

Chapter 5 Inspection and maintenance

This chapter describes how to perform regular inspection and maintenance to ensure the long operating life of the chamber.

5.1 List of consumables and regular replacement parts

The following parts must be replaced regularly. Replace the parts as soon as the replacement period is reached.

You can also use the ESPEC maintenance and inspection service.

To request a part, contact your distributor or ESPEC.

◆ Note ◆

The replacement period for the wick pan water supply pump is 3 years. If the water supply pump deteriorates, water may not be supplied steadily to the wet-bulb wick, resulting in lower accuracy of the humidity control. When the replacement period is reached, contact your distributor or ESPEC as soon as possible.

Table 5.1 List of consumables and regular replacement parts

Component name	Replacement period	Replacement method
Wet-bulb wick	After humidity control operation or 1 month	See " 4.3 Checking the wet-bulb wick (excluding LU model) ".
Door packing	3 years	Contact your distributor or ESPEC.
Wick pan Water supply pump	3 years	Contact your distributor or ESPEC.
Humidifying heater (except for LU)	When the "Humidifier fault" alarm is displayed or when the main power switch is off and the error occurs again even after taking action in " 6.1 Alarms and actions "*	Contact your distributor or ESPEC.

* The operating life of the humidifying heater depends on the temperature and humidity control operation time, and the water quality.

Using water with high conductivity can reduce the operating life.

To extend the operating life of the heater, replace the water in the humidifying tray before a temperature and humidity control operation, and regularly clean the inside of the test area. (See "[5.4 Maintenance](#)".)

* Lithium battery



Chamber instrumentation is equipped with a lithium battery that, under normal use, will not become depleted and does not require replacement by you. (The designed operating life is at least 10 years.)

■ Notification function

The inspection and maintenance periods can be set from the instrumentation.

For details, see the Controller guide.

5.2 Inspection and maintenance items

 WARNING	
	<p>Use appropriate methods to periodically clean parts of the chamber such as the electrical compartment and humidifying tray.</p> <p>Failing to do so can result in burns and electric shock.</p>

■ Inspection items

For a description of each item, see "[5.3 Inspection](#)".

If the inspection items listed below do not operate properly, contact your distributor or ESPEC.

Table 5.2 Inspection items

Operation inspection item	Inspection period
Testing main power switch (power supply leakage breaker) operation	<ul style="list-style-type: none"> Once per month Before long-time continuous operation
Testing overheat protector operation	<ul style="list-style-type: none"> Before starting operation
Checking the water level of the humidifying tray and humidifying tray water level controller (except for LU)	<ul style="list-style-type: none"> Once every 3 months Whenever the chamber is moved
Checking the operation of the air circulator for air flow inside the chamber	<ul style="list-style-type: none"> Once per month Before long-time continuous operation

■ Maintenance items


For a description of each item, see "[5.4 Maintenance](#)".

Table 5.3 Maintenance items

Maintenance item	Maintenance period
Condenser cleaning (excluding LH model)	Once a month
Water tank cleaning (excluding LU model)	Once a month
Cleaning the electromagnetic pump protective strainer inside the water tank (excluding LU model)	Once a month
Humidifying tray cleaning (Excluding LU model)	Once a month
Test area cleaning	Before starting operation
Water circuit chamber (heat exhaust chamber) cleaning	Once a year
Preparations before an extended period of non-use	Before extended period of non-use
Water supply circuit disinfecting (excluding LU model)	Wick becomes dry within a short period (one to three days), bacteria growing in the water circuit

5.3 Inspection

Testing main power switch operation

**WARNING**

! **Test the main power switch (leakage breaker) to conform normal operation once a month or before starting continuous operation for a long time.**
Failing to do so can result in electric shock.

Test the operation of the main power switch once a month and before starting continuous operation for a long time.

With the main power switch on, gently press the test button. Lowering of main power switch (leakage breaker) lever when the test button is pressed indicates normal operation.

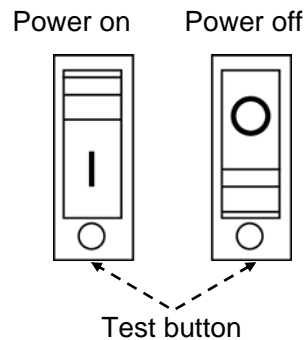



Fig 5.1 Test button

Testing overheat protector operation

 **WARNING**

! Before starting chamber operation, check that the overheat protector is operating normally.
Failing to do so can result in fire.

Before starting chamber operation, test the operation of the overheat protector.

