ESPEC

Platinous K Series

Temperature & humidity chamber
Low temperature (& humidity) chamber
Low humidity type temperature & humidity chamber
Clean temperature & humidity chamber

CAT.NO.E97110-V703

In pursuit of total reliability
The Platinous Series embodies that goal.

With the Platinous Series of standard environmental test chambers,
our goal has been to achieve optimum operational ease, safety and environmental friendliness in addition to offering superb performance and reliability.
It offers remarkable ease of use and materials recycling,
and marketed as an approaching ideal environmental test chamber.
The Platinous K Series is an embodiment of a design concept featuring energy conservation, reduced maintenance, and improved recycling of natural resources after disposal.

Type1

Type2

Type3

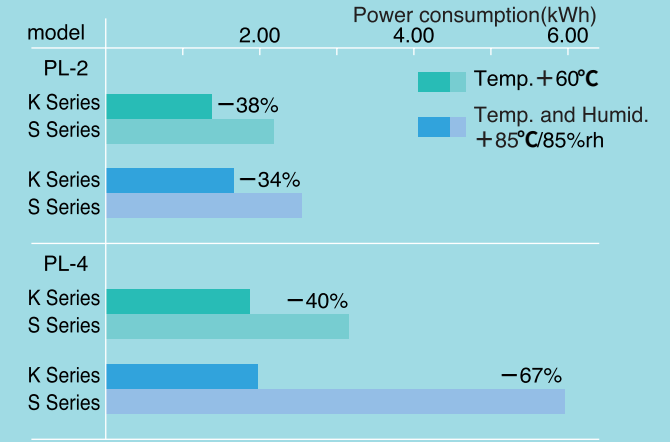
Type4

*Recorder is optional

Eco-friendly

Environmentally friendly design

Power consumption comparison
(with previous model: S Series)



※At ＋23℃±5℃ ambient temp. Power supply: 200V, Frequency: 60Hz
●Data above is reference

Recyclable resin

Paperless recorder (optional)

New refrigerant system reduces power consumption by 30%

We have developed an original refrigeration capacity control system. With this system, power consumption is maximum 67% less than previous system thus providing even greater energy savings.

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.

Low noise levels

A low-noise fan is used for the heat exhaust blower that accounts for the majority of noise produced by the drive unit. This also significantly improves the installation environment. (Except PSL)

Designed for easy recyclability

Molded plastic parts which can be recycled are clearly marked to make recyclable materials easier to identify during disassembly.

Paperless recording (optional)

The paperless recorder makes it easy record the temperatures of different components, such as the chamber temperature, on a memory card (Compact Flash).

Utility

Original technology to achieve a high-precision testing environment

T- and P-instrumentation to meet user needs

T-instrumentation (constant operation mode), which is based on digital microcomputer control, employs an easy-to-read large-segment LED. P-instrumentation, which enables high-capacity, diverse programming operations of up to 20 patterns (99 steps per pattern), uses a 6.5-inch TFT color LCD. In addition, a wide variety of other functions are provided for improved operational ease, including touch-key input, graphical display of program patterns, trend graphs of operation history and comprehensive help facilities.

Low humidity type temperature & humidity chamber(PDL)

Clean temperature & humidity chamber(PCR)

Product lineup to meet your requirements

Variations of our product lineup include the Low humidity type temperature & humidity chamber, which incorporates our unique rotary recovery dehumidification system to ensure precise control at low temperature & humidity ranges. The Clean temperature & humidity chamber achieves requirements of cleanliness Class 100.

Temperature (& humidity) chamber with fully glazed doors enabling the entire chamber interior to be observed

This is an Ultra view temperature (& humidity) chamber that provides full visibility of the chamber interior, allowing test pieces to be viewed at any time. This unit features outstanding performance, including the temperature (& humidity) range and the distribution and temperature heat-up/down range that form the basic specifications of the Platinous K Series, making it ideal for a wide range of applications.

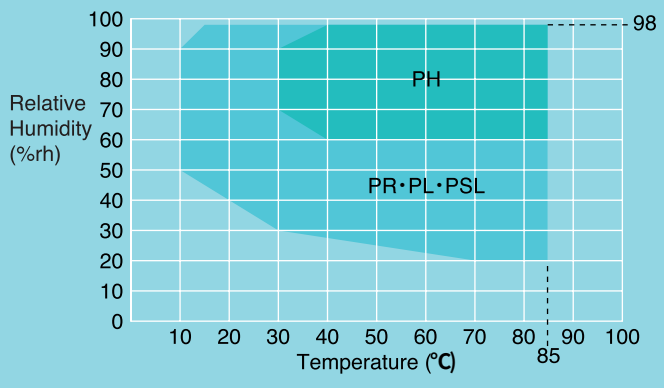
Ultra view temperature (& humidity) chamber(PWL)

Wide range of optional accessories

A wide range of optional accessories is available to suit various customer needs. (See pages 22 to 26 for detailed information.)

Utility

Temperature & Humidity Controllable Range
(at +23°C ambient temperature, non-loaded)



Viewing window for Type 4

Viewing window for Types 1 to 3

High-precision temperature and humidity control over a wide range

The use of a refrigeration system equipped with an electronic auto-expansion valve featuring stepless control makes it possible to realize high-precision temperature and humidity control over a wide range. The lower limit of the temperature control range is +10°C and the lower limit of the humidity control range is 20% rh (at +70°C to +85°C).

New design with emphasis on functionality

A new design achieves an easy-to-use, efficient testing environment by providing a flush viewing window, handles and instrumentation panel.

Large viewing window for improved visibility

Improved lighting has been provided in front of the chamber's viewing window for greater brightness, and a larger outer window provides a wider viewing angle resulting in greater visibility. Moreover, the glass contains an internal heating element to prevent fogging.

Prevents condensed water dripping from the wick pan and water splashes

The wick pan arm and drain are integrated, so any condensation in the wick pan is contained to prevent dripping. In addition, an automatic water feed system is used to prevent water splashes caused by pressure fluctuations.

Utility

Cartridge tank makes water easy to add

Both a stationary tank and a cartridge tank are used for the water tanks. A window is provided in the center of the door to make it easier to check the amount of water remaining in the cartridge tank. In addition, a warning buzzer sounds to inform the user when the cartridge tank is empty. Meanwhile, water is charged from the stationary tank to the chamber. Water can be added even while the system is operating.

Cartridge tank

Unnecessary manual feeding/ draining of humidification water

Setting the drain switch to AUTO automatically feeds or drains water inside the humidification tray depending on the operational status. As a result, during temperature pull-down at temperatures below 0℃, the humidifying water does not require manual draining, so the water can be fed and drained automatically during both temperature and temperature-humidity operations.

Stationary tank

Easy cleaning of condenser filter

The condenser filter on the left side of the chamber can be removed and reinstalled for easy cleaning (excluding model 4).

Condenser filter

Space-saving vertical exhaust system (air-cooling system)

The heat from the refrigerator is expelled vertically through a top-mounted exhaust port, thereby eliminating unusable exhaust space to be provided behind the system. In addition, the chamber is also provided with casters to make it easier to move.

Safety

Handle for door lock release

Door lock release from inside the chamber

Model 4 is equipped with door lock release handle to allow the door to be opened from inside the chamber in case an operator is accidentally locked inside.

Door hinges with self-closing prevention function

Door hinges with a self-closing prevention function cause the door to stop temporarily at opening and closing angles of 60 °and 120 °for greater safety.

Safety measures

The water supply circuit compartment is completely separate from the electric circuit compartment.
Consequently, even if water leakage or other problems occur, there is no risk of contact with the electric circuits. In addition, a buzzer sounds when the chamber is operated with the door half open. Various other safety devices and functions are also provided.

