

PC-R9series HAST Equipment

PC-304R9/422R9

- Remote operation by LAN and WiFi.
- All SUS piping, heater, solenoid valve.
- Cleaning mode.
- USB port.
- Steam generator separated.



PC-422R9



ISO 13485
CERTIFIED

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

HIRAYAMA MANUFACTURING CORPORATION

A new programmable high precision temperature-humidity controller enables more precise HAST evaluation. More advanced functions and operations including the remote operation using an external terminal device became available with the latest touch screen.

HAST Equipment PC-R9series



Advantages of new controller

Programmable high-precision temperature-humidity controller

The new temperature-humidity controller enables the more accurate accelerated evaluation when compared to conventional HAST equipment. It is easy to operate the controller, because an interactive touch screen input system is employed.

Remote operation

It is possible to remotely control by using an external terminal device. Even when many PC-R9 HAST equipments are used or when a PC-R9 HAST equipment is installed in a wide place, they can be monitored and adjusted by a small number of operators. The setting operation is easy.
(Download the application software for connecting external terminal devices.)



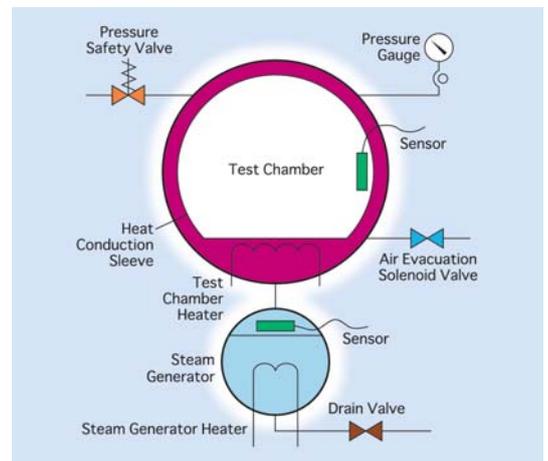
Steam generator separated

Test chamber and steam generator are separated and independent from each other.

The dual vessel structure consisting of a test chamber and a steam generator which are separated and independent from each other is employed. When compared to the single vessel structure, the dual vessel structure has the following advantages.

- The mutual thermal influence between a test chamber (DRY bulb) and a steam generator (WET bulb) is small.
- Effective dimension is large.
- The working humidity range is wide.

The round shaped chamber that is effective for the strength and that can enlarge the effective space to the maximum is used.



Easy-to-operate. Easy-to-connect

Electric clamp and slide tray

An electric clamp method that can open /close the door only by pressing a button is employed. In addition, a slide tray which can draw the door toward this side is equipped. It is easy to put specimens in and taking them out. It is not necessary for an operator to handle specimens in the chamber, therefore, the safety of an operator is ensured.

Bias terminals installed inner face of the door

The bias terminals are installed inner face of the door. Connection work with specimens at a bias test can be performed outside of the door. 20 bias terminals are installed as standard, and the optional terminals can be added by up to 100.



The interactive touch screen input system makes settings easy.

MENU screen

MONITOR, TREND GRAPH, MODE SET, PROGRAM, TEST NAME and OTHERS are displayed. Touching each desired key selects a screen.



MODE SET screen

The operation state is displayed in color for easy reading. The remaining test time can be confirmed during a test. This is an opening screen at power-on. (A standard pressure is shown.)



TREND GRAPH screen

The progress state of a program is displayed in a color graph and can be confirmed at a glance. The scaling function that a graph becomes easy to read by changing the scale range of temperature and time is installed.



MODE SET screen

OPERATION, EXECUTION, KEY LOCK, STD/ HUM SELECT and EXHAUST are displayed. Touching each desired key selects a screen.



TROUBLE monitor screen

Each safety device equipped is displayed. The ALERT is displayed in red for the alarm being generated, and the occurrence date and time are also displayed.



TROUBLE monitor screen

The causes and measures for generated alarms are displayed. The trouble state can be recovered by operating the equipment while seeing the instructions displayed in the screen.

