

Laboratory Chambers



Series of all-purpose physical and chemical environmental cabinets meeting the diverse needs of laboratories and research facilities.

The Laboratory chambers incorporate a number of sophisticated technologies including electronics, thermodynamics, process control, and ergonomics; technologies developed for meteorological environmental testing chambers. The instrumentation supports both programmed and constant operation, and several chambers include a refrigeration unit, using HFC refrigerant which is safe for the ozone layer. All these features provide high-performance and reliable operation.

LH·LHL·LHU

LU



LC



LCV





Instrumentation (LHU-113)

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

Model	ES-102
Operating mode	Program operation, constant operation
Display	7 segment LED display
Setting	Mechanical key input
Program memory capacity	9 steps per pattern (Repetition: 1 to 99 times)
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.
Setting and indication resolution	Temperature: 0.1°C (0.18°F) Humidity: 1%rh Time: 1minute (1hrs. for 100hrs. or more)
Indication accuracy	Temperature: ±0.5°C (typ.) (±0.9°F) Humidity: ±2%rh (typ.) Time: within 30 seconds per month
Input	Thermocouple type T (Copper / Copper-Nickel)
Control	PID control
Communications (Options)	E-BUS, GP-IB, RS-232C, RS-485
Auxiliary functions	<ul style="list-style-type: none"> • Input burn-out detection function • Upper and lower temperature & humidity limit alarm function • Self-diagnostic function (watchdog timer) • Alarm indication function • Power cut protection function • Timer function (automatic start/ stop) • Refrigerator capacity automatic control and others

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

PID control temperature (& humidity) controller

The PID controlled electronic temperature (& humidity) controller provides highly accurate and automatic control of all operations once the desired temperature (& humidity) is set.

Program operation

Constant or program operation can be selected for all installed instrumentation. Program operation can run up to 9 steps per pattern, set the timer for auto-start and auto-stop, and specify ramp setting for each step. (Except LC) For example, the timer activates when the chamber reaches the set temperature and stops automatically when the set time has elapsed. Reliable performance for testing, drying, sterilizing, and other types of treatments are assured. Also equipped with a display to show the remaining time.

Upper temperature limit deviation warning

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

*Only LC must be fixed with +10°C.

Complete safety features

In addition to a ground leakage breaker which also protects against overcurrent, some models feature an overheat protector or thermal fuse as a secondary safety device providing added protection.

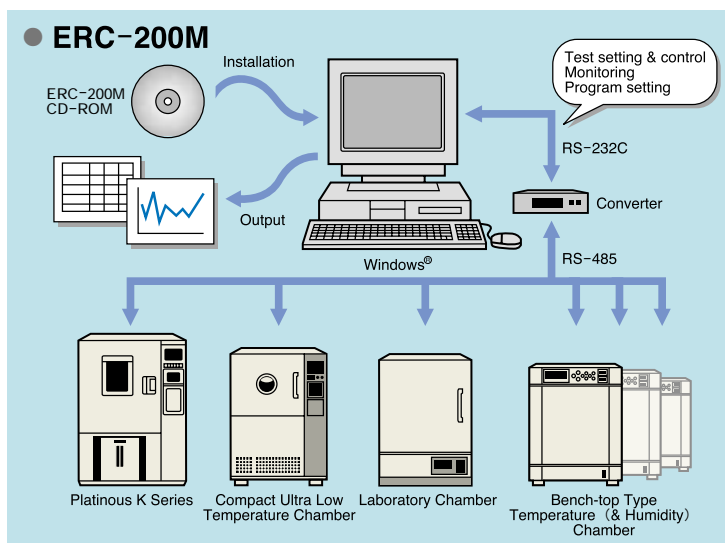
Environmental Testing Centralized Control Software ERC-100M/200M/300M (sold separately)

The application software makes it easy to monitor operation, central control, and remote control of up to 16 ESPEC test chambers. (monitoring only for 300M)

*Applicable for Laboratory Chambers manufactured in 1999 or after. (LC is not supported.)

