

Quality is more than a word

ESPEC

# Constant Climate Cabinet

LH·LHL·LHU·LU



# High performance and reliability come in a compact package, for a wide range of temperature/humidity testing needs.

Continuing improvement in the design of constant-temperature (and humidity) cabinets now add ethernet connection, which allows you to control and monitor the cabinet remotely, from a pc via web browser.

The lineup consists of six models, with two size variations, 105 liters and 206 liters, and four temperature/humidity ranges, to accommodate your needs.

## To minimize our chambers potential environmental impact

R-449A is the best alternative to R-404A



\*R-449A is available on request

LHU-114



LHU-124



# Characteristics

## ● Superior stability

With their highly efficient refrigeration system and outstanding thermal insulation, ESPEC's constant climate cabinets are ideal for use in laboratories and research facilities. They offer a wide temperature/humidity range, and create a stable cabinet environment with a temperature gradient/variation in space of temperature 5°C.

## ● Patented cross-output control system reduces required power

The LHU-124 model's cross-output control system lowers the maximum current during operation, reducing the amount of required power.

## ● Using sampling data

Sampling data (temperature set point and process value) can be copied via a USB memory device or recorded directly. It is also possible to copy program patterns between cabinets without using a PC, enabling effective use of data.

\* USB memory is not included.

## ● Global Safety Standards

ISO 12100 (Safety of machinery)  
IEC 60204-1 (Low voltages)  
IEC 61000-6-2, EN 55011 (EMC)



Test area

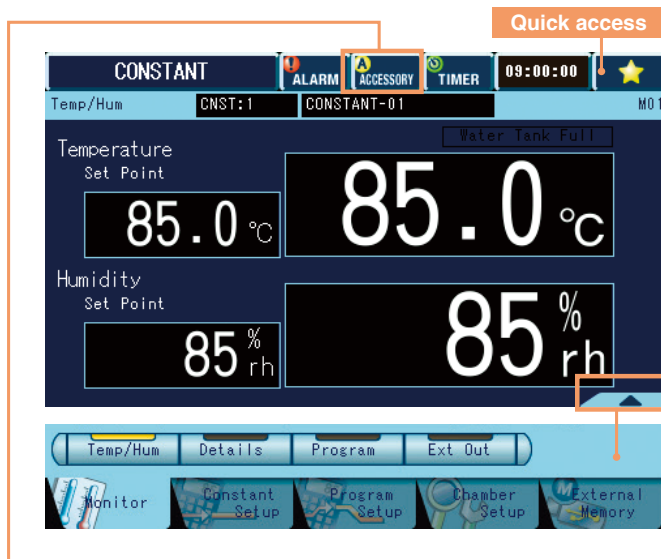


Control panel / USB memory port



Place a chamber at a desired location by Installation Simulation Tool (AR).  
Refer to page 6.

# Controller



## ● Quick access button

Star mark (★) on the top right corner can be customized to have instant access to any pages you frequently use, to start registered test program, etc.



User-friendly stylus pen operation

## ● Information



## ● Information

When the water tank is full, message “Water tank full” is shown on the operation screen. There are information need to be notified to the operator, the Accessory button will switch to Information button. By pressing the button, you will find notifications such as “Water tank is full”, “Check Humidity Tray” and “Check Wet Bulb Wick”.

## ● 1 pattern 12 steps

The controller allows you to register 3 constant operation patterns or 1 program operation patterns with maximum of 12 steps.

## N-Instrumentation (LHU-114/124)

Operating mode	Constant operation, program operation, remote operation, stop
Setting range	<ul style="list-style-type: none"> <li>Constant setup 3 patterns Setting range: Temp.: (Lowest attainable temp. -25°C) to (Highest attainable temp. +90°C), 0.1°C unit Humidity: 0%rh to 100%rh, 1% unit</li> <li>Program setup 1 pattern (12 steps) Setting range: Temp.: (Lowest attainable temp. -25°C) to (Highest attainable temp. +90°C), 0.1°C unit Humidity: 0%rh to 100%rh, 1% unit Time: 0 hour and 1 min. to 9999 hours and 59 min. 1 min. unit</li> </ul>
Language	English, Japanese
External memory function	Interface USB 2.0 standard compliant (A-type connector) Supported functions: <ul style="list-style-type: none"> <li>Write sampling data, Read/ Write program (application software: Patten Manager Lite)</li> <li>Backtrace output</li> <li>Add-ons/system updating</li> </ul>
Web function	Interface: Ethernet port (100base-TX) Web applications: monitoring, setting, operation, data recording, maintenance setting, email alert

# Network

## Remote monitoring and control (Ethernet connection)

You can connect the cabinet to your local area network. By doing so, you can control and monitor the cabinet from any computer on the network, using a web browser. You can program test patterns, start and stop the operation without you actually being at the site.

