

Quality is more than a word



Environmental Stress Chamber

AR series
Standard Type



3 YEAR WARRANTY



Global standard model for a new temperature (&humidity) chamber that meets the needs for high loads, high stresses, and large sizes

The Environmental stress chamber AR series supports heat load and provides faster temperature cycling performance with a wide temperature and humidity control range.

3 YEAR WARRANTY

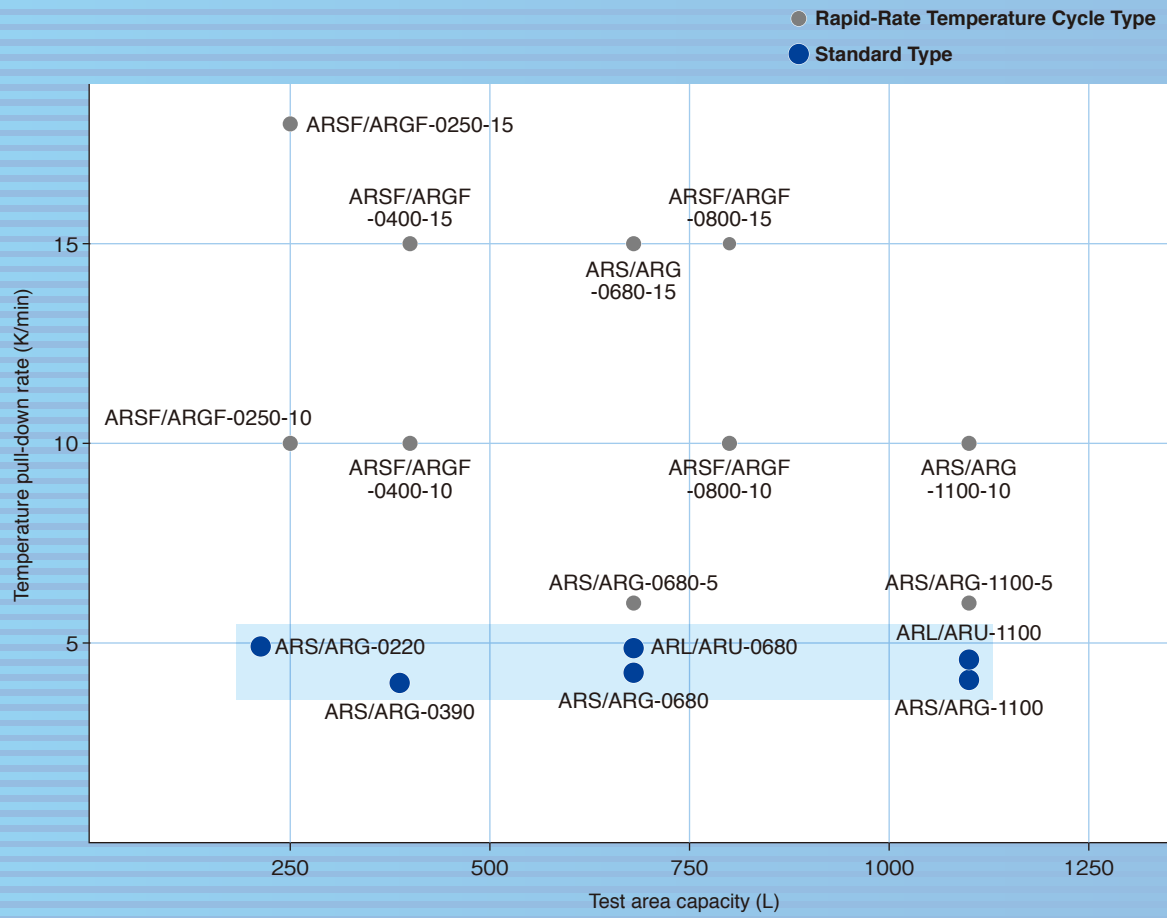
To minimize our chambers potential environmental impact

R-449A is the best alternative to R-404A



*R-449A is available on request

AR series Model lineup



* Temp. rate of change according to IEC 60068-3-5

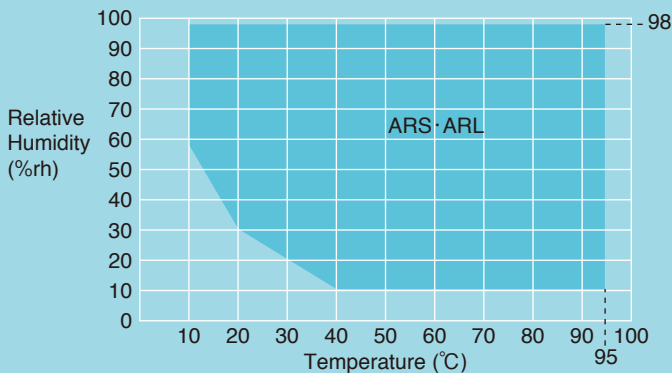
Features

Select from 12 models to meet your test applications



Product images shown may include options.

