

## 6.6 Troubleshooting

 <b>WARNING</b>	
	<p><b>When taking action on the primary power supply to which the chamber breaker is connected, be sure to turn off the main power supply switch at your facility before de-energizing. Also, use caution to ensure that power is not supplied accidentally.</b></p> <p>Attempting to solve a problem with the power on can result in an electric shock and create a very dangerous situation.</p> <p>Use the supplied breaker handle stopper to prevent the breaker from being turned on accidentally.</p>
	<p><b>Be sure to turn off the breaker before opening the electrical compartment door or the water circuit box door (heat exhaust chamber door).</b></p>

This section describes problems that the chamber cannot self-diagnose and operations that can be easily mistaken for malfunctions.

If the chamber does not operate properly even after taking the actions listed here, contact your distributor or ESPEC.

Table 6.5 Troubleshooting

Problem	Cause	Solution
Nothing is displayed when the instrumentation power switch is pressed.	The main power supply switch at your facility is off.	Turn on the main power supply switch at your facility.
	The breaker (main power switch) is not on.	Turn on the breaker (main power switch).
	The electrical compartment door or water circuit box door (heat exhaust chamber door) is open.	Close the door.
	The power supply is in open phase.	Make the proper connection. See the Installation guide.
	The fuse has blown.	Replace fuse F2. See  "6.7 Maintenance". If the fuse blows immediately after replacement, request a service call.
Display immediately turns off or is operating abnormally.	Battery for backup is exhausted.	The life of the backup battery is about 10 years. Request a service call.
	System error or internal board error	Turn the chamber's breaker (main power switch) back on. If this occurs again after resuming operation, request a service call.

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Problem	Cause	Solution
External memory tab contents are not displayed.	The function is being suppressed by the external memory protect setting.	Check with the chamber administrator or check the protect setting.
The message "Remove the memory" is displayed even while external memory is inserted.		
The door is difficult to close.	An object is blocking the door.	Remove the object.
	Frost has accumulated on the packing, hardening it.	Defrost the chamber. See  "6.7 Maintenance".
	The test area has become hot and humid, creating strong internal pressure.	This is not a malfunction. Continue operation.
The door is difficult to open.	The test area is under negative pressure.	This is not a malfunction. Continue operation.
	Frost has accumulated on the packing, hardening it.	Defrost the chamber. See  "6.7 Maintenance".
During operation at freezing temperatures, frost columns taller than 5 cm formed on the drain port in the test area or frosting occurs inside the test area.	External air entered from the cable port.	Block the cable port with the cable port cap and cable port plug.
	The door packing stopper has a defect or the door packing has deteriorated.	Request a service call.
Condensation has formed around the internal door packing, leaking water from the front of the chamber.	The door packing stopper has a defect or the door packing has deteriorated.	Request a service call.
Strange noises are heard.	The fuse of the anti-frost heater has blown, and frost has accumulated on the air circulator.	Replace fuse F3. If the fuse blows immediately after replacement, request a service call. See  "6.7 Maintenance".
	The condenser filter is clogged.	Clean the filter. See  "5.4 Maintenance".
Strange odors are detected.	A strange odor remains in the chamber.	Clean the test area. See  "5.4 Maintenance".
	Specimens are emitting strange odors.	This is not a malfunction. Continue operation.
The chamber vibrates.	The adjustable feet are not installed properly.	Adjust the adjustable feet. See the Installation guide.

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Problem	Cause	Solution
Viewing window is clouded or frosted.	The humidity has increased rapidly.	This is not a malfunction. Continue operation.
	The fuse of the anti-frost heater has blown.	Replace fuse F3. See  "6.7 Maintenance".
The outside of the chamber is wet.	A high ambient humidity is present.	This is not a malfunction. Continue operation. To end operation, allow the test area to return to room temperature before ending operation.
The wet-bulb wick has dried out.	Bacteria are growing in the water tank.	Clean the water tank and water supply pump filter element. See  "5.4 Maintenance".
The temperature (humidity) is unstable.	The door is not closed.	Close the door.
	The cable port rubber plug is not installed.	Install the rubber plug.
	The ambient temperature has changed 5°C or more in a few minutes.	Resume testing after the ambient temperature has stabilized.
	The power source of a device with a large heat generation load was turned on/off.	Reduce the heat generation load.
	The water supply pump filter element is clogged.	Clean the water supply pump filter element. See  "5.4 Maintenance".
The temperature has gradually increased above the set temperature.	The specimen heat generation load is high.	Reduce the specimen heat generation load.
	Frost has accumulated on the cooler.	Defrost the chamber. See  "6.7 Maintenance".
Settings cannot be changed.	The key lock is enabled.	Disable the key lock.
The temperature does not decrease immediately.	Due to the characteristics of the compressor, it takes 3 to 15 minutes to begin cooling.	This is not a malfunction. Continue operation.
It takes a long time to increase (decrease) the temperature.	The door is open.	Close the door.
	The specimen heat load is high.	Reduce the amount of specimens.
	The ambient temperature is too low (high).	Increase (decrease) the ambient temperature.
During warming, warming stops or the temperature decreases midway.	Frost has accumulated on the cooler and dehumidifier.	This is not a malfunction. Continue operation or defrost the chamber. See  "6.7 Maintenance".

