Chapter 6 Alarms and Troubleshooting

This section describes alarms, other problems, their possible causes, and required actions.

Contact your distributor or ESPEC in the following cases.

- When the chamber does not operate properly even after taking the actions listed here
- When a malfunction occurs for which a "service call" is listed as the solution in the table

6.1 Alarms and actions

⚠ **WARNING**

🚫 **When taking action on the primary side of the breaker (main power switch), be sure to turn off the main power supply switch at your facility. Also, use caution to ensure that power is not supplied accidentally.**

Attempting to solve a problem with the power on can result in electric shock. Use the supplied breaker handle stopper to prevent the breaker from being turned on accidentally.

🚫 **Be sure to turn off the breaker (main power switch) before opening the electrical compartment door or the water circuit box door (heat exhaust chamber door).**

This chamber has functions to sound a buzzer if a problem occurs; perform a self-diagnostic for major malfunctions; and display the malfunction details, cause, and action to take on the instrumentation screen.

The details of the displayed problem are described in the alarm list. Take the appropriate action according to the details listed.
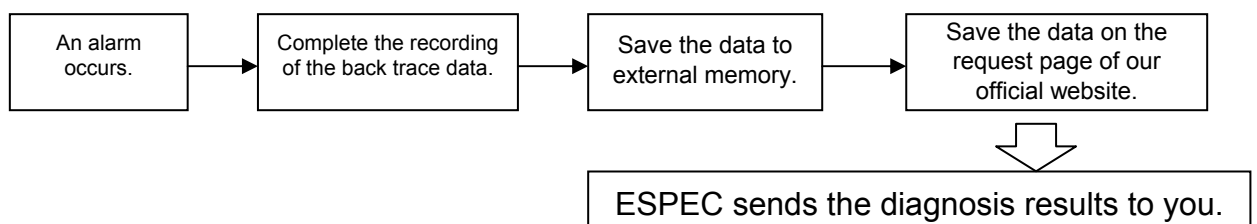
To troubleshoot problems that cannot be detected using the self-diagnostic, see "6.6 Troubleshooting". If the chamber does not operate properly even after taking the actions listed here, contact your distributor or ESPEC.

This chamber is equipped with a back trace function.

You can use the Online Diagnostics Service by sending back trace data to the request page of our official website.

* The Online Diagnostics Service is designed to analyze the cause of failure and provide the customer with the diagnosis result for customers who send the internal data (back trace data) of the chamber before and after the occurrence of an alarm.

Flow of the back trace function

| An alarm occurs. | → | Complete the recording of the back trace data. | → | Save the data to external memory. | → | Save the data on the request page of our official website. |

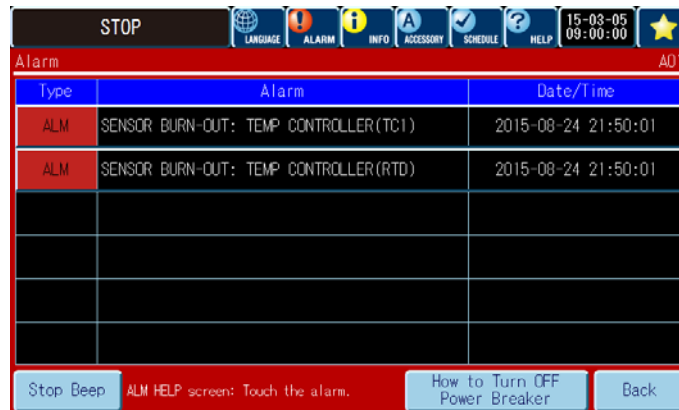ESPEC sends the diagnosis results to you.

If an alarm occurs, the alarm screen below appears automatically and a buzzer sounds. The alarm icon continues to flash until the alarm is canceled.
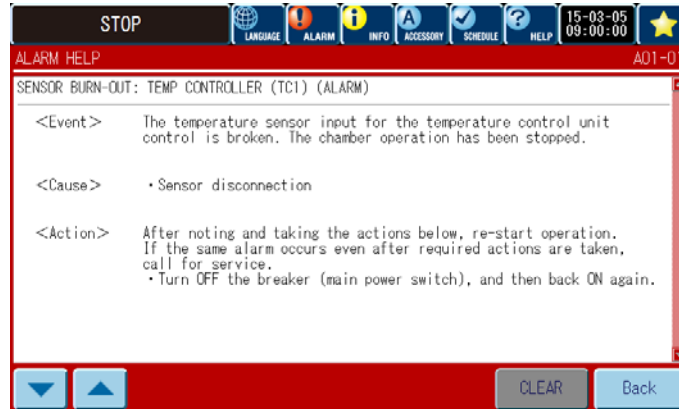
Press [Stop Beep] to stop the buzzer.