Network

Ion migration evaluation system

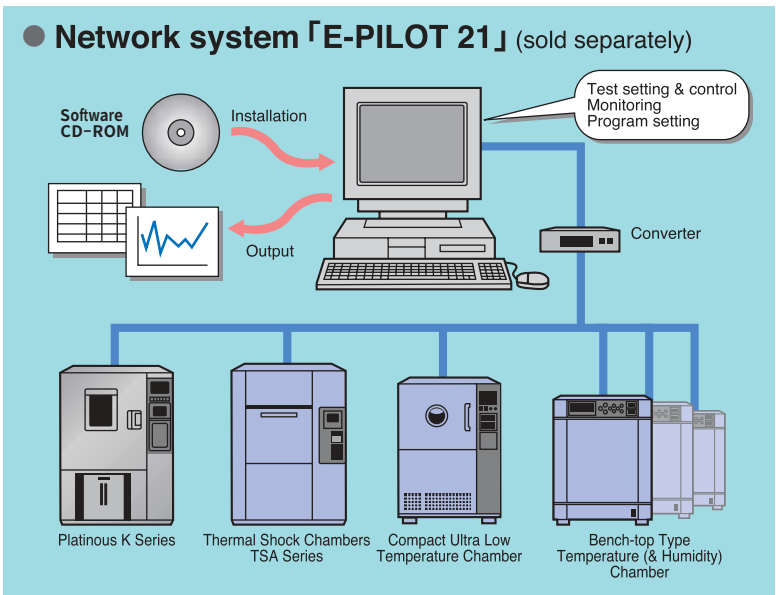
Operating the Platinous K Series with ESPEC's Ion Migration Evaluation System (AMI) enables more precise ion migration evaluation.

Network system E-PILOT 21 (Optional)

E-PILOT 21 is ESPEC's suite of networking tools for communicating between a computer and our environmental testing chambers. It enables the management of chamber operation and test settings from a remote location. Additionally, measurement data and system status can be constantly monitored and recorded on the computer.

Evaluation of ion migration

Network system「E-PILOT 21」(sold separately)



Programming operation mode 〈P-Instrumentation〉

A 6.5-inch TFT color LCD, an interactive input system using touch keys for improved visibility and operation.

P-instrumentation

P-instrumentation
(Temp. & Humid. Program Indicator-controller)

Operating mode	Program operation, Constant operation
Display	TFT Color LCD display (6.5in)
Setting	Analog touch panel method
Program capacity	RAM pattern: 20 program patterns • 99 steps per one pattern • pattern linking possible ROM pattern: 10 program patterns
Setting and indication ranges	Temp. : (lowest attainable temp −5℃) to +105℃/155℃ Humid.: 0 to 100%rh Time : 0 to 999 hours 59 minutes
Setting and indication resolution	Temp. : 0.1℃ Humid.: 1%rh Time : 1 minute
Input	Thermocouple type T (Copper/Copper-Nickel)
Auxiliary functions	Time signal function Power failure protection function Input burn-out detection function Timer function (automatic start/stop) Upper and lower temperature & humidity limit alarm function Refrigerator capacity automatic control function Self-diagnostic function Trend graph display function Alarm indication function, etc.

Variety of program settings provided

In addition to 10 standard programs, up to 20 program patterns can be stored in memory (1 pattern consisting of 99 steps; patterns can be linked).
Each step can be set in one-minute unit up to 999 hours and 59 minutes, and inserted, copied or deleted. Completed patterns can be verified on the display screen, and operation can be started from an intermediate step within the program pattern.

Alarm buzzers and displays

In the event of a problem, a description and time of occurrence of the problem are displayed on the alarm screen, with the cause, corrective actions and recovery method displayed on a subsequent screen.

Trend Graph Display

In addition to displaying temperature, humidity and other operating status parameters, a record of previous operation is also displayed in graph form.

Built-in Timer Functions

Built-in timer functions enable the chamber to be started or shut down automatically at a preset time. A timer operation can be set for month, date, day of the week and time.

P-Instrumentation

INSTRUMENTATION PANEL

Program monitoring

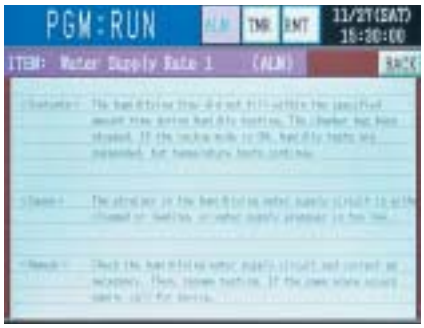
Program setting

Trend graph

Timer setup

Alarm

Alarm description



Service guide

Service guide description

Constant operation mode 〈T-Instrumentation〉

Microcomputer-based digital control and a large, 7-segment LED for improved legibility and ease of operation.

T-instrumentation

T-instrumentation
(Temp. & Humid. Indicator-controller)

Operating mode	Constant operation
Display	7-segment LED display
Setting	Mechanical key input
Setting and indication ranges	Temp. : (lowest attainable temp. −5℃) to +105℃/155℃ Humid.: 0 to 100%rh Time : 0 to 99 hours 59 minutes
Setting and indication resolution	Temp. : 0.1℃ Humid.: 1%rh Time : 1 minute
Input	Thermocouple type T (Copper/Copper-Nickel)
Auxiliary functions	Time signal function Alarm indication function Input burn-out detection function Power failure protection function Upper and lower temperature & humidity limit alarm function Timer function (automatic start/stop) Self-diagnostic function Refrigerator capacity automatic control function

Simple key entry ensures easy operation

T-instrumentation provides easy operation with just eight keys used for operation settings. Temperature and humidity settings, timer settings, and upper and lower temperature and humidity limit alarm function settings are all easy to make just by following the screen display.

Full selection of timer functions

Automatic startup, shutdown and timer functions are available for greater convenience during operation at night and on non-work days.

Relative humidity set in %rh

Relative humidity settings can be entered directly in %rh, with the resulting settings appearing on the digital display. Setting accuracy is also greatly enhanced.

Safety functions

Numerous safety functions and safety devices are provided, including an overheat protector that allows an overheating range to be specified, as well as upper and lower temperature and humidity limit alarm functions.

SERIES

	Model	Temperature (°C)	Humidity (%rh)	Inside capacity (L)	Instrumentation	Cleanliness
Temperature & Humidity Chambers	PH Temperature & Humidity Chamber	+10 to +100	60 to 98	120 225 408 800	T-instrumentation	
	PR Temperature & Humidity Chamber	−20 to +100 −20 to +150	20 to 98		T-instrumentation P-instrumentation	
	PL Low Temperature & Humidity Chamber	−40 to +100 −40 to +150	20 to 98			
	PWL Ultra View Temperature & Humidity Chamber	−40 to +120		225・408 800	P-instrumentation	
	PSL Ultra Low Temperature & Humidity Chamber*	−70 to +100 −70 to +150		306 800	T-instrumentation P-instrumentation	
	PDR Low Humidity Type Temperature & Humidity Chamber	−20 to +100	5 to 98	408 800	T-instrumentation P-instrumentation	
	PDL Low Humidity Type Low Temperature & Humidity Chamber	−40 to +100				
	PCR Clean Temperature & Humidity Chamber	−20 to +100	30 to 90	312	P-instrumentation	Class 100
Temperature Chambers	PU Low Temperature Chamber	−40 to +100 −40 to +150		120・225 408・800	T-instrumentation P-instrumentation	
	PWU Ultra View Temperature Chamber*	−40 to +120		225・408 800	P-instrumentation	
	PG Ultra low Temperature Chamber	−70 to +100 −70 to +150		306 800	T-instrumentation P-instrumentation	

* For details, please refer to the Ultra View Temperature (& Humidity) Chamber individual product catalog.

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 liquid is used, the life of the unit may be significantly shortened specifically because of the corrosion of stainless steel, resin and silicone materials.

CAUTION

- Be sure to read the instruction manual before operation.
- Please contact us for non-standard specification.

