Quality is more than a word

ESPEC

Walk-In Type Temperature (& Humidity) Chamber

E Series

CAT.NO.E11124-V1710

All new N-Instrumentation taking energy efficiency to the next level

Since the introduction of the original walk-in chamber back in 1960, we've sold more than 10,000 units throughout the world. Throughout the history of the model, we've been implementing the latest, the best available technology to improve its performance as well as its efficiency.

The latest E Series walk-in type chamber is no exception. With epoch-making technologies such as cross output control system (patented in Japan) and active map system, the E-Series is now able to reduce its energy consumption up to 50% compared to its predecessor.

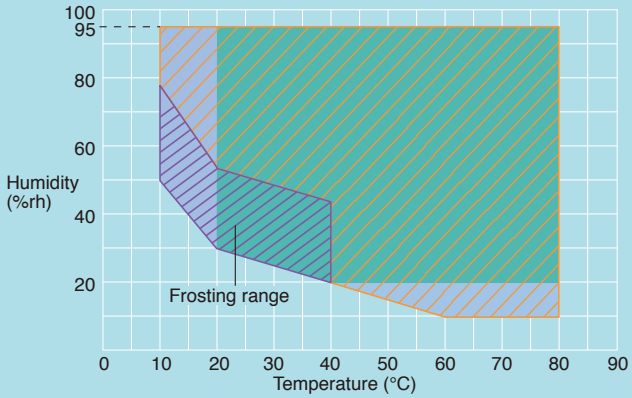
Now, the E Series capabilities are even further optimized with the N-instrumentation, a highly-accurate controller with user-friendly human-machine interface, to support easy operation and network solutions.

The E-Series, performance efficiency redefined.

* Equipped with options.

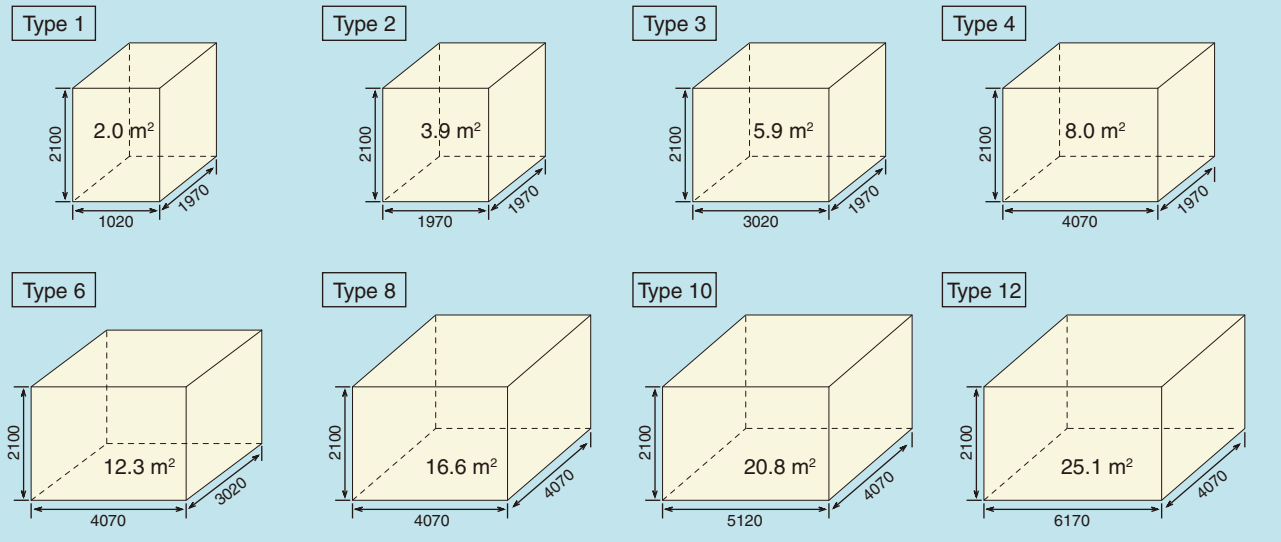
Series

	Model	Temperature	Humidity
Temperature & Humidity Chambers	EBE	–40 to +80°C	10 to 95%rh
	EBL	–30 to +80°C	10 to 95%rh
	EBR	–10 to +80°C	20 to 95%rh
Temperature Chambers	EBF	–40 to +80°C	
	EBU	–30 to +80°C	
	EBUU	–10 to +80°C	



TEST CHAMBER MODULE (INSIDE DIMENSIONS)

Unit: mm



Characteristics

Networking communications and USB data transfer for optimum test operations

Remote monitoring

An Ethernet (LAN) port is equipped as standard, so it is possible to connect to and monitor the chamber operation conditions from a device such as a PC or a tablet. As an option, a Web browser can be used to communicate with chambers to perform tasks such as modifying test conditions, and starting and stopping its operation. Besides more, the remote communication area can be expanded by connecting to your intranet (a LAN inside your company).