## Email alert

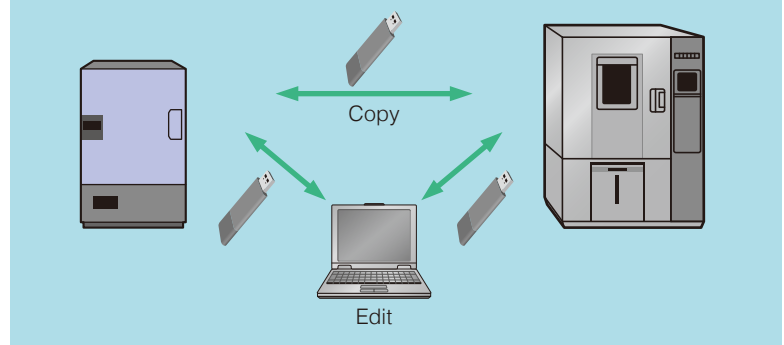
When an alarm is triggered, an e-mail is sent to the registered PC or mobile address. A notification can also be sent at the time of test completion. Set the recipient mail address from the Maintenance setting screen.

\*Requires an intranet environment capable of sending emails.

## Editing program patterns and displaying graphs

The program patterns registered in the chamber can be edited via web browser and sampling data can be displayed as graphs. Using the PC application "Pattern Manager Lite"\*, program patterns on a PC can be edited, displayed as graphs or output as CSV data even if offline.

## Program Copying and Computer Editing



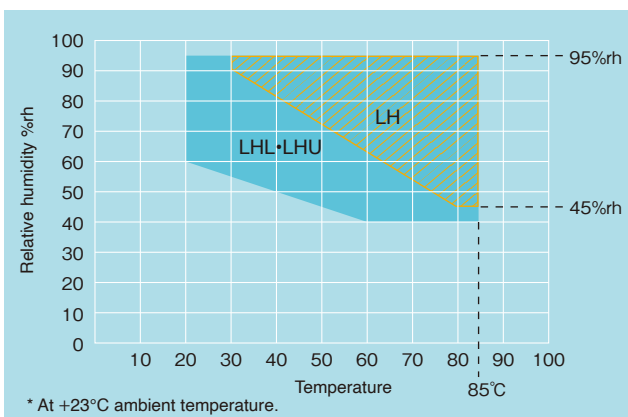
## Test Navi (<https://www.test-navi.com/eng/index.html>)

The Pattern Manager Lite software allows you to edit programs for your cabinet, view and edit data as graph, etc. The software can be downloaded from the Test Navi website.



- Updates for cabinet controller software
- Search for environmental test standards

## TEMPERATURE & HUMIDITY CONTROL RANGE



NOTE: The LH-114 is not equipped with a dehumidifying refrigerator. Therefore, the temperature and humidity control range, especially the low humidity range shown here, may fluctuate depending on the conditions of installation and environment (such as ventilation, fluctuations in ambient temperature, and other factors).

## SAFETY DEVICES

- Leakage breaker for power supply
- Glass tube fuse for control circuit short-circuit protection
- System error (error)
- Room temperature compensation burnout detection circuit
- Dry bulb temperature burnout detection circuit
- Absolute upper/lower temperature limit alarm (with built-in temperature/humidity controller)
- Air circulator temperature switch
- Thermal fuse
- Overheat protector
- Wet bulb temperature burnout detection circuit (except LU)
- Refrigerator error detection
- Humidifier dry heat protector (except LU)
- Temperature upper limit deviation alarm (with built-in temperature/humidity controller)
- Absolute upper/lower humidity limit alarm (with built-in temperature/humidity controller) (except LU)
- System error (alarm)
- Water tank drought switch (except LU)
- Water tank low-level switch (except LU)

