Chapter 6 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 "call for service" is listed as the solution in the table

6.1 Alarms and actions

This chapter describes problems that may occur with this chamber and ways to handle these problems. If this chamber's self-diagnostic function detects a problem, you will be notified of the problem by a buzzer sounding, and the details of the problem will be shown on the instrumentation display. For information on problems that are not detected with the self-diagnostic function and operation errors that are easy to mistake for malfunctions, see "6.2 Troubleshooting".
This chapter also includes information related to the options.

WARNING

Before working on the primary side of the circuit breaker (main power switch), be sure to turn off the power switch at your facility and confirm that the line is dead. Also, use caution to ensure that voltage is not applied accidentally.

Attempting to correct a problem with the power on can result in electric shock.

Before opening the electrical compartment door or machinery compartment door, be sure to turn off the circuit breaker (main power switch).

Failing to do so can result in electric shock.

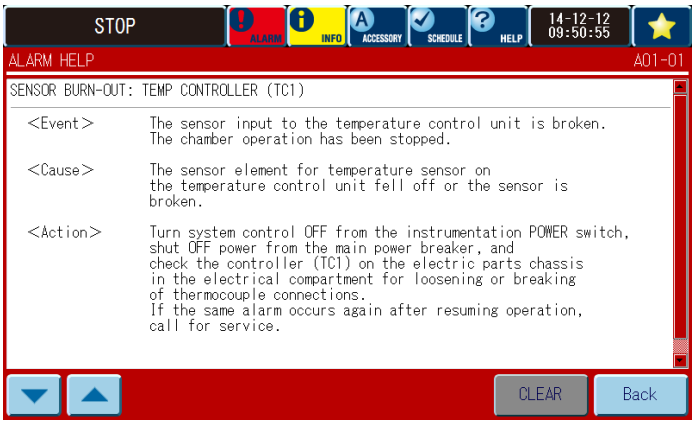
6.1.1 Alarms and actions to take

This section explains the actions to take when a chamber problem occurs and the self-diagnostic function is activated.

<Procedure>

1) When an error occurs on the chamber or controller, the Alarm screen appears.

2) Press an entry under Alarm Name.
A screen will appear with information on the contents of, cause of, and action to be taken to fix the error.



3) See "6.1.2 List of alarms", and then take the actions that correspond to the error contents shown on the instrumentation display.
However, if you are instructed to "call for service" or if the chamber does not operate properly even after you take the specified actions, contact your distributor or ESPEC.