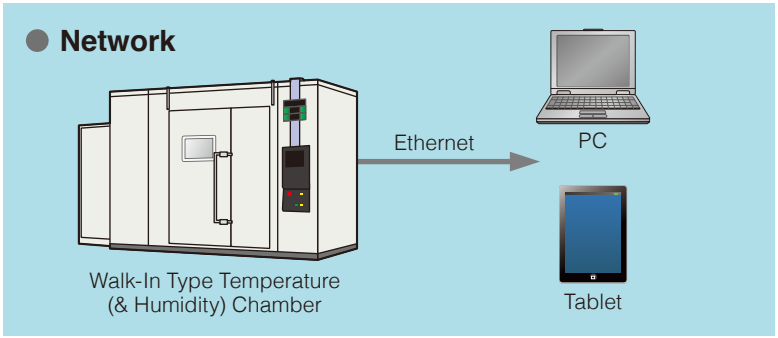
Security measures

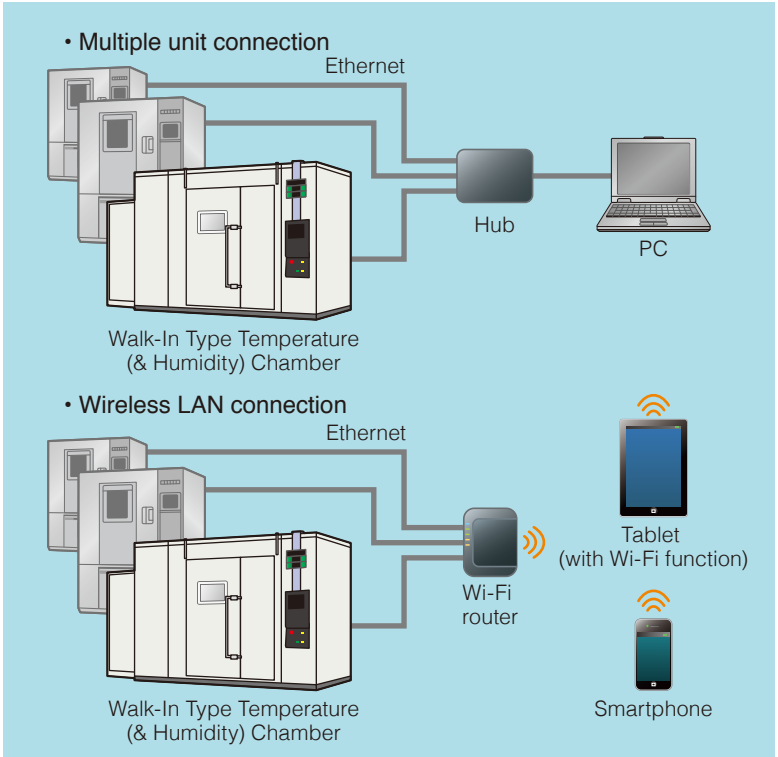
Password authentication is required when accessing the USB flash drive. LAN port and/or USB port function can be terminated as required.

Interface

- Remote monitoring
- Operation*
  (Test pattern change, run start/stop)
- Program pattern edit and copy*
- Data management
- Email alert

*Option



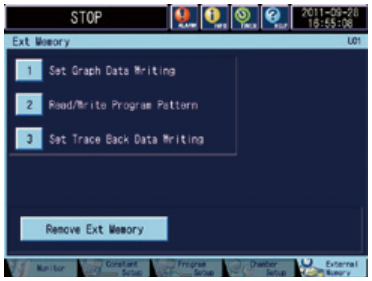


Characteristics

● Instrumentation panel

<LAN settings>

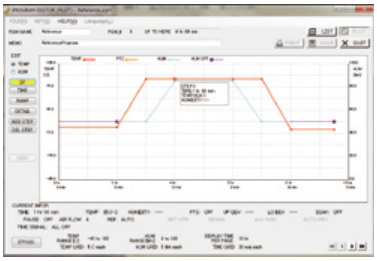
<External memory (USB) settings>



● PC screen

<Chamber monitor>

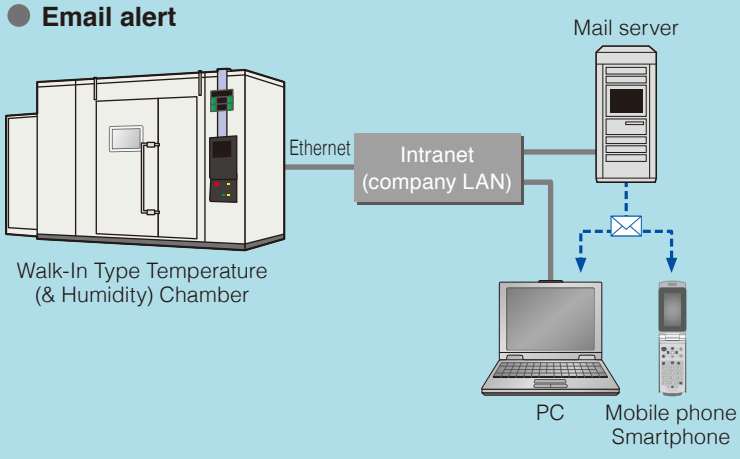
<Edit program (USB)>



● Test Navi (http://www.test-navi.com/eng/index.html)

The web-based Tech site provides practical knowledge on environmental testing that ESPEC has acquired through years of experience, as well covering everything from the fundamentals to the latest information on environmental and reliability testing.