PR

−20 to +100℃／+150℃・20 to 98%rh

TEMPERATURE & HUMIDITY CHAMBER

Model			PR-1K	PR-2K	PR-3K	PR-4K	PR-1KH	PR-2KH	PR-3KH	PR-4KH
Power supply			200V AC 3φ 3W 50/60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz, 400V AC 3φ 4W 50Hz *1							
Maximum current (A)		200V	18.5	20.0	22.0	34.0	18.5	20.0	22.0	34.0
		220V	17.5	20.0	20.5	31.5	17.5	20.0	20.5	31.5
		380V	8.5	10.0		20.5	8.5	10.0		20.5
		400V	——	9.5		19.5	——	9.5		19.5
Temperature and humidity control system			Balanced Temperature & Humidity Control system (BTHC system)							
Operating temperature			0 to +40℃(+32 to +104°F)							
Performance *2	Temperature & humidity range		−20 to +100℃(−4 to +212°F) ／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)				−20 to +150℃(−4 to +302°F) ／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)			
	Temperature & humidity fluctuation		±0.3℃(±0.54°F) ／±2.5%rh				±0.3℃(−20 to +100℃) [±0.54°F(−4 to +212°F)] ±0.5℃ (+100.1 to +150℃) [±0.9°F(+212.1 to +302°F)] ／±2.5%rh			
	Temperature & humidity uniformity		±0.5℃(±0.9°F) ／±3.0%rh			±1.0℃ (±1.8°F) ／±5.0%rh	±0.5℃ (−20 to +100℃) [±0.9°F(−4 to +212°F)] ±0.75℃ (+100.1 to +150℃) [±1.3°F(−212.1 to +302°F)] ／±3.0%rh			±1.0℃ (−20 to +100℃) [±1.8°F(−4 to +212°F)] ±1.5℃ (+100.1 to +150℃) [±2.7°F(−212.1 to +302°F)] ／±5.0%rh
	Temperature heat-up rate		−20 to +100℃(−4 to +212°F) within 35 min.				−20 to +150℃(−4 to +302°F) within 55 min.			
	Temperature pull-down rate		+20 to −10℃(+68 to +14°F) within 25 min.							
Construction	Exterior material		18 Cr stainless steel plate (hairline finish)							
	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)							
	Insulation		Chamber: Rigid polyurethane foam Door : Glass wool				Chamber: Rigid polyurethane foam, Glass wool Door : Glass wool			
Refrigeration system	Refrigeration system		Mechanical single-stage refrigerator system (air-cooled condenser)							
	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)							
	Refrigerator capacity		0.65kW			1.2kW	0.65kW			1.2kW
	Expansion mechanism		Electronic auto-expansion valve system							
	Cooler		Plate fin cooler (also functions as dehumidifier)							
Heater			Nichrome strip wire heater							
Humidifier			18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)							
Chamber air circulator			Cross-flow fan			Sirocco fan	Cross-flow fan			Sirocco fan
Fittings			Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm / 2in, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord							
Accessories			Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty							
Water supply	Water supply system		Pump out system							
	Tank capacity (front face of the chamber)		15L: cartridge, 5L: stationary			15L ×2 : cartridge 5L×2 : stationary	15L: cartridge, 5L: stationary			15L ×2 : cartridge 5L ×2 : stationary
	Water quality		Electrical conductivity 0.1 to 10μS/cm							
Inside capacity (L)			120	225	408	800	120	225	408	800
Dimensions *3	Inside dimensions (mm / inch)		W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)		W 910 / 35.8 H1440 / 56.6 D 773 / 30.4	W 910 / 35.8 H1590 / 62.6 D 973 / 38.3	W1010 / 39.7 H1690 / 66.5 D1173 / 46.1	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1173 / 46.1	W 910 / 35.8 H1440 / 56.6 D 795 / 31.3	W 910 / 35.8 H1590 / 62.6 D 995 / 39.1	W1010 / 39.7 H1690 / 66.5 D1195 / 47.0	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1195 / 47.0
Weight (kg)			230	275	305	450	230	275	305	450

*1 CE spec. (This equipment is in compliance with the requirements of the European Community Directives.)

*2 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM・K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PL −40 to +100℃／+150℃・20 to 98%rh

LOW TEMPERATURE & HUMIDITY CHAMBER

Model		PL-1K	PL-2K	PL-3K	PL-4K	PL-1KH	PL-2KH	PL-3KH	PL-4KH
Power supply		200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz, 400V AC 3φ 4W 50Hz *1							
Maximum current (A)	200V	22.5		23.0	36.0	22.5		23.0	36.0
	220V	21.0	22.0		34.0	21.0	22.0		34.0
	380V	10.0	11.0		22.0	10.0	11.0		22.0
	400V	——	10.4		21.0	——	10.4		21.0
Temperature and humidity control system		Balanced Temperature & Humidity Control system (BTHC system)							
Operating temperature		0 to +40℃(+32 to +104°F)							
Performance *2	Temperature & humidity range	−40 to +100℃(−40 to +212°F)／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)				−40 to +150℃(−40 to +302°F)／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)			
	Temperature & humidity fluctuation	±0.3℃(±0.54°F)／±2.5%rh				±0.3℃(−40 to +100℃) [±0.54°F(−40 to +212°F)] ±0.5℃ (+100.1 to +150℃) [±0.9°F(+212.1 to +302°F)] ／±2.5%rh			
	Temperature & humidity uniformity	±0.5℃(±0.9°F)／±3.0%rh			±1.0℃ (±1.8°F)／±5.0%rh	±0.5℃ (−40 to +100℃) [±0.54°F(−40 to +212°F)] ±0.75℃ (+100.1 to +150℃) [±1.3°F(+212.1 to +302°F)] ／±3.0%rh			±1.0℃(−40 to +100℃) [±1.8°F(−40 to +212°F)] ±1.5℃(+100.1 to +150℃) [±2.7°F(−212.1 to +302°F)] ／±5.0%rh
	Temperature heat-up rate	−40 to +100℃(−40 to +212°F) within 45 min.				−40 to +150℃(−40 to +302°F) within 55 min.			
	Temperature pull-down rate	+20 to −40℃(+68 to −40°F) within 50 min.				+20 to −40℃(+68 to −40°F) within 55 min.			
Construction	Exterior material	18 Cr stainless steel plate (hairline finish)							
	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)							
	Insulation	Chamber: Rigid polyurethane foam Door : Glass wool				Chamber: Rigid polyurethane foam, Glass wool Door : Glass wool			
Refrigeration system	Refrigeration system	Mechanical single-stage refrigerator system (air-cooled condenser)							
	Refrigerator	Hermetically sealed rotary compressor (applies to HFC refrigerant)							
	Refrigerator capacity	1.2kW	1.5kW		1.5kW 2 units	1.2kW	1.5kW		1.5kW 2 units
	Expansion mechanism	Electronic auto-expansion valve system							
	Cooler	Plate fin cooler (also functions as dehumidifier)							
Heater		Nichrome strip wire heater							
Humidifier		18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)							
Chamber air circulator		Cross-flow fan			Sirocco fan	Cross-flow fan			Sirocco fan
Fittings		Viewing window (glass incorporating heat generator) Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord							
Accessories		Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty							
Water supply	Water supply system	Pump out system							
	Tank capacity (front face of the chamber)	15L: cartridge, 5L: stationary			15L ×2 : cartridge 5L ×2 : stationary	15L: cartridge, 5L: stationary			15L ×2 : cartridge 5L ×2 : stationary
	Water quality	Electrical conductivity 0.1 to 10μS/cm							
Inside capacity (L)		120	225	408	800	120	225	408	800
Dimensions *3	Inside dimensions (mm / inch)	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)	W 910 / 35.8 H1440 / 56.6 D 773 / 30.4	W 910 / 35.8 H1590 / 62.6 D 973 / 38.3	W1010 / 39.7 H1690 / 66.5 D1173 / 46.1	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1173 / 46.1	W 910 / 35.8 H1440 / 56.6 D 795 / 31.3	W 910 / 35.8 H1590 / 62.6 D 995 / 39.1	W1010 / 39.7 H1690 / 66.5 D1195 / 47.0	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1195 / 47.0
Weight (kg)		240	300	350	540	240	300	350	540

*1 CE spec. (This equipment is in compliance with the requirements of the European Community Directives.)