<Procedure>

- 1) Confirm that the main power switch is on.
- 2) This will cause the monitor screen to appear.
- 3) Set the constant values and start constant operation.
Set the temperature close to room temperature or the current monitor temperature, and turn off the humidity setting.
- 4) Configure the overheat protector to a setting 5°C less than the temperature of the test area.
If the overheat protector is operating normally, a buzzer sounds and an alarm appears on the screen of instrumentation. All digits of the display on the setter flash.
If the buzzer does not sound, there is an error. Contact your distributor or ESPEC.

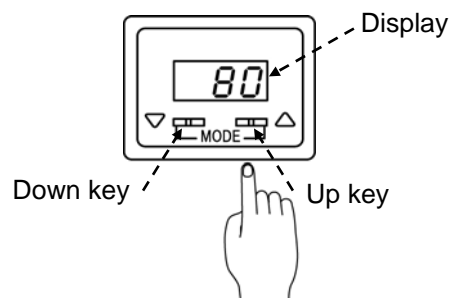


Fig 5.1 Overheat protector

- 5) Stop the buzzer, press the [Stop Beep] key on the alert screen.
The setting of the overheat protector returns to the original setting.

Checking the operation of the air circulator for air flow inside the chamber

Check the operation of the air circulator for air flow inside the chamber once a month or before starting long-term continuous operation.

<Procedure>

- 1) Check that the main power switch is in the on position.
- 2) The monitor screen appears.
The current test area temperature and humidity are displayed.
- 3) Set the chamber air temperature to 20°C.
For details on setting the temperature, see "3.2 Entering the temperature and humidity" in the Controller guide.
- 4) Start constant operation.
The chamber starts operating.
- 5) Open the test area door, and check that the air circulator for air flow inside the chamber is not vibrating abnormally.
- 6) Close the door, and check that the air circulator for air flow inside the chamber is not producing abnormal sound.

If the fan is vibrating abnormally or abnormal sound is being produced, the air circulator or the fan may be malfunctioning.
Contact your distributor or ESPEC.

5.4 Maintenance

Cleaning the condenser (excluding LH model)

Before cleaning the condenser, be sure to open the chamber door, wipe off any water on the inside of the door, and then close the door again.

<Procedure>

- 1) Unplug from the power outlet.
- 2) Use a Phillips screwdriver to remove fixing screws along the bottom of the front panel.
- 3) Pull out the bottom of the front panel and remove it.
(Opening the chamber door makes it easier to remove the front panel.)

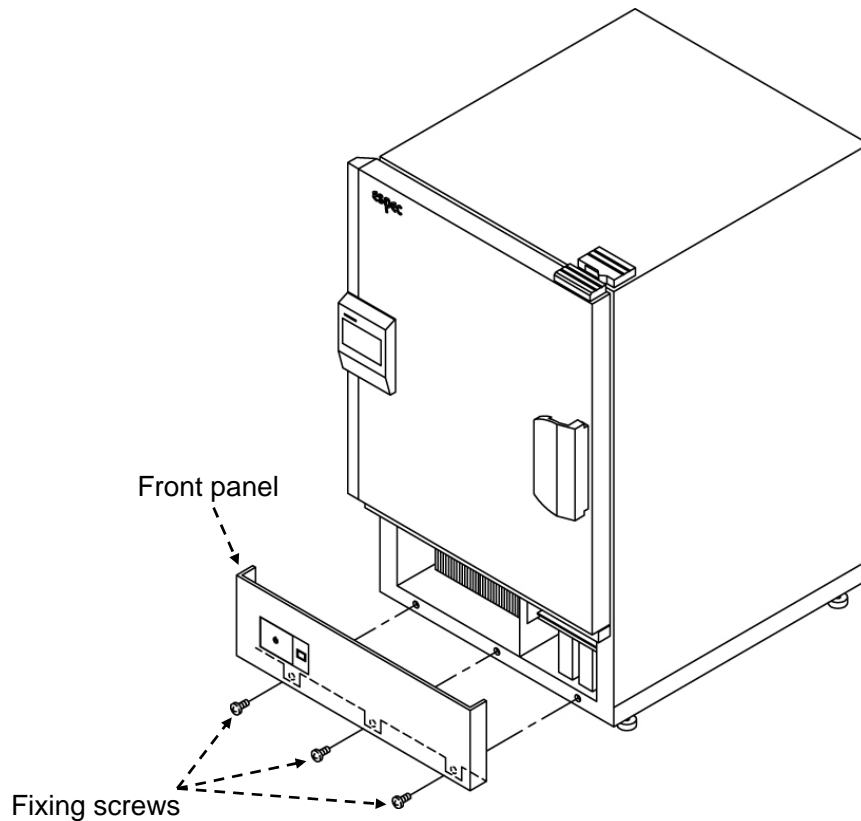


Fig. 5.3 Removing the front panel

- 4) Use a vacuum cleaner or some other means to remove any dust around the condenser.
- 5) Reinstall the front panel.

