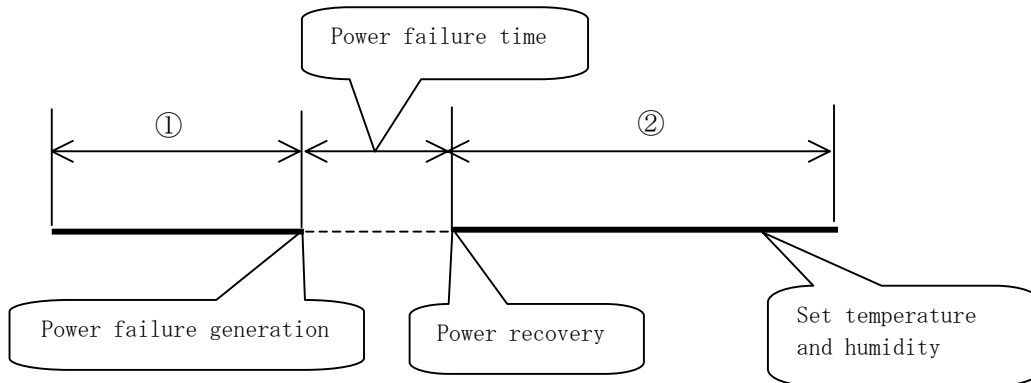
The operation when the power failure is set in 「RESUME」 is explained.
After recovery, the unit continuously runs set data.

(1) Programmed running



①+② becomes set time of the step.

(2) Fixed-condition running



①+② becomes set time .