Datacolor Constant Climate Chamber

Conditioner Eco LED
Conditioner Eco

User Manual

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1. Working Principle

The semiconductor-cooled constant temperature and humidity chamber precisely controls temperature and humidity via a PID temperature controller (touchscreen controller). It utilizes high-precision Pt100 temperature sensors and imported humidity sensors to ensure accurate, stable, and uniform temperature and humidity conditions inside the chamber. Featuring a high-power fan and optimized airflow duct design, it delivers uniform and controllable airflow with minimal temperature fluctuations and stable airflow. The system utilizes Peltier cooling and five-sided heating, with automatic switching between cooling and heating modes. This enables faster heating and cooling rates, shorter temperature stabilization times, and high control accuracy. By employing Peltier cooling technology, the system eliminates the need for traditional compressors, thereby improving cooling efficiency and effectively reducing energy consumption by over 85%.

2. Applications

The semiconductor-cooled constant temperature and humidity chamber has a temperature control range of 15–30°C and a humidity control range of 40%–70% rH. It is widely used in industries such as textiles, plastics, and electronics that require color inspection and quality control.

3. Terminology

1) Temperature and Humidity Range: Refers to the precise and stable temperature and humidity range that can be provided and utilized within the chamber;
2) Temperature Uniformity: Refers to the difference between the temperature at various monitoring points within the chamber and the average temperature inside the chamber; “±” indicates the range of upward and downward fluctuations;
3) Temperature Fluctuation: Refers to the range of variation in the temperature at the center point of the chamber over time; “±” indicates the range of upward and downward fluctuations;
4) Temperature Accuracy: Refers to the precision of the instrument’s displayed value;
5) Humidity Deviation: Refers to the deviation range between the measured humidity value inside the chamber and the calibrated humidity value;
6) Chamber Volume: Refers to the effective volume formed by the dimensions of the inner chamber.

4. Precautions

4.1 Environmental Requirements

1) For indoor use;
2) Ambient temperature: 5°C to 35°C;
3) Ambient relative humidity ≤ 70%;
4) Atmospheric pressure: 80 kPa to 106 kPa;
5) No direct sunlight or direct radiation from other heat sources;
6) Contamination level 2; no explosive gases, high concentrations of dust, or corrosive gases in the vicinity;
7) No strong vibrations or air currents in the vicinity.

4.2 Precautions for Use

4.2.1 Safety Precautions

Danger (May result in serious property damage or personal injury)

1) This product must be reliably grounded (never use the neutral or center conductor as a ground wire);
2) Before use, verify that the supply voltage and frequency match the product specifications;
3) The product must be connected to a dedicated power outlet, and ensure that both the plug and outlet are properly grounded;
4) Do not unplug or plug in the power cord while the product is running without first turning off the power switch;
5) Do not arbitrarily extend or shorten the product's power cord;
6) Do not place flammable, explosive, volatile, or corrosive substances inside the unit for cultivation;
7) Do not attempt to repair the product yourself; repairs authorized by our company must be performed by qualified personnel.

! WARNING (Unauthorized repairs may result in property damage or personal injury; you assume full responsibility)

1) You must thoroughly read and understand this product's user manual before operating it;
2) The 304 stainless steel inner chamber is not acid-resistant; please take precautions against corrosion. Never use acidic media inside the unit;
3) When unplugging the power cord, do not pull directly on the power cord;
4) Unplug this product under any of the following circumstances:

   A. When replacing a fuse;

   B. When the product malfunctions and requires inspection or repair;

   C. When the product is not in use for an extended period;

   D. When moving the product;

! Caution (Failure to do so may shorten the product's service life or cause it to malfunction)

1) The product should be placed on a firm, stable, and level surface;
2) Sufficient clearance should be maintained around the product;
3) The product must be used under specified operating conditions;
4) Never use force to open or close the product door, as this may cause the door to detach, resulting in product damage or personal injury.