● Temperature & Humidity Control Range (In environment of ambient temperature of +20°C, no specimen.)



* Continuous operation at or below +40°C is limited because of frost formation on the cooler and dehumidifier.

Model lineup for standard type

Temp. range	Temp. rate of change		Capacity	Model*
	Heat up rate	Pull down rate		
-75 to +180°C	6.0K /min	5.2K /min	220L	ARS/ARG-0220
	5.0K /min	4.0K /min	390L	ARS/ARG-0390
	6.0K /min	4.2K /min	680L	ARS/ARG-0680
	4.7K /min	4.1K /min	1100L	ARS/ARG-1100
-45 to +180°C	6.3K /min	4.8K /min	680L	ARL/ARU-0680
	4.7K /min	4.4K /min	1100L	ARL/ARU-1100

* ARS/ARL : temperature & humidity

* ARG/ARU : temperature only

● Temperature & Humidity Range

Minimum temp.: -45°C/-75°C

Maximum temp.: +180°C

Humid. (ARL/ARS only): 10 to 98%rh

● Temperature Change Rate

Approx. 3K/min, with 50kg of specimen*, -75↔+180°C. (ARS-1100)
This can also be used for acceleration testing.

*Specimen as aluminum, including 12kg of shelf

● Specimen Temperature Control

Attaching a temperature measurement sensor to the specimen enables the temperature of the specimen to be monitored and controlled, which makes tests even more accurate.

● Heat Load up to 4500W

AR series is desirable for testing large heat loads at temperature cycling test and at 85°C/85%rh test. Allowable heat load is different depends on models and operation conditions. (Page 7 to 10)

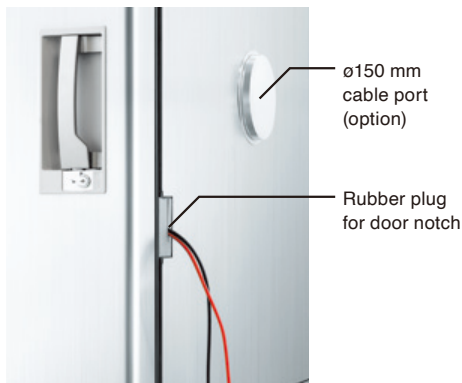
*For your safety, please be sure to connect the power through specimen power supply control terminal.

*Temperature-triggered circuit breaker is available (customized option).

Features

● Easy Access to Specimens

Cable ports are fitted as standard to enable easy access to the inside of the chamber from the left and the right. An even larger $\phi 150$ mm cable port can be selected or added as an option, while a door notch that enables cable wiring to be routed through the door is also available.



Test area(ARL-0680)

● Large Viewing Window

A large window option with test area lamp can be added to the door to observe the test sample. The window is heated to prevent moisture and ice build-up.

Size of Viewing Window
W340xH440mm



Viewing window (option)