Pressing the alarm on the alarm screen displays the alarm details.

Alarm screen

Pressing an alarm displays the alarm help (details), as shown below.

ALARM HELP screen

Notice
Disabling the error buzzer sound or alarm buzzer prevents audible notification and may delay discovery of the error or alarm. Therefore, do not disable these sounds whenever possible. If the buzzer sounds are disabled, notification is only provided by the red flashing operation lamp and alarm screen display, so be careful.

┌───┐
│ ◆ **Reference** ◆   │
├───┤
│ The operation of the alarm and error buzzers can be set using the │
│ maintenance settings and sound settings on the management setting screen. │
└───┘

Alarms and actions to take

Take the following actions when an alarm occurs.
Alarms are divided into errors and alarms, and the action to take can vary.

Error: When the chamber malfunctions or component devices malfunction resulting in an error status

Alarm: When there is no malfunction but operation may become affected, such as a maintenance announcement

┌───┐
│ ◆ **Reference** ◆   │
├───┤
│ • Even if an error occurs, backup operation may enable operation to continue. │
│   Operation continues during an alarm.   │
│ • For details about the alarms, see ☞ "6.5 List of alarms".   │
│ • For the program number and step number when an alarm occurs, check the │
│   Program Operation Details screen before pressing the controller's Power │
│   OFF switch. Once you press the Power OFF switch, the history of the │
│   program number and step number that were being executed when the alarm │
│   occurred will not be displayed.   │
└───┘

① **If an error occurs**

<Procedure>

1) Press [Stop Beep] to stop the buzzer.

2) Refer to the operation manual or the alarm help screen to determine the required action and then perform the action accordingly.

② **If an alarm occurs**

<Procedure>

1) Press [Stop Beep] to stop the buzzer.

2) Refer to the operation manual or the alarm help screen to determine the required action and then perform the action accordingly.

3) Press [Clear] on the alarm help screen.
   Although operation does not stop when an alarm occurs, the alarm cannot be cleared from the alarm screen until the clear operation is performed or the breaker is turned off.
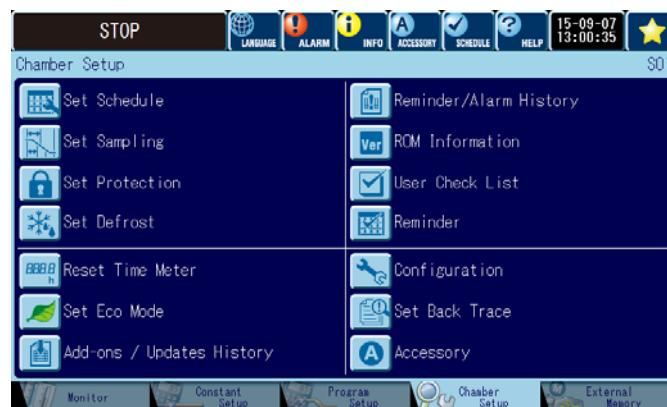
6.2 Alarm history display

The history of alarms that occur can be displayed on the management settings screen.
The current alarm can be viewed on the alarm screen, but once the alarm is canceled, the alarm display disappears. To display a history of alarms that occurred, use the alarm history display below.

<Procedure>

1) Press the Chamber Setup tab.
   On the management settings selection screen, press [Reminder/Alarm History].
   Use the icon on the side menu to select the "Alarm Report" slide label.

2) The alarm history is displayed.

No   : Displays the history number (1 to 100).
Type   : Displays whether the event is an alarm or warning.
Alarm   : Displays the name of the alarm or warning that occurred.
                  Pressing an alarm displays the Alarm Report HELP screen.
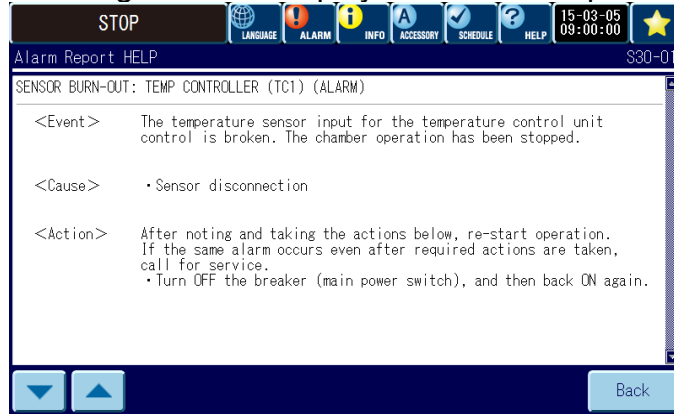
Date   : Displays the date and time the alarm occurred.

