Chapter 6 Troubleshooting

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

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 is listed as a "service call"

6.1 Alarms and actions

WARNING

When taking action on the primary side of the equipment's breaker, be sure to turn off the main power supply switch at your facility before de-energizing. Also, use caution not to apply voltage accidentally.

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

Be sure to turn off the breaker before opening the electrical compartment door or the water circuit 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.

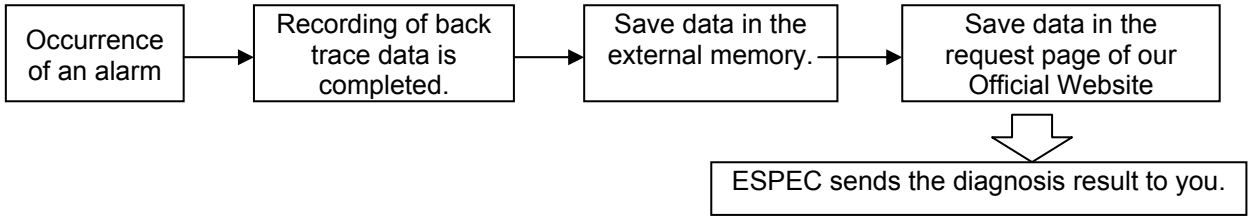
To troubleshoot problems that cannot be solved using the self-diagnostic, see "6.6 Troubleshooting". If the chamber does not operate properly even after taking the actions listed here, contact your distributor or ESPEC.

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. (Service available only to overseas customers)

* The Online Diagnostics Service is 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 equipment before and after the occurrence of an alarm.

Flow of the back trace function



◆ Reference ◆

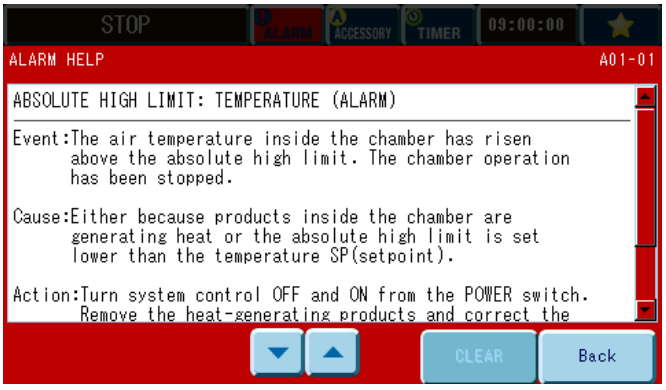
The Online Diagnostics Service is available only to overseas customers. (Back trace data recording is possible.)
If you are a customer in Japan, use the ESPEC online support.*
* A separate contract is required.

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.
Pressing the name of the alarm on the alarm screen displays the alarm details.
Check the alarm details, and then press [Stop Beep] to silence the alarm buzzer.

Alarm screen

Pressing the name of 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 notification 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 action when an alarm occurs.
Alarms are divided into errors and alarms, and the action to take can vary.

Error	When the chamber 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*".

(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.

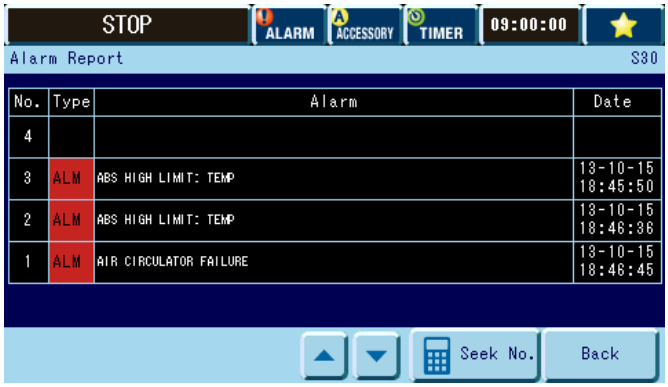
6.2 Alarm history display

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.