● Email alert



● Test profile edit and copy

A test profile created on a computer can be copied to a chamber, and vice versa via the USB interface.

● Downloading test programs

ESPEC's web-based Tech site "Test Navi" introduces various test standards related to environmental testing.
Test standards can be performed by downloading a test profile to a computer connected to the chamber. The test profile editing function enables modification of test profiles. Also, accurate testing can be performed by using USB memory to copy data between chambers and transferring it directly to N-instrumentation.

* User registration is required to use the Test Navi website for engineers.
http://www.test-navi.com/eng/index.html

● Collecting chamber data

Network function or USB memory can be used to retrieve chamber data.
The data can be opened as a list or graph thanks to a dedicated viewer or spreadsheet and can be used to check historical data.

● Email alert

When an alarm is triggered, an email is sent to the registered PC or mobile address.

* Connection to a mail server is required to use e-mail alert.

■ Copying and editing data on a computer with USB memory requires installation of the Pattern Manager Lite application software that comes with the chamber.

Characteristics

Backtrace function

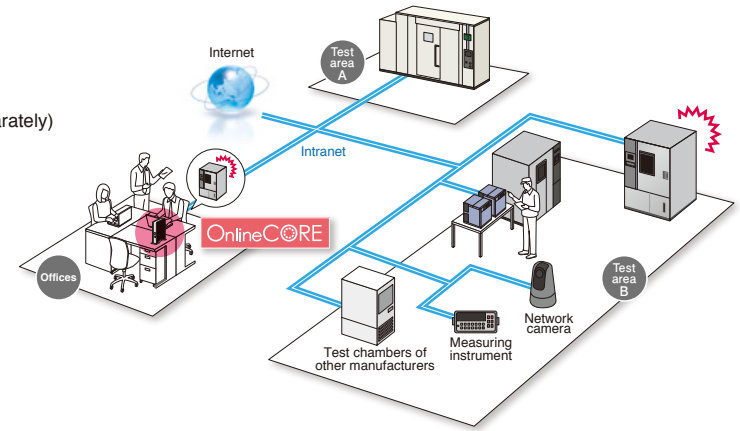
This function is activated in the background when you start using the chamber. It stores the chamber's condition data continuously in a loop. If the chamber stops for whatever the reason, it automatically stores approximately the latest 150 data sets up to the incident. The data can be transferred to a USB memory, which then can be emailed to us.
Once we receive an email with this data attached, we will analyze it and execute troubleshooting to find ways to resolve the situation.

Backtrace setting

ESPEC OnlineCore

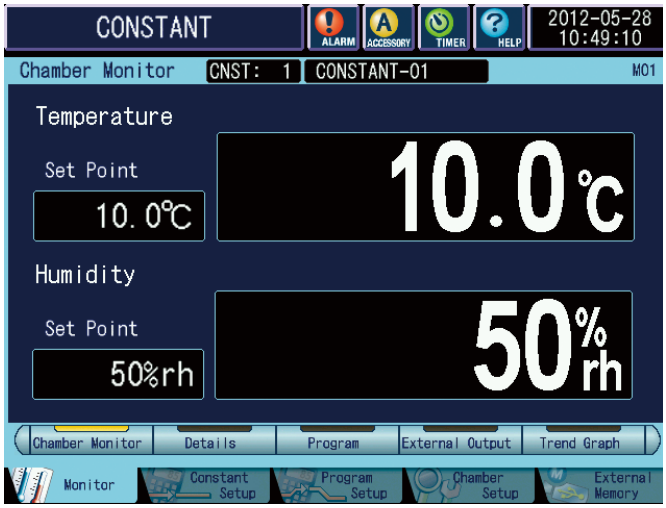
OnlineCORE (Sold separately)

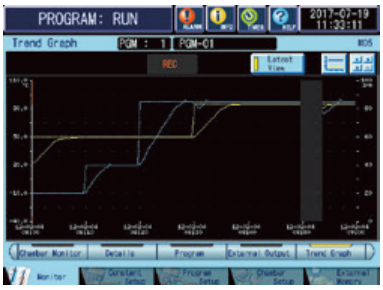
Central control system recommended for multiple environmental test chambers installations



Characteristics

High-power N-instrumentation with 10.4-inch color touch panel for superior operability

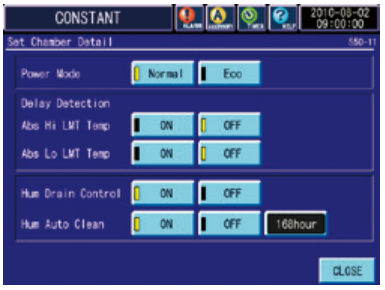




Trend-graph

Control area

USB port



Eco-mode selection screen

Tabbed user interface

Newly designed software with functional tabs at the bottom of the screen allows you to easily access each function.
The menu layout has been redesigned to be optimized for its 10.4-inch display.

A variety of program settings

The program memory has a capacity for 40 programs (99 steps per program). The time for each step is set in 1-minute increments up to a total of 9999 hours and 59 minutes.
Created programs can be confirmed on the screen and operation can be started from intermediate steps.

