

Platinous K Series

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



CAT.NO.E97110-X403

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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.



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Environmentally friendly design



At $\pm 23 \pm 5$ 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 records temperature of each section such as the temperature inside the chamber to 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. Pinstrumentation, which enables highcapacity, 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.

Product lineup to meet your requirements

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

Wide range of optional accessories

A wide range of optional accessories is available to suit various customer needs. (See pages 23-25 for detailed information.)



Low humidity type temperature & humidity chamber(PDL)

Clean temperature & humidity chamber(PCR)

Utility





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 and the lower limit of the humidity control range is 20% rh (at +70 to +85).

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.

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.

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).

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

The heat from the refrigerator is expelled vertically through a topmounted 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.



Cartridge tank



Stationary tank



Condenser filter

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

Communication Network of Environmental Test Chambers

The Platinous K Series 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 main-tenance function.



E-PILOT (ERC-100S)

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

For one-to-one users

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

Freeware

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

E-PILOT (ERC-200M)

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

Remote operation

Have full control of test chambers while sitting in your office. Potential savings

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

E-BUS version available

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

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

E-PILOT (ERC-300M)

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

E.PILOT (Lab-VIEW)

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

Driver software to connect test chambers are provided for free

Lab VIEW drivers are available to give the basic building blocks for addressing ESPEC equipment. Drivers required for connecting ESPEC products to a personal computer is provided for free. For further information, please contact your nearby ESPEC sales office.

CMS - J30

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

* Please contact us for further information.

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.

INSTRUMENTATION PANEL

Program monitoring



Timer setup



Program setting

Alarm

CLR

CLR

CLR

CLR

Bazz



Trend graph



Alarm description

PGM:RUN 💷 🛚	R RMT 11/27(SAT) 15:30:00
ALARM	1101
Alarn Name Nater Supply Rate 1	Thes Docuer 11/27(SAT) 13:38:47
	- During and the second se
r Stop	The extention Pres.

PG	I:RUN	лл.	19R	EMT	11/27(SAT) 15:30:00
ITEN: Not	er Supply Rat		(1)		BACK
(Gerbergs)	The basis by one to should from during phonesis. If the se- sense deck, but too	ny did ne i nami di tu ninan muda na na huna			n spicified other tax seen taxts are
< Davin 2	The strainer on the cloqued or beating	e hand in			e si real (16 al fea
(Renada)	Check the number of recessory. Then it spaces call for or				an Derive Teals

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 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 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.





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 introduce corrosive substances into the chamber for they might deteriorate the cooler. Stainless evaporator which is optional, with high-resistance to corrosion is also available.



Be sure to read the instruction manual before operation.

Please contact us for non-standard specification.

PR

-20~+100 /+150 •20~98%/rh

TEMPERATURE & HUMIDITY CHAMBER

Mo	dol		DD 1K	ארסס	DD 2K	DDAK				
De										
PO	wer supply	0001/	2007 F		00 HZ, 220V A		2, 380V AC 3	400 50Hz, 40	0V AC 3 4VV	50HZ 1
		2000	18.5	20.0	22.0	34.0	18.5	20.0	22.0	34.0
Ma	ximum current (A)	2200	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
Ter cor	nperature and hu itrol system	midity		Bala	nced Tempera	ature & Humidi	ty Control syst	tem (BTHC sy	stem)	
Am allc	bient temperature wable operating r	e for ange				0 to -	+ 40			
	Temperature & hur range	midity		- 20 to + 100 (Refer to e	/ 20 to 98%r diagram of ter	h nperature & hu	Imidity control	- 20 to + 150 lable range on	/ 20 to 98%r page 21)	h
nce*2	Temperature & hur fluctuation	midity		±0.3 /	± 2.5%rh		±0.3 ±0.5	(- 20 to + 1) (+ 100.1 to	00) +150) / ±2	2.5%rh
erformaı	Temperature & hu	midity	±	0.5 /±3.0%	rh	±1.0 / ±5.0%rh	±0.5 (-20 ±0.75 (+1	to + 100) 00.1 to + 150) [/] ±3.0%rh	±1.0 (-20 to +100) ±1.5 (+100.1 to +150) /±5.0%rh
Δ.	Temperature heat-u	up rate		- 20 to + 100	within 35 mi	n		- 20 to + 150	within 55 mi	n
	Temperature pull-dov	wn rate				+ 20 to - 10	within 25 mir	ı		
5 Exterior material					18 Cr :	stainless steel	plate (hairline	finish)		
ruct	Interior material			18-8 Cr- Ni stainless steel plate (2B polish)						
Insulation			Ch Do	Chamber: Rigid polyurethane foam Chamber: Rigid polyurethane foam, Glass woo Door : Glass wool Door : Glass wool						Glass wool
E Refrigeration system			Mechanical single-stage refrigerator system (air-cooled condenser)							
syst	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)							
ation	Refrigerator capa	acity	0.65kW 1.2kW 0.65kW					1.2kW		
igera	Expansion mech	anism		Electronic auto-expansion valve system						
Refr	Cooler			Plate fin cooler (also functions as dehumidifier)						
Heater Nichrome strip wi				ip wire heater						
Humidifier 18-12-2.5 C				18-12-2.5 Cr	12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)					
Ch	amber air circulate	or	Cross-flow fan Sirocco fan Cross-flow fan S				Sirocco fan			
Fitt	ings			Viewing winc Cable port (in Integrating he	low (glass inco nside diamete our meter, Tin	orporating hea r 50mm/2in, 1p ne signal (2 po	t generator), oc), Chamber I ints), Casters	amp (fluoresc with adjusters	ent lamp), , Power cord	
Aco	cessories			Cable port ru Plug type fus	bber plug(5 e, Wet-bulb w	0mm), Shelves rick (1 box), Ins	s (shelf suppor struction manu	rts, shelves: 2 Ial, Warranty	sets),	
>	Water supply sys	stem				Pump ou	t system			
Water suppl	Tank capacity (front face of the cha	amber)	15L: ca	rtridge, 5L: sta	itionary	15L ×2 : cartridge 5L×2 : stationary	15L: ca	15L: cartridge, 5L: stationary 15L: cartridge, 5L: stationary 5L × 2 :stationary		
-	Water quality				Elec	trical conducti	vity 0.1 ~ 10µS	S/cm		
Ins	ide capacity (L)		120	225	408	800	120	225	408	800
sions*3	Inside dimension (mm)	IS	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800
Dimen.	Outside dimensio (mm)	ons	W 910 H1440 D 773	W 910 H1590 D 973	W1010 H1690 D1173	W1410 H1840[1970] D1173	W 910 H1440 D 773	W 910 H1590 D 973	W1010 H1690 D1195	W1410 H1840[1970] D1195
We	ight (kg)		230	275	305	450	230	275	305	450

*1 EU spec. Except type1.

*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.