Chambers must be equipped with a communication port (optional) which corresponds with each software.

*Software: English/ Chinese (in simplified Chinese characters)/ Japanese. (English/ Japanese only for 300M)



VARIETY OF CHAMBERS

Chamber	Model	Temperature range (°C) [°F]	Humidity range (%rh)	Capacity (L)
Temperature (humidity) cabinet	Temperature & Humidity Cabinet LH	(Ambient+10) +85 [(Ambient+50) +185]	45 95	105
	LHL	+5 +85 [+41 +185]	40 95	105
	Low Temperature & Humidity Cabinet LHU	-20 +85 [-4 +185]	40 95	105
Low Temperature Cabinet LU	-20 +85 [-4 +185]		105	
Oven	Convection Oven LC	124	(Ambient+20) +200 [(Ambient+68) +392]	165
		114		90
		224	(Ambient+20) +250 [(Ambient+68) +482]	165
		234		360
	Vacuum Oven LCV	233	(Ambient+20) +200 [(Ambient+68) +392]	90
		243		165



DANGER

- 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 materials in the chamber. If corrosive substances or humidifying water is used, the life of the unit may be significantly shortened.
- Do not place life forms or substances that exceed allowable heat generation.



CAUTION

Be sure to read the instruction manual before operation.

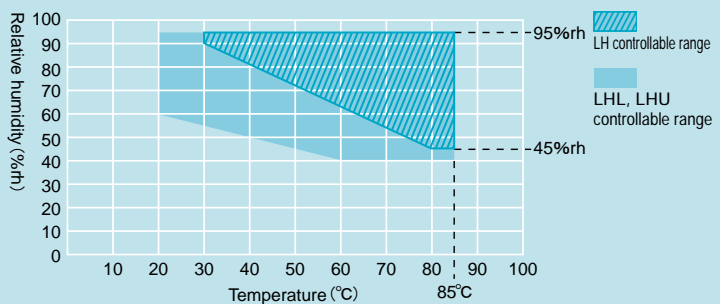
■ Some photographs listed in this catalog contain Japanese display.

BTHC system ensures a stable internal environment.

This bench-top temperature and humidity cabinet is ideal for laboratories and research facilities. It has a wide temperature and humidity control range and its superior temperature and humidity uniformity performance create a precise internal environment. It also uses refrigerants that cause no damage to the ozone layer (LHL/ LHU).



● Controllable temperature and humidity ranges (Ambient temperature of +23°C)



[NOTE] ●The LH-113 is not equipped with a dehumidifying refrigerator. Therefore, the low humidity range of the controllable temperature and humidity ranges shown here will vary depending on the installation conditions and environment (such as ventilation, fluctuations in ambient temperature, and other factors).

Low Temperature & Humidity Cabinet

Model	LH-113	LHL-113	LHU-113	
System	Balanced temperature & humidity control system (BTHC system)			
Power supply/ Maximum current	AC100V 1φ 50/60Hz·15A, AC115V 1φ 60Hz·13A, AC220V 1φ 50/60Hz·7A, AC230V 1φ 50/60Hz·6.5A			
Operating temp.	0~+40°C (+32~+104°F)			
Performance*1	Temp & humid control range	(Ambient+10)°C~+85°C (185°F)/45~95%rh	+5~+85°C (+41~+185°F)/40~95%rh	-20~+85°C (-4~+185°F)/40~95%rh
	Temp & humid fluctuation	±0.5°C (±0.9°F) / ±3%rh		
	Temp & humid uniformity	±2.0°C (±3.6°F) / ±6%rh		
Construction	External material	Painted steel (melamine coating)		
	Internal material	18-8 Cr-Ni stainless steel plate (2B polish)		
Air circulator	Propeller fan			
Heater/ Humidifier	Heater: nichrome strip wire heater Humidifier: sheathed heater			
Refrigerator	_____	Air-cooled hermetically sealed compressor (HFC134a)		
Fittings	Drain port filter, cable port (φ25mm), power cord			
Capacity	105L			
Inside dimensions*2	500W×600H×390Dmm (19.7W×23.6H×15.4Din)			
Outside dimensions*2	650W×1090H×805Dmm (25.6W×42.9H×31.7Din)			
Weight	85kg	95kg	100kg	

*1 Figures for an ambient temperature of +23°C with no specimen in the chamber.