Trend-graph display

Both the set temperature (and humidity) and the actual are stored in the memory and can be displayed on the monitor as a trend graph. The interval of measurements can be set manually.
These data can be transferred to a USB memory.

Information notification

The INFO icon will blink when chamber information is requiring your attention.

Multi-lingual display

The controller supports:

Japanese
English
Chinese (Traditional/Simplified)
Korean

Two modes for even more energy savings

The new E Series is eco-friendly as is, but we have an additional energy-saving mode called “Eco-Mode,” to help you further reduce your energy bill.

Characteristics

Saving energy –major reduction in power consumption and power equipment capacity

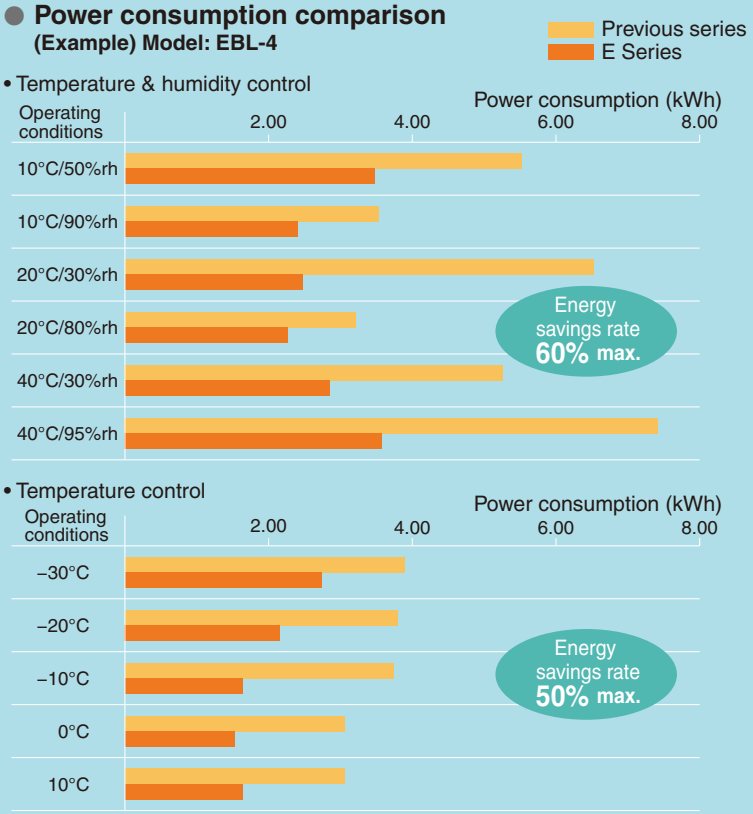
Featuring high precision cooling system with greatly reduced power consumption
(Japanese patent number 5427211)

We have developed a wide-range cooling control system composed of a DC inverter that can widely and continuously vary refrigeration capacity, an electronic expansion valve, and a unique control method called the active map system to control the operation of multiple refrigerators at minimum power consumption. This cooling system controls output and refrigeration capacity with high precision, and achieves high performance while reducing its energy consumption.
With automatic control, the system quickly responds to rapid rise and drop of temperature (and humidity) requirements, and tests with large heat loads.

Cross-output control reduces power equipment capacity
EBE, EBL, EBR

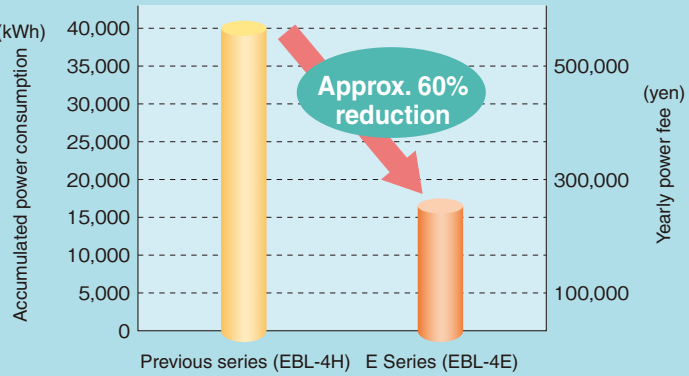
The cross-output control limits the maximum currents of the heater and the humidifier and thereby reducing the power equipment capacity. Also, this feature can also be used to prevent dew condensation through the delayed operation.

Power consumption comparison
(Example) Model: EBL-4



* When no load, no specimen
(water-cooled specification, normal operating mode)

1 year power usage comparison (Example)



* Control temp & humidity conditions: +20°C/30%rh
External temp & humidity: +23°C/50%rh
Calculated value when no load
* Yearly power fee = Calculated by Power amount x 24 hours x 365 days x Operating rate 0.7 x 15 yen/kWh
[differs by region and time period used]

Characteristics

Allowable heat generation load comparison

Model	Temperature	E Series	Previous series
EBL-4	10°C	3.8kW	2.1kW
	20°C	6.6kW	3.2kW
	30°C	7.5kW	3.8kW
	40°C	7.5kW	4.3kW

Interior LED light

Chamber interior

Improving temperature & humidity distribution performance/allowable heat load performance

By improving the airflow, the fan system, and by increasing heat exchanger efficiency, the temperature and humidity distribution have an even higher degree of precision.