5. Structural Components

5.1 Main Unit Structure

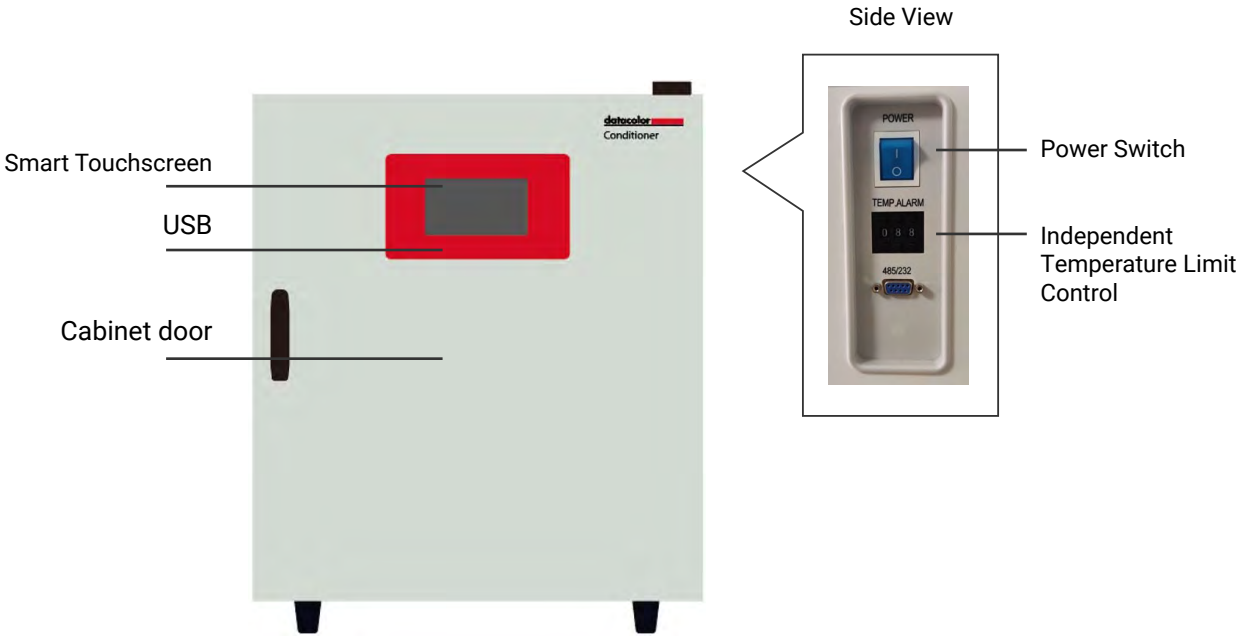


Figure (1)

5.2 Overview of Structure and Functions

The Datacolor Conditioner constant temperature and humidity chamber consists of a chamber body, temperature and humidity control system, heating elements, humidification module, air circulation system, and refrigeration system. The chamber body is stamped from high-quality steel plate with a powder-coated finish, while the inner chamber is made of high-quality mirror-finished stainless steel. The insulation layer utilizes a polyurethane foam process.

The main component of the temperature and humidity system is the controller, an intelligent unit comprising a microcomputer and peripheral circuitry. It utilizes Pt100 platinum resistance thermometers and capacitive humidity sensors as temperature and humidity sensing elements, employing PID control to regulate the heating system. The controller also features timer control, temperature error correction, and deviation alarm protection functions. This series of products offers advantages such as high temperature control accuracy, minimal overshoot, low fluctuation, and over-temperature protection. It features an independent over-temperature protection system, further enhancing product safety.