               : Use these buttons to select a page.

Seek No.   : Enter a number to jump directly to that alarm or warning.

◆ Reference ◆

- Up to 10 alarms are displayed on a page in order of occurrence, starting with the latest one.
- The history stores up to 100 alarms. If an alarm occurs when there are already 100 alarms in the history, the oldest alarm in the history will be deleted to make room for the new one.

6.3 Back trace function

This chamber automatically records back trace data during operation.
The back trace data contains the temperature/humidity settings, temperature/humidity process values, and control value information of the control items required to control the equipment. If an alarm occurs, the chamber automatically completes the recording of back trace data.
By saving this data on the request page of our official website, you can use our Online Diagnostics Service.

<Procedure>

    1) When an error occurs, the chamber automatically stops the recording of the back trace data. When stopping of recording is complete, the following message appears.
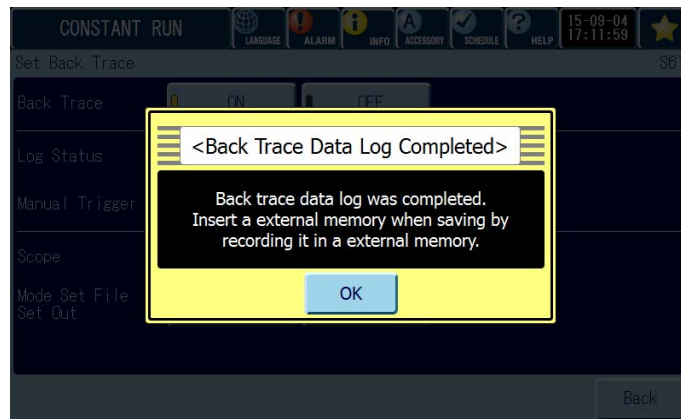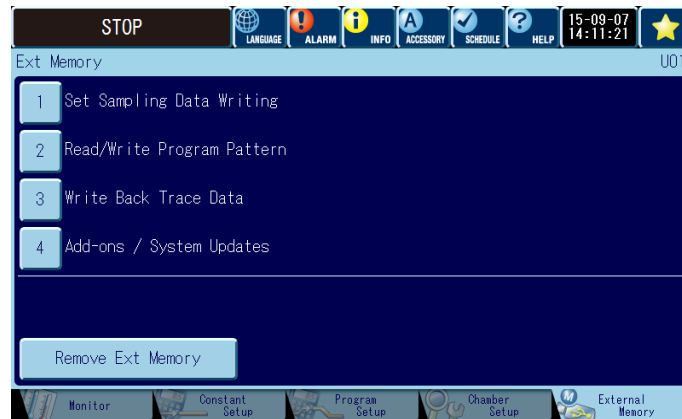

| ◆   **Reference** ◆ |
| --- |
| Resuming back trace recording
Even when data is not saved, if the back trace setting is set to on, recording of back trace data is resumed automatically. |

2) Insert external memory (a USB device) into the external memory port below the instrumentation panel and then press [Write Back Trace Data] on the External Memory tab.

