Laboratory Chambers

CAT.NO.E00310-V509

Elmatik AS, Türi 9, 11314 Tallinn Estonia tel. +372 650 3875 tel. +372 650 3876 fax +372 655 8019 e-mail: elmatik@elmatik.ee

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

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LC

LCV

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Utility

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: 1to 99 times)
Setting and indication ranges	Temperature: −25 to +90℃(−13 to +194°F) Humidity: 0 to 100%rh Time: 0 to 99hrs 59min. 100 to 999hrs.
Setting and indication resolution	Temperature: 0.1℃(0.18°F) Humidity: 1%rh Time: 1minute(1hrs. for 100hrs. or more)
Indication accuracy	Temperature: ±0.5℃(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	• 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℃ (adjustable*) of the preset temperature.

*Only LC must be fixed with +10℃.

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.

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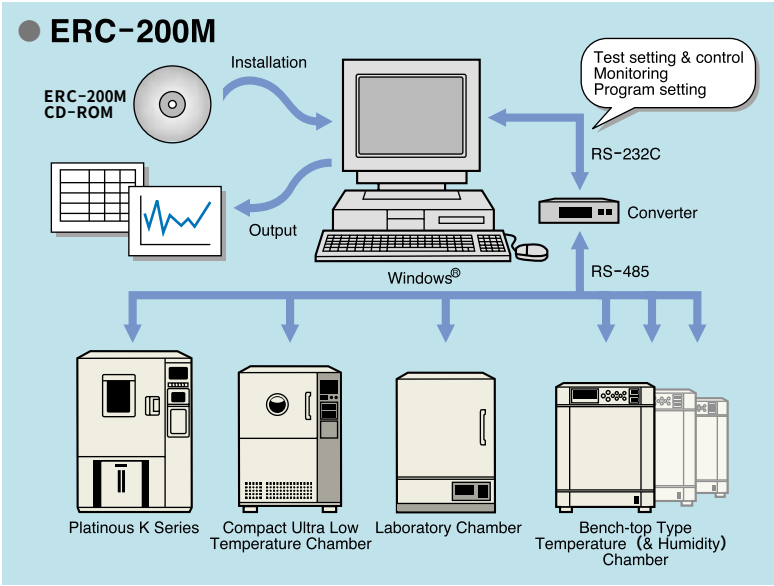
Network

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)



E-PILOT《ERC-100S》

The high-level of functions offered by ERC-200M is included in a non-networked package, meant for a single chamber to be interfaced with your personal computer. The RS-232C communications port option is required, but the software is free.

●For one-to-one users
If you are not ready to establish a network of test chambers, this software would be an ideal trial of the capabilities of our ERC-200M package.

●Freeware
ERC-100S can be downloaded from our website for free at *www.espec.co.jp/english*.

E-PILOT《ERC-200M》

Control, monitoring, programming, and datalogging for up to 16 ESPEC chambers can be performed through a single PC. RS-485 from ESPEC chambers connect via a serial bus converter to RS-232C on the PC.

●Remote operation
Have full control of test chambers while sitting in your office.

●Potential savings
Because the ERC-200M allows program operations to be run directly from the PC, test chambers with less-expensive single-setting controllers can be used.

●E-BUS version available
For existing units with E-BUS system, ERC-100M is available.

E-PILOT《ERC-300M》

Set up an Intranet Web-PILOT site to allow monitoring of up to 16 chambers through one PC (possible with E-BUS communications system). Monitor the settings and operation of your chambers from any PC on the Intranet. Web-based method allows display of chamber information across many computer platform types.

E-PILOT《LabVIEW》

Provides an interlocking system of testing and measuring devices that allows customers currently using LabVIEW to link to ESPEC chambers, opening new horizons for environmental testing. Optional E-BUS or GPIB (IEEE-488) communications interface is required.

●Driver software to connect test chambers are provided for free
LabVIEW drivers are available to give the basic building blocks for addressing ESPEC equipment. Drivers required for connecting ESPEC products to a personal computer is provided for free. For further information, please contact your nearby ESPEC sales office.

CMS-J30

This is a fully customizable system that provides centralized control, centralized monitoring, remote operation and specimen data management of ESPEC products (up to 32 units of which 16 are dedicated to centralized monitoring) by the use of a PC. (E-BUS compatible)

* Please contact us for further information.

* The series of application softwares and network systems are provided on a separate basis from the chamber.

VARIETY OF CHAMBERS

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

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LU

Low Temperature Cabinet

Refrigeration unit achieves temperatures down to −20℃.

This bench-top low-temperature chamber incorporating an aircooled refrigerator supports a wide temperature range extending from −20℃ to +85℃.
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.