6. Performance Description

1) 7.0-inch touchscreen with real-time display of parameters such as temperature, humidity, and time;
2) Chinese and English menu options available to accommodate different language needs;
3) Automatic switching between cooling and heating systems;
4) The interior chamber, heating chamber, and inner door surface are made of mirror-finished 304 stainless steel with an electrolytic finish;
5) Stainless steel insulated outer door with two-point pressure latches; sealed, recessed tempered glass inner door;
6) Shelves feature an anti-tilt mechanism to prevent them from falling out when pulled out halfway;
7) Shelf height is adjustable as needed;
8) Supports USB data export and software updates; data can be exported in PDF and CSV formats via the USB port, with selectable time ranges;
9) Features over-temperature protection; the unit automatically shuts down when the internal temperature exceeds the maximum allowable limit;
10) After power restoration, the unit resumes operation from the state it was in prior to the power outage;
11) 30mm external sensor port with silicone plug (sealing, insulating, and corrosion-resistant)

7. Technical Specifications

1) Technical Specifications

	Conditioner Eco LED	Conditioner Eco
Lighting	D65 LED + UV LED, adjustable illuminance	None
Number of shelves	2	3
Temperature setting range	15–50°C	
Temperature control range	15–30°C	
Capacity	100 L	
Temperature uniformity	±0.5°C (at 21°C, 65% RH)	
Temperature fluctuation	±0.5°C (at 21°C, 65% RH)	
Temperature Control Accuracy	±0.2°C	
Humidity Setting Range	0% RH to 70% RH	
Humidity control range	40%RH–70%RH	
Humidity fluctuation	±2% RH (at 21°C, 65% RH)	
Sensor type	Temperature: PT100 / Humidity: Imported capacitive	
Recovery time	≤6 min (at 21°C, 65% RH, door open for 10 seconds)	
Internal Dimensions (W×D×H)	480 mm × 400 mm × 560 mm	
External Dimensions (W×D×H)	668 mm × 675 mm × 752 mm	
Net weight	89 kg without lights; 96 kg with lights	
Shipping weight	126 kg without lights; 133 kg with lights	
Rated Power	Semiconductor cooling: 420 W / Resistive heating: 520 W	
Power Supply Voltage	AC 220V; 115V input available with an external transformer	
Power frequency	Wide-range 50 Hz and 60 Hz	
Noise Level (Average)	<56 dB(A)	

Note: The above performance is based on “ambient temperature 19–25°C, ambient humidity 45%–70% RH, with an operating point of 21°C and 65% RH.” Under these conditions, the time from startup to reaching and stabilizing at the setpoint is less than 1.5 hours, and the equipment can operate continuously for 24 hours (except for periodic maintenance). Performance parameters may vary if the ambient temperature and humidity exceed the specified range or if other operating points are set. Recovery time refers to the time required to return to the temperature accuracy range (typically ±1°C or ±2°C) and humidity accuracy range (typically ±2%RH, ±4%RH, or ±5%RH) specified in the brand’s color manual.

2) Lighting Function

Includes two light panels located above each shelf.

The light source can be turned on or off. At a distance of 12 cm from the light-emitting surface, the average illuminance is approximately 4500 lx, with a color temperature of 6500 K, and includes UVA 365 nm supplement. The SPD curve complies with CIE standards.

The illuminance can be adjusted within a range of 10%–100%.

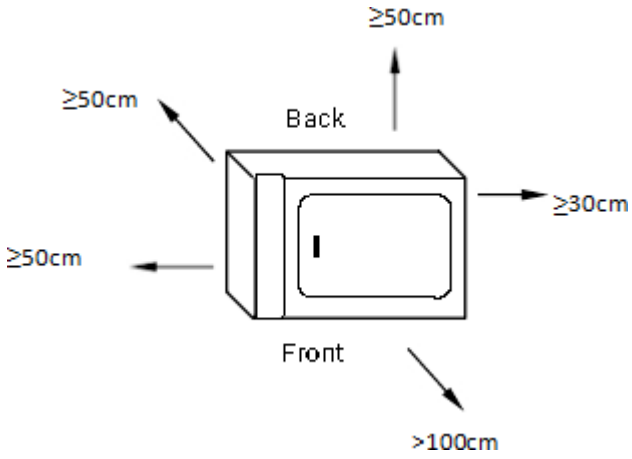
The recommended operating lifespan of the lights is 1 year or 8,000 hours, whichever comes first.