3) On the Write Back Trace Data screen, you can check the [Trigger Time] and [Trigger] details.
   Select the data you want to save.
   * If more than one error occurs, the name of the first error detected by the chamber is displayed.
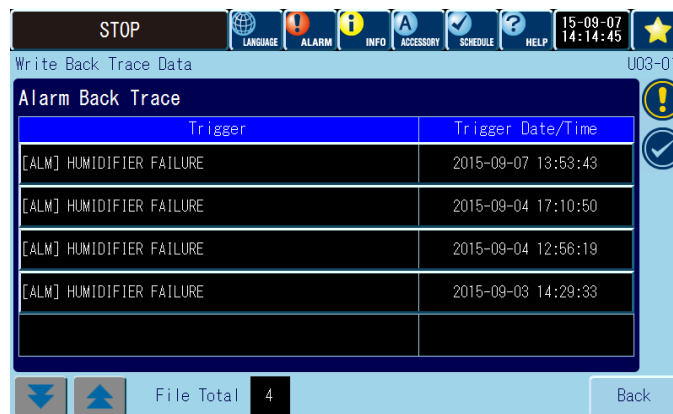
4) Press [Back]. On the External Memory screen, press [Remove Ext Memory]. Remove the external memory device after the message "Remove the memory" appears.
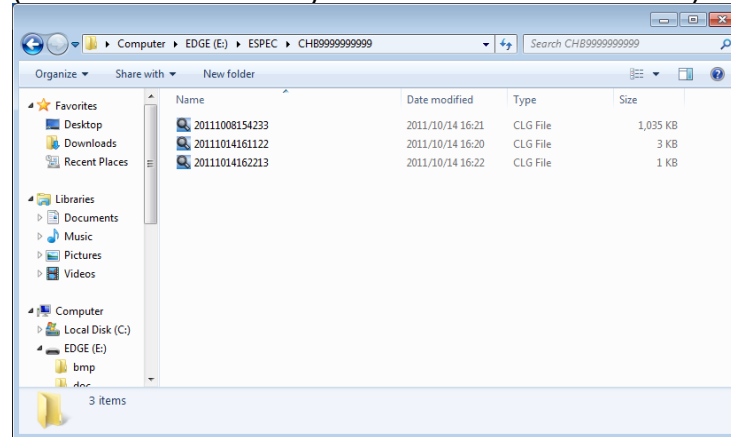
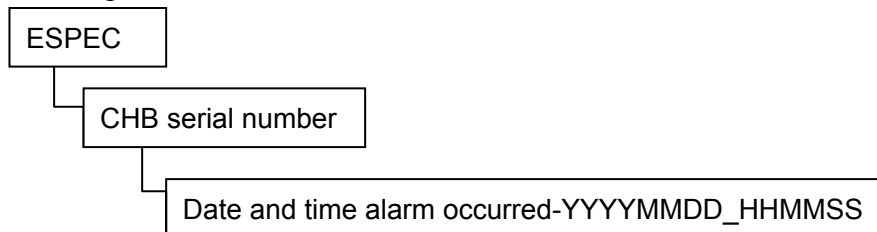| Notice |
| --- |
| **Removing the external memory device without pressing [Remove Ext Memory] first may damage the recorded data saved to the external memory.** |

■ Directory of external memory storage

In the directory that is automatically created in the external memory, three files are stored.

(Data in USB memory viewed from a PC screen)

Folder configuration:

■ Created files

Unzipping the ZIP file creates the following files.

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

Chamber setup and service information:
> Date and time alarm occurred-YYYYMMDD_HHMMSS_c.bts

Operation setup information (constant and program setup):
> Date and time alarm occurred-YYYYMMDD_HHMMSS_p.bts

The numeric part of the file name indicates the date and time.

■ Using the Online Diagnostics Service

Save the files stored in the external memory to the request page of our official website.
ESPEC will send you the diagnosis result.

◆ Reference ◆

<u>All constant operation and program operation data set on the chamber</u> is saved in the operation settings information.
If you cannot submit the "operation settings information" to ESPEC, please send the back trace data (date and time alarm occurred-YYYYMMDD_HHMMSS_t.btd) and the management settings and manufacture maintenance information (date and time alarm occurred-YYYYMMDD_HHMMSS_c.bts).
Or set Mode Set File Set Out of Set Back Trace in Chamber Setup to Off. Operation settings information will not be output.

6.4 Backup operation

This chamber is equipped with a backup function. When the chamber operation setting screen of maintenance settings is set to [On], operations will continue on other normal devices even if an error occurs.

When this is set to [Off], the chamber stops if an error occurs.

Although performance may not be satisfied during backup operation, this function is provided to prevent specimen damage due to a full operation stop and to reduce any lost time due to stopping chamber operation to switch to another test.

The operations of this function when an error occurs are described below so you can understand the backup operation and use the chamber properly.

For details about which error statuses are backed up, see ☞ "6.5 List of alarms".

Backup operations

Error type	When backup operation is [On]	When backup operation is [Off]
Humidifier error	The chamber switches to temperature control operation. Operation continues.	The chamber stops. (The operation state is "program paused" or "constant operation".)
Refrigerator error	The chamber continues operation with the remaining refrigerators. However, the chamber stops when there is only one refrigerator or when all refrigerators stopped abnormally. Depending on the conditions, the refrigerator may not operate.	
Other errors	The chamber stops.	

