

Quality is more than a word

ESPEC

Ultra View Temperature (& Humidity) Chamber

PWL · PWU



Full visibility, with improved ease-of-use and greater functionality. High-performance temperature and humidity chambers with a glass viewing door.

The Ultra View Temperature and Humidity Chamber provides a clear view of the entire chamber interior, enabling continuous observation of specimens during testing.

The doors feature large, multilayer EC (electro-coated) glass panes. These panes allow for a temperature range of -40°C to $+120^{\circ}\text{C}$.

This new series is based on the Platinous K Series, the leader among temperature and humidity chambers worldwide, and represents the realization of a simple design concept: easy viewing, greater functionality.





PWL-3KP



PWL-4KP



*The viewing window reach-in ports are optional.



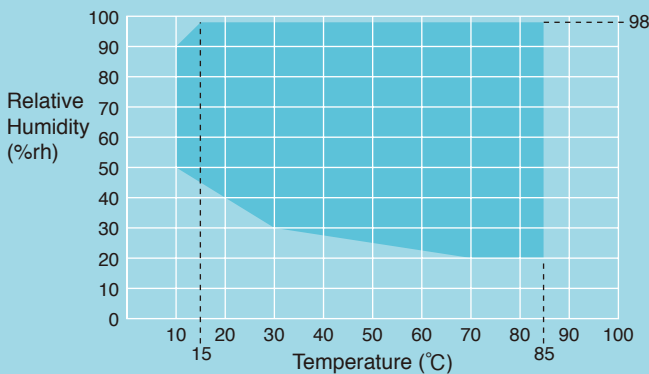
● High performance by special glass

EC (deposit metal electro-coated) multi-layer glass ensures high performance while eliminating the earlier problems of reduced temperature range and uneven temperature distribution.

● Supports high-temperature, high-humidity testing

Until now, glass doors limited the maximum temperature to +80°C, but the Ultra View Temperature and Humidity Chamber allows a greatly increased maximum temperature of +120°C. This feature now enables high-temperature testing of products like on-board vehicle components.

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



* In operation below 40°C, frost will form on the cooler eventually interrupting operation.

● 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 (at 50 to 90%rh) and the lower limit of the humidity control range is 20% rh (at +70°C to +85°C).

● Ion migration evaluation system (Sold separately)

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

- **Clear from dew condensation for increased visibility**

Both sides of the viewing window are temperature-controlled to prevent dew condensation due to temperature/humidity changes—enabling a clear view of specimens throughout the entire test process.

- **Brighter chamber interior**

A fluorescent light is fitted above the viewing window to provide adequate lighting to specimens.

- **Optional reach-in ports on the door glass**

The reach-in ports covers can be swung open and closed sideways with the press of a button. The simple locking mechanism allows the covers to be detached and reattached easily. The reach-in ports covers can also be detached when handling test pieces for extended periods.

- **Dew condensation protection maintained even with the reach-in ports installed**

The inclusion of the reach-in ports renders dew condensation more likely to occur around the holes. We have therefore developed an innovative system to prevent this phenomenon, ensuring a clear operator view.



Type 4 model (The viewing window reach-in ports are optional.)



With covers open (The viewing window reach-in ports are optional.)



Type 4 (The viewing window reach-in ports are optional.)



Door dew tray



Condenser filter



Left: Cartridge tank
Right: Stationary tank

- **Door self-closing prevention and unlocking function**

The hinges are designed to prevent the doors from closing on their own. Doors are held open at 60° and 120°.

Moreover, a door unlocking handle (type 4 model only) is installed inside the chamber, so that the door can be opened from the inside in the event someone is locked in by mistake.

- **Detailed safety precautions**

The electric circuit compartment is kept completely separate from the water circuits to prevent damage in the event of water leak. A number of additional safety devices and features are also included, such as a warning buzzer when the door is opened halfway.

- **Door dew tray**

The door is equipped with a dew tray to prevent dripping when the door is opened and closed.

- **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).

- **Cartridge tank system for easy water supply**

Both a stationary tank and a cartridge tank are used for the water tanks. 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.

- **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.

Programming operation mode

- **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.

- **Remote control from your PC**

Please contact us for details on using a PC to monitor and remotely control the equipment.



