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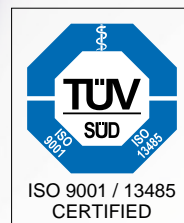


UNSATURATED & SATURATED "HAST" CHAMBERS

Pioneer in HAST Technology

Leaders by Innovation and service  
 Excellence by Design and Reliability  
 Condensation Free by design  
 Guaranteed Accuracy Real Time  
 Engineered for Perfection and Others ...

PC-R8/R8D series



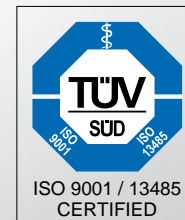
Products shown in this brochure  
 are manufactured by the company,  
 ISO 9001 / 13485 certified

Specifications subject to change without notice due to continuous product improvement

Distributor

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**HASTEST**<sup>®</sup>

HIRAYAMA MANUFACTURING CORPORATION

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## Here is the most advanced HAST Equipment, with

- Highly advantageous Dual Chamber System
- Color LCD Display
- Dialogic Touch-Screen Input
- Message function

### PC-R8/R8D series

Variety of electronic parts and devices that support the progress of electronics and precision equipment typically represented by computers increasingly tend toward miniaturization and higher density. Consequently, improvement of reliability of such electronic parts and devices has become more important and reduction of the time for evaluation of reliability has become equally important.

HIRAYAMA's HAST equipment, having its origin in the pressure vessel technologies fostered in-house, has been successfully developed to meet the needs of the times, and is now internationally acknowledged as indispensable for the accelerated evaluation of such parts and devices.



## PC-R8/PC-R8D series

HIRAYAMA's HAST equipment satisfies the test conditions stipulated by international Electrotechnical Commission Standard IEC60068-2-66 and Japan Industrial Standard JIS C0096.

## Dual Operation Modes

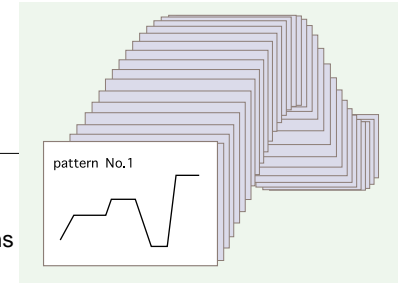
### Program Mode

Programmable up to 800 steps, 100 patterns. Operated according to the programmed patterns.

### Fixed Mode

Operated according to the fixed conditions.

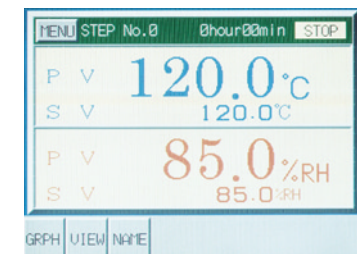
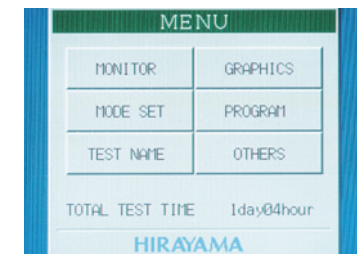
800 steps  
(800 broken lines)  
for every 100 patterns  
can be registered.



## Rich Contents of Color LCD Display

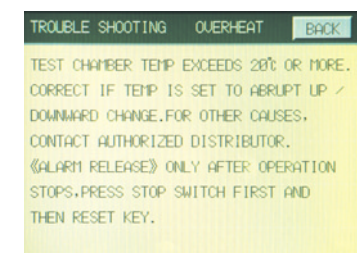
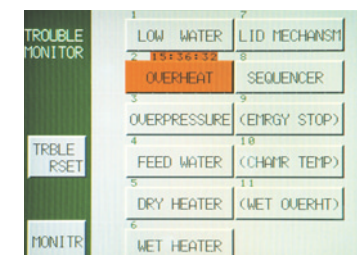
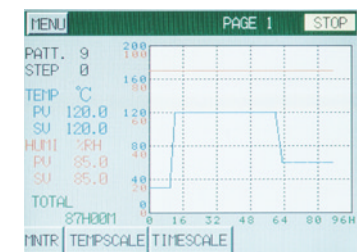
### Operational Display

- 1) Progress of Program Traceable
  - Entire progress of the program corresponding to the time.
  - Remaining time for the step in process.
  - Date and time of the day.
- 2) Title of Program (Up to 10 titles)
  - Automatic display of the title of the program in process.
- 3) Bright and Legible Color LCD
  - Operational process displayed clearly with capital letters on the color LCD screen.
- 4) Dialogic Touch-Screen Input
  - Easy and correct input by the dialogic touch-screen system.