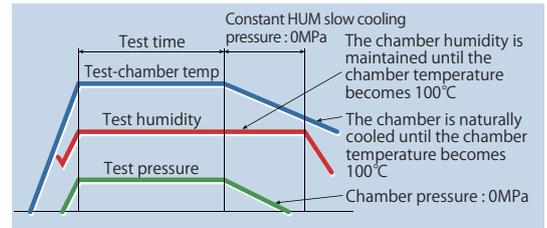


The exhaust mode can be selected according to the purpose.

Three (3) exhaust modes

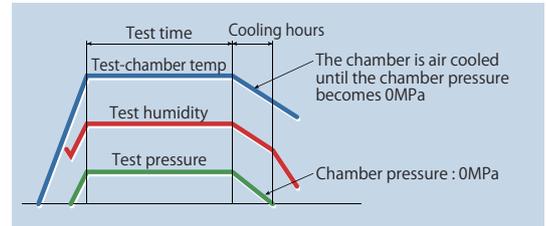
1. Slow cooling at the set humidity

After a test, the test chamber is cooled down slowly with humidity maintained until the chamber temperature becomes 100°C and the chamber pressure drops to 0MPa. This mode can protect specimens from pressure stress and drying that are caused by rapid exhaust. The high accurate test that minimizes the influence on the specimens caused by taking them out on the way can be performed.



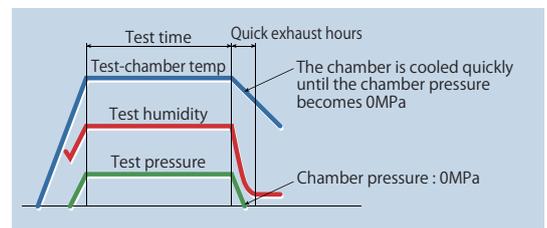
2. Cooling with moisture maintained

After a test, it is possible to cool the chamber in a short time compared to the slow cooling with humidity maintained while minimizing the pressure stress and drying.



3. Quick exhaust

Immediately after a test, the exhaust valve is opened to carry out exhaust and hot water drainage in a short time. Removing the specimens after a test can be carried out in the shortest time. This mode is suitable for specimens that are not affected by pressure stress. Data is compatible with the data of a saturated type pressure cooker.



Prevention of stain adhesion and easy-to-clean chamber

The surface of chamber made of SUS 316L stainless steel is electro-polished to improve smoothness and gloss. The chamber is excellent in corrosion resistance and cleaning performance including prevention of stain adhesion so that the influence caused by chamber contamination can be prevented as much as possible.



Programmable auto-start function

The programmable auto-start function which can set the start date and time is provided as a standard feature. Start time can be specified in accordance with the desired end time of a test.

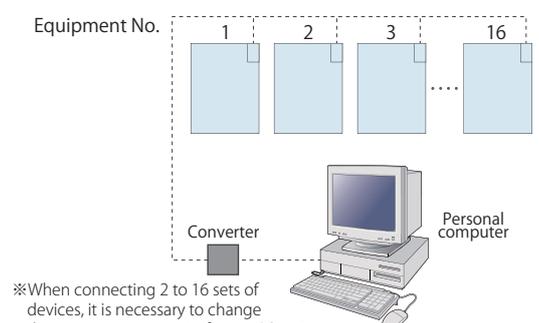
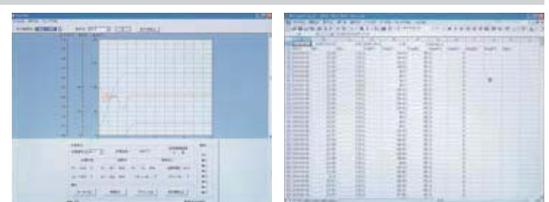
RS-485 communication function

Centralized monitoring, centralized control, and network system of PC-R9 series

The RS-485 interface is installed in the PC-R9 HAST equipment and it is possible to control the equipment with one PC. The PC-R9 series network system can collectively control up to 16 sets of testing equipments with one PC. The PC-R8/R8D series HAST equipment that you are using can be adapted to the network by performing a version-up.