PL

-40~+100 /+150 •20~98%/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 A	C 3 3W 50 /	60 Hz, 220V A	AC 3 3W 60H	z, 380V AC 3	4W 50Hz, 40	00V AC 3 4W	/ 50Hz*1
		200V	22	2.5	23.0	36.0	22	.5	23.0	36.0
Ma	vinum current (A)	220V	21.0	22	2.0	34.0	21.0	22	2.0	34.0
ivia		380V	10.0	11	.0	22.0	10.0	11	.0	22.0
		400V		10).4	21.0		10).4	21.0
Ter cor	nperature and hu htrol system	midity		Bala	nced Tempera	ature & Humidi	ty Control syst	em (BTHC sy	stem)	
Am allc	bient temperature wable operating r	e for range				0 to	+ 40			
	Temperature & hu range	midity		- 40 to + 100 (Refer to	/ 20 to 98%r diagram of ten	h nperature & hu	۔ Imidity controll	40 to + 150 able range or	/ 20 to 98%r page 21)	h
ce*2	Temperature & hu fluctuation	midity		±0.3 /	±2.5%rh		± 0.3 ± 0.5	(- 40 to + 1 (+ 100.1 to	$\begin{pmatrix} 00 \\ + 150 \end{pmatrix} / \pm 2$	2.5%rh
rforman	Temperature & hu uniformity	midity	±(0.5 / ±3.0%	órh	±1.0 / ±5.0%rh	±0.5 (-40 ±0.75 (+10	to + 100) 00.1 to + 150) [/] ±3.0%rh	±1.0 (-40 to +100) ±1.5 (+100.1 to +150) /±5.0%rh
Ре	Temperature heat-u	up rate		- 40 to + 100	within 45 mii	n		- 40 to + 150	within 55 mi	n
	Temperature pull-or	down		within	50 min	+ 20 to	o - 40	within	55 min	
u	Exterior material				18 Cr :	stainless steel	plate (hairline	finish)		
ructi	Interior material			18-8 Cr- Ni stainless steel plate (2B polish)						
Const	Insulation		Chamber: Rigid polyurethane foam Chamber: Rigid poly Door : Glass wool Door : Glass wool			: Rigid polyur : Glass wool	polyurethane foam, Glass wool wool			
em	Refrigeration sys	stem		Mech	anical single-s	stage refrigera	tor system (air	-cooled conde	enser)	
syst	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)							
ation	Refrigerator capa	apacity 1.2kW 1.5kW 1.5kW 2 units 1.2kW 1.5				kW	1.5kW 2 units			
rigen	Expansion mech	anism		Electronic auto-expansion valve system						
Ref	Cooler		Plate fin cooler (also functions as dehumidifier)							
Hea	ater					Nichrome str	ip wire heater			
Hu	midifier			18-12-2.5 Ci	r- Ni-Mo stainle	ess steel shea	thed heater (s	urface evapor	ating system)	
Ch	amber air circulate	or		Cross-flow fan	I	Sirocco fan	(Cross-flow fan	I	Sirocco fan
Fitt	ings			Viewing wind Cable port (in Integrating h	low (glass inco nside diameter our meter, Tim	orporating hea r 50mm, 1pc), ne signal (2 po	t generator) Chamber lamp pints), Casters	o (fluorescent with adjusters	lamp), s, Power cord	
Aco	cessories		Cable port rubber plug (50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty							
>	Water supply sys	stem				Pump ou	it system			
Vater supply	Tank capacity (front face of the cha	amber)	15L: ca	rtridge, 5L: sta	ationary	15L × 2 : cartridge 5L × 2 : stationary	15L: ca	rtridge, 5L: sta	ationary	15L ×2 : cartridge 5L ×2 : stationary
>	Water quality				Elec	ctrical conduct	ivity 0.1∼10µS	/cm		
Ins	ide capacity (L)		120	225	408	800	120	225	408	800
sions*3	Inside dimension (mm)	IS	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800
Diment	Outside dimensio (mm)	ons	W 910 H1440 D 773	W 910 H1590 D 973	W1010 H1690 D1173	W1410 H1840[1970] D1173	W 910 H1440 D 795	W 910 H1590 D 995	W1010 H1690 D1195	W1410 H1840[1970] D1195
Weight (kg)			240	300	350	540	240	300	350	540

*1 EU spec. Except type1.

*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.

PSL

-70~+100 /+150 •20~98%/rh

ULTRA LOW TEMPERATURE & HUMIDITY CHAMBER

Мо	del	PSI -2K	PSI -4K	PSI -2KH	PSI -4KH			
Po	wer supply	200\/ AC 3 3\\/ 50 /						
10		2007 AC 0 000 507	18 5	32 0	185			
	200	V 32.0	40.5	32.0	40.5			
Ма	ximum current (A)	v 30.5	45.5	30.5	45.5			
	380	V 18.0	31.0	18.0	31.0			
	400	V 17.1	29.4	17.1	29.4			
Teı cor	mperature and humidit htrol system	y Bala	nced Temperature & Humidi	ty Control system (BTHC sy	stem)			
Am allo	bient temperature for wable operating range)	0 to	+ 40				
01	Temperature & humidity range	- 70 to + 100 (Refer to	/ 20 to 98%rh diagram of temperature & hu	- 70 to + 150 umidity controllable range on	/ 20 to 98%rh page 21)			
ance*2	Temperature & humidity fluctuation	±0.3 / ±2.5%rh	±0.5 / ±3.0%rh	±0.3 (-70 to +100) ±0.5 (+100.1 to +150) / ±2.5%rh	±0.5 (-70 to +100) ±0.7 (+100.1 to +150) / ±2.5%rh			
rforma	Temperature & humidity uniformity	±0.5 / ±3.0%rh	±2.0 / ±5.0%rh	± 0.5 (-70 to +100) ± 0.75 (+100.1 to +150) / $\pm 3.0\%$ rh	±2.0 (-70 to +100) ±3.0 (+100.1 to +150) / ±5.0%rh			
Ре	Temperature heat-up rate	- 70 to + 100	within 35 min	- 70 to + 150	within 50 min			
	Temperature pull-down rat	e + 20 to - 70	within 70 min	+ 20 to - 70	within 75 min			
Ы	Exterior material		18 Cr stainless steel	plate (hairline finish)				
uctio	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)						
Constr	Insulation	Chamber: Rigid Door : Glass	oolyurethane foam wool	Chamber: Rigid polyure Door : Glass wool	ethane foam, Glass wool			
ш	Refrigeration system	Me	chanical cascade refrigerato	r system (air-cooled condens	ser)			
syst	Refrigerator	н	Hermetically sealed compressor (applies to HFC refrigerant)					
ttion	Refrigerator capacity	1.5kW + 1.5kW	1.5kW + 1.5kW 2unit	1.5kW + 1.5kW	1.5kW + 1.5kW 2unit			
igera	Expansion mechanisr	n Ele	Electronic auto-expansion valve system + Capillary tube system					
Cooler			Plate fin cooler (also functions as dehumidifier)					
He	ater		Nichrome str	ip wire heater				
Hu	midifier	18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)						
Ch	amber air circulator	Cross-flow fan	Sirocco fan	Cross-flow fan	Sirocco fan			
Fitt	ings	Viewing wind Cable port (i Integrating h	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					
Aco	cessories	Cable port ru Plug type fus	Cable port rubber plug (50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse. Wet-bulb wick (1 box). Instruction manual. Warranty					
Ы	Water supply system		Pump ou	it system				
er supl	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			
Wai	Water quality		Electrical conducti	vity 0.1 ~ 10µS/cm				
Ins	ide capacity (L)	306	800	306	800			
sions*3	Inside dimensions (mm)	W 600 H 850 D 600	W 1000 H 1000 D 800	W 600 H 850 D 600	W 1000 H 1000 D 800			
Dimens	Outside dimensions (mm)	W 1010 H 1690 D 1173	W 1410 H 1855[1985] D 1493	W 1010 H 1690 D 1173	W 1410 H 1855[1985] D 1493			
We	eight (kg)	400	720	400	720			

*1 EU spec.