### Color Graphic Display

- 1) Confirmation of the Programmed Pattern
  - Immediate confirmation of the preset program pattern by the color graph.
  - Many programs affirmable by shifting the graph for entire patterns.
- 2) Progress of Program
  - Progress of the program affirmable at a glance by the color graph.
- 3) Alteration of graduation Axes
  - Graduation axes for time and temperature changeable for easy reading of the color graph. Time axis changeable from hour-basis to day-basis in case of a program of long range.
- 4) Message Function for Alarm State
  - Message function showing the reason of alarm state and the countermeasure to rectify it. Alarm state rectified by following the display.

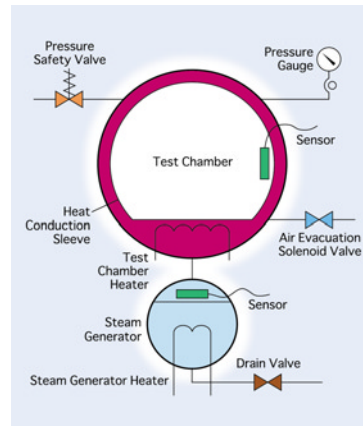


## HIRAYAMA's Dual Chamber System Assures Accuracy

The test chamber and the steam generator are separated from each other, and controlled independently. Unlike the single chamber system where steam is generated in the test chamber, the temperature interaction between the test chamber (DRY) and the steam generator (WET) is minimal. Further, the accuracy of humidity control inside the test chamber is secured by adoption of internal heating system.

Thus, the appropriate and stable environment for the test is always provided, and wider range of humidity is available compared to that of the single chamber system.

The specimens are free from dewing on them, and the bias test is accurately carried out, while the field data and the dew proof supported by the humidity retardation device are perfect. It is also important that highly reliable test is secured in a tight interrelation with traditional THB test.



## Electric Door Clamping (just by Push-Button) and Sliding Tray

Just to push a button to activate the electric clamping system to open and close the door. Further, the sliding tray system enables to draw out the tray together with the door, so that the operator is not required to put the hands into the test chamber for picking the specimens while it is still hot after the test.

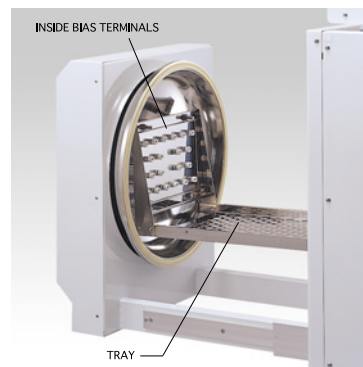


## Easier Wiring for Preparation

The bias terminals are installed at the inner side of the door, wiring to the specimens is much facilitated.

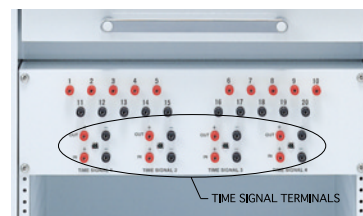
## Bias Terminals

20 bias terminals (per chamber) are provided as standard attachment. Number of the bias terminals as option can be increased up to 100 for PC-422R8/R8D, and 60 for PC-304R8/R8D.



## Time Signal Terminals (Option)

The time signal terminals are meant for picking out the ON/OFF signals at an appropriate timing, and can be provided as option.



## Selection of Control Method and Exhaust Mode according to Purpose

The test and exhaust modes can be selected according to the purpose of the test. Based on the correlation with the existing test conditions, this function is designed to allow two control methods and three exhaust modes to be set only by selecting switch positions.

## Two (2) Control Methods

### 1. Unsaturated Steam Control for HAST and PCT

The unsaturated steam test mode allows the humidity to be set freely between 65 % and 100 % RH without dew condensation. In addition to the fixed value operation, the standard program function can be used together to set the gradient of rising and falling and to control the humidity. Test conditions specified by IEC 60068-2-66, JIS C0096, etc can be satisfied.

### 2. Saturated Steam Control for PCT

This mode is only for a wet saturated steam test at 100 % RH.

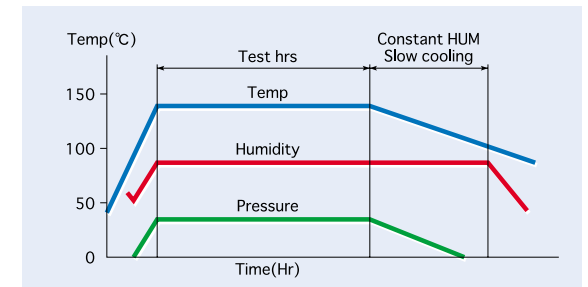
100 % RH WET condition is kept from the beginning. This is also called WET Saturated Test, generating dew fall condensation on samples.

A test corresponding to existing saturated pressure cooker can be performed.