6.1.2 List of alarms

Table 6.1 List of alarms

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
SYSTEM ERROR	48			○	An instrumentation system error (detected even when chamber is stopped) has occurred.	Internal system error	• Turn off the primary side power supply circuit breaker, and then restart operation. • If the same alarm occurs again, call for service and provide the system error number.
SYSTEM ERROR	99		○		A minor system error has occurred (chamber operation continues).	Internal system error	• Check the settings. • If the same alarm occurs again, call for service and provide the system error number.
POWER PHASE FAILURE	1			○	A reverse-phase connection or open-phase connection of the main power supply (primary side power supply) was detected, stopping operation of the chamber.	The connections of the chamber's main power supply are not correct.	• This problem may have a noted effect on the devices that the chamber is equipped with. • Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check the phase and connections of the primary-side, three-phase power supply. • If the same alarm occurs again, call for service.
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 supply turned off and then back on	• Turn primary side power supply circuit breaker off and then back on.
H-TEMP. BOX CIRCULATOR 1 FAILURE	16			○	The thermal relay of hot chamber circulator 1 tripped. The chamber has stopped.	Air circulator 1 of the hot chamber may be overloaded or the motor locked up.	• Turn off the instrumentation panel power switch. • Stop chamber operations and allow the air circulator to cool down. • If the same alarm occurs again, call for service.
H-TEMP. BOX CIRCULATOR 2 FAILURE	67			○	The thermal relay of hot chamber circulator 2 tripped. The chamber has stopped.	Air circulator 2 of the hot chamber may be overloaded or the motor locked up.	• Turn off the instrumentation panel power switch. • Stop chamber operations and allow the air circulator to cool down. • If the same alarm occurs again, call for service.
L-TEMP. BOX CIRCULATOR 1 FAILURE	19			○	The thermal relay or inverter alarm of cold chamber circulator 1 tripped. The chamber has stopped.	Air circulator 1 of the cold chamber may be overloaded, an overload stemming from frost buildup on the air circulator shaft may have occurred, or the motor locked up.	• Turn off the instrumentation panel power switch. • Stop chamber operations and allow the air circulator to cool down. • Then, defrost the chamber. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
L-TEMP. BOX CIRCULATOR 2 FAILURE	68			○	The thermal relay or inverter alarm of cold chamber circulator 2 tripped. The chamber has stopped.	Air circulator 2 of the cold chamber may be overloaded, an overload stemming from frost buildup on the air circulator shaft may have occurred, or the motor locked up.	• Turn off the instrumentation panel power switch. • Stop chamber operations and allow the air circulator to cool down. • Then, defrost the chamber. • If the same alarm occurs again, call for service.
OVERHEAT PROTECTOR TRIP	9			○	The (operation panel) overheat protector has activated. The chamber has stopped.	The test area temperature rose above the overheat setting. The test area temperature has risen due to heat generated from the specimens in the test area or due to a heater malfunction. Alternatively, the overheat protector has been set to a temperature that is lower than the set temperature of the test area.	• Remove the source of heat from inside the test area. • Ensure the setting value of the overheat protector is at least 10°C higher than the high temperature exposure value. • If the overshoot is large, set the preheat temperature lower. • If the same alarm occurs again, call for service.
OVERCOOL PROTECTOR TRIP	10			○	The (operation panel) overcool protector has activated. The chamber has stopped.	The test area temperature dropped below the overcool setting. The specimens in the test area may be exerting a cooling effect. Alternatively, the overcool protector has been set to a temperature that is higher than the set temperature of the test area.	• Remove the source of cooling from inside the test area. • Ensure the setting value of the overcool protector is at least 10°C lower than the low temperature exposure value. • If the undershoot is large, set the precool temperature higher. • If the same alarm occurs again, call for service.
AMBIENT TEMPERATURE CIRCULATOR FAILURE	69			○	The thermal relay of the ambient temperature air circulator tripped. The chamber has stopped.	The air circulator may be overloaded or the motor locked up.	• Turn off the instrumentation panel power switch. • Stop chamber operations for a short period of time. • If the same alarm occurs again, call for service.
TEST AREA DOOR OPEN	86		○		The opening of the test area door was detected. Testing has been suspended.	The test area door opened during testing or was not completely closed.	• Close the test area door. • Press the CLEAR button on the ALARM screen to clear the alarm. • Press the RESUME button.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
LOW AIR SUPPLY PRESSURE	83	○	○		The air supply pressure has dropped below the specified level. The chamber is still running.	The air supply may be low due to a long period of disuse or the air supply may be off.	• Check the air supply. • If a built-in air compressor is present, check if it is running properly. • Check that the air pressure rises. • Press the CLEAR button on the ALARM screen to clear the alarm. • Press the RESUME button.
AIR SUPPLY CIRCUIT DOWN	61	○		○	The air supply pressure has dropped below the specified level without recovering. The chamber has stopped.	The air supply is off or the supply pressure is low.	• Check the air supply. • If a built-in air compressor is present, check if it is running properly and that the air pressure rises. • If an air leak may be present, call for service.
WATER SUSPENSION RELAY TRIP	22	○		○	The cooling water has not been supplied. The chamber has stopped.	The cooling water of the refrigerator has not been supplied.	• Turn off the instrumentation panel power switch. • Check whether the cooling water is being supplied to the refrigerator. • If the same alarm occurs again, call for service.