*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.

PH

+10~+100 •60~98%/rh

TEMPERATURE & HUMIDITY CHAMBER

Мо	del	PH-1K	PH-2K	PH-3K	PH-4K			
Power supply 200V AC 3 3W 50 / 60 Hz								
Ma	ximum current (A)	18.5	20.0	22.0	34.0			
Ter cor	nperature and humidity Itrol system	Balar	nced Temperature & Humidi	ty Control system (BTHC sys	stem)			
Ambient temperature for allowable operating range 0 to + 40								
ce*1	Temperature & humidity range	(Refer to	+ 10 to + 100 diagram of temperature & hu	/ 60 to 98%rh umidity controllable range on	page 21)			
orman	Temperature & humidity fluctuation		±0.3 /	±2.5%rh				
Perfo	Temperature & humidity uniformity		±0.5 / ±3.0%rh		±1.0 / ±5.0%rh			
tion	Exterior material		18 Cr stainless steel	plate (hairline finish)				
tsruc	Interior material		18-8 Cr- Ni stainless	steel plate (2B polish)				
Con	Insulation		Chamber: Rigid polyurethan	ne foam Door : Glass wool				
tem	Refrigeration system	Mechanical single-stage refrigerator system (air-cooled condenser)						
syst	Refrigerator	Herm	erant)					
ation	Refrigerator capacity		1.2kW					
igera	Expansion mechanism							
Refi	Cooler	nctions as dehumidifier)						
Hea	ater	Nichrome strip wire heater						
Hu	midifier	18-12-2.5 Cr	18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)					
Cha	amber air circulator		Cross-flow fan					
Fitt	ings	Viewing wind Cable port (ir Integrating h	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					
Acc	cessories	Cable port rubber plug (50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty						
ply	Water supply system		Pump ou	t system				
ter sup	Tank capacity (front face of the chamber)	-	15L: cartridge, 5L: stationary	,	15L ×2: cartridge 5L ×2: stationary			
Wa	Water quality		Electrical conducti	vity 0.1 ~ 10µS/cm				
Insi	ide capacity (L)	120	225	408	800			
sions*3	Inside dimensions (mm)	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W 1000 H 1000 D 800			
Dimensi	Outside dimensions (mm)	W 910 H 1440 D 773	W 910 H 1590 D 973	W 1010 H 1690 D 1173	W 1410 H 1840[1970] D 1173			
We	ight (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.

PU

- 40 ~ + 100 / + 150

LOW TEMPERATURE CHAMBER

Мо	del		PU-1K	PU-2K	PU-3K	PU-4K	PU-1KH	PU-2KH	PU-3KH	PU-4KH
Pov	wer supply		200V A	C 3 3W 50 /	60 Hz, 220V /	AC 3 3W 60H	Iz, 380V AC 3	4W 50Hz, 40	00V AC 3 4W	√ 50Hz*1
		200V	14.5	15	.0	28.0	14.5	15	5.0	28.0
Ma	vinum current (A)	220V		14.0		26.5		14.0		26.5
ivia		380V	9.0	10).5	13.5	9.0	10).5	13.5
		400V		10).0	12.8		10).0	12.8
Ter cor	mperature and hu htrol system	midity			Balanced Te	emperature Co	ontrol system (BTC system)		
Am allc	bient temperature wable operating i	e for range				0 to	+ 40			
	Temperature range	е		- 40 to	+ 100			- 40 to	+ 150	
9*2	Temperature fluctuation			±0	.3			± 0.3 (-40 ± 0.5 (+10	to +100) 00.1 to +150)
erformance	Temperature uniformity			±0.5		±1.0	±0.5 ±0.75	(- 40 to + 10 (+ 100.1 to	0) +150)	±1.0 (-40 to +100) ±1.5 (+100.1 to +150)
۵.	Temperature heat-u	up rate		- 40 to + 100) to +100 within 45 min			- 40 to + 150	within 55 mi	n
	Temperature pull-orrate	Temperature pull-down rate			+ 20 to - 40 within 50 min within 55 min			55 min		
uo	Exterior material		18 Cr stainless steel plate (hairline finish)							
ructi	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)							
Const	Insulation	ulation Chamber: Rigid polyurethane foam Chambe Door : Glass wool Door				Chamber Door	r: Rigid polyurethane foam, Glass wool : Glass wool			
em	Refrigeration sys	stem	Mechanical single-stage refrigerator system (air-cooled condenser)							
syst	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)							
ation	Refrigerator capa	acity	1.2kW	1.5	kW	1.5kW 2units	1.2kW	1.5	kW	1.5kW 2units
igera	Expansion mech	anism			Electr	onic auto-expa	ansion valve s	ystem		
Refi	Cooler					Plate fir	n cooler			
He	ater					Nichrome str	ip wire heater			
Ch	amber air circulate	or		Cross-flow far	n	Sirocco fan	Cross-flow fan Sirocco			Sirocco fan
Fitt	ings			Viewing wind Cable port (in Integrating h	low (glass inc nside diamete our meter, Tin	orporating hea r 50mm, 1pc), ne signal (2 po	t generator), Chamber lamp pints), Casters	o (fluorescent with adjusters	lamp), s, Power cord	
Aco	cessories			Cable port ru Plug type fus	bber plug (5 6, Instruction	0mm), Shelves manual, Warra	s (shelf suppoi anty	rts, shelves: 2	sets),	
Inside capacity (L)			120	225	408	800	120	225	408	800
sions*3	Inside dimension (mm)	าร	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800	W 500 H 600 D 400	W 500 H 750 D 600	W 600 H 850 D 800	W1000 H1000 D 800
Diment	Outside dimensio (mm)	ons	W 910 H1440 D 773	W 910 H1590 D 973	W1010 H1690 D1173	W1410 H1840[1970] D1173	W 910 H1440 D 795	W 910 H1590 D 995	W1010 H1690 D1195	W1410 H1840[1970] D1195
We	iaht (ka)		230	290	340	530	230	290	340	530

*1 EU spec. Except type1.

*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.