*2 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM・K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PSL

−70 to +100℃／+150℃・20 to 98%rh

ULTRA LOW TEMPERATURE & HUMIDITY CHAMBER

Model		PSL-2K	PSL-4K	PSL-2KH	PSL-4KH
Power supply		200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz, 400V AC 3φ 4W 50Hz *1			
Maximum current (A)	200V	32.0	48.5	32.0	48.5
	220V	30.5	45.5	30.5	45.5
	380V	18.0	31.0	18.0	31.0
	400V	17.1	29.4	17.1	29.4
Temperature and humidity control system		Balanced Temperature & Humidity Control system (BTHC system)			
Operating temperature		0 to +40℃(+32 to +104°F)			
Performance *2	Temperature & humidity range	−70 to +100℃(−94 to +212°F) ／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)		−70 to +150℃(−94 to +302°F) ／20 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)	
	Temperature & humidity fluctuation	±0.3℃(±0.54°F) ／±2.5%rh	±0.5℃(±0.9°F) ／±3.0%rh	±0.3℃(−70 to +100℃) [±0.54°F(−94 to +212°F)] ±0.5℃ (+100.1 to +150℃) [±0.9°F(−212.1 to +302°F)] ／±2.5%rh	±0.5℃(−70 to +100℃) [±0.9°F(−94 to +212°F)] ±0.7℃ (+100.1 to +150℃) [±1.26°F(−212.1 to +302°F)] ／±2.5%rh
	Temperature & humidity uniformity	±0.5℃(±0.9°F) ／±3.0%rh	±2.0℃(±3.6°F) ／±5.0%rh	±0.5℃(−70 to +100℃) [±0.9°F(−94 to +212°F)] ±0.75℃ (+100.1 to +150℃) [±1.35°F(+212.1 to +302°F)] ／±3.0%rh	±2.0℃(−70 to +100℃) [±3.6°F(−94 to +212°F)] ±3.0℃ (+100.1 to +150℃) [±5.4°F(+212.1 to +302°F)] ／±5.0%rh
	Temperature heat-up rate	−70 to +100℃(−94 to +212°F) within 35 min.		−70 to +150℃(−94 to +302°F) within 50 min.	
	Temperature pull-down rate	+20 to −70℃(+68 to −94°F) within 70 min.		+20 to −70℃(+68 to −94°F) within 75 min.	
Construction	Exterior material	18 Cr stainless steel plate (hairline finish)			
	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)			
	Insulation	Chamber: Rigid polyurethane foam Door : Glass wool		Chamber: Rigid polyurethane foam, Glass wool Door : Glass wool	
Refrigeration system	Refrigeration system	Mechanical cascade refrigerator system (air-cooled condenser)			
	Refrigerator	Hermetically sealed compressor (applies to HFC refrigerant)			
	Refrigerator capacity	1.5kW+1.5kW	1.5kW+1.5kW 2unit	1.5kW+1.5kW	1.5kW+1.5kW 2unit
	Expansion mechanism	Electronic auto-expansion valve system+Capillary tube system			
	Cooler	Plate fin cooler (also functions as dehumidifier)			
Heater		Nichrome strip wire heater			
Humidifier		18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)			
Chamber air circulator		Cross-flow fan	Sirocco fan	Cross-flow fan	Sirocco fan
Fittings		Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord			
Accessories		Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty			
Water supply	Water supply system	Pump out system			
	Tank capacity (front face of the chamber)	15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary	15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary
	Water quality	Electrical conductivity 0.1 to 10μS / cm			
Inside capacity (L)		306	800	306	800
Dimensions *3	Inside dimensions (mm / inch)	W 600 / 23.6 H 850 / 33.4 D 600 / 23.6	W 1000 / 39.3 H 1000 / 39.3 D 800 / 31.5	W 600 / 23.6 H 850 / 33.4 D 600 / 23.6	W 1000 / 39.3 H 1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)	W 1010 / 39.7 H 1690 / 66.5 D 1173 / 46.1	W 1410 / 55.5 H 1855[1985] / 73.0[78.1] D 1493 / 58.7	W 1010 / 39.7 H 1690 / 66.5 D 1173 / 46.1	W 1410 / 55.5 H 1855[1985] / 73.0[78.1] D 1493 / 58.7
Weight (kg)		400	720	400	720

*1 CE spec. (This equipment is in compliance with the requirements of the European Community Directives.)

*2 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM・K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PH

+10 to +100℃・60 to 98%rh

TEMPERATURE & HUMIDITY CHAMBER

Model		PH-1K	PH-2K	PH-3K	PH-4K
Power supply		200V AC 3φ 3W 50／60 Hz			
Maximum current (A)		18.5	20.0	22.0	34.0
Temperature and humidity control system		Balanced Temperature & Humidity Control system (BTHC system)			
Operating temperature		0 to +40℃(+32 to +104°F)			
Performance *1	Temperature & humidity range	+10 to +100℃(+50 to +212°F) ／60 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21)			
	Temperature & humidity fluctuation	±0.3℃(±0.54°F) ／±2.5%rh			
	Temperature & humidity uniformity	±0.5℃(±0.9°F) ／±3.0%rh			±1.0℃(±1.8°F) ／±5.0%rh
Contsruction	Exterior material	18 Cr stainless steel plate (hairline finish)			
	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)			
	Insulation	Chamber: Rigid polyurethane foam Door : Glass wool			
Refrigeration system	Refrigeration system	Mechanical single-stage refrigerator system (air-cooled condenser)			
	Refrigerator	Hermetically sealed rotary compressor (applies to HFC refrigerant)			
	Refrigerator capacity	0.65kW			1.2kW
	Expansion mechanism	Electronic auto-expansion valve system			
	Cooler	Plate fin cooler (also functions as dehumidifier)			
Heater		Nichrome strip wire heater			
Humidifier		18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)			
Chamber air circulator		Cross-flow fan			Sirocco fan
Fittings		Viewing window (grass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord			
Accessories		Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty			
Water supply	Water supply system	Pump out system			
	Tank capacity (front face of the chamber)	15L: cartridge, 5L: stationary			15L ×2: cartridge 5L ×2: stationary
	Water quality	Electrical conductivity 0.1 to 10μS/cm			
Inside capacity (L)		120	225	408	800
Dimensions *2	Inside dimensions (mm / inch)	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W 1000 / 39.3 H 1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)	W 910 / 35.8 H 1440 / 56.6 D 773 / 30.4	W 910 / 35.8 H 1590 / 62.6 D 973 / 38.3	W 1010 / 39.7 H 1690 / 66.5 D 1173 / 47.0	W 1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1173 / 47.0
Weight (kg)		230	275	305	450

*1 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM・K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*2 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PU