● 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, GPIB, RS-232C)
- Communication cable RS-485 5, 10m
  E-BUS 5, 10m
  GPIB 2, 4m
  RS-232C 1.5, 3, 5m
- Thermocouple
- Cable port
- Rubber plug for cable port
- Shelf／Shelf bracket
- Inner door
- Caster
- Chamber stand
- Special spare parts

Model		LU-113
System		Balanced temperature control system (BTC system)
Power supply/ Maximum current		AC100V 1φ 50/60Hz・9A, AC115V 1φ 60Hz・8A, AC220V 1φ 50/60Hz・4.1A, AC230V 1φ 50/60Hz・3.9A
Operating temp.		0〜+40℃ (+32〜+104°F)
Performance*1	Temp control range	−20〜+85℃ (−4〜+185°F)
	Temp fluctuation	±0.5℃ (±0.9°F)
	Temp uniformity	±2.0℃ (±3.6°F)
Construction	External material	Painted steel (melamine coating)
	Internal material	18-8 Cr-Ni stainless steel plate (2B polish)
Air circulator		Propeller fan
Heater		Sheathed heater with fin
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		90kg

*1 Figures for an ambient temperature of +23℃ with no specimen in the chamber.
The performance is according to JTM K 01-1998 of Japan Testing Machinery Association.
*2 Excluding protrusions.

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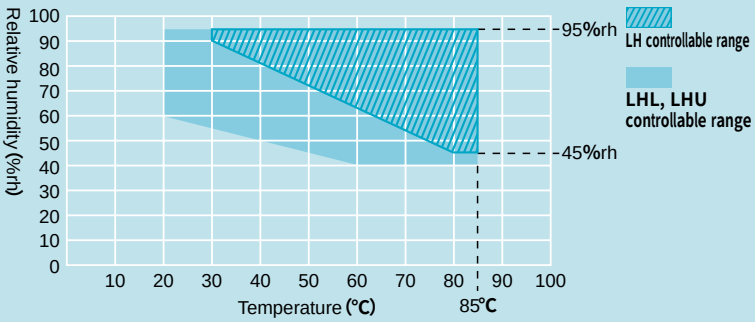
BTHC system ensures a stable internal environment.

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℃)



[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).

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℃(＋32～＋104°F)		
Performance*1	Temp & humid control range	(Ambient＋10)℃～＋85℃ (185°F)/ 45～95%rh	＋5～＋85℃ (＋41～＋185°F)/ 40～95%rh	−20～＋85℃ (−4～＋185°F)/ 40～95%rh
	Temp & humid fluctuation	±0.5℃ (±0.9°F)/ ±3%rh		
	Temp & humid uniformity	±2.0℃ (±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		Sheathed heater with fin		
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℃ 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 φ8mm) ——— 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, GPIB, RS-232C)
- Communication cable RS-485 5, 10m
  E-BUS 5, 10m
  GPIB 2, 4m
  RS-232C 1.5, 3, 5m
- 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

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LC

Convection Oven

Excellent temperature uniformity performance with easy operation.

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℃ (+41～+95°F)			
Performance*2	Temperature range	(Ambient+20)℃～+250℃ (+482°F)	(Ambient+20)℃～+200℃ (+392°F)	(Ambient+20)℃～+250℃ (+482°F)	
	Temperature fluctuation	±1.0℃ (±1.8°F)			
	Temperature uniformity	±2.0℃ (at+100℃) [±3.6°F (at ±212°F)] ±4.0℃ (at+200℃) [±7.2°F (at ±392°F)] ±6.0℃ (at+250℃) [±10.8°F (at ±482°F)]	±2.0℃ (at+100℃) [±3.6°F (at ±212°F)] ±4.0℃ (at+200℃) [±7.2°F (at ±392°F)]	±2.0℃ (at+100℃) [±3.6°F (at ±212°F)] ±4.0℃ (at+200℃) [±7.2°F (at ±392°F)] ±6.0℃ (at+250℃) [±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		Sheathed 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℃ 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.

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
- Rubber plug for cable port
- Shelf／Shelf bracket
- Caster
- Chamber stand (LC-114 only)
- Special spare parts

TEMPERATURE PROGRAM INDICATOR CONTROLLER	
Operation mode	Program operation, Constant operation
Program capacity	1 pattern/ Max.6 steps*
Setting and indication ranges	Temp. : 0～+260℃ (LC-114・224・234) 0～+210℃ (LC-124) Time : 0 to 999.9 hours
Setting and indication resolution	Temp. : 1℃ Time : 0.1hour
Input	Thermocouple type K (Copper/ Copper-Nicke)
Control	PID control
Auxiliary functions	・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.

LCV

Vacuum Oven

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, GPIB, RS-232C)
- Communication cable RS-485 5, 10m
  E-BUS 5, 10m
  GPIB 2, 4m
  RS-232C 1.5, 3, 5m
- 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)℃～＋200℃ (±392°F)	
	Pressure range	0～－101kPa (Gauge)	
	Temperature fluctuation	±1.0℃ (±1.8°F)	
	Temperature heat-up rate	Ambient temp to ＋200℃ (＋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℃ 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
(Specfication for Vacuum Oven is the same as stated above.)

Model	LCV-233P	LCV-243P
Vacuum pump performance*	Direct coupled oil－rotating vacuum pump 6.7×10-2Pa (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.

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Environmental Management System Assessed and Registere

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