PG

-70~+100 /+150

ULTRA LOW TEMPERATURE CHAMBER

$ \begin{array}{c c c c c c c } \hline P \circ I V & V & V & V & V & V & V & V & V & V$
$\label{eq:response} \begin{split} & $\ensuremath{\mbox{$\ensuremath{\mbox{$\mb\$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{$\mbox{\mb
$\begin{split} \label{eq:results} & \end{tabular} \begin{tabular}{ c c c c } \label{eq:results} \end{tabular} \begin{tabular}{ c c c c } \label{eq:results} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c } \label{eq:results} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c } \label{eq:results} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c c c } \label{eq:results} \end{tabular} \en$
$ \frac{1}{1000} \frac{1}{100$
Vert No 400V 16.6 21.8 16.6 21.8 No No Balanced Temperature Currol system (BTC system) No No O to +40 Temperature for allow and the operature for allow
Temperature and humidity systemBalanced Temperature Cortrol system (BTC system)Balanced Temperature Cortrol system (BTC system)O to +40Temperature range -70 to +100Temperature range -70 to +100Temperature range -70 to +100Temperature range ± 0.3 ± 0.5 ± 0.3 ± 0.5 <t< td=""></t<>
Ambient temperature for allowable operating range 0 to +40 Temperature range -70 to +100 -70 to +150 Temperature fuction ±0.3 ±0.5 ±0.3 (-70 to +100) ±0.5 ±0.7 (+100.1 to +150) Temperature & humidity uniformity ±0.5 ±2.0 ±0.5 (-70 to +100) ±2.0 (-70 to +100) ±2.0 ±0.5 (+100.1 to +150) ±3.0 (+100.1 to +150) ±
Temperature range $-70 \text{ to } +100$ $-70 \text{ to } +150$ Verture temperature temperature <thtemperatu< td=""></thtemperatu<>
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
Temperature & humidity uniformity ± 0.5 ± 2.0 ± 0.5 (- 70 to + 100) ± 2.0 (- 70 to + 100) ± 2.0 (- 70 to + 100) ± 2.0 (- 70 to + 100) ± 3.0 (+ 100.1 to + 150) (
Temperature heat-up rate - 70 to + 100 within 35 min - 70 to + 150 within 50 min
Temperature pull-down rate+ 20 to - 70within 70 min+ 20 to - 70within 75 min
Exterior material18 Cr stainless steel plate (hairline finish)
Interior material 18-8 Cr- Ni stainless steel plate (2B polish)
Solution Chamber: Rigid polyurethane foam Chamber: Rigid polyurethane foam Chamber: Rigid polyurethane foam Door : Glass wool Door : Glass wool Door : Glass wool
E Refrigeration system Mechanical cascade refrigerator system (air-cooled condenser)
Refrigerator Hermetically sealed compressor (applies to HFC refrigerant)
हे 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 circulatorCross-flow fanSirocco fanCross-flow fanSirocco fan
Viewing window (glass incorporating heat generator), Fittings 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 (50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Instruction manual, Warranty
Inside capacity (L) 306 800 306 800
Model W 600 W 1000 W 600 W 1000 Inside dimensions (mm) H 850 H 1000 H 850 H 1000 D 600 D 800 D 600 D 800
Conside dimensions W 1010 W 1410 W 1010 W 1410 (mm) H 1690 H 1855[1985] H 1690 H 1855[1985] D 1173 D 1493 D 1473 D 1493
Weight (kg) 400 720 400 720

*1 EU spec.

*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.

