

Fast Cycle Chamber

HC-120



The Fast Cycle Chamber

An innovative environmental testing device that meets current requirements for imposing higher stress.

Cutting-edge technologies such as mobile information devices and car electronics focus more on improved product reliability, high-density mounting, wider range of usage conditions, and environment-friendly materials. Their demand is to shorten development and evaluation cycles, lower testing costs, and impose high-stress testing. The Fast Cycle Chamber is an embodiment of these needs by supporting time-saving temperature change and higher temperature change rates through precision control.



The recorder, emergency stop switch, trouble buzzer, and rubber mat for instrument placement are optional.

(The recorder set on top of the unit is sold separately.)

Performance

Precision control yields high temperature change rate

Higher Temperature Change Rate

One solution for achieving improved reliability is to apply high temperature stress which cannot be done with conventional environmental test equipment. The Fast Cycle Chamber raises temperature from - 60 to + 150 in approximately 12 minutes, and pulls down from + 150 to - 60 in approximately 23 minutes. It also features an average temperature change rate of 10 per minute between - 40 and + 85 .

Reduced Overall Testing Costs

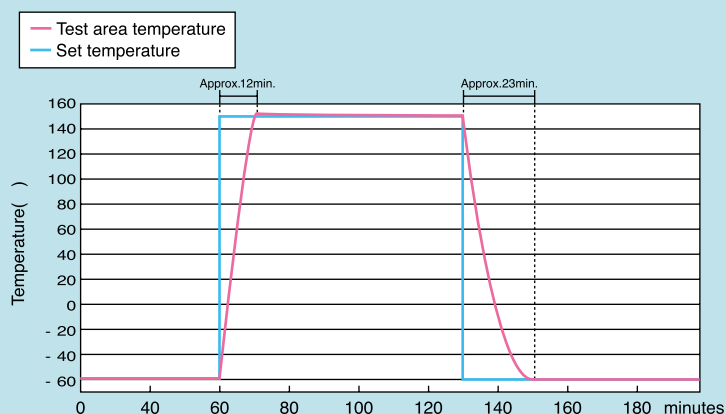
By reducing the time required to reach the set temperature in temperature characteristics tests (i.e., combined temperature increase and decrease time), the testing time can be greatly shortened, thus reducing costs due to power consumption.

Program Control Realized in Fast Cycle Testing

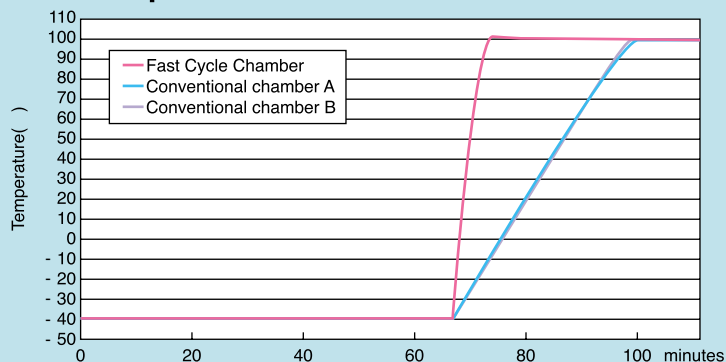
Program operation makes it possible to perform temperature cycle tests that satisfy various testing standards and environmental stress screening.