−40 to +100℃／+150℃
LOW TEMPERATURE CHAMBER

Model		PU-1K	PU-2K	PU-3K	PU-4K	PU-1KH	PU-2KH	PU-3KH	PU-4KH
Power supply		200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz, 400V AC 3φ 4W 50Hz *1							
Maximum current (A)	200V	14.5	15.0		28.0	14.5	15.0		28.0
	220V	14.0			26.5	14.0			26.5
	380V	9.0	10.5		13.5	9.0	10.5		13.5
	400V	——	10.0		12.8	——	10.0		12.8
Temperature and humidity control system		Balanced Temperature Control system (BTC system)							
Operating temperature		0 to +40℃(+32 to +104°F)							
Performance *2	Temperature range	−40 to +100℃(−40 to +212°F)				−40 to +150℃(−40 to +302°F)			
	Temperature fluctuation	±0.3℃(±0.54°F)				±0.3℃(−40 to +100℃) [±0.54°F(−40 to +212°F)] ±0.5℃ (+100.1 to +150℃) [±0.9°F(+212.1 to +302°F)]			
	Temperature uniformity	±0.5℃(±0.9°F)			±1.0℃ (±1.8°F)	±0.5℃ (−40 to +100℃) [±0.9°F(−40 to +212°F)] ±0.75℃ (+100.1 to +150℃) [±1.3°F(−212.1 to +302°F)]			±1.0℃(−40 to +100℃) [±1.8°F(−40 to +212°F)] ±1.5℃(+100.1 to +150℃) [±2.7°F(−212.1 to +302°F)]
	Temperature heat-up rate	−40 to +100℃(−40 to +212°F) within 45 min.				−40 to +150℃(−40 to +302°F) within 55 min.			
	Temperature pull-down rate	+20 to −40℃(+68 to −40°F) within 50 min.				+20 to −40℃(+68 to −40°F) within 55 min.			
Construction	Exterior material	18 Cr stainless steel plate (hairline finish)							
	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)							
	Insulation	Chamber: Rigid polyurethane foam Door : Glass wool				Chamber: Rigid polyurethane foam, Glass wool Door : Glass wool			
Refrigeration system	Refrigeration system	Mechanical single-stage refrigerator system (air-cooled condenser)							
	Refrigerator	Hermetically sealed rotary compressor (applies to HFC refrigerant)							
	Refrigerator capacity	1.2kW	1.5kW		1.5kW 2units	1.2kW	1.5kW		1.5kW 2units
	Expansion mechanism	Electronic auto-expansion valve system							
	Cooler	Plate fin cooler							
Heater		Nichrome strip wire heater							
Chamber air circulator		Cross-flow fan			Sirocco fan	Cross-flow fan			Sirocco fan
Fittings		Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord							
Accessories		Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Instruction manual, Warranty							
Inside capacity (L)		120	225	408	800	120	225	408	800
Dimensions *3	Inside dimensions (mm / inch)	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5	W 500 / 19.6 H 600 / 23.6 D 400 / 15.7	W 500 / 19.6 H 750 / 29.5 D 600 / 23.6	W 600 / 23.6 H 850 / 33.4 D 800 / 31.5	W1000 / 39.3 H1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)	W 910 / 35.8 H1440 / 56.6 D 773 / 30.4	W 910 / 35.8 H1590 / 62.6 D 973 / 38.3	W1010 / 39.7 H1690 / 66.5 D1173 / 46.1	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1173 / 46.1	W 910 / 35.8 H1440 / 56.6 D 795 / 31.3	W 910 / 35.8 H1590 / 62.6 D 995 / 39.1	W1010 / 39.7 H1690 / 66.5 D1195 / 47.0	W1410 / 55.5 H 1840[1970] / 72.4[77.5] D 1195 / 47.0
Weight (kg)		230	290	340	530	230	290	340	530

*1 CE spec. (This equipment is in compliance with the requirements of the European Community Directives.)

*2 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature range, fluctuation,and uniformity are according to JTM･K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PG

−70 to +100℃／+150℃
ULTRA LOW TEMPERATURE CHAMBER

Model			PG-2K	PG-4K	PG-2KH	PG-4KH
Power supply			200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz, 400V AC 3φ 4W 50Hz *1			
Maximum current (A)		200V	24.5	45.0	24.5	45.0
		220V	23.5	42.5	23.5	42.5
		380V	17.5	23.0	17.5	23.0
		400V	16.6	21.8	16.6	21.8
Temperature and humidity control system			Balanced Temperature Control system (BTC system)			
Operating temperature			0 to +40℃(+32 to +104°F)			
Performance *2	Temperature range		−70 to +100℃(−94 to +212°F)		−70 to +150℃(−94 to +302°F)	
	Temperature fluctuation		±0.3℃(±0.54°F)	±0.5℃(±0.9°F)	±0.3℃(−70 to +100℃) [±0.54°F(−94 to +212°F)] ±0.5℃ (+100.1 to +150℃) [±0.9°F(−212.1 to +302°F)]	±0.5℃(−70 to +100℃) [±0.9°F(−94 to +212°F)] ±0.7℃ (+100.1 to +150℃) [±1.26°F(−212.1 to +302°F)]
	Temperature & humidity uniformity		±0.5℃(±0.9°F)	±2.0℃(±3.6°F)	±0.5℃(−70 to +100℃) [±0.9°F(−94 to +212°F)] ±0.75℃ (+100.1 to +150℃) [±1.35°F(+212.1 to +302°F)]	±2.0℃(−70 to +100℃) [±3.6°F(−94 to +212°F)] ±3.0℃ (+100.1 to +150℃) [±5.4°F(+212.1 to +302°F)]
	Temperature heat-up rate		−70 to +100℃(−94 to +212°F) within 35 min.		−70 to +150℃(−94 to +302°F) within 50 min.	
	Temperature pull-down rate		+20 to −70℃(+68 to −94°F) within 70 min.		+20 to −70℃(+68 to −94°F) within 75 min.	
Construction	Exterior material		18 Cr stainless steel plate (hairline finish)			
	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)			
	Insulation		Chamber: Rigid polyurethane foam Door : Glass wool		Chamber: Rigid polyurethane foam, Glass wool Door : Glass wool	
Refrigeration system	Refrigeration system		Mechanical cascade refrigerator system (air-cooled condenser)			
	Refrigerator		Hermetically sealed compressor (applies to HFC refrigerant)			
	Refrigerator capacity		1.5kW+1.5kW	1.5kW+1.5kW 2unit	1.5kW+1.5kW	1.5kW+1.5kW 2unit
	Expansion mechanism		Capillary tube system		Electronic auto-expansion valve system+Capillary tube system	
	Cooler		Plate fin cooler			
Heater			Nichrome strip wire heater			
Chamber air circulator			Cross-flow fan	Sirocco fan	Cross-flow fan	Sirocco fan
Fittings			Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord			
Accessories			Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Instruction manual, Warranty			
Inside capacity (L)			306	800	306	800
Dimensions *3	Inside dimensions (mm / inch)		W 600 / 23.6 H 850 / 33.4 D 600 / 23.6	W 1000 / 39.3 H 1000 / 39.3 D 800 / 31.5	W 600 / 23.6 H 850 / 33.4 D 600 / 23.6	W 1000 / 39.3 H 1000 / 39.3 D 800 / 31.5
	Outside dimensions (mm / inch)		W 1010 / 39.7 H 1690 / 66.5 D 1173 / 46.1	W 1410 / 55.5 H 1855[1985] / 73.0[78.1] D 1493 / 58.7	W 1010 / 39.7 H 1690 / 66.5 D 1173 / 46.1	W 1410 / 55.5 H 1855[1985] / 73.0[78.1] D 1493 / 58.7
Weight (kg)			400	720	400	720

*1 CE spec. (This equipment is in compliance with the requirements of the European Community Directives.)

*2 At +23℃ ambient temperature, non-loaded, refrigerator capacity set to auto.
Temperature range, fluctuation,and uniformity are according to JTM･K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