An automatic control system to quickly respond to load changes

Simply by setting the temperature and humidity conditions, the automatic control system works at its maximum capacity up to the settings. But once it reaches the settings, it will shift its capacity to its minimum, just to maintain the set conditions. It can quickly respond to door openings and changes in heat loads during testing to create a constantly stable testing environment.

All-weather LED lights
(Japanese patent number 5340985)

These LED lights now illuminate covering the entire temperature and humidity range. LED luminaires are known for its energy efficiency, long life and excellent response time. Compared to conventional incandescent light, it is about 2.5 times as bright, while using only 1/5th of power.

Reduced odors/siloxane

Newly developed sealant material that reduced low-molecular siloxane is used in the panel connections.
This sealant not only prevents any effect on the specimen electrical contact failures caused by siloxane in the chamber but also greatly reduces irritating odors emitted by the material, providing a comfortable environment to the operator.

Noise level in test area reduced by 10 dB
(Traditional machine comparison: Mechanical compartment ACU10)

Improved aerodynamic design in the ducts not only enhanced its temperature and humidity performance, but it also helped its noise level in the test area.
In addition to the advance in airflow, soundproofing materials have been added to the air conditioning compartment to further reduce its noise emissions to the surrounding area.

Characteristics

Cycle time defrost system

The standard-equipped defrost system can automatically remove frost from the evaporator when operating in the frosting range by simply setting the time via the cycle timer on the instrumentation.

Frost-free expansion (option)
(Japanese patent number 5355501)

Through the development of a low-temperature regenerative dehumidification system, the entire temperature & humidity control range is now frost-free and continuous operation time has been extended. The humidity range in the lows has been expanded.

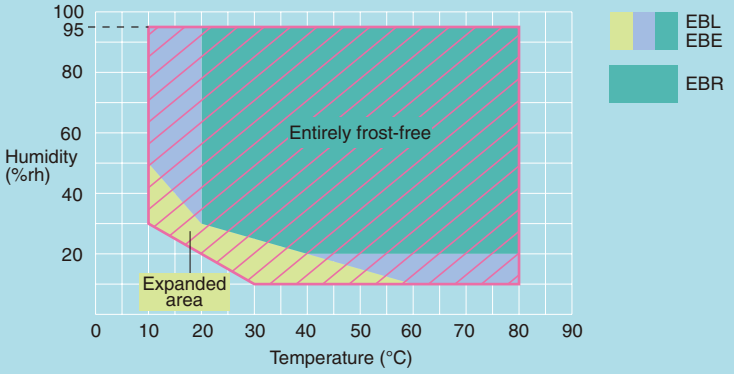
Continue operation with the automatic backup function when trouble occurs

If a problem occurs with a part of the chamber, the remaining devices can be flexibly run to continue its operation, making it unnecessary to stop the test. As an example, if the humidifier breaks, the system will switch to temperature operation automatically.

Employs a steam humidification system for improved efficiency

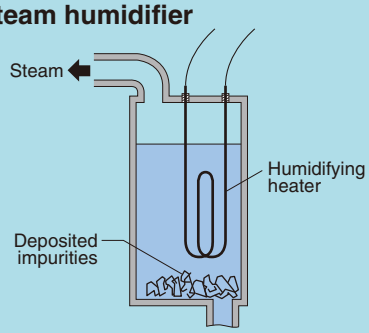
The externally installed steam humidification system is scale-forming resistant by design, with a self-cleaning mechanism which is done by refreshing the humidifying water. The externally installed steam humidification system is scale-forming resistant by design, with a self-cleaning mechanism which is done by refreshing the humidifying water. The cleaning activation timing can be set through the controller, and its cleaning can be done without taking a step in the chamber.

Temperature & humidity control range with frost-free expansion (option)



Automatic backup function

Steam humidifier



Characteristics

Viewing window
(W180 mm x H289 mm)

Option: Large viewing window
(W440 mm x H295 mm)

The viewing window automatically prevents fogging

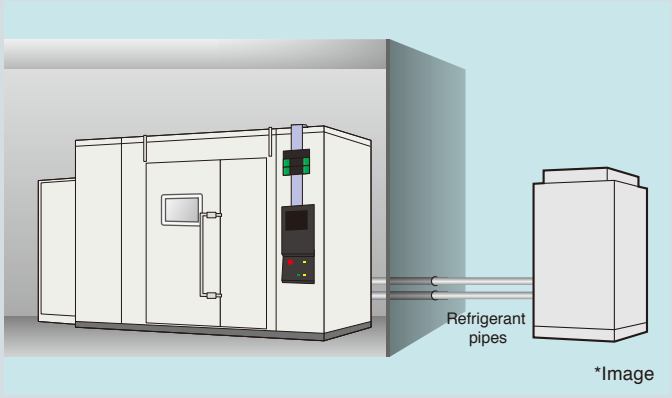
Heater in the viewing window door automatically turns on according to the temperature setting. The glasses used in the window are equipped with a deposited transparent metal layer, which works as a heater to prevent it from fogging.

We deliver custom-made chambers

From minor modifications to major customizations, we can design a chamber to accommodate your requirements.

