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°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.
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 $+80^\circ$, but the Ultra View Temperature and Humidity Chamber allows a greatly increased maximum temperature of $+120^\circ$. This feature now enables high-temperature testing of products like on-board vehicle components.

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 $+10^\circ$ (at 50 to 90%rh) and the lower limit of the humidity control range is 20% rh (at +70 $^\circ$ to +85 $^\circ$).

Communication Network of Environmental Test Chambers

The Ultra View Temperature (and Humidity) Chamber includes an RS-485 communication port, enabling remote operation via ESPEC’s [E-Pilot 21]. This software suite not only serves as a system for centralized control of environmental chambers, but also establishes an for specimen measurements and remote maintenance.
Clear from dew condensation for increased visibility (patent pending)

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 (patent pending)

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.
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

The water supply system uses a fixed tank as well as a cartridge tank. An warning buzzer goes off user when the cartridge tank is empty. The fixed tank allows uninterrupted water supply while the cartridge tank is removed for filling.

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°C, the humidifying water does not require manual draining, so the water can be fed and drained automatically during both temperature and temperature-humidity operations.
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.
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>PWL-2KP</th>
<th>PWL-3KP</th>
<th>PWL-4KP</th>
<th>PWU-2KP</th>
<th>PWU-3KP</th>
<th>PWU-4KP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td>200V AC 3φ 3W 50 / 60Hz, 220V AC 3φ 3W 60Hz, 380V AC 3φ 4W 50Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Maximum current (A)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200V</td>
<td>22.5</td>
<td>23.0</td>
<td>36.0</td>
<td>15.0</td>
<td>28.0</td>
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<tr>
<td>220V</td>
<td>22.0</td>
<td>34.0</td>
<td>14.0</td>
<td>26.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>380V</td>
<td>11.0</td>
<td>22.0</td>
<td>10.5</td>
<td>13.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature (and humidity) control system</strong></td>
<td>Balanced Temperature &amp; Humidity Control System (BTHC system)</td>
<td>Balanced Temperature Control System (BTC system)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>0°C to +40°C (+32°F to +104°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>-40°C to +120°C (-40°F to +248°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Humidity range</strong></td>
<td>20% to 98%rh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Humidity fluctuation</strong></td>
<td>2.5%rh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>40°C to +40°C (-40°F to +104°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature fluctuation</strong></td>
<td>0.5°C (0.9°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Humidity uniformity</strong></td>
<td>3.0%rh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature heat-up rate</strong></td>
<td>-40°C to +120°C within 90min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature pull-down rate</strong></td>
<td>+20°C to -40°C within 90min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exterior material</strong></td>
<td>18 Cr stainless steel plate (hardline finish)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interior material</strong></td>
<td>18-8 Cr Ni stainless steel plate (2B polish)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Refrigerator</strong></td>
<td>Hermetically sealed rotary compressor (compatible with HFC refrigerants)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Refrigeration system</strong></td>
<td>Mechanical single-stage refrigerator system (air-cooled condenser)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Refrigerator capacity</strong></td>
<td>1.5kW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expansion mechanism</strong></td>
<td>Electronic auto-expansion valve system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooler</strong></td>
<td>Plate fin cooler (also functions as dehumidifier)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Humidifier</strong></td>
<td>18-12-2.5 Cr Ni-Mo stainless steel sheathed heater (surface evaporating system)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chamber air circulator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sirocco fan</td>
<td></td>
</tr>
<tr>
<td><strong>Fittings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Viewing window effective size</strong></td>
<td>W470 x H720mm (18.5 x 28.3 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inside dimensions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outside dimensions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chamber capacity (L)</strong></td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>310</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water supply system</strong></td>
<td>Pump out system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tank capacity (front face of the chamber)</strong></td>
<td>20L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water quality</strong></td>
<td>Electrical conductivity 0.1-100 μS/cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

*2 Performance for effective inside capacity (inside capacity minus 1/8 of the space between the two corresponding interior faces inside the chamber).

*3 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.

*4 Excluding protrusions.
SAFETY DEVICES

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

MODEL

P W - 2 K P

<table>
<thead>
<tr>
<th>Capacity</th>
<th>2 : 225 L</th>
<th>3 : 408 L</th>
<th>4 : 800 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (and Humidity) range</td>
<td>L : -40 to +120 ºC / 20 to 98%rh</td>
<td>U : -40 to +120 ºC</td>
<td></td>
</tr>
</tbody>
</table>