PDR・PDL 5 to 98%rh・−20 to +100℃／−40 to +100℃

LOW HUMIDITY TYPE (LOW) TEMPERATURE & HUMIDITY CHAMBER

Model			PDR-3K	PDR-4K	PDL-3K	PDL-4K
Power supply			200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz			
Maximum current (A) (at low humidity range)		200V	23.0 (34.0)	34.0 (44.5)	24.5 (35.5)	36.0 (47.0)
		220V	21.0 (33.0)	31.0 (42.5)	22.5 (34.5)	33.5 (45.5)
		380V	10.5 (17.5)	20.0 (27.0)	11.5 (18.5)	21.5 (29.0)
Temperature and humidity control system			Balanced Temperature & Humidity Control system (BTHC system)			
Operating temperature			0 to +40℃(+32 to +104°F) +5 to +32℃(+41 to +90°F) Absolute humidity: Below 23g/kg' (at low humidity range)			
Performance *1	Temperature & humidity range		−20 to +100℃(−4 to +212°F) ／5 to 98%rh (Refer to diagram of temperature & humidity controllable range on page 21.)		−40 to +100℃(−40 to +212°F) ／5 to 98%rh	
	Temperature & humidity fluctuation		±0.3℃(±0.54°F) ／±2.5%rh (±0.5℃(±0.9°F) ／±5.0%rh (at low-humidity range))			
	Temperature uniformity		±0.5℃(±0.9°F)	±1.0℃(±1.8°F) ±1.0℃(±1.8°F) (at low-humidity range)	±0.5℃(±0.9°F)	±1.0℃(±1.8°F)
	Humidity uniformity		±3.0%rh	±5.0%rh ±5.0%rh (at low humidity range)	±3.0%rh	±5.0%rh
	Temperature heat-up rate		−20 to +100℃(−4 to +212°F) within 35 min.		−40 to +100℃(−40 to +212°F) within 45 min.	
	Temperature pull-down rate		+20 to −10℃(+68 to +14°F) within 25 min.		+20 to −40℃(+68 to −40°F) within 50 min.	
Temp & humid chamber	Exterior material		18 Cr stainless steel plate (hairline finish)			
	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)			
	Insulation		Chamber: Rigid polyurethane foam Door : Glass wool			
	Refrigeration system		Mechanical single-stage refrigerator system (air-cooled condenser)			
	Refrigerator		Hermetically sealed compressor (applies to HFC refrigerant)			
	Refrigerator capacity		0.65kW	1.2kW	1.5kW	1.5kW 2unit
	Expansion mechanism		Electronic auto-expansion valve system			
	Cooler		Plate fin cooler (also functions as dehumidifier)			
	Heater		Nichrome strip wire heater			
	Humidifier		Humidifier:18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system) Compact humidifier:18-8 Cr- Ni stainless steel sheathed heater (surface evaporating system)			
	Chamber air circulator		Sirocco fan			
Dehumidifier *2	Dehumidification system		Rotary recovery (adsorption) dehumidification system			
	Exterior		18 Cr stainless steel plate (SUS430P, hairline finish)			
	Cooler		Plate fin cooler			
	Refrigeration system		Mechanical single-stage refrigeration system (air-cooled condenser)			
	Refrigerator		Hermetically sealed compressor (applies to HFC refrigerant)			
	Expansion mechanism		Temperature-regulated automatic expansion valve			
Fittings			Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord			
Accessories			Cable port rubber plug (φ50mm), Shelves (shelf supports: 2 sets, shelf supports for cable port: 1 set, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Cloth wick, Instruction manual, Warranty			
Water supply	Water supply system		Pump out system			
	Tank capacity (front face of the chamber)		15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary	15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary
	Water quality		Electrical conductivity 0.1 to 10μS/cm			
Inside capacity (L)			408	800	408	800
Dimensions *3	Inside dimensions (mm)		W 600×H 850×D 800 (W 23.6×H 33.4×D 31.5 inch)	W1000×H1000×D800 (W 39.3×H 39.3×D 31.5 inch)	W 600×H 850×D 800 (W 23.6×H 33.4×D 31.5 inch)	W1000×H1000×D800 (W 39.3×H 39.3×D 31.5 inch)
	Outside dimensions (mm / inch)		W1885 / 74.2 H 1690[1820] / 66.5[71.6] D 1173 / 46.1	W2285 / 89.9 H 1840[1970] / 72.4[77.5] D 1173 / 46.1	W1885 / 74.2 H 1690[1820] / 66.5[71.6] D 1173 / 46.1	W2285 / 89.9 H 1840[1970] / 72.4[77.5] D 1173 / 46.1
Weight (kg) *4			507	652	552	742

*1 At +23℃ ambient temperature, non-loaded, and refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM・K01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*2 For operating in low-humidity range.

*3 Excluding protrusions. Dimension indicated in [ ] includes protrusion.

*4 Total weight (Temperature & humidity chamber and dehumidifer)

PCR

−20 to +100℃·30 to 90%rh

CLEAN TEMPERATURE & HUMIDITY CHAMBER

Model			PCR-3K[W]
Power supply			200V AC 3φ 3W 50／60 Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz
Maximum current (A)		200V	23.5
		220V	22.0
		380V	11.0
Temperature and humidity control system			Balanced Temperature & Humidity Control system (BTHC system) Vertical laminar flow circulation system
Operating temperature			+5 to +35℃(+41 to +95°F) (except lowest attainable temperature and temperature pull-down rate)
Performance	Temperature (& humidity) range *1		−20 to +100℃(−4 to +212°F) ／30 to 90%rh (Refer to diagram of temperature & humidity controllable range on page 21.)
	Temperature (& humidity) fluctuation *1		±0.5℃(±0.9°F) ／±3%rh
	Temperature (&humidity) uniformity *1		±0.8℃(±1.44°F) ／±5%rh
	Temperature heat-up rate		−20 to +100℃(−4 to +212°F) within 60 min.
	Temperature pull-down rate		+20 to −20℃(+68 to −4°F) within 45 min.
Construction	Cleanliness		Class 100
	Exterior material		18 Cr stainless steel plate (hairline finish)
	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)
	Insulation		Chamber: Rigid polyurethane foam　Door : Glass wool
Refrigeration system	Refrigeration system		Mechanical single-stage refrigerator system (air-cooled condenser)
	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)
	Refrigerator capacity		1.5kW
	Expansion mechanism		Electronic auto-expansion valve system
	Cooler		Plate fin cooler
Heater			Nichrome strip wire heater
Humidifier			18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)
HEPA filter			Dust collection efficiency is 99.97% or more in 0.3μm single distribution D.O.P. test
Chamber air circulator			Sirocco fan
Fittings			Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord, Clean meter, Duct meter
Accessories			Cable port rubber plug (φ50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty
Water supply	Water supply system		Pump out system
	Tank capacity (front face of the chamber)		15L: cartridge, 5L: stationary
	Water quality		Electrical conductivity 0.1 to 10μS/cm
Exhaust equipment			Exhaust flow rate 16／18m³／min. (50／60Hz), Chamber connection φ123mm
Inside capacity (L)			312
Dimensions *2	Inside dimensions (mm)		W600×H650×D800(W23.6×H25.5×D31.5 inch)
	Outside dimensions (mm)		W1010×H1880×D1173(W39.7×H74.0×D46.1 inch)
Weight (kg)			375

*1 ●At +23℃ ambient temperature, non-loaded, and refrigerator capacity set to auto.
Temperature & humidity range, fluctuation, and uniformity are according to JTM･K01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.
●Never open the door when the chamber is being operated at or below 0℃
●Cleanliness Class 100 is applicable only when the door is closed.
Cleanliness applies when the temperature is stable. Class 100 is the level of cleanliness when there are 100 or less particles of 0.5μm or larger in every cubic foot of air circulating in the chamber.

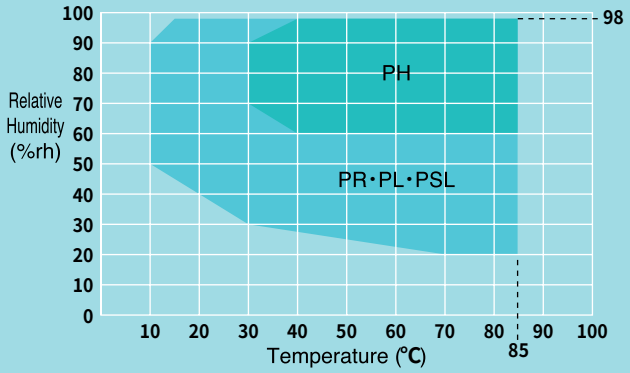
*2 Excluding protrusions.

Model No. suffixed with [W] are water-cooled types whereas those not suffixed are air-cooled types.

TEMPERATURE & HUMIDITY CONTROLLABLE RANGE

● PR・PL・PSL・PH

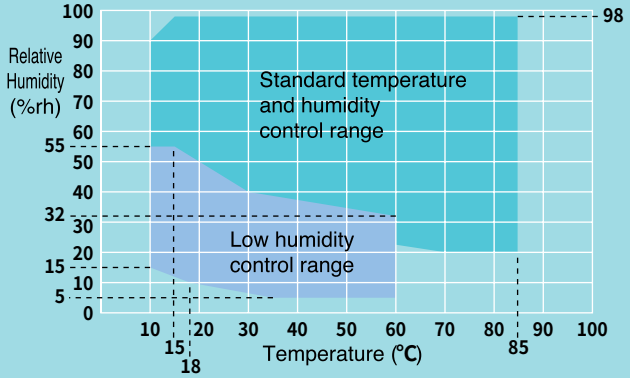
At +23℃ ambient temperature, non-loaded



*There is limitation to continuous humidity operation at +40℃ or below due to frosting on cooler unit.