The performance is according to JTM K 01-1998 of Japan Testing Machinery Association.

*2 Excluding protrusions.

● Safety devices

- Leakage breaker for power supply
- Boil dry protector
- 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)
- Overheat protector
- Float switch for protecting electromagnetic pump

● Accessories

- Shelf (Stainless steel wire) _____ 2
- Shelf bracket (18-8 Cr-Ni stainless steel) _____ 2 sets
- Water supply and drain hose (Hose with quick coupling φ9mm) _____ 1
- Wet-bulb wick (24pcs) _____ 1 box
- Brush (for cleaning humidifying tray) _____ 1
- Socket adapter (AC100V·115V spec. only) _____ 1
- Instruction manual _____ 1 set

● Options

- Specimen power supply control terminal
- Communication function (RS-485, E-BUS, GP-IB, RS-232C)
- Communication cable
 - RS-485 5, 10m
 - E-BUS 5, 10m
 - GP-IB 2, 4m
 - RS-232C 1.5, 3, 5, 10m
- Thermocouple
- Inner door
- Shelf/Shelf bracket
- Chamber stand
- Caster
- Cable port
- Rubber plug for cable port
- Portable water supply tank
- Wet-bulb wick
- Special spare parts

Refrigeration unit achieves temperatures down to -20°C .



This bench-top low-temperature chamber incorporating an aircooled refrigerator supports a wide temperature range extending from -20°C to $+85^{\circ}\text{C}$.

It utilizes the BTC system, an ideal temperature control system for maintaining a precise, stable temperature environment, and the efficient refrigeration system, with ozone-friendly refrigerants, and superb insulation.

Model	LU-113	
System	Balanced temperature control system (BTC system)	
Power supply/ Maximum current	AC100V 1 ϕ 50/60Hz·9A, AC115V 1 ϕ 60Hz·8A, AC220V 1 ϕ 50/60Hz·4.1A, AC230V 1 ϕ 50/60Hz·3.9A	
Operating temp.	$0\sim +40^{\circ}\text{C}$ ($+32\sim +104^{\circ}\text{F}$)	
Performance*1	Temp control range	$-20\sim +85^{\circ}\text{C}$ ($-4\sim +185^{\circ}\text{F}$)
	Temp fluctuation	$\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$)
	Temp uniformity	$\pm 2.0^{\circ}\text{C}$ ($\pm 3.6^{\circ}\text{F}$)
Construction	External material	Painted steel (melamine coating)
	Internal material	18-8 Cr-Ni stainless steel plate (2B polish)
Air circulator	Propeller fan	
Heater	Nichrome strip wire heater	
Refrigerator	Air-cooled hermetically sealed compressor (HFC134a)	
Fittings	Drain port filter, cable port ($\phi 25\text{mm}$), power cord	
Capacity	105L	
Inside dimensions*2	500W×600H×390Dmm (19.7W×23.6H×15.4Din)	
Outside dimensions*2	650W×1090H×805Dmm (25.6W×42.9H×31.7Din)	
Weight	90kg	

*1 Figures for an ambient temperature of $+23^{\circ}\text{C}$ with no specimen in the chamber.

The performance is according to JTM K 01-1998 of Japan Testing Machinery Association.

*2 Excluding protrusions.