8. Operating Instructions

8.1 Equipment Installation

8.1.1 Pre-use Preparation

To ensure proper operation, verify that the product's operating environment meets the following conditions:



1) Ambient temperature: 5°C to 35°C;
2) Relative humidity: ≤ 70%;
3) Atmospheric pressure: (80–106) kPa;
4) Altitude not exceeding 2,000 meters;
5) No sources of strong vibration or strong electromagnetic fields in the vicinity;
6) The product should be placed indoors on a stable, level surface, free from heavy dust, direct sunlight, and corrosive gases;
7) Sufficient clearance must be maintained around the product, as shown in the upper right diagram; it should not be placed below a fire alarm;
8) The product's power supply voltage must comply with the technical specifications;
9) Position the product appropriately, adjust the number and placement of shelves, and when placing work items, ensure there is sufficient clearance on all sides (> 100 mm) on all sides; the weight of items placed on the shelves should be such that the shelves do not bend or deform.

8.1.2 Powering On the Equipment

1) Connect the machine to the power supply as required and ensure the power source is properly grounded;
2) Double-check that all items have been removed from the cabinet;
3) Connect the water refill device;

Connect the hose to the water inlet on the side of the unit (Please fill the water bucket with distilled water or laboratory-grade purified water)

Place the drip tray under the overflow outlet and clean it regularly

Figure (2)

4) Set the parameters according to user requirements.

8.2 Operating Steps

8.2.1 Main Screen Overview

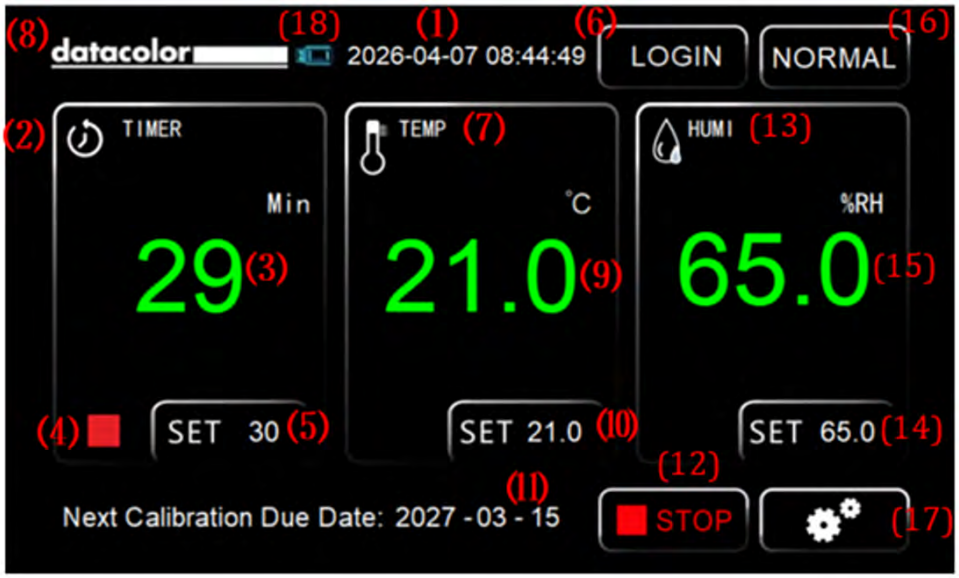


Figure (3)

1) System Time: Displays the current system date and time
2) Timer: Tap to turn off the timer alarm sound
3) Timer Display: Shows the remaining time
4) Start or stop the timer
5) Timer Setting: Set the desired timer duration

6) Account Login: Log in to different accounts
7) Tap to view or disable the temperature output percentage
8) Device logo display area
9) Temperature reading: Displays the measured temperature
10) Temperature setpoint: Set the target temperature
11) Display panel next calibration due date
12) Start/Stop: Start/stop indicator
13) Tap to view and toggle the humidity output percentage
14) Humidity Setpoint: Set the target humidity
15) Humidity reading: Displays the measured humidity value
16) Operating Status: Displays operating status
17) Display Status: Parameter Settings
18) Displayed when a USB drive is connected and correctly recognized