● PDR・PH

At +23℃ ambient temperature, non-loaded



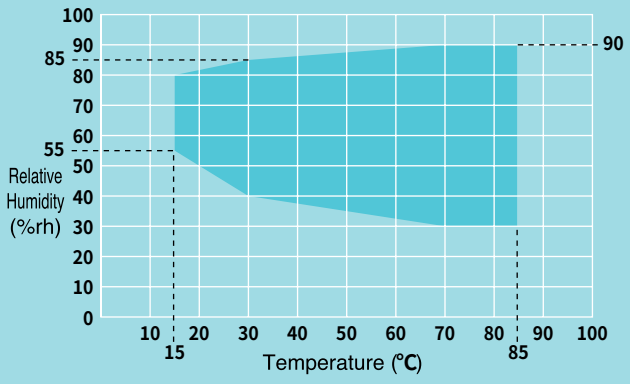
*There is limitation to continuous humidity operation at +40℃ or below due to frosting on cooler unit.

*Notice for operating in low-humidity range

- It is not possible to operate from a high temperature of above +60℃ to a low humidity area. Lower the temperature to below +60℃ before operation.
- Gradient programs cannot be used in the low humidity range.
- Programs requiring humidifier switching cannot be used.
- Programs shifting from a standard temperature and humidity range to a low humidity range cannot be used.
  It is possible to shift from a low humidity range to another range.

● PCR

At +23℃ ambient temperature, non-loaded



MODEL (for K Series)

P□ − □K□□

Temperature range
- Non : 100℃ specification
- H : 150℃ specification

Instrumentation
- P : P instrumentation(Program operation)
- T : T instrumentation(Constant operation)

Capacity
- 1 : 120L
- 2 : 225L(306L for PSL/PG)
- 3 : 408L(312L for PCR)
- 4 : 800L

Series
- R : −20 to +100℃ / 20 to 98%rh
- L : −40 to +100℃ / 20 to 98%rh
- SL : −70 to +100℃ / 20 to 98%rh
- H : +10 to +100℃ / 60 to 98%rh
- U : −40 to +100℃
- G : −70 to +100℃
- DR : −20 to +100℃ / 5 to 98%rh
- DL : −40 to +100℃ / 5 to 98%rh
- CR : −20 to +100℃ / 30 to 90%rh cleanliness Class 100

SAFETY DEVICES

- Leakage breaker for power supply
- Boil dry protector (except PU/PG)
- Refrigerator overload relay
- Air circulator temperature switch (except PCR)
- SSR overload & short circuit protecting circuit breaker
- Electric parts compartment door switch
- Water circuit box door switch (except PU/PG)
- Thermal fuse
- Control circuit overload & short circuit protection fuse
- Specimen power supply control terminals
- Overload relay for condenser heat exhaust fan
- Upper and lower temperature (& humidity) limit alarms (built inside temperature (& humidity) controller)
- Burn-out circuit (built inside temperature (& humidity) controller)
- Watchdog timer (built inside temperature (& humidity) controller)
- Overheat protector
- Refrigerator high pressure switch
- Reverse prevention relay
- Compressor temperature switch
- Cooling box door switch (PU/PG only)
- Compact humidifier heater boil dry protector (PDR/PDL only)
- Air circulator overload relay (PDR/PCR only)
- Overheat protector for recovery heater (PDR/PDL dehumidifier only)
- Circuit breaker (PDR/PDL dehumidifier only)

OPTIONS

OPTION	PR	PL	PSL	PH	PU	PG	PDR PDL	PCR
Water cooled specification (type 3･4, PSL/ PG-2･4)	●	●	●	—	●	●	—	●
Cable port	●	●	●	●	●	●	●	●
Cable port rubber plug	●	●	●	●	●	●	●	●
Reach-in ports	●	●	●	●	●	●	●	—
Inner door with reach-in ports (with/without viewing window)	●	●	●	●	●	●	●	—
Inner door without reach-in ports (with/without viewing window)	●	●	●	●	●	●	●	—
Precision internal chamber	●	●	●	●	●	●	—	—
Stainless evaporator	●	●	—	●	●	—	—	—
Floor load resistance	●	●	●	●	●	●	—	—
Shelf, Shelf bracket	●	●	●	●	●	●	●	●
Load resistance shelf	●	●	●	●	●	●	—	—
Specimen basket	●	●	●	●	●	●	●	●
Additional overheat protector	●	●	●	●	●	●	●	●
Overcool protector	●	●	●	●	●	●	●	●
Defrost circuit (P-instrumentation only)	●*1	●*1	●*2	—	●*1	—	●*3	●
Frost-free circuit	●	●*1	●*2	●*1	●*1	—	●	●
Operating panel cover	●	●	●	●	●	●	●	●
Filter clogged alarm	●	●	●	●	●	●	●	●
Trouble buzzer	●	●	●	●	●	●	●	●
Rotating type warning signal light	●	●	●	●	●	●	●	●
External alarm terminal	●	●	●	●	●	●	●	●
Emergency stop switch	●	●	●	●	●	●	●	●
Temperature attainment output	●	●	●	●	●	●	●	●
Humidifier delay control	●	●	●	●	—	—	●	●
Integrating hour meter with reset	●	●	●	●	●	●	●	●
Time up output	●	●	●	●	●	●	●	●
Additional relay contact	●	●	●	●	●	●	●	●
Water purifier (WS-1)	●	●	●	●	—	—	●	●
Water supplier (B, C, D)	●	●	●	●	—	—	●	●
Additional water supply tank	●	●	●	●	—	—	●	—
Paperless recorder	●	●	●	●	●	●	●	●
Temperature recorder	●	●	●	●	●	●	●	●
Temperature and humidity recorder	●	●	●	●	—	—	●	●
Temp. recorder for future installation	●	●	●	●	●	●	●	●
Temp. & humid. recorder for future installation	●	●	●	●	—	—	●	●
Connecting terminal for temp & humid recorder	●	●	●	●	—	—	●	●
Temperature sensor terminal	●	●	●	●	●	●	●	●
Thermocouple	●	●	●	●	●	●	●	●
Communication functions	●	●	●	●	●	●	●	●
Communication cable	●	●	●	●	●	●	●	●
Power cord	●	●	●	●	●	●	●	●
Power plug	●	●	●	●	●	●	●	●

*1 Except type1.

*2 Applies to the refrigeration circuit of the centralized operation only.

*3 Applies to the refrigeration circuit of the main unit only.

OPTIONS

Water cooled specification

The standard condenser on the refrigeration system is replaced with a water-cooled type.

*Applicable to type 3 and 4 of PR/PL/PU, and type 2 and 4 of PG/PSL.

Cable port

A through hole of 25, 50, or 100mm dia. is provided on the wall (top plate or left side) of the chamber to allow electrical cables to be introduced into the chamber.

*Equipped with rubber plug.
*Can be equipped on the left side only for PCR / PCU.

Cable port rubber plug

The additional silicon sponge rubber port plug.

Reach-in ports

Two operation ports of 130mm dia. are provided on the door. These are used for handling specimens inside the chamber without opening the door. (Optional choice of 2 or 4 ports for Type 4)

Inner door (with or without reach-in ports)

Applicable to type 3 and 4 of all models, and type 2 and 4 of PG/PSL.
A glass inner door is provided inside the chamber door so that specimens can be observed. Can be combined with chamber door with or without observation window, realizing 4 types of combinations to choose from.