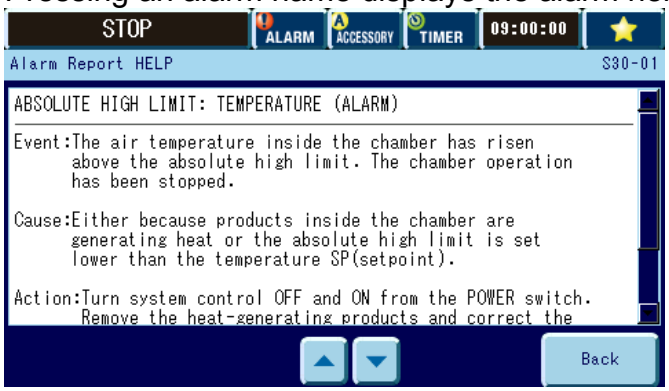
<Procedure>

1) While the menu is displayed, enter management setting mode.
   Press the Chamber Setup tab.
   On the Chamber Setup selection screen, press [Alarm Report].

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 that occurred.
Pressing an alarm name displays the alarm help screen.



Date: Displays the date and time the alarm occurred.

Use these buttons to select a page.

History number: Enter a number to jump directly to that alarm.

◆ Reference ◆

- Up to four alarms are displayed on each page in order of occurrence, starting with the most recent one.
- The history stores up to 100 alarms. Occurrence of an alarm when there are already 100 alarms in history causes the oldest alarm in history to be deleted to make room for the new one.

6.3 Back trace function

This equipment automatically records back trace data during operation.
The back trace data contains the temperature/humidity set points, temperature/humidity process values, and control value information of the control items required to control the equipment. If an alarm occurs, the equipment automatically completes the recording of back trace data.
If you store the data in the request page of our Official Website, you can receive the Online Diagnostics Service.

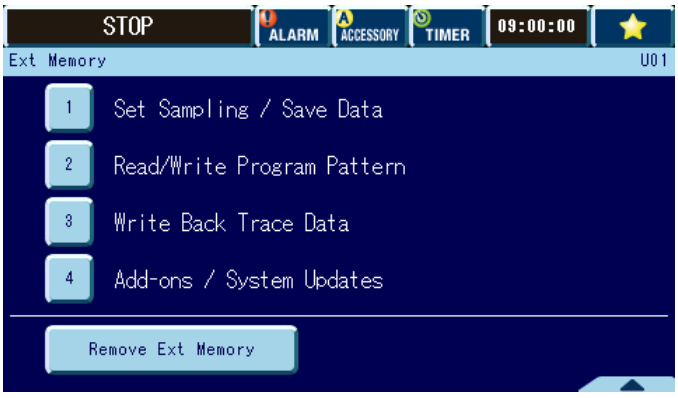
<Procedure>

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

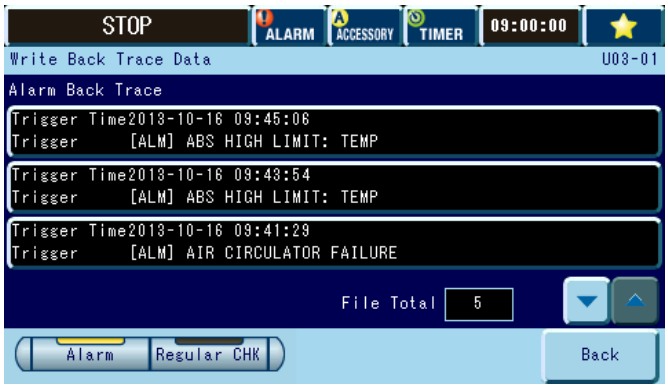
◆ Reference ◆

Resuming back trace recording
Even when data is not saved to the ESPEC Web site, if the back trace setting is set to on, recording of back trace data is resumed automatically.