PDR PDL

5~98%rh•-20~+100 /-40~+100

LOW HUMIDITY TYPE (LOW) TEMPERATURE & HUMIDITY CHAMBER

Power supply 200V AC 3 3W 50 / 60 Hz, 220V AC 3 3W 60Hz, 380V AC 3 4W 50Hz Maximum current (A) allow humidity angle 2200 23.0 (34.0) 34.0 (44.5) 24.5 (35.5) 35.5 (45.5) Temperature and humidity control system 220.0 (27.0) 11.5 (18.5) 21.5 (28.0) Temperature and humidity control system (BTHC system) 40.0 + 40 21.0 (33.0) 40.0 (42.5) 22.5 (34.5) Temperature and humidity control system (BTHC system) 40.0 + 40 20.0 (27.0) 11.5 (18.5) 21.5 (28.0) Temperature and humidity insclution - 20.0 + 100 / 5 to 98%rh 40.0 + 100 / 40.0 + 100 <th>Мо</th> <th>del</th> <th></th> <th>PDR-3K</th> <th>PDR-4K</th> <th>PDL-3K</th> <th>PDL-4K</th>	Мо	del		PDR-3K	PDR-4K	PDL-3K	PDL-4K				
Maxmum current (A) 200V 23.0 (34.0) 34.0 (44.5) 24.5 (35.5) 36.0 (47.0) at low hundity at low hundity and build hundit and build hundity and build hundit and build hundit and	Power supply			200V AC	3 3W 50 / 60 Hz, 220V A	C 3 3W 60Hz, 380V AC 3	4W 50Hz				
Maximum Current (A) range 220V 21.0 (33.0) 31.0 (42.5) 22.5 (34.5) 33.5 (45.5) renge 380V 10.5 (17.5) 20.0 (27.0) 11.5 (18.5) 21.5 (29.0) Temperature and humidity control system Ambient temperature for allowable operating range -0.0 - 4.0 -0.0 - 4.0 +0.0 + 100 - / 5 to 98% h Temperature & humidity rengerature & humidity -2.0 to +100 / 5 to 98% h -0.0 to +100 +0.0 + 100 / 5 to 98% h Temperature & humidity rengerature & humidity rengerature & humidity ±0.5 ±1.0 ±0.5 ±1.0 Temperature & humidity remperature & humidity ±0.5 ±1.0 ±0.5 ±1.0 Temperature & humidity remperature haup rate -2.0 to +100 within 55 min -4.0 to +100 within 55 min Temperature haup rate -2.0 to +100 within 55 min -4.0 to +00 within 55 min Temperature haup rate -2.0 to +100 within 55 min +2.0 to +40 within 55 min Temperature haup rate -2.0 to +100 within 55 min +2.0 to +40 within 55 min Temperature haup rate -2.0 to +100 within 55 min +			200V	23.0 (34.0)	34.0 (44.5)	24.5 (35.5)	36.0 (47.0)				
range 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 (Refer to diagram of balow 23pkg) (at low humidity range) 0 to +40 Temperature & humidity range -20 to +100 >5 to 98% h -40 to +100 >5 to 98% h Temperature & humidity range -20 to +100 >5 to 98% h -40 to +100 >5 to 98% h Temperature & humidity range -20 to +100 x to 5 to 98% h -40 to +100 >5 to 98% h Temperature & humidity range ±0.5 ±1.0 ±0.5 ±1.0 Humidity unitormity ±0.5 ±1.0 ±0.5 ±1.0 Humidity unitormity ±3.0% rh ±5.0% rh (at low-humidity range) ±5.0% rh Exterior material Interior material 18 8 Cr. Ni stainless steel plate (hairino linish) 100 Refigerator capacity 0.65KW 1.2KW 1.5KW 200 Refigerator capacity 0.65KW 1.2KW 1.5KW 200 Refigerator capacity 0.65KW 1.2KW 1.5KW 200 Refigeration system Mechanica single-stage refigerator system	Ma	t low humidity	220V	21.0 (33.0)	31.0 (42.5)	22.5 (34.5)	33.5 (45.5)				
Temperature and humidity Control system Balanced Temperature & Humidity Control system (BTHC system) Ambient temperature for allowable operating range +5 to +32 Absolute humidity. Balanced 23g/kg' (at low humidity range) Temperature & humidity range -20 to +100 /5 to 98% h -40 to +100 /5 to 98% h Temperature & humidity range +0.3 / ± 2.5% ht (± 0.5 / ± 5.0% ht (± 0.5 / ± 1.0 Temperature & humidity range ± 0.5 ± 1.0 ± 0.5 ± 1.0 Temperature Aumidity range ± 0.5 ± 1.0 ± 0.5 ± 1.0 Temperature Aumidity remerature heat-up rate - 20 to +100 within 35 min - 40 to +100 within 35 min Temperature Aumidity remerature heat-up rate - 20 to +100 within 35 min - 40 to +100 within 35 min Temperature Aumidity remerature Aumidity 0.65 kW 1.8 kmines steel plate (hainine finish) Insulation Temperature Aumidity remerature Aumidity 0.65 kW 1.5 kW 1.5 kW 2unit Temperature Aumidity remerature Aumidity 0.65 kW 1.2 kW 1.5 kW 2unit Temperature Aumidity remerature Aumiditifier 1.0 kmin 50 min -	range 380V		380V	10.5 (17.5)	20.0 (27.0)	11.5 (18.5)	21.5 (29.0)				
Control system Distance of lemperature shumidity Control system (LETHC system) Temperature for allowable operature for allowable operature shumidity - 0.0 + 40 + 5.0 + 5.0 + 640 + 0.5 + ±1.0 + 0.0 + thindity control = ±0.5 + thindity control = ±1	Ter	mperature and hu	midity	(
Ambient temperature for ange 0 to +40 0 to +40 Temperature & humidity range -5 to +32 Absolute humidity: Eelow 23gkf (at low humidity range) Temperature & humidity range -20 to +100 /5 to 98% mither (Refer to diagram of temperature & humidity controllable range on page 21.) Temperature & humidity functionation ± 0.5 ± 1.0 ± 0.5 ± 1.0 Temperature Build function ± 0.5 ± 1.0 ± 0.5 ± 1.0 Humidity uniformity ± 3.0% fn ± 5.0% fn ± 3.0% fn ± 5.0% fn ±	cor	ntrol system		Balar	nced Temperature & Humidi	ty Control system (BTHC sy	(stem)				
Temperature & humidity range -20 to +100 /5 to 98%/th -40 to +100 /5 to 98%/th Temperature & humidity fuctuation ±0.5 ±1.0 ±0.5 ±1.0 Temperature & humidity uniformity ±0.5 ±1.0 ±0.5 ±1.0 Humidity uniformity ±3.0%/th ±5.0%/th (at low-humidity range) ±1.0 Temperature hat-up rate -20 to +100 within 35 min -40 to +100 within 45 min Temperature hat-up rate -20 to +100 within 35 min -40 to +100 within 50 min Temperature hat-up rate -20 to -10 within 25 min +20 to -40 within 50 min Temperature hat-up rate -20 to -10 within 25 min +20 to -40 within 50 min Temperature hat-up rate -20 to -10 within 25 min +20 to -40 within 50 min Temperature hat-up rate +20 to -10 within 25 min +20 to -40 within 50 min Temperature hat-up rate -20 to -10 Within 25 min -20 to -10 within 25 min Temperature hat-up rate 180 cr stalness steel plate (bac colde condenser)	Am allc	bient temperature wable operating r	e for range	+ 5 to	0 to + 40 + 5 to + 32 Absolute humidity: Below 23g/kg' (at low humidity range)						
		Temperature & hur range	midity	- 20 to + 100 (Refer to c	/ 5 to 98%rh Jiagram of temperature & hu	- 40 to + 100 midity controllable range on	/ 5 to 98%rh page 21.)				
	e*1	Temperature & hur fluctuation	midity	±0	.3 / ±2.5%rh (±0.5 / ±	5.0%rh (at low-humidity rar	nge)				
Product Humidity uniformity ± 3.0%rh ± 5.0%rh ± 3.0%rh ± 5.0%rh Temperature heat-up rate 20 to +100 within 35 min 40 to +100 within 45 min Temperature pull-down rate +.20 to -10 within 25 min 40 to +100 within 50 min Temperature pull-down rate +.20 to -10 within 25 min 40 to +100 within 50 min Temperature pull-down rate +.20 to -10 within 25 min 40 to +100 within 50 min Temperature pull-down rate +.20 to -10 within 25 min 20 to +100 within 50 min Temperature pull-down rate +.20 to -10 within 25 min 20 to +100 within 50 min Temperature pull-down rate Temperature plate (28 polish) 20 to +100 within 50 min Temperature or pacing 0.65kW 1.2kW 1.5kW 1.5kW 2unit Extension mechanism Electronic auto-expansion valve system 1.5kW 2unit 1.5kW 2unit Temperature raticulato Color Sirocco fan Color 5kW 2unit Temperature raticulatosin system Color	manc	Temperature uniformity		±0.5	± 1.0 ± 1.0 (at low-	± 0.5 humidity range)	± 1.0				
Temperature heat-up rate - 20 to + 100 within 35 min - 40 to + 100 within 45 min Temperature pull-down rate + 20 to - 10 within 25 min + 20 to - 40 within 50 min Exterior material 18 Cr stainless steel plate (Approximate inish) + 20 to - 40 within 50 min 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 codd-codd-codd-codd-codd-codd-codd-cod	Perfoi	Humidity uniform	nity	± 3.0%rh	±5.0%rh ±5.0%rh (at low	±3.0%rh v humidity range)	±5.0%rh				
Temperature pull-down rate+ 20 to - 10within 25 min+ 20 to - 40within 50 minTemperature pull-down rate-16 Cr stainless steel plate (Patinie Insish)		Temperature heat-u	ip rate	- 20 to + 100	within 35 min	- 40 to + 100	within 45 min				