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Problem	Cause	Solution
The temperature uniformity is poor.	The air flow inside the test area is poor.	Improve the air flow.
	The specimen heat load is high.	Reduce the amount of specimens.
	Frost has accumulated on the cooler.	Defrost the chamber. See  "6.7 Maintenance".
The chamber lamp does not light.	The fuse has blown.	Replace fuse F2. If the fuse blows immediately after replacement, request a service call. See  "6.7 Maintenance".
	The bulb-type fluorescent lamp is out.	Replace the bulb-type fluorescent lamp. See  "6.7 Maintenance".
The humidity does not decrease.	The refrigeration capacity is set to [Manual (stop)], so the test area cannot be dehumidified.	Set the refrigeration capacity to [Auto] or [Manual (stop or one of 3 values between max. and min.)]. See  "Chapter 4 Constant value operation" or "Chapter 5 Program operation" in the Controller guide.

## 6.7 Maintenance

### Replacing a fuse

When a fuse blows, replace it with a supplied fuse.

 **WARNING**

 **Use appropriate methods, as shown below, to replace the fuse.**  
Failing to do so can result in electric shock.

**◆ Note ◆**

If the new fuse blows as soon as the power is turned back on, contact your distributor or ESPEC.

#### <Procedure>

- 1) Turn off the breaker.
- 2) Remove the electrical compartment door.
- 3) Replace the blown fuse with a new fuse.

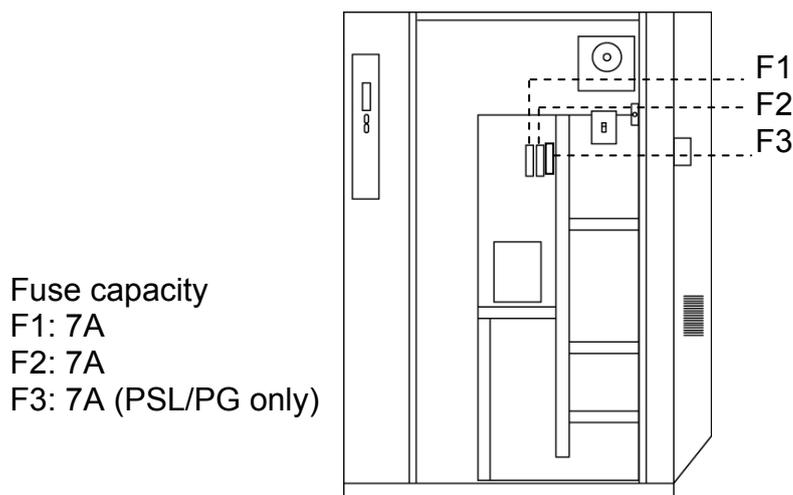


Fig. 6.1 Fuse replacement

- 4) Attach the electrical compartment door.

## Replacing the chamber lamp

Replace the chamber lamp after 6,000 hours or when it goes out. Prepare a new bulb-type fluorescent lamp (E17 40-watt bulb) and a Phillips screwdriver.

 <b>CAUTION</b>	
	<b>The fluorescent lamp is extremely hot immediately after it turns off. Allow it to sufficiently cool down before replacing it.</b> Failing to do so can result in burns.

### <Procedure>

- 1) Turn off the breaker.
- 2) Use a Phillips head screwdriver to remove the chamber lamp cover screw.

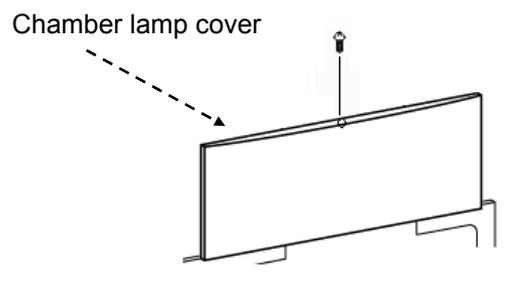


Fig. 6.2 Removing the chamber lamp cover (1)

- 3) Slide up and remove the chamber lamp cover.
- 4) Use a Phillips screwdriver to remove the screws of the reflector mounted in front of the bulb-type fluorescent lamp.

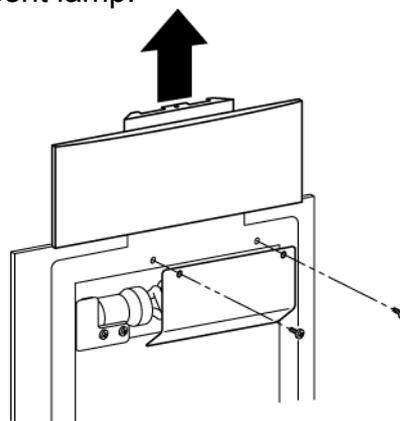


Fig. 6.3 Removing the chamber lamp cover (2)

- 5) Unscrew and remove the bulb-type fluorescent lamp.
- 6) Replace it with a new bulb-type fluorescent lamp.
- 7) Install the reflector and chamber lamp cover, and then secure them with screws.