H-TEMP. BOX ABS. HIGH LIMIT TEMP.	13			○	The temperature inside the hot chamber has risen above the absolute high limit. The chamber has stopped.	The hot chamber temperature rose above the set temperature limit. The hot chamber temperature has risen due to heat generated from the specimens in the test area, due to lost air flow because of an excess of specimens, due to inadequate damper operation because of low air pressure, or due to a heater malfunction.	• Remove the source of heat from inside the test area. • Check the specimen quantity and the air pressure. • If the same alarm occurs again, call for service.
L-TEMP. BOX ABS. HIGH LIMIT TEMP.	14			○	The temperature inside the cold chamber has risen above the absolute low limit. The chamber has stopped.	The cold chamber temperature rose above the set temperature limit. The cold chamber temperature has risen due to heat generated from the specimens in the test area, due to lost air flow because of an excess of specimens, due to inadequate damper operation because of low air pressure, or due to a heater malfunction.	• Remove the source of heat from inside the test area. • Check the specimen quantity and the air pressure. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
L-TEMP. BOX ABS. LOW LIMIT TEMP	45			○	The temperature inside the cold chamber has dropped below the absolute low limit. The chamber has stopped.	The cold chamber temperature dropped below the set temperature limit. The cold chamber temperature has dropped due to lost air flow because of an excess of specimens or due to inadequate damper operation because of low air pressure.	• Check the specimen quantity and the air pressure. • If the same alarm occurs again, call for service.
OVER-HEATING (TEST AREA)	11			○	The test area temperature was detected to have risen to an inappropriate value. The chamber has stopped.	The test area temperature rose above the overheat protection setting of the registered pattern. The test area temperature has risen due to heat generated from the specimens in the test area, due to lost air flow because of an excess of specimens, due to inadequate damper operation because of low air pressure, or due to a heater malfunction. Alternatively, the overheat protection has been set to a temperature that is lower than the set temperature of the test area.	• Remove the source of heat from inside the test area. • Check the specimen quantity and the air pressure. • Ensure the setting value of the overheat protection in the pattern settings is at least 10°C higher than the high temperature exposure value. • If the overshoot is large, set the preheat temperature lower. • If the same alarm occurs again, call for service.
OVERCOOLING (TEST AREA)	12			○	The test area temperature was detected to have dropped to an inappropriate value. The chamber has stopped.	The test area temperature dropped below the overcool protection setting of the registered pattern. The specimens in the test area may be exerting a cooling effect, there may be lost air flow because of an excess of specimens, or there may be a large undershoot due to a low precool temperature. Alternatively, the overcool protection has been set to a temperature that is higher than the set temperature of the test area.	• Remove the source of cooling from inside the test area. • Check the specimen quantity and the precool temperature. • Ensure the setting value of the overcool protection in the pattern settings is at least 10°C lower than the low temperature exposure value. • If the undershoot is large, set the precool temperature higher. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
FROSTED OVER	71			○	Chamber operation has stopped because frost was detected on the evaporator.	If the defrost mode is set to cycle, the number of defrost cycles is not appropriate. Alternatively, the chamber has been used at a low temperature for a long time, the precool temperature is too low, or the precool time is too long.	• Defrost the chamber. • If the defrost mode is set to cycle, check the number of defrost cycles or select the auto defrost mode. • Check the exposure time and the precool temperature. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (RTD)	7			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal or disconnection of connected sensor (RTD).	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (RTD) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC1)	3			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC1) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC2)	4			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC2) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
SENSOR BURN-OUT: TEMP CONTROLLER (TC3)	46	○		○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC3) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC5)	2			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC5) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC6)	5			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC6) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC7)	47			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC7) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
SENSOR BURN-OUT: TEMP CONTROLLER (TC8)	47			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC8) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC9)	47			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC9) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC10)	47			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC10) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
SENSOR BURN-OUT: TEMP CONTROLLER (TC11)	47			○	A disconnection of the sensor input on the temperature control unit was detected, stopping the operation of the chamber.	Loose temperature control unit terminal, which is connected to the temperature sensor, or disconnection of connected sensor.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check for looseness or disconnections in the thermocouple connector of the controller (TC11) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
