

Standard Temperature/Humidity Chamber

Operating manual and applicable equipment

S-TH series / TC2 version



Check	Details
Controller	TC2
Operating temperature	Use the supplied temperature/humidity range
About this edition	English translation and re-edited version of the supplied Korean operating manual. Match it to the equipment nameplate, controller and supplied configuration before use.

Photographs are representative examples. Appearance and controls can vary with manufacturing date or custom configuration. Do not apply these instructions to a different controller.

Contents: applicable model / safety and installation / equipment and operation / controller / maintenance and faults / warranty and GHT support.

Standard Temperature/Humidity Chamber

Safety precautions

Read this manual and your facility procedures before use. Only authorised, trained personnel may operate the equipment. DANGER, WARNING and CAUTION identify precautions against electric shock, fire, explosion, burns and equipment damage.

Hazard	Required precautions
DANGER	Do not place explosive or flammable substances in the chamber. Do not install near ignition sources or where combustible gas or organic-solvent vapour may be present.
WARNING: electricity	Use a correctly rated, earthed supply matching the nameplate. Avoid overloaded multi-outlet connections. Never operate electrical parts with wet hands. Do not earth to gas pipes, plastic water pipes or telephone lines.
WARNING: heat	The chamber, door and exhaust become hot. Allow adequate cooling before opening or unloading. Use protective equipment suited to the temperature and task.
WARNING: service	Only qualified service technicians may dismantle, modify or inspect internal parts. Stop operation, cool the equipment and isolate the supply before cleaning, maintenance or moving.
Abnormal operation	If there is unusual noise, odour, smoke, leakage current or other abnormal behaviour, stop use, make the area safe, isolate the supply and contact GHT.

Do not wash by spraying water. Keep ventilation openings clear. Avoid moisture, dust, corrosive gases, direct sunlight, rain and external heat sources. Install indoors on a firm, level surface. Do not tilt, lay down or strike the equipment during transport.

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Configuration, water and operation

This chamber maintains temperature and humidity for durability and other tests. Components include a viewing window, temperature/humidity sensors, perforated shelves, water tank, level indication, low-water alarm, lighting and power controls. Match the controller to the version on the cover.

Source performance statements: standard and R1 chambers report internal tests within $\pm 1^{\circ}\text{C}$ and $\pm 2\%$ humidity at $85^{\circ}\text{C}/85\%$. The benchtop source states deviations within $\pm 1^{\circ}\text{C}$ and $\pm 2\%$. These are not a blanket guarantee for all conditions or evidence of independent certification.

1. Check installation, rated supply and earth, then fill the tank with suitable water. Use distilled/deionised water or the specified filtered water. Do not use tap water, groundwater or water of unknown composition.
2. Turn the main breaker and POWER ON. Check the display, fan and water level. Open the Vent Hole appropriately and avoid loading samples that obstruct circulation.
3. Set temperature and humidity and start. After operation, beware of hot vapour; open only at a safe temperature to remove residual moisture. Cool before switching off the main supply.

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Cooling, dehumidification and water system

The refrigeration unit has a protective temperature limit. The standard source describes inhibition above a normal limit of 60°C. On changing from hot to cold operation, allow natural cooling to the protective temperature; this can take time. Do not alter the protection setting, including on R1 versions.

Dehumidification condenses moisture on the evaporator. If the compressor is inhibited at high temperature, open the designated cable port as directed for the actual unit to allow natural moisture exhaust. This increases water consumption; watch the level.

Long operation can ice the evaporator, preventing temperature/humidity control and overloading refrigeration. Include a defrost stage without humidity control, within the chamber temperature limits.

Do not use an electronic humidity sensor at 100°C or above. At humidity of 98% or higher, condensation may form. Remove droplets with a soft cloth, or dry for at least 30 minutes at a 0% humidity setting. Keep the drying temperature below the sensor limit and within the actual specification.

The internal tank pump supplies humidification water. Identify the manual tank drain, manual chamber return valve and automatic drain on the actual equipment. In non-humidified sub-zero operation, the arrangement returns humidification water to the tank.

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Inspection, cleaning and storage

Check the low-water alarm and humidifier-heater surface quarterly. Sample leachates can affect piping and parts, so include weekly inspections where required by the test conditions.

Clean the chamber approximately monthly. Stop, cool and isolate power before removing shelves and draining the chamber and tank. Only a technician should remove heater covers; wear gloves against sharp stainless-steel edges.

Use a soft cloth with neutral detergent or compatible alcohol to remove scale from the humidification reservoir, level sensor and heater. Do not use thinner or incompatible solvents, or block the pipes with debris. Rinse with distilled water, close the drain, circulate clean water and drain again.

Wipe the exterior with a suitable cloth. Have a technician remove electrical-area dust or work inside covers. Do not disturb the pressure-adjustment silicone hose. Remove condenser dust approximately monthly.