● Global Safety Standards

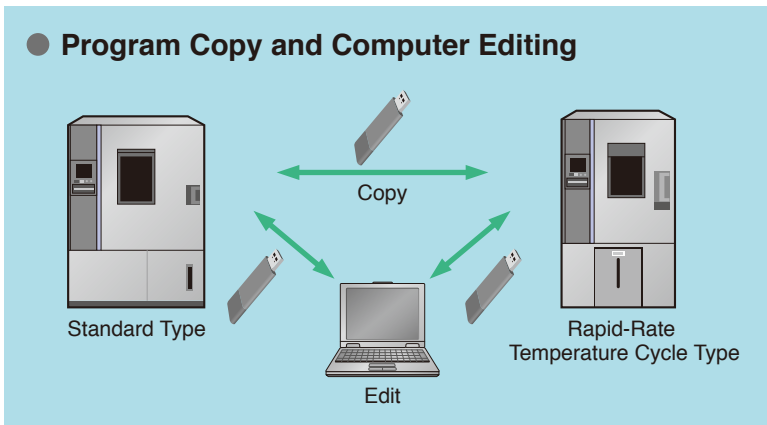
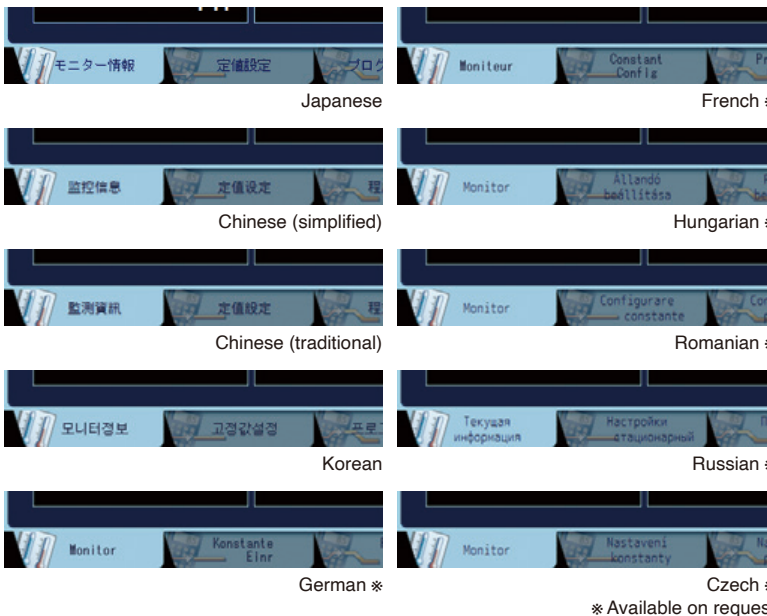
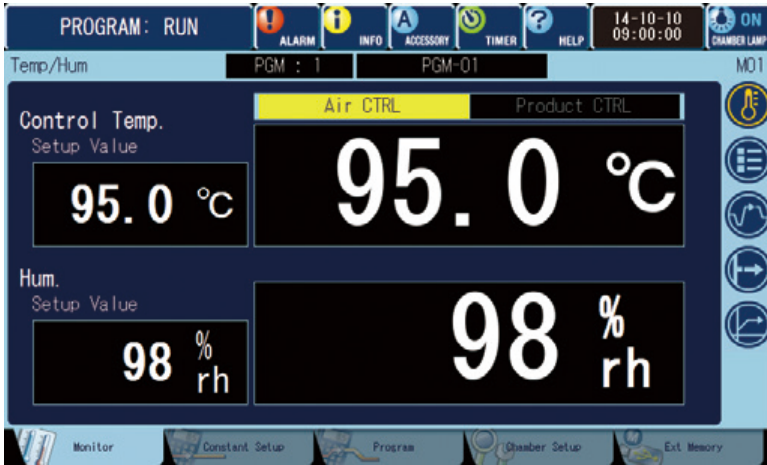
ISO 12100 (Safety of machinery)
IEC 60204-1(Low voltages)
IEC 61000-6-2, IEC 61000-6-4 (EMC)
EN 50581 (RoHS)
Pressure Equipment Directive
CE marking

3 YEAR WARRANTY

● Test Standard Conformance

- IEC 60068-2-1: Cold
- IEC 60068-2-2: Dry heat
- IEC 60068-2-78: Damp heat, steady state
- ISO 16750-4 (5.3): Road vehicles (Temperature cycling)

Controller



* Some items may not be copied between different models and chambers with different options.

● Faster and smoother user interface

The user interface uses tabs for faster access to any screen. The bright and clear 7" color LCD is easy to read.

● Chamber Lamp ON/OFF

The chamber lamp can be switched ON and OFF from all screens.
*Chamber lamp is equipped with viewing window option

● Multilingual Support

The language can be changed with the screen settings (Japanese / English / Chinese (simplified / traditional) / Korean).

● Store up to 40 programs

Program operation: 40 patterns (99 steps per program)
Constant operation: 3 patterns

● Test Data Records

Temperature & humidity settings and measurement values can be recorded on the internal memory and external memories.

● Information Function

The INFO icon will blink when chamber information requiring attention.

• Inspection Period Notifications

It is possible to randomly preset the period and details of inspections for humidifier plates and condenser filters.