SPECIMEN TEMP. SENSOR 1 ERROR	92	○	○		A disconnection of the specimen temperature sensor input was detected.	Incorrect specimen temperature sensor connection, loose temperature control unit terminal (TC3), or disconnection of connected sensor.	• Check the connection to the specimen temperature input connector. • Press the CLEAR button on the ALARM screen to clear the alarm.
SPECIMEN TEMP. SENSOR 2 ERROR	93	○	○		A disconnection of the specimen temperature sensor input was detected.	Incorrect specimen temperature sensor connection, loose temperature control unit terminal (TC12), or disconnection of connected sensor.	• Check the connection to the specimen temperature input connector. • Press the CLEAR button on the ALARM screen to clear the alarm.
SPECIMEN TEMP. SENSOR ERROR	97	○		○	All specimen temperature inputs used for the test were disconnected. Testing has stopped.	The specimen temperature input connector is not connected correctly.	• Check the connection to the specimen temperature input connector. • Turn off the instrumentation panel power switch, and then resume testing. • If the same alarm occurs again, call for service.
SPECIMEN TEMP. SENSOR OFF	98	○		○	During operations that required the specimen temperature, all the specimen temperature sensors were disabled. The chamber has stopped operating.	All the specimen temperature sensors have been disabled.	• Check whether [ON] has been selected for specimen temperature sensors on the sensor calibration screen of the maintenance screen. • Turn off the instrumentation panel power switch, and then resume testing. • If the same alarm occurs again, call for service.
STT EXPOSURE TIME (WARNING)	90	○	○		With the STT function enabled, the specimen temperature did not reach the set point within the forced step shift time, so the process has shifted to the next exposure.	Too many specimens have been loaded into the test area resulting in a longer time to reach the set point. Alternatively, the exposure shift time has been set to a value that is too short.	• Check the specimens and the set point. • Press the CLEAR button on the ALARM screen to clear the alarm.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
SPECIMEN OVERHEATING	11	○		○	The specimen temperature was detected to have risen to an inappropriate value. The chamber has stopped.	The test area temperature rose above the overheat protection setting of the registered pattern. The test area temperature has risen due to heat generated from the specimens in the test area, due to lost air flow because of an excess of specimens, due to inadequate damper operation because of low air pressure, or due to a heater malfunction. Alternatively, the overheat protection has been set to a temperature that is lower than the set temperature of the test area.	• Remove the source of heat from inside the test area. • Check the specimen quantity and the air pressure. • Ensure the setting value of the overheat protection in the pattern settings is at least 10°C higher than the high temperature exposure value. • If the overshoot is large, set the preheat temperature lower. • If the same alarm occurs again, call for service.
SPECIMEN OVERCOOLING	12	○		○	The specimen temperature was detected to have dropped to an inappropriate value. The chamber has stopped.	The test area temperature dropped below the overcool protection setting of the registered pattern. The specimens in the test area may be exerting a cooling effect, there may be lost air flow because of an excess of specimens, or there may be a large undershoot due to a low precool temperature. Alternatively, the overcool protector has been set to a temperature that is higher than the set temperature of the test area.	• Remove the source of cooling from inside the test area. • Check the specimen quantity and the precool temperature. • Ensure the setting value of the overcool protection in the pattern settings is at least 10°C lower than the low temperature exposure value. • If the undershoot is large, set the precool temperature higher. • If the same alarm occurs again, call for service.
CURRENT VALUE: CONDENSER FAN	21			○	Chamber operation has stopped because a rise in condenser fan operating current activated the temperature switch or thermal relay.	This is the overload operation of the condenser fan motor.	• Turn off the instrumentation panel power switch. • Check if the condenser is clogged with dust. • Exercise caution to avoid being cut by the fins. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
HI STAGE REFRIG. DISCHARGE TEMP.	25			○	The high stage refrigerator discharge pipe temperature switch tripped. The chamber has stopped.	The refrigerator may be malfunctioning, an error may have occurred on the condenser, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • Check that there is sufficient space above/behind the chamber and that the power supply voltage is not fluctuating. • If the same alarm occurs again, call for service.
HI STAGE REFRIG. HIGH PRESSURE ERR	24			○	The high stage refrigerator high pressure switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, an error may have occurred on the condenser, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. Also check the condenser, strainer, and cooling pipe for clogging. • Check that there is sufficient space above/behind the chamber and that the power supply voltage is not fluctuating. • If the same alarm occurs again, call for service.
HI STAGE REFRIG. LOW PRESSURE ERR	24			○	The high stage refrigerator low pressure switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, frost may have formed on the evaporator, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • If the same alarm occurs again, call for service.
HIGH STAGE REFRIG. OVERLOAD	23			○	The high stage refrigerator circuit breaker, temperature switch, or motor protector tripped. The chamber has stopped.	The refrigerator may be overloaded or malfunctioning, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the wiring circuit breaker (MCB11) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