Equipment management and program edit are easy

It is possible to carry out settings of test conditions, grasp a testing state, confirm an ending date and time of a test, grasp a trouble state, etc., collectively. Data processing including program edit is easily carried out by using application software for Windows. For details, please contact our distributor in your region.



※When connecting 2 to 16 sets of devices, it is necessary to change the communication interface to RS-485. For details, please contact our distributor in your region.

The control method can be selected according to the purpose.

Two (2) control methods

1. Unsaturated control

The unsaturated control mode prevents dew condensation and can set humidity at any value between 65%RH and 100%RH. In addition to the fixed value operation, this mode can set the gradient for temperature rise and fall. Humidity control is also available. This mode conforms to the IEC 60068-2-66 and C60068-2-66.

2. Saturated control

In the saturated control mode, humidity is fixed at 100%RH. Humidity is maintained at 100%RH from the rising start time. This mode is also called as a wet saturation test, and dew condensation occurs on the specimens. A test that corresponds to the conventional saturated type pressure cooker can be performed.

Chamber cleaning mode

In addition to the fixed value operation and programmed operation, the automatic cleaning mode is installed. Selecting the cleaning mode and pressing the START button starts the cleaning operation with the conditions effective for the test chamber cleaning.

Operation data can be stored in an external memory.

Operation record including temperature, humidity and pressure can be stored in an external memory such as an USB memory. Even if there is not an optional recorder, operation data can be recorded.

Cooling tank for safety drainage

Hot water after a test is cooled in the cooling tank equipped as standard then discharged safely. The heat resistant vinyl chloride resin pipe (JIS K6776) can be used for drainage piping.

Options

■ Communication software

It is possible to control and monitor up to 16 sets of devices collectively with one PC.



■ Recorder

6-point dotting recorder
Digital recorder



■ Basket

- PC-304R9 : W172×D346×H30mm
- PC-422R9 : W252×D410×H30mm



■ High resistance measuring terminal (Measuring wire)

Insulation resistance can be measured automatically when used in combination with a migration tester.



■ Three-tiered shelf

Frame size

- PC-304R9 : W264×D350×H135mm
- PC-422R9 : W370×D412×H215mm



■ Bias terminal

For PC-422R9, up to 100 terminals can be installed including 20 standard terminals. For PC-304R9, it is possible to install up to 60 terminals including 20 standard terminals.

■ Board Rack

- Custom-made board rack available.



■ Automatic water supply system to plastic tank

Water is supplied to a built-in plastic tank directly from the pure water piping.

■ Observation window for specimens

Diameter of window:
50 mm, with interior illuminator



■ High voltage terminal

1000V or 2000V is available.

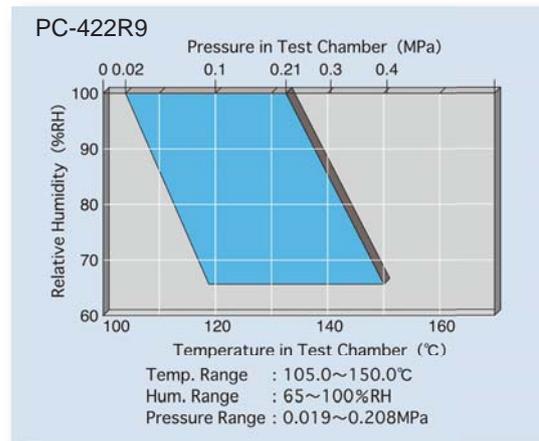
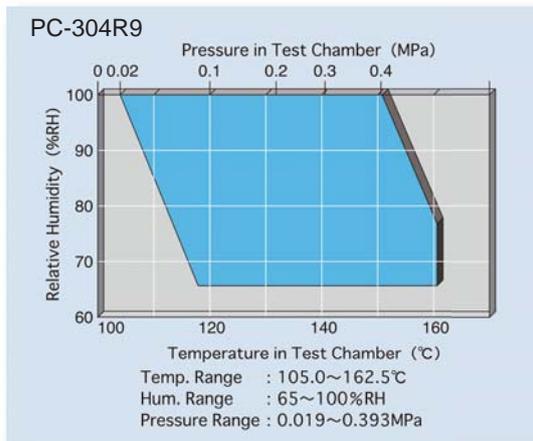
■ Max. heat dissipation value of specimen: 50 watts