## SPECIFICATIONS

Model	LH-114	LHL-114	LHU-114	LHU-124	LU-114	LU-124	
System	Balanced Temperature & Humidity Control system (BTHC system)			Balanced Temperature Control system (BTC system)			
Performance*1	Temp. (& humid.) control range	(Ambient temp.+10°C) to +85°C 45%rh to 95%rh	+5°C to +85°C 40 to 95%rh	-20°C to +85°C 40 to 95%rh		-20°C to +85°C	
	Temp. (& humid.) fluctuation	±1.0°C / ±5%rh				±1.0°C	
	Temp. gradient	5°C					
	Temp. variation in space	5°C					
	Temp. extreme achievement time (Pull down time)	-		+20°C to -20°C within 130 min.			
	Lowest attainable temp.	-		-20°C In an ambient temperature of +5°C to +30°C			
Construction	Heater	Sheathed heater with fin					
	Humidifier	Sheathed heater				-	
	Refrigeration unit	System	Mechanical refrigeration system (air-cooled condenser)				
		Cooler	-	Plate fin cooler			
		Refrigerator	-	Hermetically sealed compressor			
Refrigerant		-	R-134A	R-404A (R-449A is available on request)	R-134A	R-404A (R-449A is available on request)	
Fittings	Drain port filter (x2), cable port I.D. ø25 mm on left side, power cable (with 3-pole plug), drain socket, drain hose (except LU), Ethernet port (LAN), USB memory port						
Capacity	105 L			206 L	105 L	206 L	
Cabinet total load resistance	30 kg						
Inside dimensions*2 (mm)	W500 x H600 x D390			W500 H750 D590	W500 H600 D390	W500 H750 D590	
Outside dimensions*2 (mm)	W680 x H1090 x D826			W680 H1240 D1026	W680 H1090 D826	W680 H1240 D1026	
Weight	85 kg	95 kg	100 kg	140 kg (148 kg)*3	90 kg	130 kg (138 kg)*3	
Utility requirements	Allowable ambient conditions	Ambient temperature 0°C to +40°C up to 75%rh					
	Power supply	100V AC 1φ 50/60Hz	15 A		11.7 A	9 A	11.7 A
		115V AC 1φ 60Hz (CE)	13 A		10 A	8 A	10 A
		220V AC 1φ 50/60Hz (CE)	7 A		7 A	4.1 A	7 A
		230V AC 1φ 50/60Hz (CE)	6.5 A		7 A	3.9 A	7 A
	Water supply rate for humidifying tray	40 to 70 ml/h (at condition +60°C / 95%rh), 100 to 130 ml/h (at condition +85°C / 95%rh)			40ml/h to 70ml/h (at condition +60°C / 95%rh), 100ml/h to 150ml/h (at condition +85°C / 95%rh)	-	
Water quality	Electrical conductivity between 0.1 µS/cm to 10 µS/cm					-	

\*1: The temperature cabinet conforms to IEC60068-3-5:2001, JTM K07:2007 and the humidity cabinet conforms to IEC60068-3-6:2001, JTM K09:2009 under the conditions of an ambient temperature of +23°C, rated voltage, and no specimen.

\*2: Excluding protrusions

\*3: In case of 220 V/230 V AC

### Low GWP Refrigerant



R-449A is available on request.  
(LHU-124/LU-124 only)

### ACCESSORIES

- Shelf (stainless steel wire).....2
- Shelf bracket (18-8 Cr-Ni stainless steel plate)..... 2 sets
- Cable port rubber plug..... 1 (I.D. ø25 mm)
- Water supply/drainage hose (with plug; except LU)..... 1
- Wet-bulb wick (24 pcs; except LU)..... 1 box
- Socket adapter (100V, 115V AC spec.only)..... 1
- Cartridge fuse..... 1
- Breaker handle cover..... 1
- Stylus pen..... 1
- Operation manual..... 1



# Installation Simulation Tool (AR [Augmented Reality])

Read the QR code with a smartphone or tablet camera to start the web browser. \*1

View the intended installation location (a floor) through the camera to check the installation image in the web browser. \*2



Exterior view *3	Model *4	View with door open *3
	LH / LHL / LHU / LU-114	
	LHU / LU-124	

\*1 This service is designed specifically for use on smartphones. It will also work on some tablets.

Operation has been confirmed in the Safari and Google Chrome browsers.

Use the camera function of your smartphone or tablet to read the 2D codes.

Recommended environment

- OS: iOS 14 or higher, Android 9.0 or higher
- Browser: Safari (latest version), Google Chrome (latest version)
- Even if you meet the above conditions, this service may not operate normally on your terminal.
- Not all Android terminals support AR. For details on terminals that support AR, access the following URL.  
<https://developers.google.com/ar/devices?hl=en>



\*2 Precautions

- These contents can be used free of charge, but you will be charged communication fees to access them.
- Possible causes for the contents not being displayed properly include the camera capturing a location with no flat surfaces, objects being present on the flat surfaces, and insufficient brightness in the location.
- This service may not operate properly due to the communication environment.
- Before using AR to capture images, thoroughly check the surrounding area to make sure it is safe.

\*3 Initially, models are displayed with roughly their actual sizes. Stretch and pinch to change the dimensions of displayed models.

Use this service only as a reference. It does not provide any guarantees for actual installation of chambers.

\*4 Temperature and humidity type is displayed in AR as a representative image. Operation panel and test area sensor of temperature type is different from the image.