◆ **Reference** ◆

To set the backup operation mode for when an alarm occurs, see ☞ "Chapter 6. Chamber setup" in the Controller guide.

6.5 List of alarms

Alarms detected by the chamber are categorized as "Warning" and "ALARM".

After taking the recommended action for an alarm categorized as a "Warning," you can use the [Clear] button on the help screen to clear the alarm indication.

When an alarm occurs, view the actions required, perform these actions, and then restart or continue operations.

If an alarm or warning occurs again even after taking action, contact a service representative.

The <option name> is listed for the alarms that occur when the chamber is equipped with an option as well as for the causes and actions to perform for these alarms.

The possible cause and the action vary depending on the equipped options, so check the possible causes and actions for the different options.

For the numbers of alarms that occur with the communication function, see the Operation manual, Network guide.

The entries in the following table are listed alphabetically according to the names of the alarms.

Alarm name	Event	Possible cause	Action
ABSOLUTE HIGH LIMIT: HUMIDITY (WARNING)	Humidifier control is stopped because the test area humidity is greater than the absolute high limit of the humidity alarm. It will remain stopped until the humidity returns within range.	• Inappropriate absolute high limit setting • Dry wet-bulb wick	• Check the absolute high limit setting. • Replace the wet-bulb wick • Auto recovery
ABSOLUTE HIGH LIMIT: TEMPERATURE (ALARM)	Chamber operation is stopped because the test area temperature is greater than the absolute high limit of the temperature alarm.	• Inappropriate absolute high limit setting • Heat generation by products	• Check the absolute high limit setting. • Turn OFF the breaker (main power switch). • Confirm that heat generation by the product is reduced. • Turn ON the breaker (main power switch).
ABSOLUTE LOW LIMIT: HUMIDITY (WARNING)	Heater and refrigerator control are stopped because the test area humidity is less than the absolute low limit of the humidity alarm. It will remain stopped until the humidity returns within range.	• Inappropriate absolute low limit setting	• Check the absolute low limit setting. • Auto recovery
ABSOLUTE LOW LIMIT: TEMPERATURE (ALARM)	Chamber operation is stopped because the test area temperature is lower than the absolute low limit of the temperature alarm.	• Inappropriate absolute low limit setting • Inappropriate cooling ability setting	• Check the absolute low limit setting. • Check the cooling ability setting. • Turn OFF the breaker (main power switch), and then back ON again.

Alarm name	Event	Possible cause	Action
AIR CIRCULATOR FAILURE	Air circulator area on the chamber became abnormally hot and temperature switch inside the air circulator has tripped. The chamber operation has been stopped.	• Problem due to air circulator motor overload.	• Turn OFF the breaker (main power switch). • Stop operation for at least one hour to allow for cooling. • Turn ON the breaker (main power switch).
COOLING FAN FAILURE (PHP)	Cooling fan motor area on the chamber became abnormally hot and temperature switch inside the cooling fan tripped. The chamber operation has been stopped.	• Problem due to cooling fan motor overload	• Turn OFF the breaker (main power switch). • Clean the filter. • Stop operation for at least one hour to allow for cooling. • Turn ON the breaker (main power switch).
CURRENT VALUE ALARM: CONDENSER FAN	The operating current of condenser fan is high and a temperature switch or a motor breaker tripped. The chamber operation has been stopped.	• Problem due to condenser fan motor overload	• Turn OFF the breaker (main power switch). • Clean the condenser filter. • Stop operation for at least one hour to allow for cooling. • Turn ON the breaker (main power switch).
CURRENT VALUE ALARM: CONDENSER FAN <DC Inverter Refrigeration Circuit System Option>	The operating current of condenser fan is high and a temperature switch or a motor breaker tripped. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Problem due to condenser fan motor overload	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Stop operation for at least one hour to allow for cooling. • Turn ON the breaker (main power switch).
DEHUMIDIFIER FAILURE	Chamber operation is stopped due to any one of the following causes: dehumidifier refrigerator abnormality (abnormal high pressure, abnormal current value, abnormal surface temperature), an abnormal condenser fan motor current value, or a recovery heater abnormal temperature rise or abnormal current value.	• Dehumidifier internal refrigerator problem • Dehumidifier internal recovery heater problem • Dehumidifier problem	• Turn OFF the breaker (main power switch). • Clean the dehumidifier condenser filter. • Clean the dehumidifier air filter. • Turn ON the breaker (main power switch).
Door Open (PAUSE) (WARNING)	Open chamber door detected during chamber operation. Pause Control is set to ON, so chamber operation is paused.	• Open chamber door • Improperly closed door	• Re-consider the Hold Time. • Push in the door handle to lock the door. • Recovery will be automatic after the door is closed.