Main specifications

Model	PC-304R9	PC-422R9
Outside dimension	W710×D950×H1620 mm	W710×D950×H1620 mm
Test chamber size	Φ300×D522 (34.5 L)	Φ420×D657 (84.4 L)
Effective chamber size	Φ220×D350 (12 L)	Φ340×D475 (40 L)
Weight (approx.)	260 kg	295 kg
Power supply	1 φ AC220V/230V/240V 50/60Hz 2.3kW	1 φ AC220V/230V/240V 50/60Hz 3.0kW
Heater capacity	Steam generator 1.5kW Test chamber 0.6kW	Steam generator 1.5kW Test chamber 1.3kW
Operation mode	Programmed operation, Fixed-value operation	
Programmed operation	Up to 150 patterns, 1500 steps (maximum)	
Test mode	HUM (unsaturated), STD (saturated)	
Temperature control method	PID control, SCR drive	
Working temperature range	105.0 ~ 151.4°C (at 100%RH)	105.0 ~ 133.3°C (at 100%RH)
	110.0 ~ 157.5°C (at 85%RH)	110.0 ~ 140.0°C (at 85%RH)
	118.0 ~ 162.5°C (at 65%RH)	118.0 ~ 150.0°C (at 65%RH)
Temperature control accuracy	±0.5°C	
Temperature distribution accuracy	±0.5°C (at 100%RH)	
	±1.0°C (at 100%RH)	
Working humidity range	65-100%RH	
Humidity control accuracy	±3%RH (at 85%RH)	
Working pressure range	0.019 ~ 0.393MPa	0.019 ~ 0.208MPa
Pressure vessel category	Small sized pressure vessel	
Continuous operation time	Up to 500 hours	
Time setting range	1 minute - 999 hours 59 minutes	
Temporary power failure backup	Approx. 4 seconds	
Temperature rise time	Approx. 70 minutes (time to 120°C / 85%RH from room temperature)	
Exhaust mode	EXHT MODE Selector Switch MODE 1: Slow cooling at the set humidity MODE 2: Cooling with moisture maintained MODE 3: Quick exhaust	
Bias terminal	20 (Applied voltage:125V, within 30W in total)	
Time signal terminal	4	
Emergency stop switch	Equipped	
Chamber material	Stainless steel SUS316L (Electro-polished)	
Water supply method	A water supply tank is built in, and initial supply of water into the steam generator is performed automatically	
Door operation	Drawer type door, Door clamping driven by motor	
Safety devices and alarms	Pressure safety valve, Over-pressure prevention device, Overheat prevention device, Low water cut off device, Water supply abnormality detection device, Over-current and earth leakage breaker, Circuit breaker for heater Fuse, Thermal fuse, Set-value lock, Hot water drainage treatment system, Self-diagnosis function of sequence controller, Negative pressure prevention system, Door safety system (Door lock check mechanism during operation, Door open/close check mechanism)	
Supplied accessories	USB port x 1, Drainage hose x 2, Water supply/drainage hose x 1, Auxiliary water supply tank x 1 Lid gasket x 2, Power supply switch key x 2, Power supply cord x 1, Operation manual x 1	

• The size of protrusions is not included in the outside dimension. • The above performance values were obtained when the ambient temperature was normal and there was nothing in the test chamber.

Temp. & Humidity Control Range at Test process



Specifications and appearance are subject to change without notice due to continuous product improvement.



Manufactured under
ISO 13485

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