Instrumentation

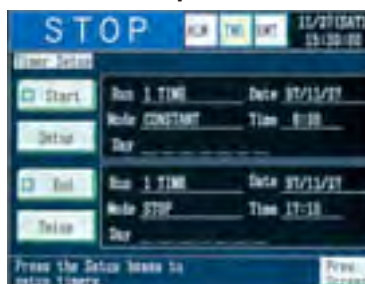
- **Program setting**



- **Trend graph**



- **Timer setup**



- **Alarm**

Alarm Name	Start Occur
Water Supply Rate 1	11/27 (SAT) 17:38:47

SPECIFICATIONS

Model	PWL-2KP	PWL-3KP	PWL-4KP	PWU-2KP	PWU-3KP	PWU-4KP	
Power supply	200V AC 3 ϕ 3W 50/60Hz, 220V AC 3 ϕ 3W 60Hz, 380V AC 3 ϕ 4W 50Hz						
Maximum current (A)	200V	22.5	23.0	36.0	15.0	28.0	
	220V	22.0		34.0	14.0	26.5	
	380V	11.0		22.0	10.5	13.5	
Temperature (and humidity) control system	Balanced Temperature & Humidity Control system (BTHC system)			Balanced Temperature Control system (BTC system)			
Operating temperature	0 to +40°C (+32 to +104°F)						
Performance ^{*1}	Temperature range	-40 to +120°C (-40 to +248°F)					
	Humidity range	20 to 98% rh			—		
	Temperature fluctuation	$\pm 0.3^{\circ}\text{C}$ (-40 to +100°C) [$\pm 0.54^{\circ}\text{F}$ (-40 to +212°F)] $\pm 0.5^{\circ}\text{C}$ (+100.1 to +120°C) [$\pm 0.9^{\circ}\text{F}$ (+212.2 to +248°F)]					
	Humidity fluctuation	$\pm 2.5\%$ rh			—		
	Temperature uniformity	-40 to +100°C (-40 to +212°F)	$\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$)		$\pm 1.0^{\circ}\text{C}$ ($\pm 1.8^{\circ}\text{F}$)	$\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$)	$\pm 1.0^{\circ}\text{C}$ ($\pm 1.8^{\circ}\text{F}$)
		+100.1 to +120°C (+212.1 to +248°F)	$\pm 0.75^{\circ}\text{C}$ ($\pm 1.3^{\circ}\text{F}$)		$\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$)	$\pm 0.75^{\circ}\text{C}$ ($\pm 1.3^{\circ}\text{F}$)	$\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$)
	Humidity uniformity	$\pm 3.0\%$ rh		$\pm 5.0\%$ rh	—		
	Temperature heat-up time	-40 to +120°C within 50min.					
	Temperature pull-down time	+20 to -40°C within 60min.					
Construction	Exterior material	18 Cr stainless steel plate (hairline finish)					
	Interior material	18-8 Cr- Ni stainless steel plate (2B polish)					
	Insulation	Glass wool, Rigid polyurethane foam (for main unit)					
Refrigeration system	Refrigerator	Hermetically sealed rotary compressor (R404A)					
	Refrigeration system	Mechanical single-stage refrigerator system (air-cooled condenser)					
	Refrigerator capacity	1.5kW		1.5kW 2units	1.5kW	1.5kW 2units	
	Expansion mechanism	Electronic auto-expansion valve system					
	Cooler	Plate fin cooler (also functions as dehumidifier)			Plate fin cooler		
1		4	1		4		
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	Cable port (inside diameter 50mm / 2inch, 1pc), Chamber lamp (fluorescent lamp), Integrating hour meter, Time signal (2 points), Casters with adjusters, Power cable						
	Viewing window effective size	W470×H720mm (18.5×28.3 in.)	W570×H820mm (22.4×32.2 in.)	W970×H970mm (38.1×38.1 in.)	W470×H720mm (18.5×28.3 in.)	W570×H820mm (22.4×32.2 in.)	W970×H970mm (38.1×38.1 in.)
Accessories	Cable port rubber plug (ϕ 50mm), Shelves (shelf supports, shelves: 2 sets), Cartridge fuse, Wet-bulb wick (PWL only), User's manual						
Water supply	Water supply system	Pump out system			—		
	Tank capacity (front face of the chamber)	20L		40L	—		
	Water quality	Electrical conductivity 0.1 to 10 μ S/cm			—		
Inside dimensions ^{*2} (mm / inch)	W500×H750×D600 (19.6×29.5×23.6)	W600×H850×D800 (23.6×33.4×31.5)	W1000×H1000×D800 (39.3×39.3×31.5)	W500×H750×D600 (19.6×29.5×23.6)	W600×H850×D800 (23.6×33.4×31.5)	W1000×H1000×D800 (39.3×39.3×31.5)	
Outside dimensions ^{*2} (mm / inch)	W910×H1590×D1039 (35.8×62.6×40.9)	W1010×H1690×D1239 (39.7×66.5×48.7)	W1410×H1970×D1239 (55.5×77.5×48.7)	W910×H1590×D1039 (35.8×62.6×40.9)	W1010×H1690×D1239 (39.7×66.5×48.7)	W1410×H1970×D1239 (55.5×77.5×48.7)	
Capacity (L)	225	408	800	225	408	800	
Weight (kg)	310	370	560	300	360	550	