Desired Temperature Change Rate is Set by Temperature and Time

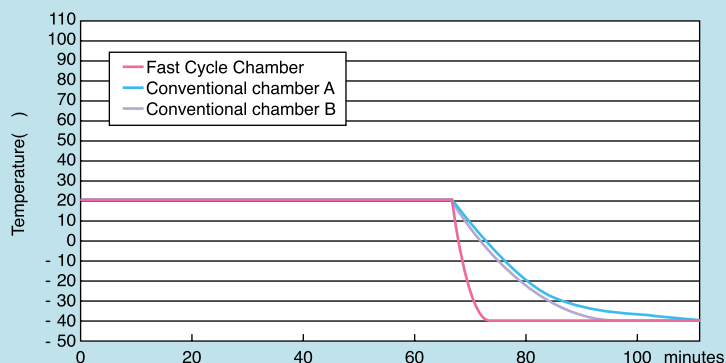
Temperature property at - 60 to + 150



Heat-up rate at - 40 to + 100



Pull-down rate at + 20 to - 40

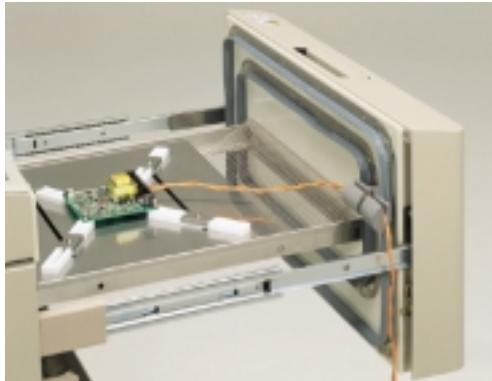


• Measurement condition
Power: 200VAC 60Hz 3
Stabilization time: 1 hour
Ambient temperature + 23 , no specimen

Data above is an example

User-friendly

User-conscious and attention to detail An innovative design to improve ease of operation



Fixture (sold separately)



Large viewing window



Example of placing a measurement instrument

- **Supports Heat Load of 800W (at - 40 °C)**

Features sufficient refrigeration capacity to handle specimen heat load during power application test.

- **Drawer-Type Test Area Offers Improved Specimen Handling**

Specimens can be set in place in a wired condition. The wiring is passed through the cable clamp after which it can be easily connected to measurement instruments.

- **Custom Fixtures can be Provided to Allow Easy Specimen Handling (sold separately)**

Dedicated fixtures that allow specimens to be easily set in the test area can be provided upon request.

- **Standard Large Viewing Window**

A large viewing window (W315 × D185mm) is provided to allow easy observation of the test specimen from above during testing. This helps to ensure accurate control of test specimens.

- **Space to Place Instruments on Top of Chamber**

A W800 × D460mm space is provided on top of the chamber for placing a personal computer or measurement instruments (maximum weight 30kg), thus saving extra table space.

- **Uses HFC to Protect the Global Environment**

The refrigerant used for the refrigerator is an HFC which causes no damage to the ozone layer, and thus complies with the measures for ozone layer protection specified by the Montreal Protocol.

Control operation

● Easy-to-Handle High-Level Program Operation

The instrumentation incorporates a 6.5-inch TFT color LCD and a touch-key interactive input method which enable high-level programming. It has a capacity to store 20 program patterns (99 steps per pattern), set required number of repetitions, and chain program patterns together.

● Communication Network of Environmental Test Chambers

Our Fast Cycle Chamber incorporates the communication port RS-485 as standard to cope with the [E-PILOT 21], which is a newly developed centralized control system. [E-PILOT 21] not only serves as a system for centralized control of environmental chambers, but also establishes an open network including specimen measurement function and remote chamber maintenance function.

● 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)

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



(Additional overheat protector and overcool protector are optional)

Instrumentation

Operation mode	Program operation, Constant operation
Display	Color TFT LCD display (6.5inch 640 × 480 dot)
Setting	Analog touch panel method
Program capacity	RAM pattern : 20 program patterns (99 steps per pattern) *Patterns can be chained ROM pattern : 10 program patterns
Setting and indication ranges	Temperature : - 70 ~ + 160 (- 94 ~ + 320° F) Time : 0 ~ 999 hours 59 minutes
Setting and indication resolution	Temperature : 0.1 Time : 1 minute
Indication accuracy*	Temperature : ± 0.3 Time : within 30 sec per month
Input	Thermocouple type T (Copper/Copper-Nickel)
Control	PID control
Communications	RS-485
Auxiliary functions	Time signal function, Input burn-out detection function, Upper and lower temperature limit alarm function, Self-diagnostic function, Alarm indication function, Power cut protection function, Timer function (automatic start/stop), Refrigerator capacity automatic control function, Trend graph display function, Help function