Avoid benzene, sharp implements, hot water or cleaning methods that damage coatings, rubber or plastics. For storage, unplug, drain all water, clean the door packing, store accessories, wrap the unit and lock its castors.

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Fault checks

Symptom	Checks
No power	Check plug, switches, building supply and distribution board.
Temperature does not rise	Check whether T over-temperature protection is set too low. The source mentions 150°C or above, but the supplied equipment setting and rating take precedence. Do not raise protection beyond its rating.
Humidity does not rise	Check tank level and water delivery. The source gives H protection at 120°C. A technician should inspect H.SSR indications and distinguish heater from control faults.
Temperature/humidity will not fall	Check R protection (source: 60°C; some custom units 80°C), refrigeration, condenser dust and evaporator ice. Lack of compressor vibration below 20°C also requires technician inspection.
Breaker trips	Breaker, humidifier-heater leakage or motor faults may be involved. Do not repeatedly reset; isolate the supply and arrange inspection.

Live testing inside covers and inspection of SSRs, wiring and heaters are for qualified technicians only. Report the model, serial number, set conditions and fault circumstances to GHT.

Standard Temperature/Humidity Chamber

TC2: display and keys

TC2 displays the measured value and setpoint and sets temperature, time and PID control. The source describes PID settings for lower and higher temperatures; the normally unused ramp function is hidden.

Display / key	Function
Upper / lower display	Upper: measured temperature or parameter. Lower: setpoint or setting.
ON / OFF	Starts or stops output. Hold for about 3 seconds.
MODE	Selects TEMP, TIME, BEEP and other items and saves settings. Hold for about 3 seconds to enter/leave setting mode.
Digit / increase keys	Select a digit with the left/right keys and change its value with the increase key.
A/T	Starts/cancels auto tuning. A short press changes output or remaining-time displays.
Indicators	ON: running; HEATER: heating output; TIME: timer; A/T: automatic tuning.

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TC2: settings, running and stopping

After main power is turned ON, the controller is in standby. Set temperature and time, exit the setting display, then hold ON/OFF for about 3 seconds to run.

Use MODE to move through TEMP, TIME and BEEP. Change values with the digit and increase keys and save. Hold MODE for about 3 seconds to return to the initial display.

TIME uses 00.00 for hours/minutes. Counting starts after reaching the set temperature. TIME flashes while waiting and stays lit while counting. On completion, END appears and output stops.

BEEP is initially 30 seconds and can be set up to 9999 seconds. Check the actual display and setting range.

During operation, hold ON/OFF for about 3 seconds to pause; hold again for about 3 seconds to restart. A short press of A/T accesses output or remaining timer information.

Continuous operation at TIME = 00.00 is expressly described in the muffle-furnace and industrial-vacuum-oven source manuals. Do not assume the same behaviour for other equipment without checking its actual configuration.

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TC2: auto tuning

Set the required temperature, start output and hold A/T for about 6 seconds. The A/T indicator flashes, then goes out when tuning finishes. Operation continues at the setpoint.

Tuning cycles the temperature up and down. The source gives approximately three cycles and a condition-dependent duration of 2 to 6 hours. Assess the effect of temperature excursions before tuning with a sensitive sample.

If stopped partway through, tuning data are not saved and tuning must be repeated. Factory tuning is provided; it is not necessary to tune on every run if temperature is stable.

The source contains generic factory tuning temperatures of 40°C and 120°C. These do not apply to every model. Never tune above the equipment operating limit.

If temperature does not rise, check the over-temperature setting and operating state. Contact GHT if the issue remains unresolved.

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Maintenance, faults and warranty

Stop, cool and isolate the supply before wiping with a soft cloth. Use only cleaning agents compatible with the materials; keep water and solvents out of electrical parts. Contact GHT for appropriate genuine or specified replacement parts.

If there is no power, check the external supply, plug and main breaker. Internal wiring, fuse, SSR and heater checks must be performed by a qualified technician with safe supply isolation. Users must not remove covers for live inspection.

If temperature does not rise, check the setpoint, operating state, over-temperature setting and heater indicator. Some source instructions mention setting protection at least 20% above the test temperature. Do not exceed the equipment or sample limit; ask GHT to confirm the correct setting.

For storage, clean and dry, unplug and protect against foreign matter. Close the oven vent when stored unused. Drain water-based equipment.

Warranty: the source manuals state one year from purchase or delivery. Confirm the applicable period, start date, transport charges and other terms in the GHT quotation/supply documents. Disaster, fire, flooding, unsuitable environments, misuse and unauthorised dismantling/modification are excluded. Humidity-chamber heaters are excluded as consumables in the source.

Contact GHT

GHT CO., LTD.

E-mail: lee@actinova.kr

TEL: +82-31-484-1065

Provide the model, serial number, delivery date, operating conditions, symptoms and photographs.