*1 At +23°C ambient temperature, non-loaded, refrigerator capacity set to auto.

Performance for effective inside capacity (inside capacity minus 1/6 of the space between the two corresponding interior faces inside the chamber).

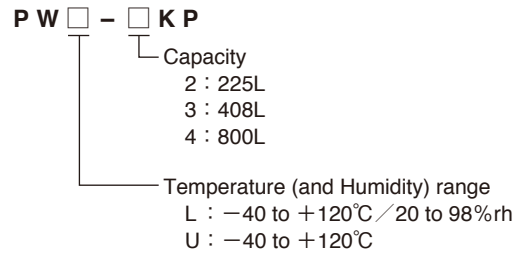
Temperature & humidity range, fluctuation, and uniformity are according to JTM-K 01-1998 (Standard for performance of temperature and humidity chambers) of the Japan Testing Machinery Association.

*2 Excluding protrusions.

SAFETY DEVICES

- Leakage breaker for power supply
- Boil dry protector (PWL only)
- Refrigerator overload relay
- Refrigerator high pressure switch
- Air circulator temperature switch
- SSR overload & short circuit protecting circuit breaker
- Electric parts compartment door switch (PWL only)
- Water circuit compartment door switch
- 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 (independent type)
- Reverse prevention relay
- Compressor temperature switch
- Cooling box door switch (PWU only)

MODEL



TEMP. (& HUMID.) PROGRAM INDICATOR-CONTROLLER

Operating mode	Program operation, Constant operation
Display	TFT Color LCD display (6.5 in.)
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. : -45 to +125°C (-45 to +105°C / With reach-in ports) Humid. : 0 to 100%rh Time : 0 to 999 hours 59 minutes
Setting and indication resolution	Temp. : 0.1°C Humid. : 1%rh Time : 1 minute
Input	Thermocouple type T (Copper/Copper-Nickel)
Control	PID control
Communication function	RS-485
Auxiliary functions	Time signal function Power cut protection function Input burn-out detection function Timer function (automatic start/stop) Upper and lower temp. & humid. limit alarm function Refrigerator capacity automatic control function Self-diagnostic function Trend graph display function Alarm indication function Help function



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 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.



CAUTION

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

OPTIONS

Viewing window reach-in ports

The viewing window in the door of the main unit is fitted with reach-in ports to allow test specimens to be manipulated inside the test chamber. The covers can be removed if they obstruct manipulation or observation.

- Internal diameter: 130 mm
- Quantity: 1 pair
(one each on left and right)

New specifications when reach-in ports are fitted.

Temperature range:
–40°C to +100°C
Temperature heat-up rate:
–40°C to +100°C
within 45min.

*Standard performance may not be achieved if operated with the reach-in ports open.

Cable port (with rubber plug)

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

- ϕ 25, 50 or 100mm dia.
- Flat cable port



Cable port rubber plug

The additional silicon sponge rubber port plug.

Floor load resistance

To enhance floor load capacities inside the chamber.

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

Stainless evaporator

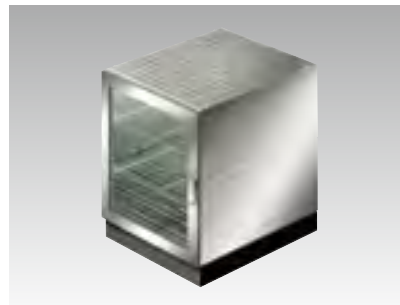
The evaporator can be changed to the stainless evaporator to protect chamber from the test product.

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

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.