Custom-made specifications

High temperature specification	Highest adjustable temperature may be raised to +120°C by changing the insulation method.
Cryogenic specification	Equipped with a cascade refrigeration system for lowest temperature measurements even below –40°C.
Low-humidity specifications	Low-temperature/low-humidity control range may be expanded by using dry dehumidifier (ex. +5°C/5%rh)
Custom shape and size	Chamber with a capacity greater than Type 12 (standard specification) may be ordered. Adjustable height.
Shield installation	Shielding to eliminate electromagnetic noise that can be generated outside or inside the chamber (radio wave insulation).
Chamber without floor panel	The floor of the structure may become the floor of the chamber to allow heavy objects.
Outdoor air cooling specification	Refrigerator may be installed outside the building.
Low VOC specification	VOC concentration measurement
Noise-reduction specification	A sound-absorbing unit may be installed to reduce noise.
Increased safety specification	Pressure relief vent, fire extinguishing equipment, gas detectors, etc.



*Image

Remote Cooling Modification

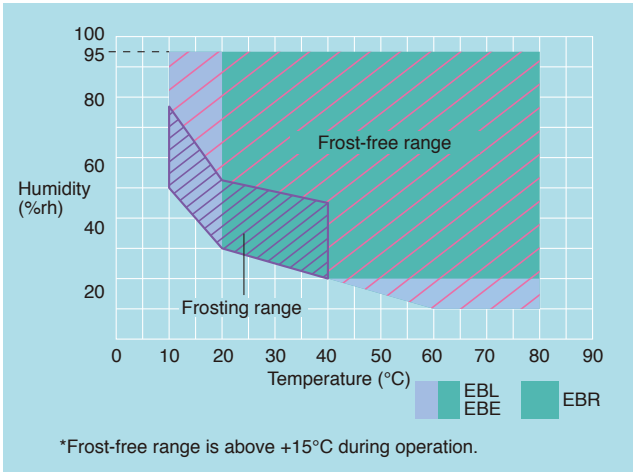
Condenser for high temp. chamber changes to remote cooling system which is placed outdoors.

SPECIFICATIONS

Model		Walk-in Type Temperature & Humidity Chamber			Walk-in Type Temperature Chamber		
		EBE	EBL	EBR	EBF	EBU	EBUU
System		Balanced Temperature and Humidity Control system (BTHC system) Vapor pressure divide control system			Balanced Temperature Control system (BTC system)		
Allowable ambient conditions		0 to +40°C/up to 75% rh					
Performance*1	Temp. range*2	–40 to +80°C (–40 to +176°F)	–30 to +80°C (–22 to +176°F)	–10 to +80°C (+14 to +176°F)	–40 to +80°C (–40 to +176°F)	–30 to +80°C (–22 to +176°F)	–10 to +80°C (+14 to +176°F)
	Humid. range*2	10 to 95%rh (at +10 to +80°C)		20 to 95%rh (at +20 to +80°C)	—		
	Temp. / Humid. fluctuation*3	±0.5°C/±4%rh			±0.5°C		
	Temp. variation in space*3	2.5°C			2.5°C		
	Temperature rate of change (Pull down)*3	0.4°C/min or higher					
	Temperature rate of change (Heat up)*3	1°C/min or higher					
Main unit (Panel assembly)	Exterior material	Color coated sheet metal					
	Interior material	18-8 Cr-Ni stainless steel plate (SUS 304)					
	Floor load resistance	Equal load distribution: 6 kPa (600 kgf/m²)					
	Door	Single opening door W850 x H1800 mm					
	Insulation	Hard urethane foam					
Refrigeration system		Single-stage refrigeration system Air-cooled condenser or water-cooled condenser					
Machinery compartment		Fan motor, Humidifier, Heater, Refrigerator, Evaporator, Temperature sensor, Humidity sensor			Fan motor, Heater, Refrigerator, Evaporator, Temperature sensor		
Fittings		Viewing window (W180 x H289 mm), Cable port (Inside diameter 50 mm), Chamber lamp (LED), Ventilation system					
Utility requirements	Power supply	200V AC 3ø 50/60Hz (with ±5% of rated voltage)					
		AC 220 V AC 3ø 50/60 Hz					
		AC 380 V AC 3ø 50/60 Hz					

*1 Performance figures are given for +5°C to +32°C ambient temperature, +25°C to +32°C cooling water temperature and no specimen inside the test area.
*2 The performance values are performances at the temperature sensor and humidity sensor (installed on the blow out of the air conditioner).
*3 The performance values are based on to IEC 60068-3-6:2001 (EBE, EBL, EBR), IEC 60068-3-5:2001 (EBF, EBU, EBUU).

TEMPERATURE & HUMIDITY CONTROL RANGE



*Frost-free range is above +15°C during operation.