kerior material Interior material18 Cr stainless steel plate (AB polish)Inferior material Inferior materialInferior material Inferior materialRefrigeration systemMeChamber: Rigid polyurethame form Door: Glass woldeRefrigeration systemMeChamber: Rigid polyurethame form Door: Glass woldeRefrigeration systemMeChamber: Rigid polyurethame form Inferior auto-expansion valve systemRefrigerator capacity0.65kW1.2kWNetherband1.5kW1.5kW 2unitKapansion mechanismElectronic auto-expansion valve systemKapansion mechanismRefrigerator: aystemHumidifier: 15:2-5: Cr- Ni-Mo stainless steel sheathed heater (surface evariting system) Compact humidifier: 18:8: Cr- Ni stainless steel sheathed heater (surface evariting system)Dehunidification systemRotary recovery (adsorptico) Hohumidification systemEvenorePaterian circulatorStainless steel plate localerPolyunidification systemRotary recovery (adsorptico) Hairine finicable: system (air-cooled cond- ColerRefrigerator systemMeChamber: Rigid scaler efrigeration system (air-cooled cond- Compact humidifier: 18:8: Cr- Ni stainless steel plate field colerRefrigerator systemMeChamber: Rigid scaler efrigerator system (air-cooled cond- Scaler scaler)Refrigerator systemMeChamber: Stainless steel plate (SUS430PL)Refrigerator systemMeChamber: Stainless steel plate (SUS430PL)Refrigerator systemStainless steel plate (SUS430PL)Refrigerator systemStainless steel plate (SUS430PL)Refrigerator system <td></td> <td colspan="2">Temperature pull-down rate</td> <td>+ 20 to - 10</td> <td>within 25 min</td> <td>+ 20 to - 40</td> <td>within 50 min</td>		Temperature pull-down rate		+ 20 to - 10	within 25 min	+ 20 to - 40	within 50 min				
Interior material Insulation Interior material Insulation Interior material Insulation Interior material Chamber: Rigid polyurethane form 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 2unit Expansion mechanism Electronic auto-expansion valve system .5kW 2unit Heater Ocoler Plate fin cooler (also functions as dehumidifier) .5kW 2unit Heater Humidifier:18-12-2.5 Cr. Ni-Mo stainless steel sheathed heater (surface evaporating system) Compact humidifier:18-6 Cr- Ni stainless steel sheathed heater (surface evaporating system) Cohamber air circulator Chamber air circulator Humidifier:18-6 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system) Cohamber air circulator Cooler Humidifier:18-8 Cr- Ni stainless steel plate (SUS430P, hairline finish) Esterior Cooler Refrigerator system Mechanical single-stage refrigeration system (air-cooled condenser) Ferigerator Hermetically sealed compressor (applies to HFC refrigerant) Cooler Refrigerator Hermetically sealed compressor (applies to HFC refrigerant) Cooler <td></td> <td>Exterior material</td> <td></td> <td></td> <td>18 Cr stainless steel</td> <td>plate (hairline finish)</td> <td></td>		Exterior material			18 Cr stainless steel	plate (hairline finish)					
Insulation Insulation Refrigeration system Mechanical single-stage refrigerator system (air-cooled condenser) Refrigerator Hermetically sealed compressor reprises to HFC refrigerator Refrigerator capacity 0.65kW 1.2kW 1.5kW 2unit Refrigerator capacity 0.65kW 1.2kW 1.5kW 2unit Cooler Electronic auto-expansion valve system Heater Nichrome strip wire heater Humidifier Cooler Humidifier:18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system) Chamber air circulator Corrocorrocorrocorrocorrocorrocorrocorr		Interior material			18-8 Cr- Ni stainless	steel plate (2B polish)					
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 1.5kW 2unit 1.5kW 2unit Cooler Plate fin cooler (also functions as debumidifier) Heater Nichrome strip wire heater (surface evaporating system) Chamber air circulator Coorer Site Coorer Site Coorer Site Coorer Dehumidification system Rotary recovery (adsorption) dehumidification system Electronic auto-expansion valve system (air-cooled condenser) Cooler Plate fin cooler Plate (SUSA30P, hairline finish) Electronic auto-expansion valve Cooler Plate fin cooler Plate (also cooler c	۲	Insulation			Chamber: Rigid polyurethar	ne foam Door : Glass wool					
Performation Hermetically sealed compressor (applies to HFC refrigerant) Refrigerator capacity 0.65kW 1.2kW 1.5kW 1.5kW 2unit Refrigerator capacity 0.65kW 1.2kW 1.5kW 2unit 1.5kW 2unit Expansion mechanism Electronic auto-expansion valve system Electronic auto-expansion valve system 1.5kW 2unit Cooler Plate fin cooler (also functions as dehumidifier) Nichrome strip wire heater Viewing system Heater 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) Other system Chamber air circulator Kerrior Sirocor far Exterior Plate fin cooler Plate (SUS430P, hairline finish) Cooler Plate fin cooler Plate fin cooler Refrigerator Mechanical single-stage refrigeration system (air-cooled cond-ser) Refrigerant Exterior Mermetically sealed compressor (applies to HFC refrigerant) Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord Scaters with adjusters, Power cord Kittings Cable port rubber plug (50mm),	mbe	Refrigeration sys	stem	Mech	anical single-stage refrigera	tor system (air-cooled conde	enser)				
PerformanceRefrigerator capacity0.65kW1.2kW1.5kW1.5kW 2unitExpansion mechanismElectronic auto-expansion valve systemCoolerPlate fin cooler (also fur-tional sa dehumidifier)HeaterNichrome strip wire heaterHumidifierHumidifier:18-12-2.5 Cr. Ni-Mo stainless steel sheathed heater (surface evanorating system)Composed humidifierCompact humidifier:18-12-2.5 Cr. Ni-Mo stainless steel sheathed heater (surface evanorating system)Compact numidifierSiroco FaMumidifierMotoration (adsoration) dehumidification system)ExteriorTark capacityExteriorSiroco FaExteriorPlate fir coolerRefrigerator systemMechanical single-stage refrigeration system (air-cooled conore-sor (applies to HFC refrigerat)RefrigeratorMechanical single-stage refrigeration system (air-cooled conore-sor (applies to HFC refrigerat)RefrigeratorViewing window (glass incorporating heat generator). Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluore-scent lamp). Integrating hour meter, Time signal (2 points).KoterCable port rubber plug (5 0mm). Shelves (shelf supports: 2 sets, shelf supports: 2 sets), shelf supports: 2 sets), shelf supports: 2 sets, shelf	chai	Refrigerator		Hermetically sealed compressor (applies to HFC refrigerant)							
Image: Provide a state of the sta	nid	Refrigerator capacity		0.65kW	1.2kW	1.5kW	1.5kW 2unit				
Math Plate fin cooler (also functions as dehumidifier) Heater Nichrome strip wire heater Humidifier Compact 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 Siroc-Cr Vertication Siroc-Cr Exterior 0 Cooler Refrigerator Refrigerator Mech Expansion mechanism Temperature-regulated automatic expansion valve Firligerator Viewing window (glass-incorporating heat generature), Cable port (inside diametr 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord Viewing window (glass incorporating heat generature), Cable port (inside diametr 50mm, 1pc), Chamber lamp (fluorescent lamp), Nelves (shelf suports: 2 sets, shelf suports: 2 sets: 2 setationary Vie	hun	Expansion mecha	anism		Electronic auto-expa	ansion valve system					
Nichrome strip wire heater Heater 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 Dehumidification system Rotary recovery (adsorption) dehumidification system Exterior Rotary recovery (adsorption) dehumidification system Refrigeration system Method is ingle-stage refrigeration system (air-cooled cond-cond-cond) Refrigerator Temperature-regulated automatic expansion valve Expansion mechanism Viewing window (glass incorporating heat generator). Cable port (inside diam=t=70m, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cord K Cable port rubber plug (50mm), Shelves (shelf suports: 2 sets, shelf suports: 1 set, shelves: 2 set), Plug tist, wet-bulb wick (1 box), Cloth wick, Instruction-manual, Warranty Mumidifier Stationary Stationary Stationary Stationary Stationary Viewing window (glass incorporating heat generator). Stationary Stationary Stationary Stationary Viewing window (glass incorporating heat generator). Cable port rubber plug (5 mm), Shelves (shelf suports: 2 sets, shelf suports: a stationary Stationary	о Х	Cooler		Plate fin cooler (also functions as dehumidifier)							
Image: Problem State S	eml	Heater		Nichrome strip wire heater							