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



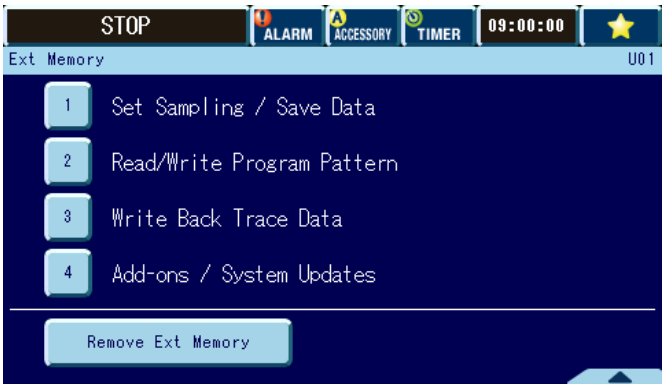
3) On the Write Back Trace Data screen, you can check the [Trigger Time] and [Trigger] details.
Select the data you want to save.
* If more than one error occurred, the name of the first error detected by the chamber is displayed.



4) When writing to the external memory is complete, back trace is resumed.

5) Click [CLOSE]. On the External Memory screen, press [Remove Ext Memory]. Remove the external memory device after the message "Remove the memory" appears.

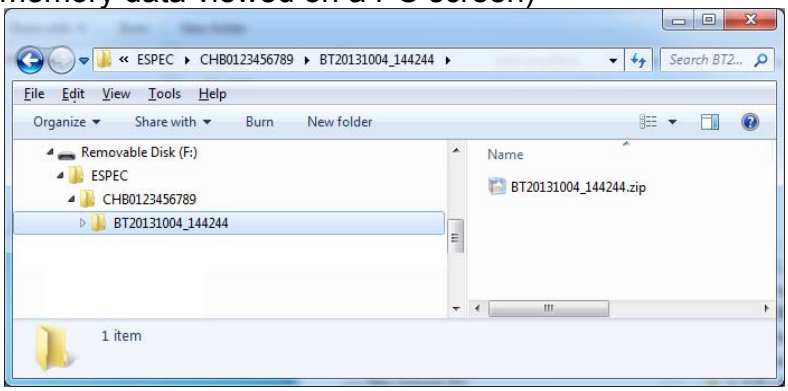
Notice
Removing the external memory device without pressing [Remove Ext Memory] first may damage the recorded data saved to the external memory.



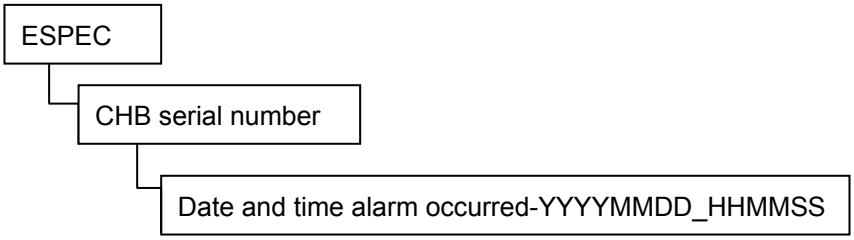
■ Directory of external memory storage

Three files are created in the directory that is automatically created in external memory.

(USB memory data viewed on 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

Store the files stored in the external memory in the request page of our Official Website. ESPEC will send the diagnosis result to you.

◆ Reference ◆

All constant operation and program operation data set on the chamber is saved in the operation settings information.
If "operation settings information" is not submitted to ESPEC, please send the back trace data (date and time alarm occurred-YYYYMMDDHHMMSS_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 specimen.
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	Switches to temperature control operation. Continues operation.	Chamber stops. (Operation state is "program paused" or "constant operation".)
Other error	Chamber stops.	

◆ Reference ◆

- Items listed under "BU" in the list of alarms are backed up.
- To set the backup operation mode for when an alarm occurs, see "*Chapter 5. Chamber setup" in the Controller guide.*".