SAFETY DEVICES

- Control circuit overcurrent protection
- Glass tube fuse for control circuit short-circuit protection
- Air circulator short-circuit protection
- Electrical compartment door switch
- Specimen power supply control terminal
- System error (error/alarm)
- Room temperature compensation burnout detection circuit
- Dry bulb temperature burnout detection circuit
- Wet bulb temperature burnout detection circuit (T&H type)
- Absolute upper/lower temperature limit alarm (with built-in temperature/humidity controller)
- Reverse prevention relay
- Fan over current protection local overheating switch
- Overheat protector
- Heater overcurrent protection
- Heater short-circuit protection
- Refrigerator Temperature sensor burnout detection circuit
- Refrigerator Circuit temperature range over
- Refrigerator High-pressure (low-pressure) pressure switch
- Refrigerator Short-circuit protection
- Refrigerator Overcurrent protection
- Humidifier Short-circuit protection (T&H type)
- Humidifier Overcurrent protection (T&H type)
- Humidifier Dry heat protector (T&H type)
- Humidifier Thermal fuse (T&H type)
- Humidifier Water level detection (T&H type)
- Temperature upper limit deviation alarm (with built-in temperature/humidity controller)
- Absolute upper/lower humidity limit alarm (with built-in temperature/humidity controller) (T&H type)
- Water suspension relay (excluding cooling water)

OPTIONS

Status indicator light

Indicates three chamber states: OPERATION, PERSONNEL INSIDE, and ALARM.

Operation indicator

Indicates "OPERATION" during operation.

Personnel indicator

Indicates "PERSONNEL INSIDE" when workers have entered the temperature (humidity) chamber.

Alarm indicator

Indicates "ALARM" in red when a chamber fault occurs.

Revolving pilot lamp

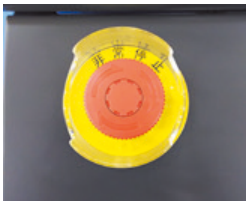
In case of malfunction, the lamp connected to the safety circuit is activated, thus attracting the operator's attention even from a distance.

Operator safety mushroom

A mushroom-head button installed to protect workers who enter the temperature (humidity) chamber. When pressed, chamber operation stops and the safety buzzer issues an alarm.

Emergency stop pushbutton

Stops the chamber immediately.



Grounding terminal

A grounding terminal for test equipment used inside the temperature (humidity) chamber.

Electrical grounding in chamber

Each of the insulation panels are grounded and connected to the ground line in the power distribution board.

In-chamber work timer

The alarm lamp and buzzer is activated to inform the operators when the preset working time limit is over.

Intercom

Allows contact of personnel inside and outside the chamber.

Interior

Exterior

Cold-weather suit

We provide a set of protective clothing including headwear, a pair of gloves, a pair of boots and a two-piece suit. (For use in chamber under –40°C)

Leakage detector

Detects leakage with the leakage sensor.

Independent temperature overcooling alarm

In case of malfunction due to overcooling, operation is terminated and an alarm message is displayed, preventing freezing and damage to specimens inside the chamber.

Gas alarm

Detects concentrations of various gases in the chamber and activates a safety alarm when necessary to protect the personnel during a continuous operation.

OPTIONS

Paperless recorder

Records the temperature of each section such as the temperature inside the chamber.
The data can be transferred by USB.
Scan interval: 5 sec.
Internal recording media:
Flash memory 8MB
External recording media:
CF memory card port
(Includes a 256MB CF card)
USB memory port
Languages: Can be switched between English/Japanese

<Temperature type>
Temperature range: –50 to +100°C
–100 to +100°C
–50 to +150°C
–100 to +200°C
Number of inputs: Temperature 1
(5 more channels can be turned OFF)

<Temperature and humidity type>
Temperature range: –50 to +100°C
–100 to +100°C
–50 to +150°C
–100 to +150°C
Humidity range: 0 to 100%rh
Number of inputs: Temperature 1/ Humidity 1
(4 more channels can be turned OFF)

Temperature & humidity type

Recorder (digital)

No. 1 –50 to +100°C 100 mm
6-dot system
No. 2 –50 to 100°C/
0 to 100%rh 100 mm
6-dot system


100 mm

Recorder output terminal

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

Humidity sensor (for temperature & humidity chambers only)

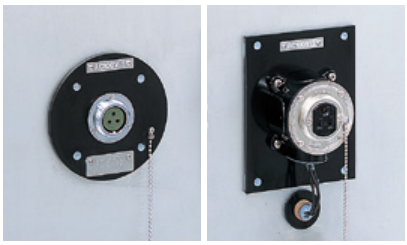
Eliminates the need to change wicks and can accommodate a range of measurements impossible with a dry bulb sensor, including low humidity ranges.

Thermocouple

Used for arbitrary temperature measurement points inside the temperature (humidity) chamber or measuring the specimen temperature.

Interior plug socket

To supply power inside the chamber.
We provide two types of sockets according to use.



Time signal terminal

Adds additional terminals to the standard time signal terminals.

Remote control function

Test conditions can be changed and operation can be started or stopped from your PC over an Ethernet connection.
(Web browser)

Run/stop operation

Interface

Communication port to connect the chamber to a PC.
• RS-485
• RS-232C
• GPIB

Communication cable

• RS-485 5m/ 10m/ 30m
• GPIB 2m/ 4m

Additional cable port

Provided addition/replacement of the standard cable port (50 mm)
• ø25 mm
• ø50 mm
• ø100 mm
• ø150 mm


ø50 mm

OPTIONS

Enlarged viewing window

The standard window (W180×H289 mm) can be changed to a larger type (W440× H295 mm). Tempered heat-resistant glass with defogging heater.