Cleaning the water tank (excluding LU model)

If water is left in the water tank for more than one month, the water may become contaminated. Using contaminated water creates the risk of defective water circuit component operation, and shortened humidifying heater and wet-bulb wick life.

Clean the water tank and filter element once a month.

◆ Note ◆

- Stop chamber operation before cleaning. Add water to the humidifying tray after cleaning. Adding water removes air from the water circuit automatically, keeping the water supply to an appropriate level.
- Be sure to return all parts that were removed for cleaning to their original locations after cleaning is complete.
- Open and close the water circuit chamber door (heat exhaust chamber door) slowly and completely. Opening and closing with undue force can break the door.
- Clean your hands and the cleaning cloth beforehand to prevent bacteria in the water tank.

<Procedure>

- 1) Unplug the power cord from the power outlet.
- 2) Connect the provided drain hose to the water supply and drain port of the water tank, and drain the water from the tank. (Required time: 8 minutes for a full tank)

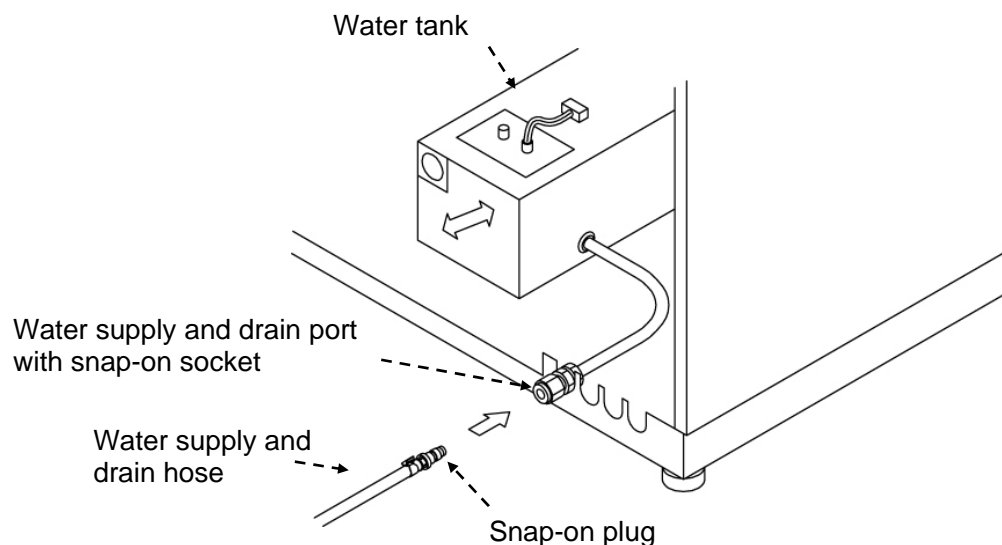


Fig. 5.4 Connecting the snap-on plug

- 3) Remove the water circuit chamber door (heat exhaust chamber door).
- 4) Use the water supply and drain hose to supply water to the water tank.
- 5) Discharge the water tank again when its water level becomes about two-thirds full.
- 6) Repeat steps 4 and 5 two or three times.

Cleaning the electromagnetic pump protective strainer inside the water tank (excluding LU model)

<Procedure>

- 1) Unplug the power cord from the power outlet.
- 2) Remove the water circuit chamber door (heat exhaust chamber door).
- 3) Use a Phillips screwdriver to loosen the screws that secure the 3-way float switch and strainer flange to the top of the water tank, and then raise the flange to remove it.