* At ambient temp. + 23 ± 1

SPECIFICATIONS

Model		HC-120		
Power supply		200VAC 3 3W 50 / 60Hz	220VAC 3 3W 60Hz	380VAC 3 4W 50Hz
		Voltage fluctuation: $\pm 10\%$ of rated value.		
Max current		28A	27A	23.5A
Temp. control system		Balanced temperature control system (BTC system)		
Ambient temp. for allowable operating range		+ 5 to + 35 (+ 41 to + 95° F)		
Performance*1	Temp. control range*2	- 60 to + 150 (- 76 to + 302° F)		
	Temp. fluctuation*2	± 0.5		
	Temp. uniformity*2	± 1.0 (- 60 to + 100 / - 76 to + 212° F) ± 1.5 (+ 100.1 to + 150 / + 212.1 to + 302° F)		
	Temp. heat-up rate	- 40 to + 100 within 10 minutes (When refrigerator is stopped)		
	Temp. pull-down rate	+ 20 to - 40 (+ 68 to - 40° F) within 10minutes		
	Lowest attainable temp.*2	- 60 (- 76° F)		
	Allowable heat load	800W (at - 40 / - 40° F)		
Construction	Exterior material	Cold rolled rust proof steel plate (Melamine baked finish)		
	Interior material	18-8 Cr-Ni stainless steel plate (2B polish)		
	Insulation material	Glass wool, Rigid polyurethane foam		
Heater		Nichrome strip wire heater		
Cooler		Plate fin cooler		
Refrigeration system		Mechanical cascade refrigeration system		
Refrigerator		Hermetically sealed compressor		
Refrigerant		High temp. side: R404A (HFC) Low temp. side: R508A (HFC)		
Condenser		Air cooled condenser		
Dimensions and Capacity	Inside dimensions*3	W380 × H100 × D320mm (W15 × H4 × D12.6in)		
	Outside dimensions*3	W 800 × H1115 × D1000mm (W31.5 × H43.9 × D39.4in)		
	Capacity	12L		
Weight		280kg		
Fittings		Viewing window (W 315 × D185mm) , Viewing window ornament, Integrating hour meter, Time signal, Drain tube, Casters with adjuster foot, Power cord		

*1 Ambient temperature + 23 with no specimen inside.

*2 The performance is according to JTM K 01-1998 (Performance test and indication method) of Japan Testing Machinery Association.

*3 Excluding protrusions

SAFETY DEVICES

Leakage breaker for power supply
 Refrigerator overload relay
 Air circulator temperature switch
 SSR overload and short circuit protecting circuit breaker
 Electric parts compartment door switch
 Thermal fuse
 Control circuit overload & short circuit protection fuse
 Specimen power supply control terminals
 Refrigerator-high pressure switch
 Reverse prevention relay
 External alarm terminal
 Upper and lower temperature limit alarms
 (built inside temperature controller)
 Burn-out detection circuit
 (built inside temperature controller)
 Watchdog timer
 (built inside temperature controller)
 Refrigerator automatic delay circuit
 (built inside temperature controller)
 Overheat protector
 Compressor temperature switch

ACCESSORIES

Specimen basket
 (W350 × H55 × D270mm)



Cable clamp
 (silicon sponge rubber) 1
 Single-heated cable 4
 Glass tube fuse 10A 1
 7A (220V, 380VAC spec. only) 1
 Instruction manual 1
 Warranty 1



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.

OPTIONS

Temperature Attainment Output

A signal is output via a contact switch when temperature inside the chamber reaches the set temperature. Useful for applying power and conducting measurement.



Temperature recorder (Digital type)

- RJ03 - 100 to + 100 100mm 1pen
- RJ04 - 100 to + 200 100mm 1pen
- RJ21 - 50 to + 100 100mm 6dots
- RJ23 - 100 to + 100 100mm 6dots
- RJ25 - 100 to + 200 100mm 6dots

Temperature Recorder for Future Installation

A power cord, temperature sensor, and grounding wire are prepared for additional installation in the future.

Cable Port

Fitted on the door.

Select from 25mm inner diameter cable port or a flat cable port (25 × 100mm slot).

One silicon sponge rubber plug provided with a cable port.