Alarm name	Event	Possible cause	Action
DOOR OPEN (RUNNING) (WARNING)	Open chamber door detected during chamber operation. Pause Control is set to OFF, so operation continues with the door open, but normal operation may not be possible and other alarms may be generated.	• Open chamber door • Improperly closed door	• Re-consider the Hold Time. • Push in the door handle to lock the door. • Recovery will be automatic after the door is closed.
DRY WICK (WARNING)	During humidity operation, the wet-bulb (for measuring relative humidity) temperature rose above the specified temperature. The operation will continue but proper humidity control is impossible and another humidity alarm might be triggered.	• Dry wet-bulb wick	• Replace the wet-bulb wick • Recovery will be automatic after replacement.
EMPTY WATER (WARNING)	The water tank is empty. The humidifier operation has been stopped but temperature-only operation continues.	• Water tank out of water (Type 1, 2, 3: Approximately 1.3 liters or less; Type 4: Approximately 2.6 liters or less) < Optional Additional Supply Water Tank> • Connection pipe problem < Optional Continuous Water Supply > • Continuous water supply circuit problem	• Replenish water tank water. • Recovery will be automatic after water is supplied. < Optional Additional Supply Water Tank> • Perform water supply work on the portable tank. • Check the supply water circuit switch valve. < Optional Continuous Water Supply > • Check the instrumentation supply water setting. • Check the supply water circuit switch valve. • Check the continuous water supply piping. • Check the supply water source.
EXTERNAL EQUIPMENT: 1 <Optional Input Terminal for External Equipment Errors>	Trouble was detected in the external unit. The chamber operation has been stopped.	• Problem detected in connected external unit	• Turn OFF the breaker (main power switch). • Check for problems in external unit. • Turn ON the breaker (main power switch).

Alarm name	Event	Possible cause	Action
HEATING FAILURE	The chamber temperature exceeded the thermal fuse temperature, or rose above the overheat protector (instrument panel's option) setting, or the heater's circuit protector tripped because of overcurrent in the heater. The chamber operation has been stopped.	• Inappropriate overheat protector setting • Heat generation by products	• Check the overheat protector setting. • Turn OFF the breaker (main power switch). • Confirm that heat generation by the product is reduced. • Turn ON the breaker (main power switch).
HUMIDIFIER DRAINAGE FAILURE	Humidifier water level did not lower during drainage operations. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Humidifier water drainage circuit problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Check for water circuit box problems. • Turn ON the breaker (main power switch).
HUMIDIFIER FAILURE	The humidifier's circuit protector tripped because operating current was high. Or the boil-dry protector tripped. The chamber operation has been stopped. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Water level adjustment failure	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Check that the chamber is horizontally placed. • Turn ON the breaker (main power switch).
HUMIDIFIER LEAD-OFF WATER SUPPLY	The humidifier did not fill within the specified time at the start of humidity operation. The chamber operation has been stopped. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Humidifier water supply circuit problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Check for water circuit box problems. • Turn ON the breaker (main power switch).
HUMIDIFIER NORMAL WATER SUPPLY	The humidifying tray did not fill within the specified time during humidity operation. The chamber operation has been stopped. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Humidifier water supply circuit problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Check for water circuit box problems. • Turn ON the breaker (main power switch).