Large viewing window

Viewing window (installed on chamber wall)

Two viewing windows are available:
- Small (W350 × H250 mm)
- Large (W600 × H400 mm)

Heatproof reinforced glass with heat generator incorporated.

Hand-in ports (with viewing window W350 × H 250 mm)

Inner diameter: 150 mm (1 pair).
Useful when handling specimens in the chamber from outside.

Chamber lamp

- LED (adds the same as the standard accessory)
- Fluorescent lamp, ON when room temperature is +5°C to +40°C
- Incandescent lamp

Floor reinforcement

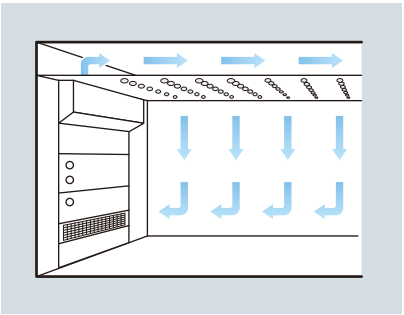
Distributes the concentrated load that occurs when specimens are carried into the chamber on a trolley, preventing distortions and dents in the floor. Additional frames to support the floor panels also enhance distributed load resistance.

Protective flooring (rubber type)

Prevents operators from slipping and prevents damage and dents.

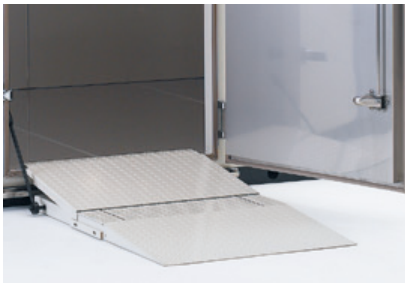
Full-ceiling air duct

Lowers and stabilize air circulation speed to protect specimen.



Insertion ramp

This ramp is used to move heavy specimens into the chamber. The ramp is available in a removable type and a lever type.



Insertion ramp (lever type)

Double swing door

The standard single door (W850 × H1800 mm) can be changed for a double swing door (W1400 × H1800 mm).

Additional door

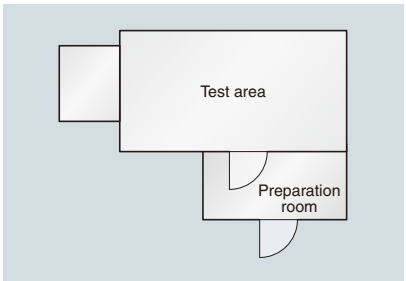
Two types are available: single-swing and double-swing doors. Both come with a viewing window (W180 × H289 mm).

Entrance curtain

Prevents atmospheric disturbance of temp. and humid. within the chamber when opening and closing the door.

Preparation room

Minimizes atmospheric disturbance of temperature and humidity when opening and closing the door. Also used as a measurement room for specimens.



OPTIONS

Frost-free expansion (temperature & humidity chamber only)

Expands the temperature and humidity control range on the low temperature side and increases continuous operation time by preventing frost formation.

Airflow adjuster

Used when tests require low airflow velocity or a constant velocity.
Setting value range: 4 levels

Low humidity equipment (for temperature & humidity chambers only)

Expands the low-humidity range at low temperatures by using a dry-bulb dehumidifier.

Refrigerator for heat load

Refrigerators can be added to allow heat generation from the specimen during operation.

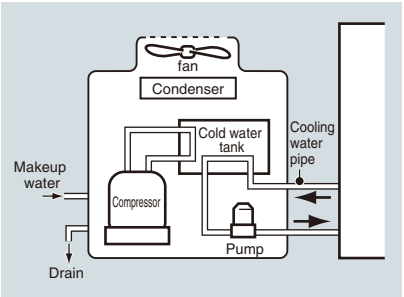
Auxiliary humidifier (for temperature & humidity chambers only)

Effective for heat load generation and high humidity specification. Pure water required.

Air-cooled inverter chiller system

Supplies cooling water to water-cooled equipment. The system features a sealed circuit that can reduce the need to clean pipes.

• Water supply temperature 20 to 25°C



Water purifier (for temperature & humidity chambers only)

Connects to the steam humidifier and optional auxiliary humidifiers. Improves the reliability of measurements over long periods of time and extends the life of the humidifiers.

• Reverse osmosis membrane water purifier
• Ion-exchange water purifier

Reverse osmosis membrane water purifier

Ion-exchange water purifier

Flow switch (for water-cooled models only)

This safety switch for refrigeration unit activates when the cooling water level becomes too low or cut off, and shuts down the equipment.

Exhaust air duct (for air-cooled type)

Exhausts hot air out of the refrigeration system. Installed on the upper part of the machinery compartment.

Operation Manual

• DVD
• Booklet

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 materials in the chamber. If corrosive substances or liquid is used, the life of the unit may be significantly shortened specifically because of the corrosion of stainless steel, resin and silicone materials.
- Do not place life forms or substances that exceed allowable heat generation.
- Be sure to read the operation manual before operation.

Please contact us for non-standard specification.

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UKAS MANAGEMENT SYSTEMS 051

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