8.2.2 Account login

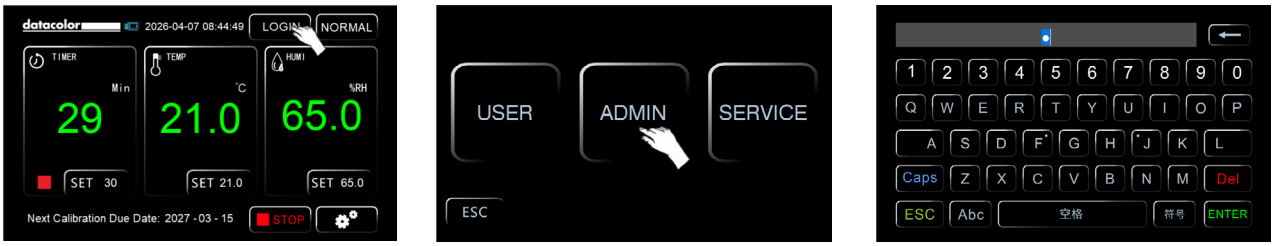


Figure (4)

USER Password : 1111
ADMIN Password : 8888

8.2.3 Parameter Settings

a. Timer Settings

Figure (5)

b. Temperature Settings

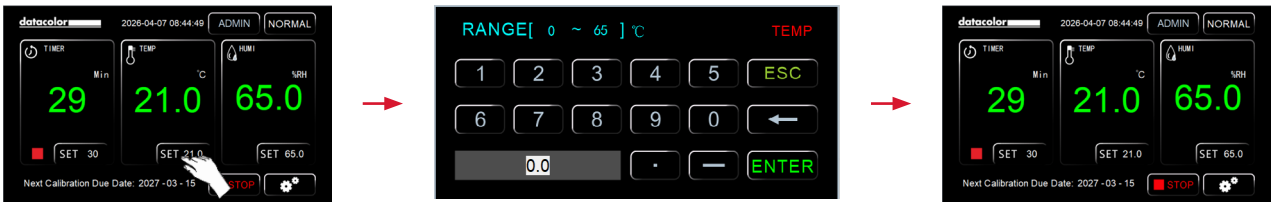


Figure (6)

c. Humidity Settings

Figure (7)