## OPTIONS

### Portable tank

Approx. 18L (not available for LU).

### Inner door

Glass door provided inside the cabinet to observe the conditions of the specimens.

### Additional cable port

Provided in addition to the standard cable port (left side).

- $\phi 25$  mm
- $\phi 50$  mm
- $\phi 100$  mm

\* Cabinet performance may be affected when equipped with a cable port.

### Cable port rubber plug

Comes with the cable port.

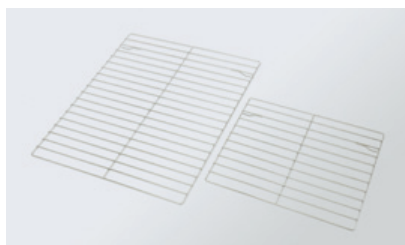
- for  $\phi 25$  mm
- for  $\phi 50$  mm
- for  $\phi 100$  mm



$\phi 50$ mm

### Shelf/Shelf bracket

Equivalent to standard accessory.



Shelf

\*To prevent damage in the event of water leakage, a dew tray (sold separately) can be prepared.

### I/O Interface

Communication ports to connect the cabinet to a PC.

- RS-485
- RS-232C
- GPIB

### Communication cables

- RS-485 5 m / 10 m / 30 m
- GPIB 2 m / 4 m

### Recorder output terminal

This terminal outputs the temperature and humidity in the test area.



### Thermocouple

Attached to specimen to measure specimen temperature.

Thermocouple type T (Copper/Copper-Nickel)

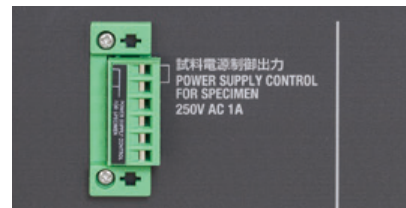
- 2 m
- 4 m



### Specimen power supply control terminal

Shuts off the power to the specimen if an equipment problem occurs while testing the power supply to the specimen.

\* When applying voltage to a specimen, be sure to use the specimen power supply control terminal option.



### Cabinet stand

Stand designed to facilitate specimen loading/unloading from the test area (except LHU/LU-124).

Size: W750 x H700 x D800 mm



### Casters

4 casters, with leveling feet

### Safety precautions

- Do not use specimens which are explosive or inflammable, or which contain such substances. To do so could be hazardous, as this may lead to fire or explosion.
- Do not place corrosive substances in the cabinet. If corrosive substances are generated by the specimen, the life of the cabinet may be significantly shortened specifically because of the corrosion of stainless steel and copper and because of the deterioration of resin and silicon.
- Do not place life forms or substances that exceed allowable heat generation.
- Be sure to read the user's manual before operation.

■ Some photographs listed in this catalog contain Japanese display.



## Bench-Top Type Temperature (& Humidity) Chamber

**Bench-top models run on a standard voltage for single phase, enabling easy installation anywhere**

- **Premium design with a space-saving footprint**
- **Quiet operation, suitable for offices and small labs**
- **Integration with other test equipment**



Model	SH-222	SH-242	SU-222	SU-242
System	Balanced Temperature & Humidity Control system (BTHC system)		Balanced Temperature Control system (BTC system)	
Temp. range *1	-20°C to +150°C	-40°C to +150°C	-20°C to +150°C	-40°C to +150°C
Humid. range *1	30% rh to 95% rh		—	
Inside dimensions *2	W300 × H300 × D250 mm			
Outside dimensions *2	W440 × H690 × D696 mm		W440 × H625 × D696 mm	
Capacity	22.5 L			
Utility requirements	Allowable ambient conditions	+5°C to +35°C		
	Power supply *3	100V AC 1 φ 50/60Hz	11.3 A	9.3 A
		115V AC 1 φ 60Hz (NEC)	12.8 A	11.0 A
		220V AC 1 φ 50/60Hz *4	5.4 A	4.5 A
		230V AC 1 φ 50Hz *4	5.3 A	4.4 A

\*1 The performance values are based on IEC 60068-3-5:2001 for the temperature chamber, IEC 60068-3-6:2001 for the humidity chamber. Performance figures are given for a +23°C ambient temperature, 65% rh, rated power supply and no specimens inside the test area. However, the lowest attainable temperature is given for a max. ambient temperature of +30°C. Heat-up time is the achieved time from lowest temperature to highest temperature within temperature range.

\*2 Excluding protrusions.

\*3 At ambient temperature +23°C.

\*4 Compliance with CE marking or UKCA marking.

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**ISO 9001 (JIS Q 9001)**

**Quality Management System Assessed and Registered**

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\* The organization of these certificates is  
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