Temperature Detection Terminal

Terminal to output chamber temperature.

Thermocouple

Measures temperature of specimen.

- Type T (Copper/ Copper-Nickel)
- 2, 4, 6m

Communication Function

An interface to connect with a PC.

- E-BUS
- GP-IB
- RS-232C

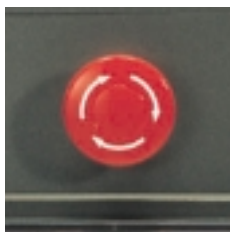
* Connector is equipped on back side of chamber.

Communication Cable

- RS-485 cable (5 and 10 m)
- E-BUS cable (5 and 10 m)
- GP-IB cable (2 and 4 m)
- RS-232C cable (1.5, 3, 5, and 10 m)

Emergency Stop Switch

Immediately shuts down operation in an emergency.



Additional Overheat Protector

The chamber is fitted with an additional overheat protector, separate from the standard equipped temperature alarm and overheat protector, to protect specimens against abnormally high temperature.

Overcool Protector

Protects specimen by shutting down operation in case temperature drops below set rate.

Trouble Buzzer

The buzzer sounds when trouble occurs.

Rotating Signal Lamp

The signal lamp lights up to indicate troubles. Select the color of the signal lamp from red or yellow.

Rubber Mat for measuring Instruments

This rubber mat keeps instruments or other equipment from sliding about when set on top of the chamber. It also minimizes static electricity generation to prevent equipment malfunction.

W790 × D450 × t1.5mm

W590 × D450 × t1.5mm



Power Cord

If the standard 2.5 m is not long enough, 5 m and 10 m cords are available.

*This option is applicable to all Fast Cycle Chambers, except chambers with 380VAC specification.

Some photographs listed in this catalog contain Japanese display.

ESPEC CORP. <http://www.espec.co.jp/english>

Head Office

3-5-6, Tenjinbashi, Kita-ku, Osaka 530-8550, Japan

Tel: 81-6-6358-4741 Fax: 81-6-6358-5500

Europe Office

Tel: 49-6196-77-99980 Fax: 49-6196-77-99985

ESPEC NORTH AMERICA, INC.

Tel: 1-616-896-6100 Fax: 1-616-896-6150

ESPEC EVALUATION & TEST SYSTEMS, INC.

Tel: 1-408-433-2295 Fax: 1-408-433-2296

ESPEC ENVIRONMENTAL EQUIPMENT (SHANGHAI) CO., LTD.

Head Office

Tel: 86-21-58303322 Fax: 86-21-58661781

BEIJING Rep. Office

Tel: 86-10-64627025 Fax: 86-10-64627036

GUANGZHOU Rep. Office

Tel: 86-20-83317826 Fax: 86-20-83317825

SHENZHEN Rep. Office

Tel: 86-755-83674422 Fax: 86-755-83674228

SUZHOU Rep. Office

Tel: 86-512-68664007 Fax: 86-512-68601994

ESPEC (MALAYSIA) SDN. BHD.

Tel: 60-3-89451377 Fax: 60-3-89451287



JIS Q 9001:2000
Registration Number
JSAQ 004



JAB Certificate Number
R001



BMS Accreditation
RE 009



ISO 9001/JIS Q 9001

Quality Management System Assessed and Registered

ESPEC CORP. has been assessed by and registered in the Quality Management System based on the International Standard ISO 9001:2000 (JIS Q 9001:2000) through the Japanese Standards Association (JSA).

ISO 14001 (JIS Q 14001)

Environmental Management System Assessed and Registered

ESPEC GROUP

ESPEC CORP.

ESPEC ENGINEERING CORP.

ESPEC KANSAI CORP.

ESPEC ENVIRONMENTAL TEST

TECHNOLOGY CENTER CORP.

ESPEC BUSINESS CREATE CORP.

•Specifications are subject to change without notice due to design improvements.

•Windows® is a trademark or registered trademark of Microsoft Corporation in the U.S.A. and other countries. Other corporate names and trade names mentioned in this catalog are trademarks or registered trademarks.

•Printed on recycled paper.