8.2.4 Menu Settings

a. System Settings

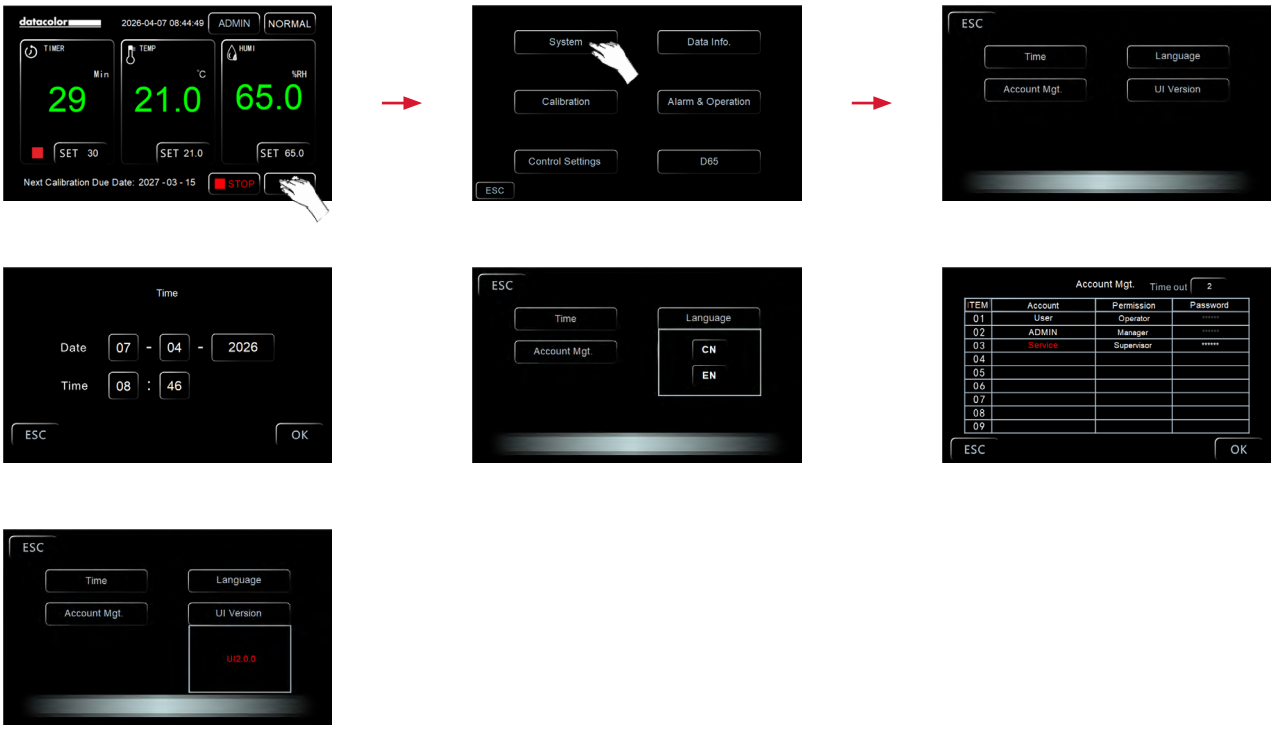


Figure (8)

System Time: Used to set the system time;

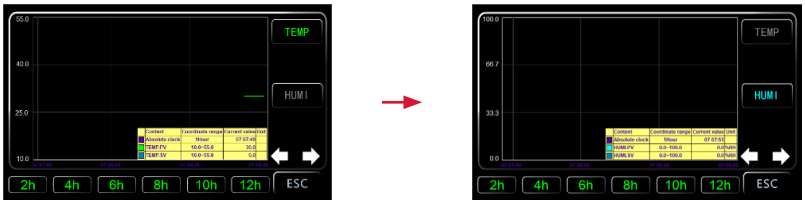
Language Selection: Used to switch between Chinese and English in the user interface;

User Management: Used to manage different accounts, including password changes and selecting logout times; (Available only to the admin account)

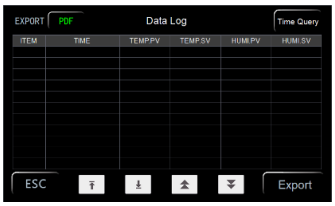
UI Version: Used to view the software version number of the user interface;

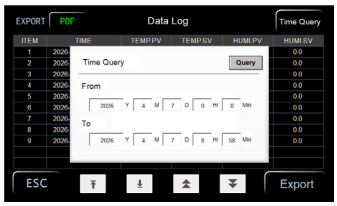
b. Data Information

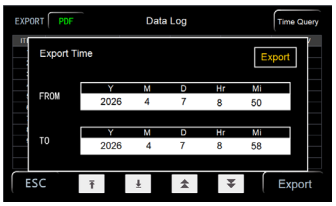
(1) Historical Graphs — View historical temperature and humidity graphs

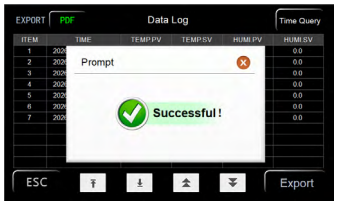


(2) Historical Data — View and export historical data (a USB drive must be inserted to export; export available in CSV or PDF format)

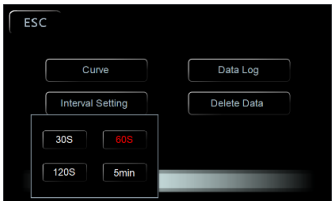








(3) Sampling Interval — Set the data collection interval (Admin account only)