6.5 List of alarms

Alarm detected by the chamber is categorized as "Warning" and "Error".
If the [Clear] button is displayed on the help screen of an alarm categorized as a "Warning", the alarm indication can be cleared after taking action.
If an alarm occurs again even after taking action, contact a service representative.

BU: : Indicates that backup operation can be performed.
Com: : Indicates the network alarm number.
OP: : Indicates an alarm when using optional equipment.
If a chamber has an option or module option installed, there may be alarms related to the option that are included in the table below.
Refer to the applicable option manuals for more information.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
SYSTEM ERROR	31			○		Instrumentation system error (Detected even when chamber is stopped.)	Internal system error	• Turn off the primary side power breaker and then restart operation. • If error recurs, provide system error number to service personnel.
SYSTEM ERROR	31			○		A minor system error has occurred (chamber operation continues).	Internal system error	• Check the settings. • If error recurs, provide system error number to service personnel.
DISPLAY UNIT FAULTY CONNECTION	-			○		Display is blank or screen contents are abnormal. Chamber operation stops.	• Internal circuitry error (communication error when turned on) • Communication error after primary side power breaker is turned off and then back on	• Turn primary side power breaker off and then back on.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
RECORDING MEDIA RECOGNITION WARNING	-		○			The following functions are not performed because the recording media cannot be recognized. You can operate the chamber. ・Save sampling data to internal memory ・Record back trace data ・Write back trace data to external memory ・Download back trace data (web) ・Add-ons/system update ・Record camera images ・Download camera images (web)	The recording media may have failed.	・Turn primary side power breaker off and then back on. ・If the error recurs, contact a service representative.
RECORDED DATA DELETION WARNING	-		○			A portion of the following recorded data has been deleted. You can operate the chamber. ・Sampling data ・Back trace data ・Add-ons/system updates history ・Camera images (add-on)	The recording area for the recorded data has been corrupted, so a portion of the recorded data has been deleted.	If the error recurs, contact a service representative.
RECORDED DATA INITIALIZATION WARNING	-		○			The following recorded data has been lost due to initialization. You can operate the chamber. ・Sampling data ・Back trace data ・Add-ons/system updates history ・Camera images (add-on)	The recording area for the recorded data has been corrupted, so the recording area was initialized.	If the error recurs, contact a service representative.
INDEPENDENT OVERHEATING ERROR /THERMAL FUSE ERROR	12			○		The test area temperature has exceeded the setting of the overheat protector (installed in the instrumentation panel) or the set temperature fuse value, stopping operation of the chamber.	• Heat generated by sample • Low overheat protector setting • Heater error	• [Power] switch off. • Remove the source of heat. • Configure overheat protector settings correctly.
HEATER DRY HEAT ERROR	21			○	○	The humidifier dry heat prevention mechanism activated, stopping operation of the chamber. If the backup operation is set to [On], humidity control operation stops and temperature control operation continues.	• Heater supply water system error • Low water level due to faulty heater water level adjustment	• Check the water level of the chamber.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
REFRIG-1 COMPRESSOR ERROR	8			○		Chamber operation is stopped because refrigerator-1 in the machinery compartment is abnormally hot, activating the overload relay built into refrigerator-1 or the pressure in refrigerator-1 is abnormally high, activating the high-pressure switch.	The ambient temperature is too high or the power supply voltage is too low.	• Stop operation and allow the refrigerator to cool for some time. • Check the power supply voltage.
REFRIG-2 COMPRESSOR ERROR	8			○		Chamber operation is stopped because refrigerator-2 in the machinery compartment is abnormally hot, activating the overload relay built into refrigerator-2 or the pressure in refrigerator-2 is abnormally high, activating the high-pressure switch.	The ambient temperature is too high or the power supply voltage is too low.	• Stop operation and allow the refrigerator to cool for some time. • Check the power supply voltage.
ABS HIGH LIMT: TEMP	2			○		Chamber operation is stopped because the test area temperature is greater than the upper limit absolute value of the temperature alarm.	• Heat generated by sample • Low upper limit alarm value setting	• [Power] switch off. • Remove the source of heat from inside the test area. • Configure a proper upper limit absolute value. • Auto recovery will be performed when a setting lower than the temperature in the test area is specified.
ABS LOW LIMT: TEMP	3			○		Chamber operation is stopped because the test area temperature is less than the lower limit absolute value of the temperature alarm.	• Over capacity of cooling within the test area • Cooling source effect • Lower limit alarm value setting is too high.	• [Power] switch off. • (When using manual selection) change the cooing capacity. • Remove the cooling source from inside the test area. • Specify a proper lower limit absolute setting value.