**◆ Note ◆**

Use an E17 fluorescent lamp. Do not use an incandescent light bulb.

**Defrosting****! CAUTION**

**Periodically defrost the cooler. An excessive amount of frost forming on the cooler will lead to symptoms such as it taking a long time to decrease the temperature and notably poor chamber control.**

In this situation, do not perform defrost operations. Too much frost on the cooler prevents the defrosting procedure because air does not flow inside the chamber. On the contrary the thermal fuse may blow in order to protect the chamber.



**If an excessive amount of frost forms on the cooler, stop operations, open the door, and then leave the chamber at room temperature until the chamber defrosts naturally (which will take from half a day to about a full day).**



**Operating the chamber continuously for a long time with frost on the cooler can lead to malfunctions. Be sure to defrost the cooler.**

Frost may form on the cooler in temperature (and humidity) operations below 30 to 40°C. Perform defrosting:

- If temperature (and humidity) inside the chamber is uncontrollable or rises slowly
- If the air blown from the chamber is weak (when the door is opened)
- If frost or ice forms on the test area walls
- If the "DRY WICK (WARNING)" alarm is displayed and frost forms on the front wall of the test area during the temperature and humidity control operation

Use this procedure to defrost packing as well.

**■How to defrost the chamber****<Procedure>**

- 1) Check that the breaker is in the on position.
- 2) Turn refrigerator control off.  
For an explanation on how to set refrigerator control, see "2.4 Convenient functions" in the Controller guide.
- 3) Change settings so that the operation is not interrupted or an alarm generated if the chamber is run with the door cracked slightly. Make the following settings. For details on settings, see Controller guide.
  - Set [Pause Control] to OFF.
  - Set [Hold Time] to OFF.
- 4) Set the internal chamber temperature to 70°C or higher and turn off humidity control (not necessary with temperature-only chambers).
- 5) Display the Operation Mode Selection screen.  
Press the chamber operating status box on the common area.
- 6) Press the START key to start operation.  
Run the chamber for about 60 minutes with the door closed, then for 15 minutes with the door slightly cracked.
- 7) Return the settings made in step 3 to their original values.

**◆ Note ◆**

As necessary, drain the humidifying tray manually during operation (not necessary with temperature-only chambers).

### Replacing the HEPA filter (PCR only)

Accumulation of dirt on the HEPA filter makes it difficult for air to pass, which results in a drop in air velocity and air volume. The needle of the clean meter, which is used to judge whether the filter should be replaced, initially points in the vicinity of 0.2 kPa (20 mmAq). The needle will move to the right as the filter becomes clogged. Replace the HEPA filter whenever the clean meter reading is in the vicinity of 0.3 kPa (30 mmAq). The life of the HEPA filter is around three years.

#### <Procedure>

- 1) Remove the decorative plate (1) under the filter.
- 2) Remove the duct face plate (2).

#### ◆ Note ◆

The duct face plate (2) is not secured by a screw, so be careful not to drop it.

- 3) Loosen the filter anchor bolt (3).
- 4) Pull the filter (4) toward you.
- 5) Install a new filter.

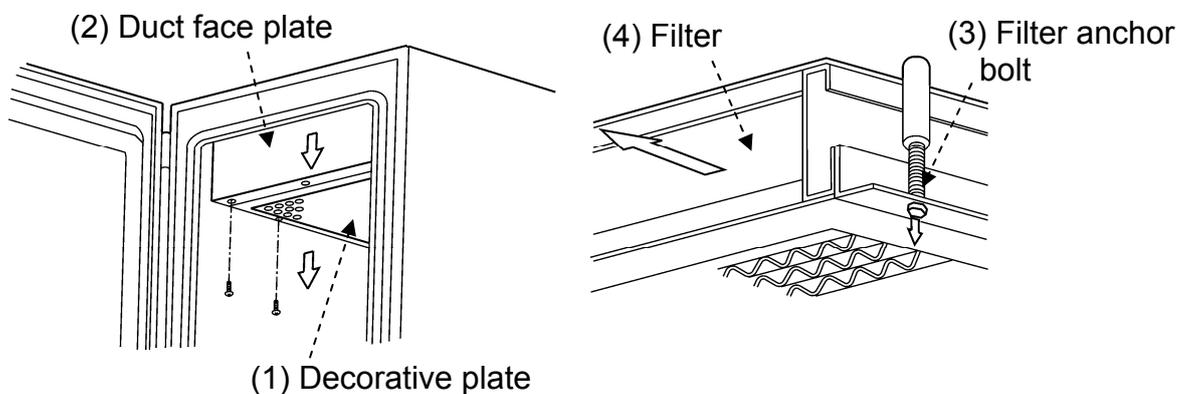


Fig. 6.4 Replacing the HEPA filter