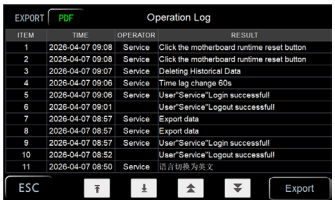


(4) Delete Data — Delete historical data (Admin accounts only)

Figure (9)

d. Alarms & Logs

(1) Log Management — Used to view and export device operation logs (a USB drive must be inserted to export; export available in CSV or PDF format)



(2) Alarm Information — Used to view and export device alarm information (a USB drive must be inserted to export; export available in CSV or PDF format)

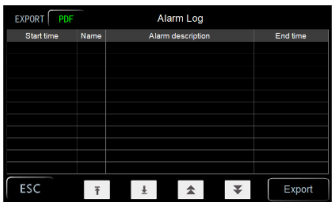
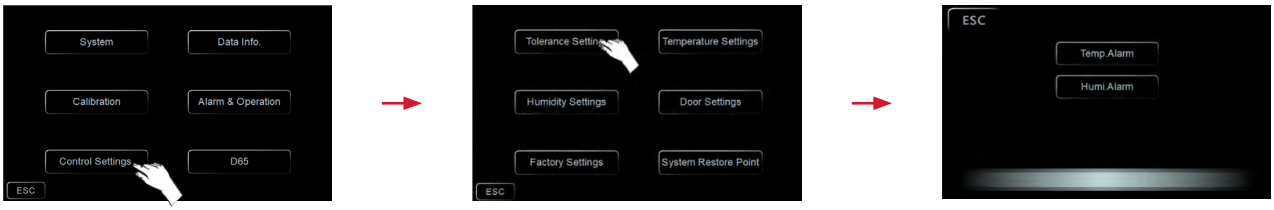
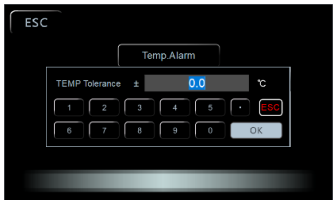


Figure (10)

e. Control Settings (Admin account only)



(1) Temperature Alarm Settings — Used to configure alarm thresholds for temperature deviations



(2) Humidity Alarm Settings — Used to configure alarm thresholds for upper and lower humidity limits

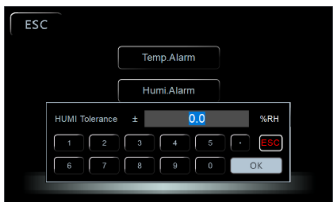


Figure (11)

f. D65 Light Source (Admin account only)

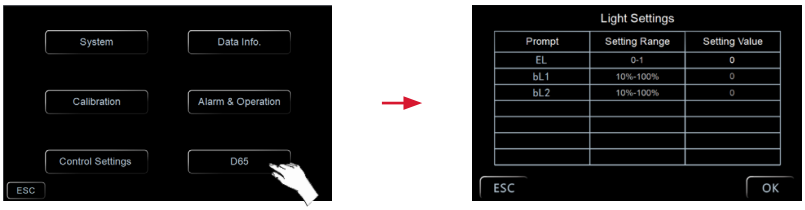


Figure (12)

EL: Used to turn the light panel on or off; “0” means off, “1” means on;
bL1: Used to adjust the light intensity of the upper light panel, with a range of 10%–100%;
bL2: Used to adjust the light intensity of the lower light panel, with a range of 10%–100%;

8.3 Operational Precautions

1) If the unit will be out of service for an extended period, thoroughly clean the interior and exterior of the cabinet, unplug the power cord, and ensure dust protection;

2) If the storage environment is humid, the unit should be powered on periodically (approximately once a month) to heat it up and remove moisture. Set the temperature to 50°C, and humidity to 0% RH;

3) Except for adjusting parameters such as temperature, humidity, and time settings, any adjustments to other function menu parameters must be approved by our company’s service center or performed by qualified personnel.