## Exhaust Modes Appropriate to the Purpose of Test

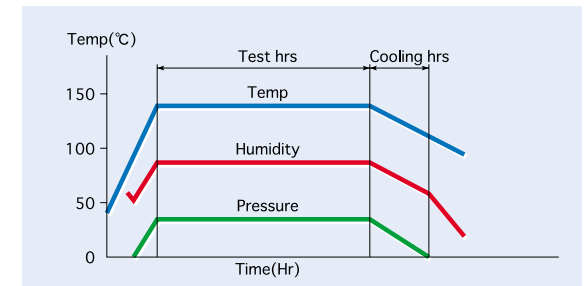
### 1. Slow Cooling with the Constant Humidity

After the test, slow cooling takes place while the preset humidity is maintained.



### 2. Cooling while Keeping the Humidity

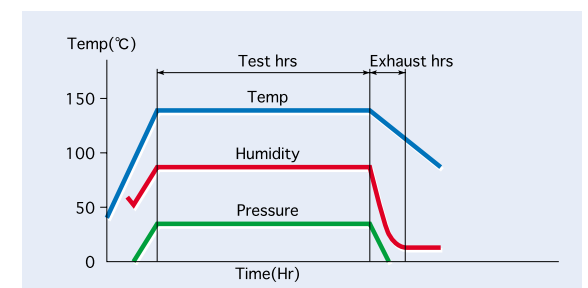
After the test, the interior of chamber is cooled by fan, without exhausting, until the pressure is down to 0 MPa, so as to avoid pressure stress on the specimens and drying of them caused by abrupt exhaust. At the same time, cooling in this way is faster compared to natural cooling.



### 3. Rapid Exhaust

Immediately after the test, the exhaust valve is opened for rapid discharge of hot water and steam.

This will give an interchangeability with the test by Saturated Pressure Cooker.



## Electro-polished Chamber

The electro-polished chambers of stainless steel SUS316L are provided in order to make the surface lustrous and microscopically smooth. It improves the appearance and anticorrosive characteristics. Accordingly, it prevents dusts from adhering, and facilitates removal and washing of them.

## Automatic Starter

Automatic Starter enables starting at a designated time, (month/day/time)

## Automatic Water Supply

Only by pushing START button, optimum amount of water is automatically supplied from built-in Water Tank to Steam Generator, enabling carefree of no-water heating due to shortage or failure of water supply.

## Safety Draining

Hot water discharged after the test is cooled by the built-in cooling tank. A heat resisting PVC piping can be used and easily connected.

## RS232C Interface

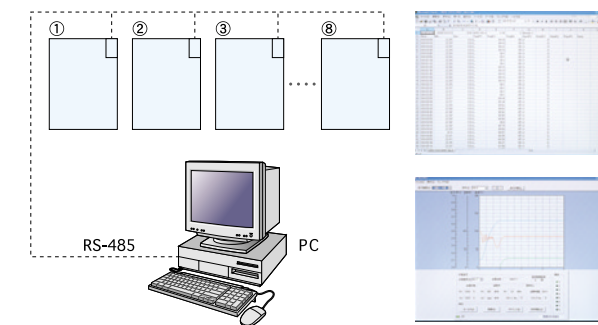
### Centralized Data Collection System

By having RS232C interface (Software is option), a plural number of HAST can be collectively controled even from a distance by one (1) computer.

In case of networking for 2 - 8 units of HAST chambers, RS-485 converter is necessary on the each chambers and Personal computer, too. Please contact our distributor in your region.

### Easy Operation for Control and Program Editing

Setting Test Condition, Monitoring the Test Condition, confirming Test completion time and date, Monitoring the trouble condition etc can be done by one computer. For more details, please contact our distributor in your region.



# Option

## Option

### HAST-NET RS232C Interface

- One computer can control collectively up to 8 units of HAST



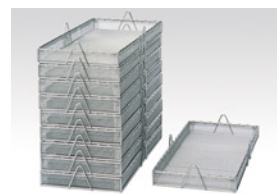
### Observation Window

- With Light



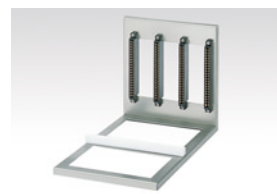
### Basket

- PC-304R8 / R8D  
172W x 346D x 30H mm
- PC-422R8 / R8D  
252W x 410D x 30H mm



### Board Rack

- Custom-made board rack available.



### Measuring Wires

- Up to 100 pcs for 422R8 / R8D (up to 60 pcs for 304R8 / R8D)



### Recorder

- Temp., Humidity & Pressure Recorder
- Temp. & Humidity Recorder



### 3-tiered Tray

- PC-304 type frame dimensions  
264W x 350D x 135H mm
- PC-422 type frame dimensions  
370W x 412D x 215H mm



### Feed-water Device for Steam Generator

- Pure water can be supplied directly to Steam Generator from the piping in the plant.

### Feed-water Device for Built-in Water Tank

- Pure water can be supplied automatically to built-in Water Tank from the piping in the plant.