Alarm name	Event	Possible cause	Action
LOW WATER (WARNING)	Water in the water tank is low. Humidity operation can continue at the present level, but it will eventually stop unless more water is added.	• Low water tank level (Type 1, 2, 3: Approximately 4.4 liters or less; Type 4: Approximately 8.5 liters or less) < Optional Additional Supply Water Tank> • Connection pipe problem < Optional Continuous Water Supply > • Continuous water supply circuit problem	• Replenish water tank water. • Recovery will be automatic after water is supplied. < Optional Additional Supply Water Tank> • Perform water supply work on the portable tank. • Check the supply water circuit switch valve. < Optional Continuous Water Supply > • Check the instrumentation supply water setting. • Check the supply water circuit switch valve. • Check the continuous water supply piping. • Check the supply water source.
OUT-OF-RANGE: TEMP CONTROLLER SENSOR (TC5 to TC12) (ALARM)	The refrigerator sensor input to the controller is out of specified range. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Refrigerator problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
OVERCOOLING <Overcool Protector Option>	Chamber operation is stopped because the test area temperature is below the overcool protector setting (installed on the instrumentation panel).	• Inappropriate overcool protector setting • Inappropriate cooling ability setting	• Check the overcool protector setting. • Check the cooling ability setting. • Turn OFF the breaker (main power switch), and then back ON again.
OVERCURRENT: INTERNAL DC POWER <Optional Internal Power Supply for Applying Voltage>	Overcurrent was detected at internal DC power supply for applying voltage. The chamber operation has been stopped.	• Product capacity overload	• Turn OFF the breaker (main power switch). • Reduce the loaded capacity to 300W or lower. • Turn ON the breaker (main power switch).

Alarm name	Event	Possible cause	Action
POWER PHASE FAILURE	A reverse or open phase was detected in the 3-phase primary power supply connection. The chamber operation has been stopped.	• Connection problem in cable from primary power supply	• Turn OFF the breaker (main power switch). • Turn OFF the primary power supply. • Check the power cable connection. • After turning ON the primary power supply, turn ON the breaker (main power switch).
RECORDING DATA DELETED (WARNING)	Some of the following recording data has been deleted. • Sampling data • Back trace data • Add-ons / System updates history The chamber is capable of operation.	• Recording data corruption	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
RECORDING DATA FORMATTED (WARNING)	Some of the following recording data has been lost because of formatting. • Sampling data • Back trace data • Add-ons / System updates history The chamber is capable of operation.	• Recording data corruption	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
REFRIG-1 CURRENT VALUE ALARM: COMPRESSOR	The chamber operation has been stopped because refrigerator current value is high. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-1 FROSTED OVER (WARNING)	Frost was detected on the evaporator. The chamber continues the operation, however, proper operation is impossible in this situation, and another alarm might be triggered.	• Frost on evaporator	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Perform the defrost operation.

Alarm name	Event	Possible cause	Action
REFRIG-1 PRESSURE ALARM: HIGH PRESSURE	Refrigeration pressure is high. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error • Evaporator problem < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Perform the defrost operation. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-1 PRESSURE ALARM: LOW PRESSURE	Refrigeration pressure is low. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Evaporator problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Perform the defrost operation. • Turn ON the breaker (main power switch).
REFRIG-1 TEMPERATURE ALARM: COMPRESSOR SURFACE	The chamber operation has been stopped because compressor surface temperature is high. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Stop operation for at least one hour to allow for cooling. • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.

Alarm name	Event	Possible cause	Action
REFRIG-1 TEMPERATURE ALARM: DISCHARGE LINE	The discharge temperature of refrigeration has exceeded the standard value. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Stop operation for at least one hour to allow for cooling. • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-2 CURRENT VALUE ALARM: COMPRESSOR	The chamber operation has been stopped because refrigerator current value is high. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-2 FROSTED OVER (ALARM)	Frost was detected on the evaporator. The chamber has been stopped. If the backup mode is ON, the chamber continues the temperature (humidity) operation with setpoint.	• Frost on evaporator	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Perform the defrost operation. • Turn ON the breaker (main power switch).
REFRIG-2 FROSTED OVER (WARNING)	Frost was detected on the evaporator. The chamber continues the operation, however, proper operation is impossible in this situation, and another alarm might be triggered.	• Frost on evaporator	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Perform the defrost operation.

Alarm name	Event	Possible cause	Action
REFRIG-2 PRESSURE ALARM: HIGH PRESSURE	Refrigeration pressure is high. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error • Evaporator problem < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Perform the defrost operation. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-2 PRESSURE ALARM: LOW PRESSURE	Refrigeration pressure is low. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Evaporator problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again. • Perform the defrost operation.
REFRIG-2 TEMPERATURE ALARM: COMPRESSOR SURFACE	The chamber operation has been stopped because compressor surface temperature is high. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Stop operation for at least one hour to allow for cooling. • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.