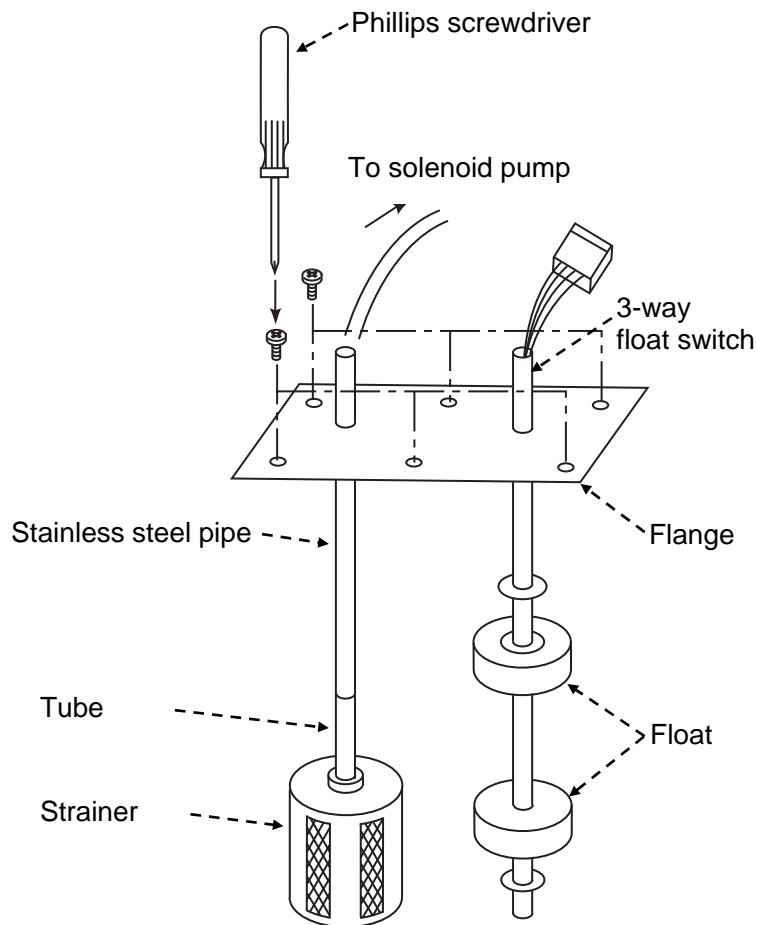







Fig. 5.5 Cleaning the electromagnetic pump protective strainer

- 4) Pull off the strainer attached to the end of the tube and use clean water to remove any foreign matter.
- 5) Perform the above step to reassemble the components.

Cleaning the humidifying tray (excluding LU model)

 **CAUTION**

-  **For your safety, be sure to wear gloves.**
The test area has protruding parts and sharp parts, so be careful of cuts.
-  **Allow the test area to return to around room temperature before cleaning the humidifying tray.**
Failing to do so can result in burns and frostbite.
-  **Make sure that the main power switch is off before starting work.**
Working the power on creates the risk of electric shock.
-  **Take precautions against hot water when draining the humidifying tray.**
Hot water creates the risk of burn injury.

Debris and impurities adhere to the humidifying tray and humidifying heater during operation. Clean these components once a month to extend their operating life. Discharging the water from the humidifying tray after each test is completed can prevent the build-up of debris and impurities.

<Procedure>

- 1) Open the test area door.
- 2) Pull the bottom of the protective grille towards you and then lift up to remove it.

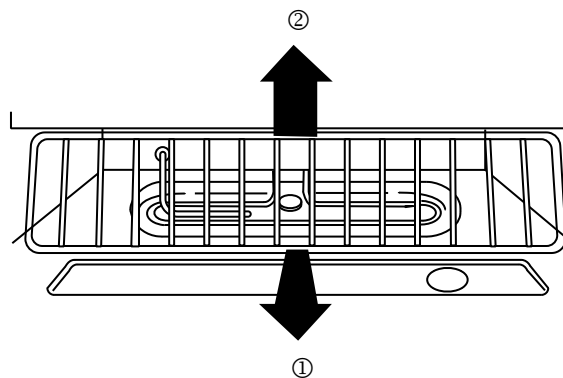


Fig. 5.6 Removing the protective grille

- 3) Use a brush to clean the surfaces of the humidifying tray and humidifying heater.
- 4) Install the protective grille and close the test area door.

Cleaning the test area

The build-up of dust and impurities on the inside of the chamber interfere with accurate test results. Clean the test area before starting operation.

<Procedure>

- 1) Open the test area door.
- 2) Use a soft cloth to wipe the inside of the test area.
- 3) Close the test area door.

Cleaning the water circuit chamber (heat exhaust chamber) cleaning

The collection of dust in the water circuit chamber (heat exhaust chamber) can lead to malfunction.

Clean the water circuit chamber (heat exhaust chamber) once a month.