- With reach-in ports, without observation window
- With reach-in ports and observation window
- Without reach-in ports, with observation window
- Without reach-in ports and observation window

In accordance with addition of the inner door, standard specification will be changed as follows.

- Temperature heat-up rate: standard rate ＋15 min or less
- Temperature pull-down rate: standard rate ＋15 min or less
- Temperature uniformity: ±0.5℃ wider than standard
- Humidity uniformity: ±2%rh wider than standard

*PU and PG are not equipped with wiper.

Chamber without observation window equipped with an inner door

Inner door without operation ports

Precision internal chamber

Used for testing affected by the air circulation inside the chamber. Placing an aluminum box inside the chamber reduces the air-circulation speed and helps maintain the required temperature and humidity distribution.

- Air velocity: below 0.5 m/s
- Temperature/humidity fluctuation: ±0.5℃/±2.5%rh
- Temperature/humidity uniformity: ±0.75℃/±5.0%rh
- Outside dimensions:(effective cross)
  Type 1—W400×H440×D200mm (W335×H285mm)
  Type 2—W400×H590×D400mm (W335×H435mm)
  Type 3—W500×H740×D600mm (W435×H585mm)
  Type 4—W900×H840×D600mm (W835×H685mm)

Stainless evaporator

The evaporator can be changed to the stainless evaporator to protect chamber from the test product.

*The performance with this option is not identical to the standard performance partly. For further information, please contact us.

Floor load resistance

To enhance floor load capacities inside the chamber.

- Up to 100kg
- Up to 200kg
- Up to 300kg

●Please refer to chart on p.22 for applicable models.

OPTIONS

Shelf, Shelf bracket

Standard specification shelves and shelf brackets are added as required.

Load resistance shelf

Use load resistance shelf when the total weight of the specimens exceeds the maximum allowable load of the standard shelf.

- Type 1 to 3: up to 30kg (max. of three shelves)
- Type 1 to 4: up to 50kg (max. of two shelves)

Allowable load of standard shelves
Type 1: 10kg
Type 2: 10kg
Type 3: 10kg
Type 4: 30kg

Specimen basket

For small specimen that cannot be put on the shelf.

- Basket 1
  size: W350×H35×D270mm
  load capacity:
  3kg equally distributed load
  material: stainless (4 mesh)
  number of baskets that can be placed per shelf: Type 1—1
  Type 2—2
  Type 3—4
  Type 4—6
- Basket 2
  size: W700×H35×D450mm
  load capacity:
  5kg equally distributed load
  material: stainless (4 mesh)
  number of baskets that can be placed per shelf: Type 3—1
  Type 4—2

*The basket should be set on shelf.
*Specimen volume should not be more than the shelf load capacity.
*Leave enough space around the basket for air circulation to ensure effective operation.

Additional overheat protector

To prevent overheating inside the chamber and prevent the specimens from being damaged, an upper temperature limit alarm and overheat protector have been incorporated in the chamber as standard. An additional overheat protector can be installed.

Overcool protector

If the temperature inside the chamber decreases excessively, the chamber stops operating to prevent the specimens from being damaged.

Defrost circuit

Quickly defrosts the refrigeration circuit(dehumidifier).
*P-Instrumentation only

Frost-free circuit

Prevents the refrigeration circuit (dehumidifier) from frosting, thus enabling continuous chamber operation.

Operating panel cover

Plastic cover for the operating panel.

Filter clogged alarm

An indicator lights up if clogging of the refrigerator condenser filter causes the cooling air flow velocity to fall below its specified value.

Trouble buzzer

If a malfunction occurs, the buzzer sounds to warn you of the malfunction.

Rotating type warning signal light

A signal light to light up when malfunction occurs. (selection of red or yellow)

External alarm terminal

If the safety device of the chamber activates, the alarm is notified to a distance via the external alarm terminal.

Emergency stop switch

Stops the chamber immediately.

●Please refer to chart on p.22 for applicable models.

OPTIONS

Temperature attainment output

When temperature and humidity in the chamber reach the set values, the chamber outputs contact signals. This output is used for adjusting the timing for measurement or application of electrical current to specimens, and also prevents condensation from forming on specimens.

Humidifier delay control

To protect specimens from condensation, humidity cdontrol starts after temperature reaches the set value.

Integrating hour meter with reset

This integrating hour meter can be reset if necessary.
(An integrating hour meter is available as standard.)

Time up output

At time up, the chamber outputs contact signals using the timer function of temperature (& humidity) controller. This function enables current to flow or to stop flowing through specimens.

Additional relay contact

The standard 2 relay contacts (time signals) can be added to 12 contacts. (10 contacts for PDR and PDL)

Water purifier (WS-1)

Water purifier with reverse osmosis membrane. Produces approx 6.6L per hour (at primary water temp ＋10℃). Water supplier D is required.

Water supplier

Water supply circuit to supply pure water for humidification.

- Water supplier B
  Water supply piping to ion exchange purewater device and water supply circuit of the main body.
- Water supplier C
  Water supply circuit connected to user's pure-water piping.
- Water supplier D
  Water supply piping for connecting the optional water purifier (WS-1) to the water supply circuit of the main body.

Additional water supply tank

These tanks are used to replenish the standard tank, thus ensuring long-term, continuous operation.

- Capacity 18L

Paperless recorder

Records temperature of each section such as the temperature inside the chamber.
[Temperature type]
Temperature range: － 50～＋100℃
－100～＋100℃
－100～＋200℃
Number of inputs:
Temperature 1 (5 more but turned OFF*)
Data saving cycle: 5 sec.
External recording media:
CF memory card (32MB)
Language: English
* Settings may be modified.

[Temperature and humidity type]
Temperature range: － 50～＋100℃
－ 50～＋150℃
－100～＋100℃
－100～＋150℃
Humidity range: 0~100%rh
Number of inputs:
Temperature 1 / Humidity 1
(4 more but turned OFF*)
Data saving cycle: 5 sec.
External recording media:
CF memory cord (32MB)
Language: English
* Settings may be modified.

When installing chamber on upper floor with options below, a water leak detector (sold separately) is recommended to be equipped in case water leaks.
• Water cooled specification • Water purifier • Water supplier C・D

●Please refer to chart on p.22 for applicable models.

OPTIONS

Temperature recorder (digital)

- RJ03 −100 to +100°C 1 pen
- RJ04 −100 to +200°C 1 pen
- RJ21 −50 to +100°C 6 dots
- RJ23 −100 to +100°C 6 dots
- RJ25 −100 to +200°C 6 dots

Temperature and humidity recorder (digital)

- RJ11 −50 to +100°C/0 to 100%rh 6 dots
- RJ12 −50 to +150°C/0 to 100%rh 6 dots
- RJ13 −100 to +100°C/0 to 100%rh 6 dots
- RJ14 −100 to +150°C/0 to 100%rh 6 dots

Temperature recorder for future installation

Preparation of a power cable, temperature sensor, and a grounding wire for additional installation in the future.

Temp. & Humid. recorder for future installation

Preparation of a power cable, temperature sensor, relatively humidity signal and a grounding wire for additional installation in the future.

Connecting terminal for temp & humid recorder

Terminal board for temperature and relative humidity output.

Temperature sensor terminal

Terminal board for wet bulb and dry bulb temperature sensor in the chamber.

Thermocouple

Thermocouple measures the temperature of specimens.

- 2, 4, 6m
- Thermocouple type T (Copper/ copper-Nickel)

Communication functions

Connects chamber to a personal computer, enabling operation control of the chamber.

- E-BUS
- GPIB
- RS-232C

Communication cable

- RS-485 cable 5, 10m
- E-BUS cable 5, 10m
- GPIB cable 2, 4m
- RS-232C cable 1.5, 3, 5m

Power cord

A standard cord is 2.5m long.
We provide two other choices.

- 5, 10m

*Not applicable for optional 380/400V AC power supply specification.

Power plug

The power plug is fitted at the end of the power cord.

*Not applicable for optional 380/400V AC power supply specification.

●Please refer to chart on p.22 for applicable models.
■Some photographs listed in this catalog contain Japanese display.