### Bias Terminal

- 40 & 60 Bias Terminals are available as option, and can be increased up to 100 for PC-422R8 / R8D.

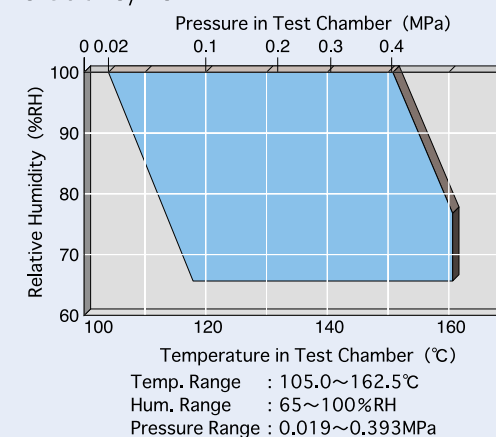
## Main specifications

Model	PC-304R8	PC-422R8	PC-304R8D	PC-422R8D
Dimensions	709W x 950D x 1674H mm		900W x 1100D x 1780H mm	
Test Chamber Size	300 x 522D mm (34.5L)	420 x 657D mm (84.4L)	300 x 522D mm (34.5L) (x 2 chambers)	420 x 657D mm (84.4L) (x 2 chambers)
Effective Chamber Size	220 x 350D mm (12L)	340 x 475D mm (40L)	220 x 350D mm (12L) (per chamber)	340 x 475D mm (40L) (per chamber)
Net Weight	Approx. 260kg	Approx. 280kg	Approx. 470kg	Approx. 480kg
Power (AC 1ph 220/230/240V 50/60Hz)	2.5kW	3.2kW	2.5kW (per chamber)	3.2kW (per chamber)
Heater Capacity	Steam Generator 1.7kW Test Chamber 0.6kW	Steam Generator 1.7kW Test Chamber 1.3kW	Steam Generator 1.7kW Test Chamber 0.6kW (per chamber)	Steam Generator 1.7kW Test Chamber 1.3kW (per chamber)
Operation Mode	Program Mode and Fixed Mode			
Program	Programmable up to 100 patterns, 800 steps			
Testing Mode	HUM (unsaturated) and STD (saturated)			
Temp. Control	PID / SSR			
Testing Temperature	105.0 ~ 151.4 /100%RH	105.0 ~ 133.3 /100%RH	105.0 ~ 151.4 /100%RH	105.0 ~ 133.3 /100%RH
	110.0 ~ 157.5 /85%RH	110.0 ~ 140.0 /85%RH	110.0 ~ 157.5 /85%RH	110.0 ~ 140.0 /85%RH
Temp. Range	118.0 ~ 162.5 /65%RH	118.0 ~ 150.0 /65%RH	118.0 ~ 162.5 /65%RH	118.0 ~ 150.0 /65%RH
Temp. Control Accuracy	± 0.5			
Distribution Accuracy	± 0.5 (at 100%RH)			
	± 1.0 (at 85%RH)			
Hum. Range	65 ~ 100%RH			
Hum. Contr. Accuracy	± 3%RH (at 85%RH)			
Press. Range	0.019 ~ 0.393MPa	0.019 ~ 0.208MPa	0.019 ~ 0.393MPa	0.019 ~ 0.208MPa
Test Time	Max. 500hrs. continuously			
Time Range	1min. ~ 999hrs. 59min.			
Power Interr. back-up	Approx. 4 sec.			
Time to Reach Rated Temp.	Approx. 70min. (Room temp. 120 °C, 85%RH)			
Exhaust Mode	Mode Switch 1, 2 and 3			
Bias Terminal	20 per Chamber (125V up to total 30W)			
Chamber	Stainless Steel SUS316L (Electro-polished)			
Water Supply	Automatic water supply from built-in Water Tank			
Door System	Motor-driven clamping system, with Sliding Tray			
Safety Alarm Device	Pressure safety valve, Proof to overpressure, overheating and no-water heating, Feed-water failure sensor, Electric leakage breaker (with OC), Breaker for heater, Temperature fuse, Safety door system, Rated value Locking device, Sequence control self-checking device, Hot water discharge system, Negative pressure prevention device			
Standard Accessories	Drain Hose ... 2pcs, Feed-water Hose ... 1pcs, Aux. Feed-water Tank ... 1pc, Lid Gasket ... 2pcs, Power SW Key ... 2pcs / R8D ... 4pcs, Power Cord ... 1pc / R8D ... 2pcs, Operation Manual ... 1pc			

The performance values are valid when the ambient temperature is at normal room temperature and when no specimens are loaded in the chamber. Power source voltage and frequency are fixed between the above.

## Temp. & Humidity Control Range at Test process

### PC-304R8/R8D



### PC-422R8/R8D