LOW STAGE REFRIG. DISCHARGE TEMP.	28			○	The low stage refrigerator discharge pipe temperature switch tripped. The chamber has stopped.	The refrigerator may be malfunctioning, an error may have occurred on the condenser, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. HIGH PRESSURE ERR	27			○	The low stage refrigerator high pressure switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, an error may have occurred on the condenser, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • Check that there is sufficient space above/behind the chamber and that the power supply voltage is not fluctuating. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. LOW PRESSURE ERR	27			○	The low stage refrigerator low pressure switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, frost may have formed on the evaporator, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. OVERLOAD	26			○	The low stage refrigerator circuit breaker, temperature switch, or motor protector tripped. The chamber has stopped.	The refrigerator may be overloaded or malfunctioning, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the wiring circuit breaker (MCB21) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. LIQUID BACK	29			○	The low stage refrigerator liquid backflow detection temperature switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, frost may have formed on the evaporator, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • After checking these items, defrost the chamber. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
LOW STAGE REFRIG. 2 DISCHARGE TEMP.	57			○	The low stage refrigerator 2 discharge pipe temperature switch tripped. The chamber has stopped.	The refrigerator may be malfunctioning, an error may have occurred on the condenser, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. 2 OVERLOAD	55			○	The low stage refrigerator 2 circuit breaker, temperature switch, or motor protector tripped. The chamber has stopped.	The refrigerator may be overloaded or malfunctioning, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the wiring circuit breaker (MCB22) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
LOW STAGE REFRIG. 2 LIQUID BACK	58			○	The low stage refrigerator 2 liquid backflow detection temperature switch tripped. The chamber has stopped.	There may be an error in the refrigerator circuit, frost may have formed on the evaporator, the refrigerant gas may be leaking, or the chamber may be affected by its installation environment.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Check that the ambient temperature, water temperature and supply pressure, and power supply voltage are within the allowable ranges. • After checking these items, defrost the chamber. • If the same alarm occurs again, call for service.
BLOWER BREAKER TRIP	62			○	The air circulator circuit breaker tripped. The chamber has stopped.	An error may have occurred on the air circulator.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the wiring circuit breaker (MCB1) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
HEATER BREAKER TRIP	62			○	The heater circuit breaker tripped. The chamber has stopped.	An error or short circuit may have occurred on the heater.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the wiring circuit breaker (CB2 or CB3) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
CIRCUIT BREAKER TRIP	62			○	The circuit protector for the control circuit tripped. The chamber has stopped.	An error or short circuit may have occurred on the overheat/overcool detector or refrigerator solenoid valve.	• Turn off the instrumentation panel power switch. • Turn off the primary side power supply circuit breaker. • Manually reset the circuit protector (CP2) on the instrumentation chassis in the electrical compartment. • If the same alarm occurs again, call for service.
RECORDING MEDIA RECOGNITION WARNING	-		○		The following functions are not performed because the recording media cannot be recognized. • Saving sampling data to internal memory • Recording back trace data • Writing back trace data to external memory • Downloading back trace data (web) • Updating add-ons/system • Recording camera images • Downloading camera images (web) Although the above functions cannot be performed, you can otherwise operate the chamber.	The recording media may have failed.	• Restart the primary side power supply circuit breaker. • If the same alarm occurs again, call for service.
RECORDED DATA DELETION WARNING	-		○		A portion of the following recorded data has been deleted. • Sampling data • Back trace data • Add-ons/system update history • Camera images (add-on) You can operate the chamber.	The recording area for the recorded data has been corrupted, so a portion of the recorded data has been deleted.	• If the same alarm occurs again, call for service.

Alarm Name	Com	OP	Category		Problem	Probable cause	Action
			Warning	Alarm			
RECORDED DATA INITIALIZATION WARNING	-		○		The following recorded data has been lost due to initialization. • Sampling data • Back trace data • Add-ons/system update history • Camera images (add-on) You can operate the chamber.	The recording area for the recorded data has been corrupted, so the recording area was initialized.	• If the same alarm occurs again, call for service.
Ext. Equipment Failure (ALARM)	73	○		○	An error was detected on an external device connected to the chamber. The chamber has stopped.	Troubleshoot the external device as explained in its instruction manual.	• Take the appropriate actions as indicated in the instruction manual of the external device. • After that, turn off the instrumentation panel power switch, and then resume testing. • If the same alarm occurs again, call for service.
Invalid time (economy ope. mode)	48		○		The chamber was not able to perform preheating economy operations or precooling economy operations. The chamber continues operating.	The chamber was not able to perform economy operations due to the condition settings of preheating economy operations or precooling economy operations and the exposure time settings.	• Disable economy operations or change the economy condition settings or exposure time settings to appropriate values. • Press the CLEAR button on the ALARM screen to clear the alarm.