● Safety devices

- Leakage breaker for power supply
- Thermal fuse
- Upper and lower temperature limit alarms
- Watchdog timer
- Burn-out detection circuit
- Refrigerator automatic delay circuit
- Overheat protector
- Air circulator temperature switch
- Refrigerator overload relay

● Accessories

- Shelf (Stainless steel wire) _____ 2
- Shelf bracket
(18-8 Cr-Ni stainless steel) _____ 2 sets
- Socket adapter
(AC100V/115V spec. only) _____ 1
- Instruction manual _____ 1 set

● Options

- Specimen power supply control terminal
- Communication function
(RS-485, E-BUS, GP-IB, RS-232C)
- Communication cable RS-485 5, 10m
E-BUS 5, 10m
GP-IB 2, 4m
RS-232C 1.5, 3, 5, 10m

- Thermocouple
- Cable port
- Rubber plug for cable port
- Shelf/Shelf bracket
- Inner door
- Caster
- Chamber stand
- Special spare parts

Excellent temperature uniformity performance with easy operation.

This hot-air oven uses a sirocco fan to evenly distribute hot air within the chamber. The ease of temperature setting and use of an upper temperature limit deviation warning make this device both safe and user-friendly.

● Safety devices

- Leakage breaker for power supply
- Circuit breaker for SSR overload shortcircuit protection
- Thermal fuse
- Upper temperature limit alarms
- Watchdog timer
- Burn-out detection circuit
- Overheat protector
- Air circulator temperature switch

● Accessories

- Shelf (Stainless steel wire)
 - LC-114 _____ 2
 - LC-124/224/234 _____ 3
- Shelf bracket (18-8 Cr-Ni stainless steel)
 - LC-114 _____ 2 sets
 - LC-124/224/234 _____ 3 sets
- Socket adapter _____ 1 (except LC-223/234)
- Instruction manual _____ 1set

● Options

- Cable port
- Shelf/Shelf bracket
- Chamber stand
- Rubber plug for cable port
- Caster
- Special spare parts



Model	LC-114	LC-124	LC-224	LC-234
System	Hot air circulation			
Power supply*1	AC100V 1φ 50/60Hz		AC200V 1φ 50/60Hz	
Maximum current	11A	14A	10.5A	
Operating temp.	+5~+35°C (+41~+95°F)			
Performance*2	Temperature range	(Ambient+20°C)~+250°C (+482°F)	(Ambient+20°C)~+200°C (+392°F)	(Ambient+20°C)~+250°C (+482°F)
	Temperature fluctuation	±1.0°C (±1.8°F)		
	Temperature uniformity	±2.0°C (at+100°C) [±3.6°F (at ±212°F)] ±4.0°C (at+200°C) [±7.2°F (at ±392°F)] ±6.0°C (at+250°C) [±10.8°F (at ±482°F)]	±2.0°C (at+100°C) [±3.6°F (at ±212°F)] ±4.0°C (at+200°C) [±7.2°F (at ±392°F)]	±2.0°C (at+100°C) [±3.6°F (at ±212°F)] ±4.0°C (at+200°C) [±7.2°F (at ±392°F)] ±6.0°C (at+250°C) [±10.8°F (at ±482°F)]
Construction	External material	Painted steel (Urethane resin electrostatic coating)		
	Internal material	18-8 Cr-Ni stainless steel plate (2B polish)		
Heater	1000W	1300W	2000W	
Air circulator	Direct coupled motor, Sirocco fan			
Fittings	Viewing window	Reinforced glass (W200×H350mm)×3		_____
	Cable port	φ25mm, left side×1		φ50mm, left side×1
	Power cord	With 3P plug		
Capacity	90L	165L		360L
Inside dimensions*3	450W×450H×450Dmm (17.7W×17.7H×17.7Din)	450W×820H×450Dmm (17.7W×32.3H×17.7Din)		600W×1000H×600Dmm (24W×40H×24Din)
Outside dimensions*3	600W×875H×590Dmm (23.6W×34.4H×23.6Din)	600W×1250H×590Dmm (23.6W×49.2H×23.6Din)		750W×1430H×740Dmm (30W×57.2H×29.6Din)
Weight	60kg	82kg		100kg

*1 Voltage fluctuation: ±10% of the rated voltage.

*2 Figures for an ambient temperature of +23°C with no specimen in the chamber.

The performance is according to JTM K 05-2000 of Japan Testing Machinery Association.

*3 Excluding protrusions.

■ A separate type transformer for voltage modification is available upon request.