4) 5L external water tank; deionized (demineralized) water must be used. Inlet water temperature: 5–40 °C. The water source must be provided by the user. Water consumption: <2 L/week. Manual refilling is required no more than once a month.

5) Equipped with a quick-connect fitting for the automatic water refill tube.

6) Wastewater drainage: Equipped with a small drip tray to accommodate the drainage volume at common temperature and humidity points. It can be positioned based on the distance between the unit and the wall; maintain a 10–15 cm clearance between the unit and the wall for heat dissipation. It can be placed at the bottom of the unit; the tube can be cut to length. With only a few drops per day, the water evaporates automatically, eliminating the need for regular emptying.

7) Temperature and Humidity Calibration
The unit is factory-calibrated; we recommend annual recalibration.

   i, Before calibration, the unit should have been running continuously for at least 2 hours to reach a stable state.

   ii, Please contact the after-sales service center for specific calibration procedures.

   iii, If a sensor malfunction occurs and is confirmed during use, please contact our after-sales service center to arrange for a replacement.

9. Cleaning and Maintenance

1) For routine maintenance, clean the equipment regularly. Use a dry cloth to wipe down the inner chamber and shelves periodically to ensure the inner chamber is clean and free of foreign objects;

2) Daily Maintenance: Clean the exterior surfaces regularly, paying attention to dust accumulation around the air vents and test ports;

3) Long-term Maintenance: If the unit is to be left unused for an extended period, thoroughly clean both the interior and exterior of the cabinet. Unplug the power cord, cover the unit with a plastic dust cover, and periodically (approximately once a month) power it on to perform a dehumidification cycle (remove the light panel, turn off the humidity control, set the temperature to 50°C, and dry for 0.5 hours);

4) Transport and Storage under Normal Temperature and Humidity Conditions

10. Troubleshooting

Fault Symptoms	Analysis of Possible Causes	Solution
Slow cooling	Frequent opening of the door during low-temperature operation	Reduce the number of times the door is opened
	Loose seal around the lead holes	Use rubber plugs to seal the lead holes during low-temperature operations
Temperature does not drop	Ambient temperature is too high	Lower the ambient temperature
Condensation on the internal viewing window	The dehumidification module is not working or is faulty	Please contact our service department
Unusual odor detected	Residual odor in the cabinet	Please clean the inside and outside of the unit
Humidity levels are not rising	Humidity sensor is malfunctioning	Replace the sensor
	Water tank is empty	Fill the tank with water; the water level must be above the tank spout
	The water tank valve is not open	Turn on the tank switch so it is in the "1" position
	The fill tube is not filled with water	The device will not begin humidifying until the fill tube is full
Unusual noises are heard	Foreign object has entered the fan	After troubleshooting, please contact our service department
Poor humidity distribution	Sample overheating	Reduce the number of samples placed
Door is difficult to close	Objects are blocking the door or hinges	Remove obstructions
Difficulty opening the equipment door	Foreign object is caught in the hinge	Remove the foreign object
The device won't start	Power supply does not meet requirements	Please adjust the power supply to ensure power reaches the device
	Power is not reaching the device	Please connect the correct power supply
	AC 220V is present, but the ground wire is mistakenly connected as the neutral wire	Please connect the correct neutral wire
Temperature not rising	Over-temperature threshold is set too low	Set the over-temperature value correctly
	Instrument setting is too low	Please set according to test requirements
	Fan not spinning	Check for excessive fan resistance or a faulty capacitor; replace with a fan or capacitor of the same model
	Sensor malfunction	Replace with a sensor of the same model

11. Packing List

No	Category	Item	Quantity	Remarks
1	Main Unit	Constant Climate Chamber	1	Ship according to order number
2	Documents	Packing List	1	
3	Documents	Factory Inspection Certificate	1	
4	Spare Parts	Shelves	2 or 3	See specifications table
5	Spare parts	Water tank	1	
6	Spare Parts	Drip tray (small)	1	
7	Optional Accessories	Lighting Panel	2	Depends on the model purchased
8	Spare parts	USB drive	1	