<Procedure>

- 1) Confirm that the main power switch is off.
Note that there is a potentially dangerous air circulation fan inside the water circuit chamber (heat exhaust chamber). Whenever you need to open the water circuit chamber door (heat exhaust chamber door), be sure to first turn off the main power switch.
- 2) Open the water circuit chamber door (heat exhaust chamber door).
- 3) Use a vacuum cleaner or some other means to remove any dust in the water circuit chamber (heat exhaust chamber).
- 4) Close the water circuit chamber door (heat exhaust chamber door).

Preparations before an extended period of non-use

If the chamber will not be used for an extended period of time, be sure to perform the steps shown below. Failure to do so may result in inaccurate testing and reduce the operating life of the chamber.

- Replace the water in the water circuit chamber. (excluding LU model)
- Discharge water. (excluding LU model)
- Perform a dry operation.
- Turn off the main power switch.

■ Replacing the water in the water circuit chamber (excluding LU model)

Set the temperature of the test area to 70°C and the humidity to 90%RH, and operate the chamber in constant mode for approximately 10 minutes.

<Procedure>

- 1) Confirm that the main power switch is on.
- 2) Set the temperature of the test area to a constant setting of 70°C and the humidity to a constant setting of 90%RH.
- 3) On the operation control screen, start operation.
- 4) Perform the operation for approximately 10 minutes with the test area door closed.

◆ Energy Saving Advice ◆

IMPORTANT Turn off the chamber main power switch.

Reduce the standby power.

If the chamber will not be used for an extended period of time, turn off the main power switch to reduce standby power.

Turn on the main power switch one hour before using the chamber.
(Ambient temperature: 20°C)

■ Draining water (excluding LU model)

Discharge the water from the wick pan, humidifying tray, and water supply tank.

For information about the water tank, see "Cleaning the water tank (excluding LU model)." For information about the humidifying tray, see "Cleaning the humidifying tray (excluding LU model)."

To drain water from the wick pan, connect the snap-on plug of the water supply and drain hose to the humidifying tray supply port snap-on socket. After wick pan water draining is complete, turn off temperature (humidity) operation, and then remove the hose.

■ Performing a dry operation

◆ Note ◆

Under certain ambient conditions, suddenly stopping operation following low-temperature operation can cause condensation to form on the chamber surface. In some cases, water may leak at the installation location.

Return the temperature in the test area to room temperature before stopping operation.

Operate the chamber to dry out its test area.

Use constant operation at 70°C or higher and humidity setting off for approximately 60 minutes.

After that, open the test area door slightly and operate in constant mode for approximately 15 minutes using the same settings.

<Procedure>

- 1) Confirm that the main power switch is on.
- 2) Configure settings to a test area temperature of 70°C or higher, and turn off humidity control (excluding LU models).
- 3) Start operation.
Run the chamber for about 60 minutes with the door closed, then for 15 minutes with the door slightly open.

■ Turn off power

Turn off the main power switch and then turn off the primary power supply.

Disinfecting the water supply circuit (excluding LU model)

Bacteria can grow in the water circuit over time. If this happens use a hydrogen peroxide solution or oxydol to disinfect the circuit.

■ Preparing the cleaning agent

- Using a hydrogen peroxide solution: Use a 30% hydrogen peroxide solution (two 500mL bottles) diluted with distilled water (9 liters).
- Using oxydol: Use oxydol (twenty 500mL bottles).

<Procedure>

- 1) Drain and dispose of all the water in the water circuit and water tank.
For information about the water tank, see "Cleaning the water tank (excluding LU model)."
For information about the humidifying tray, see "Cleaning the humidifying tray (excluding LU model)."
- 2) Fill the water tank with the cleaning solution you prepared.
- 3) First water circuit cleaning
Start a temperature (humidity) operation. (Set points: $\pm 20^{\circ}\text{C}$, 0%RH)
* A temperature set point that is too high creates the risk of humidifying heater dry-boil.
This will start water supply to the humidifying tray.
Supply water until the humidifying tray becomes full and then let the water sit for about 15 minutes.
Stop temperature (humidity) operation after the tray is full of water.
- 4) First humidifying tray water draining
Referring to "Cleaning the humidifying tray (excluding LU model)," drain water from the humidifying tray.
After draining water, disconnect the hose.
- 5) Second water circuit cleaning
Repeat step 3.
(There is no need to replace or add to the water in the water tank.)
- 6) Second humidifying tray water draining
Repeat step 4.
- 7) Dispose of any cleaning solution remaining in the water tank.
- 8) Fill the water tank with pure water.