TEMPERATURE PROGRAM INDICATOR CONTROLLER

Operation mode	Program operation, Constant operation
Program capacity	1 pattern/ Max.6 steps*
Setting and indication ranges	Temp. : 0~+260°C (LC-114·224·234) 0~+210°C (LC-124) Time : 0 to 999.9 hours
Setting and indication resolution	Temp. : 1°C Time : 0.1hour
Input	Thermocouple type K (Copper/ Copper-Nicke)
Control	PID control
Auxiliary functions	<ul style="list-style-type: none"> • Input burn-out detection function • Upper temperature limit alarm function • Self-diagnostic function (Watchdog timer) • Alarm indication function • Power failure protection function • Timer function (automatic start/ stop)

*Available by setting patterns 1, 2, and 3 (2 steps each) consecutively.

Direct heating system for fast vacuum-dry.



In addition to the gas exchange function, it can treat specimens in oxygen-free atmospheres using nitrogen or other gases, and supports baking, degassing, hardening, deaeration and numerous other applications.

● Safety devices

- Leakage breaker for power supply
- Overheat protector
- Thermal fuse
- Upper and lower temperature limit alarms
- Watchdog timer
- Burn-out detection circuit

● Accessories

- Shelf/Shelf bracket (Stainless steel plate) _____ 5 sets
- Instruction manual _____ 1 set

● Options

- Communication function (RS-485, E-BUS, GP-IB, RS-232C)
- Communication cable
 - RS-485 5, 10m
 - E-BUS 5, 10m
 - GP-IB 2, 4m
 - RS-232C 1.5, 3, 5, 10m
- Shelf/Shelf bracket
- Chamber stand
- Hermetic terminal (for thermocouple, for voltage application)
- Reverse flow prevention valve (model with vacuum pump only)
- Special spare parts

Model	LCV-233	LCV-243	
System	Direct PID control		
Vacuum control	Manual LEAK-VACUUM balance system		
Power supply	AC200V 3φ 50/60Hz		
Maximum current	8A	9A	
Performance*1	Temperature range	(Ambient+20)°C~+200°C (±392°F)	
	Pressure range	0~101kPa (Gauge)	
	Temperature fluctuation	±1.0°C (±1.8°F)	
	Temperature heat-up rate	Ambient temp to +200°C (+392°F) 70 min	110min
Construction	External material	Painted steel (melamine coating)	
	Internal material	18-8 Cr-Ni stainless steel plate (2B polish)	
	Viewing window	Tempered glass	
	Vacuum gauge	Bourdon tube vacuum gauge	
Heater	Mica heater		
Capacity	90L	165L	
Inside dimensions*2	450W×450H×450Dmm (17.7W×17.7H×17.7Din)	550W×550H×550Dmm (21.7W×21.7H×21.7Din)	
Outside dimensions*2	670W×890H×700Dmm (26.4W×35H×27.6Din)	770W×990H×800Dmm (30.3W×39H×31.5Din)	
Weight	170kg	250kg	

*1 Figures for an ambient temperature of +23°C with no specimen in the chamber.
The performance is according to JTM K 05-2000 of Japan Testing Machinery Association.

*2 Excluding protrusions

■ A separate type transformer for voltage modification is available upon request.

Vacuum Oven with vacuum pump (Specification for Vacuum Oven is the same as stated above.)

Model	LCV-233P	LCV-243P
Vacuum pump performance*	Direct coupled oil-rotating vacuum pump 6.7×10 ⁻² Pa (abs) with gas ballast valve closed 0.67Pa (abs) with gas ballast valve open	
Power supply	AC200V 3φ 50/60Hz	
Discharge speed*	253/ 309L/ min	
Outside dimensions*2	670W×1540H×700Dmm (26.4W×60.6H×27.6Din)	770W×1640H×800Dmm (30.3W×64.6H×31.5Din)
Weight	240kg	320kg

* Individual performance rate of vacuum pump.



ISO 14001 (JIS Q 14001)
Environmental Management System Assessed and Registered

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