- Velocity: 0.5 m/sec max.
- Temperature/humidity fluctuation:
 $\pm 0.5^\circ\text{C} / \pm 2.5\% \text{ rh}$
- Temperature/humidity uniformity:
 $\pm 0.75^\circ\text{C} / \pm 5.0\% \text{ rh}$
- Outside dimensions:(effective cross)
Type 2 – W400 × H590 × D400mm
(W335 × H435mm)
Type 3 – W500 × H740 × D600mm
(W435 × H585mm)
Type 4 – W900 × H840 × D600mm
(W835 × H685mm)



Water cooled specification

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

Defrost circuit

Quickly defrosts the refrigeration circuit (dehumidifier).

Frost-free circuit

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

Paperless recorder

Records temperature of each section such as the temperature inside the chamber.

Data saving cycle: 5 sec

External recording media:

CF memory card (128MB)

Language support: ENG, JPN, CHN

[Temperature type]

Temperature range: –100 ~ +200°C

Number of inputs:

Temperature 1

(5 more channels can be turned ON)

[Temperature and humidity type]

Temperature range: –50 ~ +150°C

Humidity range: 0~100% rh

Number of inputs:

Temperature 1 / Humidity 1

(4 more channels can be turned ON)



Temperature and humidity recorder (digital)

RJ12 –50 to +150°C / 0 to 100%rh

6 dots



Temperature recorder (digital)

• RJ04* –100 to +200°C 1 pen

• RJ25 –100 to +200°C 6 dots

*PWU only

OPTIONS

OPTION	PWL	PWU
Viewing window reach-in ports (excluding type 2)	●	●
Cable port	●	●
Cable port rubber plug	●	●
Floor load resistance	●	●
Stainless evaporator	●	●
Precision internal chamber	●	●
Water cooled specification (excluding type 2)	●	●
Defrost circuit	●	●
Frost-free circuit	●	●
Paperless recorder	●	●
Temperature and humidity recorder	●	—
Temperature recorder	●	●
Dual communication logger	●	●
Temp. & humid. recorder for future installation	●	—
Temp. recorder for future installation	●	●
Connecting terminal for temp. & humid. recorder	●	—
Temperature sensor terminal	●	●
Thermocouple	●	●
Temperature attainment output	●	●
Humidifier delay control	●	—
Integrating hour meter with reset	●	●
Time up output	●	●
Additional relay contact	●	●
Operating panel cover	●	●
Trouble buzzer	●	●
Filter clogged alarm	●	●
Rotating type warning signal light	●	●
External alarm terminal	●	●
Emergency stop switch	●	●
Overcool protector	●	●
Additional overheat protector	●	●
Shelf, Shelf bracket	●	●
Load resistance shelf	●	●
Specimen basket	●	●
Water purifier (WS-1)	●	—
Water supplier (B, C, D)	●	—
Additional water supply tank	●	—
Communication functions	●	●
Power cable	●	●
Power plug	●	●

OPTIONS

Dual communication logger

In addition to the functions of paperless recorder, the logger records the temperature inside the chamber and information from the controller with functional monitor on PC via Ethernet, and alarm message via E-mail.

Communication data:

- Operating status
- Temperature (& humidity) indicated
- Setting temperature (& humidity)
- Number of alarm occurred
- The first alarm number
- The second alarm number

Temp. & Humid. recorder for future installation

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

Temp. recorder for future installation

Preparation of a power cable, temperature sensor, 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 (and wet bulb) temperature sensor in the chamber.

Thermocouple

Thermocouple measures the temperature of specimens.

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

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 control 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)

Operating panel cover

Plastic cover for the operating panel.

Trouble buzzer

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

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.

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.

Overcool protector

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

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.

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 2 to 3: up to 30kg (max. of three shelves)
- Type 2 to 4: up to 50kg (max. of two shelves)

Allowable load of standard shelves
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 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.

Water purifier (WS-1)

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



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 B·C·D

Water supplier

Water supply circuit to supply pure water for humidification.

- Water supplier B
Water supply piping to ion ex-change 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

Communication functions

Connects chamber to a PC, enabling operation control of the chamber. (Standard: RS-485)

- GP-IB
- RS-232C

Power cable

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

- 5, 10m

*Not applicable 380V AC power supply specification.

Power plug

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

*Not applicable 380V AC power supply specification.

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ISO 14001 (JIS Q 14001)
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