TEMP. (& HUMID.) PROGRAM INDICATOR-CONTROLLER

<table>
<thead>
<tr>
<th>Operating mode</th>
<th>Program operation, Constant operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>TFT Color LCD display (6.5in)</td>
</tr>
<tr>
<td>Setting</td>
<td>Analog touch panel method</td>
</tr>
<tr>
<td>Program capacity</td>
<td>RAM pattern: 20 program patterns</td>
</tr>
<tr>
<td>Setting and indication ranges</td>
<td>Temp: -45 to +125 ºC</td>
</tr>
<tr>
<td>Setting and indication resolution</td>
<td>Temp : 0.1 ºC</td>
</tr>
<tr>
<td>Input</td>
<td>Thermocouple type T (Copper/Copper-Nickel)</td>
</tr>
<tr>
<td>Control</td>
<td>PID control</td>
</tr>
<tr>
<td>Communication function</td>
<td>RS-485</td>
</tr>
<tr>
<td>Auxiliary functions</td>
<td>Time signal function</td>
</tr>
</tbody>
</table>

⚠️ 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.
OPTIONS

Water cooled specification

The standard condenser on the refrigeration system is replaced with a water-cooled type. (type 3-4 only)

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 °C / ± 2.5%rh
- Temperature/humidity uniformity: ± 0.75 °C / ± 5.0%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)

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.

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

*Cable port rubber plug

The additional silicon sponge rubber port plug.

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)

Floor load resistance

To enhance floor load capacities inside the chamber.
- Up to 100kg
- Up to 200kg
- Up to 300kg

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.

Elmatik AS, Türi 9, 11314 Tallinn Estonia tel. +372 650 3875 tel. +372 650 3876 fax +372 655 8019 e-mail: elmatik@elmatik.ee
<table>
<thead>
<tr>
<th>OPTION</th>
<th>PWL</th>
<th>PWU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water cooled specification (excluding model 4)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Cable port</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Cable port rubber plug</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Viewing window reach-n ports (excluding model 4)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Precision internal chamber</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Stainless evaporator</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Floor load resistance</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Shelf, Shelf bracket</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Load resistance shelf</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Specimen basket</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Additional overheat protector</td>
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<tr>
<td>Overcool protector</td>
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<tr>
<td>Defrost circuit</td>
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<tr>
<td>Frost-free circuit</td>
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<tr>
<td>Operating panel cover</td>
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<tr>
<td>Filter clogged alarm</td>
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<tr>
<td>Trouble buzzer</td>
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<tr>
<td>Rotating type warning signal light</td>
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<tr>
<td>External alarm terminal</td>
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<tr>
<td>Emergency stop switch</td>
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<tr>
<td>Temperature attainment output</td>
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<td>☐</td>
</tr>
<tr>
<td>Humidifier delay control</td>
<td>☐</td>
<td>—</td>
</tr>
<tr>
<td>Integrating hour meter with reset</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Paperless recorder</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Temperature and humidity recorder</td>
<td>☐</td>
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</tr>
<tr>
<td>Temperature recorder</td>
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<tr>
<td>Temperature sensor terminal</td>
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<tr>
<td>Connecting terminal for temp &amp; humid recorder</td>
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<tr>
<td>Time up output</td>
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<td>Additional relay contact</td>
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<td>Thermocouple</td>
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<tr>
<td>Temp &amp; humid recorder for future installation</td>
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</tr>
<tr>
<td>Temp recorder for future installation</td>
<td>☐</td>
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</tr>
<tr>
<td>Communication functions</td>
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<tr>
<td>Communication cable</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Power cord</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Power plug</td>
<td>☐</td>
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</tr>
<tr>
<td>Water purifier (WS-1)</td>
<td>☐</td>
<td>—</td>
</tr>
<tr>
<td>Water supplier (B, C, D)</td>
<td>☐</td>
<td>—</td>
</tr>
<tr>
<td>Additional water supply tank</td>
<td>☐</td>
<td>—</td>
</tr>
</tbody>
</table>
OPTIONS

**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).

**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 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.)

**Paperless recorder**
Records temperature inside the chamber. Additional inputs may also be recorded

- **[Temperature type]**
  - Temperature range: 
    - -100°C to +200°C
  - Number of inputs:
    - Temperature 1 (5 more but turned OFF*)
  - Data saving cycle: 5 sec
  - External recording media:
    - CF memory card (32MB)
  - * Settings may be modified.

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

**Temperature and humidity recorder (digital)**
RJ12 - 50°C to +150°C / 0 to 100%rh
6 dots

**Temperature and humidity recorder (digital)**
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)

Communication functions

Connects chamber to a personal computer, enabling operation control of the chamber. (Standard: RS-485)
- 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, 5m

Power cord

A standard cord 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.

Thermocouple

Thermocouple measures the temperature of specimens.
- 2, 4, 6m
- Thermocouple type T (Copper/ copper-Nickel)

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.

Temperature recorder for future installation

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

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

Some photographs listed in this catalog contain Japanese display.