Chamber air circulatorSiroco fanPelumidification systemRotary recovery (adsorption) dehumidification systemExterior18 Cr stainless steel plate (SUS430P, hairline finish)CoolerPlate fin coolerRefrigeration systemMechanical single-stage refrigeration system (air-cooled conduction system)RefrigeratorPlate fin coolerExpansion mechanismTemperature-regulated automatic expansion valveFirstViewing window (glass incorporating heat generator). Cable port (inside diameter 50mm, 1pc), Chamber lamp) (Integrating penteror). Cable port (inside diameter 50mm, 1pc), Chamber lamp) (Integrating penteror). Cable port vibers is spelves: vertorViewing window (glass incorporating heat generator). Cable port rubber pluse, Power cordViewing window (glass incorporating heat generator). Cable port rubber pluse, Sover cordViewing window (glass incorporating heat generator). Cable port rubber pluse, Sover cordViewing window (glass incorporating heat generator). Cable port inside diameter 50mm, 1pc), Chamber lamp (Iluorescent lamp). Integrating with adjusters.Viewing window (glass incorporating heat generator). Cable port inside diameter 50mm, 1pc), Chamber lamp (Iluorescent lamp). Integrating bis is stationaryViewing window (glass incorporating heat generator). Cable port inside diameter 50mm, 1pc), Chamber lamp (Iluorescent lamp). Integrating bis is stationaryViewing window (glass incorporating heat generator). Cable port i 1 set, shelves: 2 sets), Plus is stationaryViewing window (glass incorporating heat generator). Cable port i 1 set, shelves: 2 sets, shelf suppression.Viewing window (glass incorporating heat generator). Cable port i 1 set, shelves: 2 sets), Plus is	F	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)							
Vertication Dehumidification system Rotary recovery (adsorption) dehumidification system Exterior 18 Cr stainless steel plate (SUS430P, hairline finish) Cooler 0 Refrigeration system Mechanical single-stage refrigeration system (air-cooled condenser) Refrigerator 0 Expansion mechanism Temperature-regulated automatic expansion valve Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 port), Casters with adjusters. Power cord Ketre supply system Cable port rubber plug (50mm), Shelves (shelf supports: 2 sets, shelf supports: 5 ro cable port: 1 set, shelves: 2 sets), Plug to is to i		Chamber air circ	ulator								
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Image: Probability of the state o	er*2	Exterior									
PerformRefrigeration systemMechanical single-stage refrigeration system (air-cooled condenser)RefrigeratorHermetically sealed compressor (applies to HFC refrigeration valveExpansion mechanismTemperature-regulated automatic expansion valveFittingsViewing 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 cordAccessoriesCable port rubber plug (50mm), Shelves (shelf supports: 2 sets, shelf supports for cable port: 1 set, shelves: 2 sets), Plu type fuse, Wet-bulb wick (1 box), Cloth wick, Instruction manual, WarrantyMater supply systemTelectrical conductive of the chamber)Tank capacity (ront face of the chamber)15L: cartridge 5L: stationaryInside dimensions (mm)W 600 × H 850 × D 800Witide dimensions (mm)W 600 × H 850 × D 800Witide dimensions (mm)W 1885 H 1840[1970] D 1173Weipt (kg)*4507Kight (kg)*4507	difie	Cooler			Plate fir	n cooler					
Image: Problem Signal Signa	nmi	Refrigeration sys	stem	Mecha	anical single-stage refrigerat	ion system (air-cooled conde	enser)				
Expansion mechanismTemperature-regulated automatic expansion valveFittingsViewing 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 cordImage: 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 cordImage: Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Casters with adjusters, Power cordImage: Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Casters with adjusters, Power cordImage: Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Casters with adjusters, Power cordImage: Viewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Cable port (inside diameter 50mm, 1pc), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Cable port, inside diameter 50mm, 1pc), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Casters with adjusters, Power cordViewing window (glass incorporating heat generator), Casters with adjusters, Power cordViewing window (glass incorporating heat generator)Viewing window (glass	Deh	Refrigerator		He	ermetically sealed compress	or (applies to HFC refrigerar	nt)				
FittingsViewing 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 cordActest constructionCable port rubber plug (50mm), Shelves (shelf supports: 2 sets, shelf supports: 7 sets, shelf supports: 2 sets, shelf support = 1 set, shelf support = 1 set; she	_	Expansion mecha	anism		Temperature-regulated a	utomatic expansion valve					
AccessoriesCable port rubber plut (50mm), Shelves (shelf supports: 2 sets, shelf supports: 1 set, shelves: 2 sets), Plut type fuse, Wet-bulb wick (1 box), Cloth wick, Instruction manual, WarrantyVater supply systemPumpout systemTank capacity (front face of the chamber)15L: cartridge 5L: stationary15L × 2: cartridge 5L × 2: stationary15L: cartridge 5L × 2: stationary15L × 2: cartridge 5L × 2: stationaryInside dimensions (mm)W 600 × H 850 × D 800W 1000 × H 1000 × D800W 600 × H 850 × D 800W 1000 × H 1000 × D800Vatisde dimensions (mm)W 1885 D 1173W 2285 D 1173W 1885 D 1173W 2285 D 1173W 1885 D 1173W 2285 D 1173Weight (kg)*4507652552742	Fitt	ings		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							
Water supply systemWater supply systemPump out systemTank capacity (ront face of the chamber)15L: cartridge 5L: stationary15L: cartridge 5L: stationary15L: cartridge 5L: stationary15L: x2: cartridge 5L: stationaryWater quality5L: stationary15L × 2: stationary15L × 2: stationaryInside dimensions (mm)W 600 × H 850 × D 800W 1000 × H 1000 × D800W 600 × H 850 × D 800Outside dimensionsW 1885W 2285W 1885H 1690[1820] (mm)H 1690[1820] D 1173H 1690[1820] D 1173H 1840[1970] D 1173Weight (kg)*4507652552742	Aco	cessories		Cable port rubber plu shelves: 2 sets), Plug	g(50mm), Shelves (shelf s g type fuse, Wet-bulb wick (1	supports: 2 sets, shelf supports: box), Cloth wick, Instruction	orts for cable port: 1 set, n manual, Warranty				
Tank capacity (front face of the chamber) 15L: cartridge 5L: stationary 15L x 2: cartridge 5L x 2: stationary 15L x 2: cartridge 5L x 2: stationary Water quality Electrical conductivity 0.1 ~ 10µS/cm 100 x 408 800 Inside capacity (L) 408 800 408 800 Inside dimensions (mm) W 600 x H 850 x D 800 W1000 x H1000 x D800 W1000 x H1000 x D800 W1000 x H1000 x D800 Utside dimensions (mm) W 1885 U 1885 W 2285 U 1835 W 1885 U 1835 W 2285 U 1835 W 1285 U 173 W 1885 U 173 W 1885 U 173 W 1285 U 173 W 1885 U 173 W 2285 U 1173 W 1885 U 1173 W 1285 U	ply	Water supply sys	stem		Pump ou	it system					
Solution Water quality Electrical conductivity 0.1 ~ 10µS/cm Inside capacity (L) 408 800 408 800 Inside dimensions (mm) W 600 × H 850 × D 800 W1000 × H1000 × D800 W 600 × H 850 × D 800 W1000 × H1000 × D800 Outside dimensions (mm) W 1885 U 1885 W 2285 W 1885 W 1885 W 2285 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 1885 U 173 W 2285 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 2285 H 1690[1820] H 1840[1970] D 1173 W 2285 H 1690[1820] H 1840[1970] D 1173 W 2285 H 1690[1820] H 1840[1970] H 1690[1820] H 1840[1970] H 1840[1970] H 1840[1970] H 1840[1970	ter sup	Tank capacity (front face of the cha	amber)	15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary	15L: cartridge 5L: stationary	15L ×2: cartridge 5L ×2: stationary				
Inside dimensions (mm) 408 800 408 800 Visite dimensions (mm) W 600 × H 850 × D 800 W 1000 × H1000 × D800 W 600 × H 850 × D 800 W 1000 × H1000 × D800 W 2285 W 1885 W 2285 W 1885 W 2285 W 1885 W 2285 H 1840[1970] H 1840[1970] H 1840[1970] D 1173	Wa	Water quality			Electrical conducti	vity 0.1 ~ 10µS/cm					
Noise dimensions (mm) W 600 × H 850 × D 800 W1000 × H1000 × D800 W 600 × H 850 × D 800 W1000 × H1000 × D800 Outside dimensions (mm) W 1885 H 1690[1820] D 1173 W 2285 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 2285 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 1885 H 1690[1820] D 1173 W 2285 H 1690[1820] D 1173 Weight (kg)*4 507 652 552 742	Ins	ide capacity (L)		408	800	408	800				
W W 1885 W 2285 W 1885 W 2285 (mm) M 1690[1820] H 1840[1970] H 1690[1820] H 1840[1970] D 1173 D 1173 Weight (kg)*4 507 652 552 742	1s*3	Inside dimensions	(mm)	W 600 × H 850 × D 800	W1000 × H1000 × D800	W 600 × H 850 × D 800	W1000 × H1000 × D800				
Weight (kg)*4 507 652 552 742	Dimensior	Outside dimensio (mm)	ons	W 1885 H 1690[1820] D 1173	W 2285 H 1840[1970] D 1173	W 1885 H 1690[1820] D 1173	W 2285 H 1840[1970] D 1173				
	We	eight (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~+100 •30~90**%**rh