Alarm name	Event	Possible cause	Action
REFRIG-2 TEMPERATURE ALARM: DISCHARGE LINE	The discharge temperature of refrigeration has exceeded the standard value. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Stop operation for at least one hour to allow for cooling. • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-3 CURRENT VALUE ALARM: COMPRESSOR	The chamber operation has been stopped because refrigerator current value is high. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIG-3 PRESSURE ALARM: HIGH PRESSURE	Refrigeration pressure is high. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Condenser error • Evaporator problem < Refrigeration Circuit Water Cooling System Option > • Cooling water problem	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch). • Clean the condenser filter. • Perform the defrost operation. • Turn ON the breaker (main power switch). < Refrigeration Circuit Water Cooling System Option > • Clean the strainer. • Check the cooling water temperature and flow rate.
REFRIGERATOR SYSTEM ERROR <DC Inverter Refrigeration Circuit System Option>	Refrigerator system has an error. The chamber operation has been stopped.	• Refrigerator system control problem	• Turn OFF the breaker (main power switch), and then back ON again.

Alarm name	Event	Possible cause	Action
REFRIGERATOR : COOLING WATER FAILURE \<Refrigeration Circuit Water Cooling System Option\>	Cooling water pressure for the condenser is low. The water suspension relay tripped and the chamber operation has been stopped.	• Cooling tower (cooling water pump) stop • Closed water supply valve • Clogged strainer • Cooling water problem	• Turn OFF the breaker (main power switch). • Check cooling tower operation. • Check the water supply valve opening. • Clean the strainer. • Check cooling water piping. • Turn ON the breaker (main power switch).
SENSOR BURN-OUT: EXT ANALOG BOARD (RTD1) (ALARM) \<Specimen Temperature Control Option\>	The sensor input for the extended analog board is broken. The chamber operation has been stopped.	• Sensor disconnection	• Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: PRODUCT TEMPERATURE SENSOR (ALARM) \<Specimen Temperature Control Option\>	Trouble was detected in a product temperature sensor input. The chamber operation has been stopped.	• Sensor disconnection	• Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: PRODUCT TEMPERATURE SENSOR (WARNING) \<Specimen Temperature Control Option\>	Trouble was detected in a product temperature sensor input.	• Sensor disconnection	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: TEMP CONTROLLER (DC) (ALARM) \<Electrostatic Capacity Type Humidity Sensor Control System Option\> \<Stability Test Specifications Option\>	The sensor input for the temperature control unit is broken. The chamber operation has been stopped. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Sensor disconnection	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.

Alarm name	Event	Possible cause	Action
SENSOR BURN-OUT: TEMP CONTROLLER (TC1, RTD) (ALARM)	The temperature sensor input for the temperature control unit control is broken. The chamber operation has been stopped.	• Sensor disconnection	• Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: TEMP CONTROLLER (TC11, TC12) (WARNING) <Wide-view Door, Wide-view Door Reach-in Port Option>	The sensor input for the temperature control unit is broken. The chamber operation continues.	• Sensor disconnection	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: TEMP CONTROLLER (TC2) (ALARM)	The humidity sensor input for the temperature control unit control is broken. The chamber operation has been stopped. If the backup mode is ON, humidity operation has been suspended, but temperature-only operation continues.	• Sensor disconnection	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
SENSOR BURN-OUT: TEMP CONTROLLER (TC5 to TC12) (ALARM)	Trouble was detected in a refrigerator sensor input to the controller. The chamber operation has been stopped. If the backup mode is ON and the chamber has multiple refrigerators, only the affected refrigerator stops while all others continue running.	• Sensor disconnection	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.
STORAGE MEDIUM UNRECOGNIZED (WARNING)	Storage medium is unrecognized. The following items malfunction. • Saving of sampling data to the internal memory • Recording of back trace data • Writing of back trace data to the external memory • Download of back trace data (via Web) • Add-ons / System updates Above items are not functioning but the chamber is capable of operation.	• Storage medium failure	• If testing requires priority, resume operation. • If re-start is possible, stop operation. • Turn OFF the breaker (main power switch), and then back ON again.

Alarm name	Event	Possible cause	Action
SYSTEM ERROR	Instrumentation system error (Detected even when chamber is stopped.)	• Instrumentation system problem	• Turn OFF the breaker (main power switch), and then back ON again. • If the same alarm occurs again, request a service call with the number of the system error.
UPPER DEVIATION LIMIT: TEMPERATURE (WARNING)	The heater and humidifier are stopped because the test area temperature is greater than the upper deviation limit of the temperature alarm. They will remain stopped until the temperature returns within range.	• Inappropriate upper deviation limit setting • Heat generation by products	• Check the upper deviation limit setting. • Confirm that heat generation by the product is reduced. • Auto recovery