

Quality is more than a word

ESPEC

Constant Climate Cabinet

LH·LHL·LHU·LU



Reliable, high-performance support for a wide range of temperature/humidity testing needs

Improvement of ESPEC's evolving lineup of constant-temperature (and humidity) chambers with capabilities and reliability supports an expanded range of testing needs in laboratories and research facilities. Refined in operation ease and safety, as well as lower energy consumption and easier recycling, these chambers offer ESPEC's advanced technologies. The six-model lineup includes 105- and 206-liter models available in four temperature (humidity) ranges and two sizes. All models support a single phase power supply and a wide range of applications.





LU-113



LHU-123





Test area (LHU-123)

● A stable internal environment

With their highly efficient refrigeration system and outstanding thermal insulation, ESPEC's constant climate chambers are ideal for use in laboratories and research facilities. They offer a wide temperature/humidity range, and create a stable chamber environment with a temperature/humidity uniformity of $\pm 2^{\circ}\text{C}$ and $\pm 6\%$ rh.

● Low-temperature (-20°C) type available in 206-liter models

Using air-cooled refrigerator, the LHU and LU Series are available in 105- and 206-liter capacities, and support a wide temperature range (-20 to $+85^{\circ}\text{C}$).

● PID control temperature (& humidity) controller

Temperature (humidity) control mechanisms are driven by electronic controllers with PID control, offering outstanding precision and automatic control by simply setting the desired temperature (humidity).

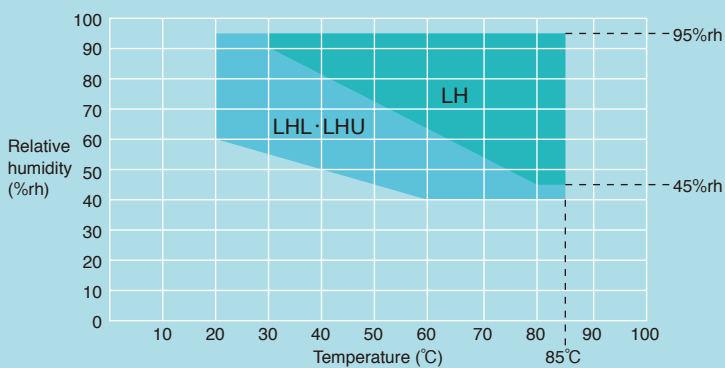
● Single phase power

To enable installation in a lab or testing center, all models run on a single phase power.

● Patented cross-output control system reduces required power

The LHU-123 model's cross-output control system (patent No. 2928162) lowers the maximum current during operation, reducing the amount of required power.

● Temperature & Humidity Control Range



* At $+23^{\circ}\text{C}$ ambient temperature.

NOTE: The LH-113 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).

● Program operation

‘Constant’ or ‘program’ operation can be selected on the installed instrumentation. Program operation can run up to 9 steps per pattern and can specify ramp time for each step. A digital display shows the conditions and remaining time during operation.

● Upper deviation limit temperature alarm

When the temperature is set, the warning function is automatically set to activate at +10°C (adjustable) above the preset temperature.

● Complete safety features

In addition to a ground leakage breaker, which also protects against overcurrent, every model features an overheat protector or thermal fuse as a secondary safety device to provide additional protection.



Instrumentation panel

Temperature & humidity indicator-controller (for LHU-113)

Setting	Mechanical key input
Display	7 segment LED display
Operating mode	Program operation, constant operation
Control	PID control, cross-output control
Setting and indication resolution	Temperature: 0.1°C (0.18°F) Humidity: 1% rh Time: 1 minute (1 hour for 100hrs. or more)
Input	Thermocouple type T (Copper/ Copper-Nickel)
Setting and indication ranges	Temperature: -25 to +90°C (-13 to +194°F) Humidity: 0 to 100% rh Time: 0 to 99hrs 59min. 100 to 999hrs.
Indication accuracy	Temperature: ±0.5°C (typ.) (±0.9°F) Humidity: ±2% rh (typ.) Time: within 30 seconds per month
Program memory capacity	9 steps per pattern (Repetition: 1 to 99 times)
Communications (Options)	RS-485, GPIB, RS-232C
Auxiliary functions	<ul style="list-style-type: none"> • Input burn-out detection • Upper and lower temp. & humid. limit alarm • Self-diagnostic (watchdog timer) • Alarm indication • Power cut protection • Refrigerator capacity automatic control

*Specifications differ according to the models. For further information, please contact us.