CLEAN TEMPERATURE & HUMIDITY CHAMBER

Мо	del		PCR-3K[W]
Power supply			200V AC 3 3W 50 / 60 Hz, 220V AC 3 3W 60Hz, 380V AC 3 4W 50Hz
		200V	23.5
Ма	ximum current (A)	220V	22.0
		380V	11.0
Ter cor	mperature and hu htrol system	midity	Balanced Temperature & Humidity Control system (BTHC system) Vertical laminar flow circulation system
Am allo	bient temperature	e for ange	+ 5 to + 35 (except lowest attainable temperature and temperature pull-down rate)
Temperature		ue*1	-20 to $+100$ / 30 to 90%rh (Refer to diagram of temperature & humidity controllable range on page 21.)
ance	Temperature (& hur fluctuation*1	nidity)	±0.5 / ±3%rh
erform	Temperature (&hur uniformity*1	midity)	±0.8 / ±5%rh
٩	Temperature heat-up rate		- 20 to + 100 within 60 min
	Temperature pull-dov	wn rate	+ 20 to - 20 within 45 min
Ы	Cleanliness		Class 100
lotic	Exterior material		18 Cr stainless steel plate (hairline finish)
Istru	Interior material		18-8 Cr- Ni stainless steel plate (2B polish)
Cor	Insulation		Chamber: Rigid polyurethane foam Door : Glass wool
system	Refrigeration sys	stem	Mechanical single-stage refrigerator system (air-cooled condenser)
	Refrigerator		Hermetically sealed rotary compressor (applies to HFC refrigerant)
tion	Refrigerator capa	acitv	1.5kW
gera	Expansion mech	anism	Electronic auto-expansion valve system
Refri	Cooler		Plate fin cooler
He	ater		Nichrome strip wire heater
Humidifier			18-12-2.5 Cr- Ni-Mo stainless steel sheathed heater (surface evaporating system)
HE	PA filter		Dust collection efficiency is 99.97% or more in 0.3µm single distribution D.O.P. test
Ch	amber air circulate	or	Sirocco fan
Fitt	ings		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
Aco	cessories		Cable port rubber plug (50mm), Shelves (shelf supports, shelves: 2 sets), Plug type fuse, Wet-bulb wick (1 box), Instruction manual, Warranty
ply	Water supply sys	stem	Pump out system
iter sup	Tank capacity (front face of the cha	amber)	15L: cartridge, 5L: stationary
Ŵ	Water quality		Electrical conductivity 0.1~10µS/cm
Ex	haust equipment		Exhaust flow rate 16 / 18m ³ / min (50 / 60Hz), Chamber connection 123mm
Ins	ide capacity (L)		312
sions*3	Inside dimension (mm)	IS	W600 × H650 × D800
Dimen	Outside dimensio (mm)	ons	W1010 × H1880 × D1173
We	eight (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

 $\label{eq:cleanliness} Class \ \mbox{100 is applicable only when the door is closed}.$

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



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



*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.



MODEL (for K Series)



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)

OPTION	PR	PL	PSL	PH	PU	PG	PDR PDL	PCR
Water cooled specification (type 3·4, PSL/PG-2·4)							_	
Cable port								
Hands-on port								
Inner door with hands-on port (with/without viewing window)								
Inner door without hands-on port (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								
Filter clogged alarm								
Defrost circuit (P-instrumentation only) *								
Frost-free circuit		*	*	*	*		*	*
Trouble buzzer								
Rotating type warning signal light								
External alarm terminal								
Emergency stop switch								
Operating panel cover								
Water purifier (WS-1)								
Water supplier (B, C, D)								
Additional water supply tank								
Communication functions								
Communication cable								
Time up output								
Additional relay contact								
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								
Humidifier delay control								
Temperature attainment output								
Thermocouple								
Integrating hour meter with reset								
Power cord								
Power plug								
* Eveenthmed								

Water cooled specification

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

Hands-on port

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 hands-on port)

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 hands-on port, without observation window
- · With hands-on port and observation window
- · Without hands-on port, with observation window
- · Without hands-on port 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 lessTemperature uniformity:
- ± 0.5 wider than standard • Humidity uniformity:
- $\pm 2\%$ 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

The precision internal chamber prevents any contact between circulating air and the specimens, and maintains uniformity in distribution of temperature and humidity.

- Air velocity: below 0.5 m/s
- Temperature/humidity fluctuation: ± 0.5 / $\pm 2.5\%$ 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.

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 3-1Type 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.

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.)

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

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 purifier WS-1

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

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)

Paperless recorder

Records temperature of each section such as the temperature inside the chamber. [Temperature type] Temperature range: $-50 \sim +100$ $-100 \sim +100$ $-100 \sim +200$ 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: $-50 \sim +100$ $-50 \sim +150$ $-100 \sim +100$ $-100 \sim +150$ Humidity range: $0\sim100\%$ 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.



Paperless recorder

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.

Temperature recorder (digital)

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

Temperature and humidity recorder (digital)

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



Temperature and humidity recorder (digital)

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
- $\boldsymbol{\cdot}$ Thermocouple type T
- (Copper/ copper-Nickel)

Communication functions

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

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

Communication cable

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

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.

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