UPPER DEV LIMIT: TEMP	1		○			The test area temperature has exceeded the upper limit deviation of the temperature alarm, stopping the heater and humidifier until a reset is performed.	• Heat generated by sample • Low deviation alarm value setting	• Remove the source of heat from inside the test area. • Set the alarm value for deviation from the setting temperature 10°C higher. • Auto recovery will be performed when a setting lower than the temperature in the test area is specified.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
ABS HIGH LIMT: HUM	22		○			The test area humidity has exceeded the upper limit value of the humidity alarm, stopping the humidifier until a reset is performed.	• Momentary relative humidity rise • Low upper limit absolute value • Dry wick	• Configure a proper upper limit absolute value. • Replace the wick. • Auto recovery will be performed when test area internal humidity drops below the alarm value.
ABS LOW LIMT: HUM	23		○			The test area humidity is below the lower limit absolute value of the humidity alarm, stopping the heater and refrigerator control until a reset is performed.	• Momentary drop in relative humidity • Lower limit alarm value setting is too high.	• Check the lower limit alarm value setting. • Auto recovery will be performed when test area internal humidity rises above the alarm value.
HUMIDIFIER LEAD OFF WATER SUPPLY	26			○	○	After humidity control operation started, the humidifier could not be filled with water in the set time during initial water supply, stopping operation of the chamber. If the backup operation is set to [On], humidity control operation stops and temperature control operation continues.	• Heater supply water system error • Drop in supply water pressure	• Turn off the primary side power breaker. • Check the heater supply water system and then restart operation.
HUMIDIFIER NORMAL WATER SUPPLY	26			○	○	During humidity control operation, the humidifier could not be supplied with sufficient water in the set time, stopping operation of the chamber. If the backup operation is set to [On], humidity control operation stops and temperature control operation continues.	• Heater supply water system error • Drop in supply water pressure	• Turn off the primary side power breaker. • Check the heater supply water system and then restart operation.
WATER TANK EMPTY	26		○			The water tank is empty. Though the humidity operation will continue using the water in the humidifying tray, humidity operation will stop if operation continues without replenishment.	• Water tank is empty (Less than approx. 0.8L).	• Replenish water tank water. • Auto recovery will be performed after water is replenished.
WATER TANK WATER LOW	26		○			The water level of the water tank is low. Though the humidity operation will continue using the remaining water, humidity operation will stop if operation continues without replenishment.	• Water level of water tank is low. (Less than approx. 1.2L).	• Replenish water tank water. • Auto recovery will be performed after water is replenished.
AIR CIRCULATOR FAILURE	12			○		The area surrounding the air circulator motor became abnormally hot, activating the temperature switch built in to the air circulator and stopping operation of the chamber.	• Overload operation of air circulator motor	• Stop operation for awhile and allow the air circulator motor to cool down.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
OVERCOOLING	12	Overcooling		○		The test area temperature is below the setting of the overcool protector (installed in the instrumentation panel), stopping operation of the chamber.	• Over capacity of cooling • Cooling source effect • Overcool protector setting is high.	• [Power] switch off. • (When using manual selection) change the cooing capacity. • Reduce the cooling sources of the test area. • Properly configure the overcool protector.
DOOR OPEN	13		○			Open chamber door detected during operation. Chamber operation is paused because the prescribed time has elapsed.	• Open chamber door • Improperly closed door	• Close the chamber door properly.
SENSOR BURN-OUT:PRODUCT TEMP SENSOR	0	Specimen Temperature Control		○		A disconnection of the specimen temperature sensor input was detected, stopping operation of the chamber.	• Faulty specimen temperature sensor connection • Loose expansion analog circuit board terminal (TC1) • Sensor disconnection	• Check the connection of the specimen temperature sensor.
SENSOR BURN-OUT: PRODUCT TEMP SENSOR	0	Specimen Temperature Control	○			A disconnection of the specimen temperature sensor input was detected.	• Faulty specimen temperature sensor connection • Loose expansion analog circuit board terminal (TC1) • Sensor disconnection	• Check the connection of the specimen temperature sensor.
SENSOR BURN-OUT: EXT ANALOG BOARD (RTD1)	0	Specimen Temperature Control		○		A disconnection of the expansion analog board sensor input was detected, stopping operation of the chamber.	• Loose expansion analog circuit board terminal • Sensor disconnection	• [Power] switch off, check the connection, then resume operation.
SENSOR BURN-OUT: EXT ANALOG BOARD (RTD1)	0	Specimen Temperature Control	○			A disconnection of the expansion analog board sensor input was detected.	• Loose expansion analog circuit board terminal • Sensor disconnection	• [Power] switch off, check the connection, then resume operation.
SENSOR BURN-OUT: TEMP CONTROLLER (RTD)	0			○		Chamber is stopped because of detection of disconnection of the sensor input on the temperature control unit.	• Loose temperature control unit terminal • Sensor disconnection	• [Power] switch off, check the connection, then resume operation.
SENSOR BURN-OUT: EXT ANALOG BOARD (TC1)	0			○		Expansion analog board sensor is disconnected, and chamber operation is stopped.	• Loose expansion analog circuit board terminal • Sensor disconnection	• [Power] switch off, check the connection, then resume operation.