SPECIFICATIONS

Model	LH-113	LHL-113	LHU-113	LHU-123	LU-113	LU-123	
System	Balanced Temperature & Humidity Control system (BTHC system)				Balanced Temperature Control system (BTC system)		
Operating conditions	0 to +40°C (+32 to +104°F)						
Performance *1	Temp. (& humid.) range	(Ambient +10°C / +50°F) to +85°C / +185°F 45 to 95%rh	+5 to +85°C (+41 to +185°F) 40 to 95%rh	-20 to +85°C (-4 to +185°F) 40 to 95%rh		-20 to +85°C (-4 to +185°F)	
	Temp. (& humid.) fluctuation	±0.5°C (±0.9°F) ±3%rh				±0.5°C (±0.9°F)	
	Temp. (& humid.) uniformity	±2.0°C (±3.6°F) ±6%rh				±2.0°C (±3.6°F)	
	Temp. pull down time *2	————		+20 to -20°C within 130 min.			
	Lowest attainable temp. *2	————		-20°C (-4°F)			
Construction	Exterior material	Cold-rolled rust-proofed steel plate (melamine baked finish)					
	Interior material	18-8 Cr-Ni stainless steel plate (2B finish)					
	Insulation	Rigid polyurethane foam, glass wool, urethane board					
	Door	Manually operated door (hinge on left, handle on right)					
	Heater	Sheathed heater with fin					
	Humidifier	Sheathed heater				————	
	Refrigeration unit	Mechanical refrigeration system (air-cooled condenser)					
	Refrigerator	————	Hermetically sealed compressor				
	Refrigerator capacity	————	100 W	250 W	400 W	250 W	400 W
	Expansion mechanism	————	Capillary tube system				
Refrigerant	————	R134A		R404A	R134A	R404A	
Cooler	————	Plate fin cooler					
Air circulator	Propeller fan						
Fittings	Drain port filter (×2), cable port ID φ 25 mm on left side, power cable (with 3-pole plug)						
Capacity L	105			206	105	206	
Withstand load kg	30						
Inside dimensions *3 mm (inch)	W500 × H600 × D390 (W19.69 × H23.62 × D15.35)			W500 (W19.69) H750 (H29.53) D590 (D23.23)	W500 (W19.69) H600 (H23.62) D390 (D15.35)	W500 (W19.69) H750 (H29.53) D590 (D23.23)	
Outside dimensions *3 mm (inch)	W650 × H1090 × D805 (W25.59 × H42.91 × D31.69)			W650 (W25.59) H1240 (H48.82) D1016 (D40.00)	W650 (W25.59) H1090 (H42.91) D805 (D31.69)	W650 (W25.59) H1240 (H48.82) D1016 (D40.00)	
Weight kg	85	95	100	140	90	130	
Utility requirements	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)			40 to 70 ml/h (at condition +60°C / 95% rh), 100 to 150 ml/h (at condition +85°C / 95% rh)		————	
Water quality	Electrical conductivity between 0.1 to 10 μS/cm						

*1: At ambient temperature +23°C, with no load in the chamber. Performance shown above conforms to JTM K 01-1998 of Japan Testing Machinery Association.

*2: At ambient temperatures above +30°C, temperature pull down performances decrease and the difference between each chamber increases.

It is recommended to keep ambient temperature to a maximum of +28°C.

*3: Excluding protrusions.

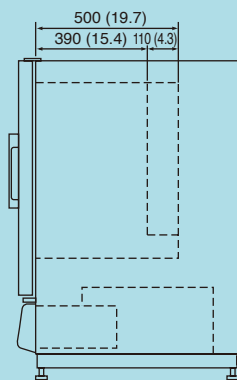
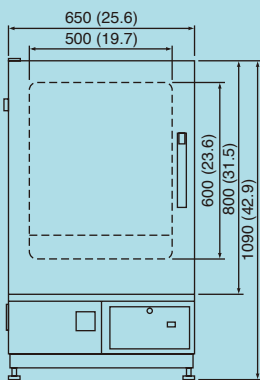
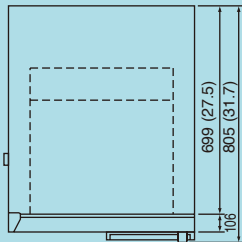
ACCESSORIES

- Shelf (stainless steel wire) 2
- Shelf bracket (18-8 Cr-Ni stainless steel plate) 2 sets
- Water supply/drainage hose
(8 mm diameter hose with quick release socket; except LU) 1
- Wet-bulb wicks (box of 24; except LU) 1
- Brush (for cleaning humidifier tray; except LU) 1
- User's Manual 1 set
- Cartridge fuse 10A (except 100V AC spec.) 1

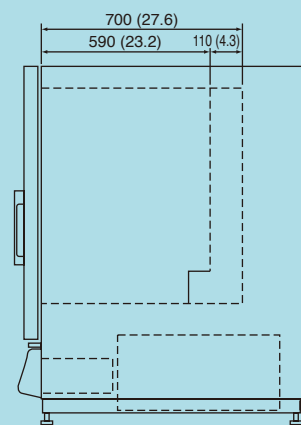
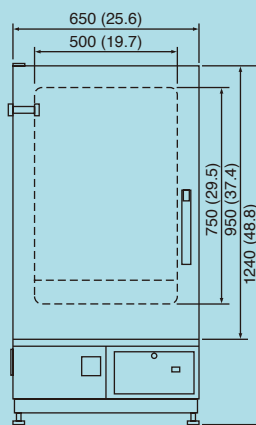
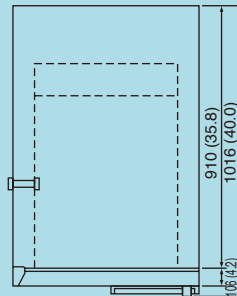
DIMENSIONS

unit: mm (inch)

● LH·LHL·LHU·LU-113



● LHU·LU-123



SAFETY DEVICES

- Leakage breaker for power supply
- Boil dry protector (except LU)
- Thermal fuse
- Refrigerator overload relay (except LH)
- Upper and lower temperature & humidity limit alarms
- Burn-out detection circuit
- Watchdog timer
- Air circulator temperature switch
- Refrigerator automatic delay circuit (except LH)
- Refrigerator high pressure switch (LHU/LU-123 only)
- Overheat protector
- Float switch for electromagnetic pump protection (except LU)

OPTIONS

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.

Thermocouple

- 2, 4 m
- Thermocouple type T (Copper/ Copper-Nickel)

Inner door

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

Shelf/Shelf bracket

Equivalent to standard accessory.

Portable tank

Approx. 18L (not available for LU).

Casters

- 4 casters, with adjuster feet

Additional cable port

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

- 25, 50 or 100 mm dia.
- Chamber performance may be affected when equipped with a cable port.

Cable port rubber plug

Prevents air leakage from the cable port.

Chamber stand

Stand designed to facilitate specimen loading/unloading from the test area (except LHU/LU-123).

Communication functions

- RS-485
- GPIB
- RS-232C

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