Alarm name	Com	OP	Category		BU	Problem	Probable cause	Action
			Warning	Alarm				
SENSOR BURN-OUT: TEMP CONTROLLER (TC1)/(TC2)	0			○		Chamber is stopped because of disconnection of control temperature sensor input on the temperature control unit.	• Loose temperature control unit terminal • Temperature detect terminal disconnection	• [Power] switch off, check the connection, then resume operation.
EXTERNAL DEVICE (1): ERROR	19	External device alarm input		○		Chamber operation is stopped because an error was detected in the external device connected to the chamber.	See the provided "External Devices: User's Manual".	• See the "External Devices: User's Manual".
SYSTEM ERROR 1801	31	Specimen temp. control		○		Chamber operation is stopped because an interface error was detected in the specimen temp. control(OP) board by Instrumentation (CPU board).	・Breaker of option box is not turned ON when the main power (beaker) turn ON. ・Interface alarm between CPU board and specimen temp. control board	・Turn ON the breaker of option box first, then turn ON the main power (breaker). If there is an error after operation, call the service. ・If there is an error during operation, call service.
SYSTEM ERROR 1601	31	External output terminal set(x3)				Chamber operation is stopped because an interface error was detected in the external output terminal set(x3) (OP) by Instrumentation (CPU board).	・Breaker of option box is not turned ON when the main power (beaker) turn ON.	
SYSTEM ERROR 1651	31	External output terminal set(x3)		○		Chamber operation is stopped because an interface error was detected in the external output terminal set(x3) (OP) by Instrumentation (CPU board).	・Before turn OFF the main power, breaker of option box is turned OFF in advance. ・Interface alarm between CPU board and external output terminal set(x3).	