● Program Pattern Copying

It is possible to copy program patterns between chambers with the use of USB flash drives without the need for PC operations. (USB flash drives not supplied.)

Chambers Can be Operated from PCs and Tablet Terminals

Remote Monitoring and Control (Ethernet Connection)

The chambers are equipped with unique web applications that enable chamber status to be confirmed and operated from a web browser screen (PC or tablet terminal). It is also possible to start operations with a PC or other device from a remote location.



Image

Editing Test Profiles with a Browser

It is possible to edit the program patterns registered in the testing chamber with a web browser.

Displaying Data in Graphs

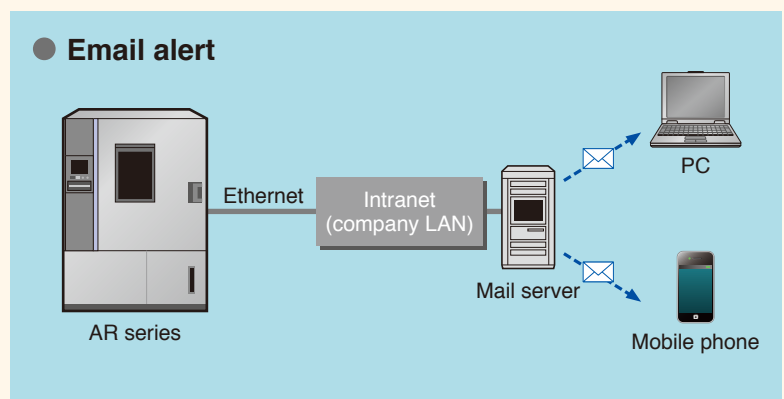
Settings and measurement values saved in the testing chamber can be displayed as graphs on a web browser.

E-mail Notifications

Details on alarms that have been triggered will be sent to pre-registered e-mail addresses. It is also possible to transmit e-mails when testing has finished.

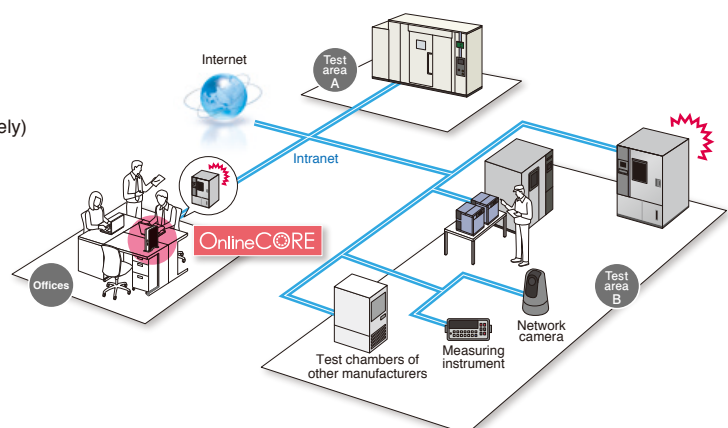
* An Intranet environment is required to transmit e-mails.

Email alert



ESPEC OnlineCore OnlineC^{ORE} (Sold separately)

Central control system recommended for multiple environmental test chambers installations



*Please contact ESPEC for more information, about which products can be connected.

Model		ARS-0220	ARS-0390	ARS-0680	ARS-1100	
System		Balanced Temperature & Humidity Control (BTHC) system				
Temp. performance ^{*1}	Temp. range	-75 to +180°C (-103 to +356°F)				
	Temp. fluctuation	±0.3K				
	Temp. variation in space	3.0K				
	Temp. rate of change ^{*2}	Heat up rate	6.0 K/min	5.0 K/min	6.0 K/min	4.7K/min
		Pull down rate	5.2 K/min	4.0 K/min	4.2 K/min	4.1K/min
	Temperature extremes achievement time	Heat up time	+20 to +180°C			
			Within 35 min.	Within 45 min.	Within 30 min.	Within 40 min.
	Pull down time	+20 to -75°C				
		Within 40 min.	Within 50 min.	Within 50 min.	Within 50 min.	
Allowable heat load		Test area temperature: +20°C				
		3000 W		4500 W		
Temp. & humid. performance ^{*1}	Temp. & humid. range	+10 to +95°C / 10 to 98%rh				
	Humid. fluctuation	±2.5%rh				
	Allowable heat load	Test area conditions: +25 to +95°C /90%rh		Test area conditions: +85°C /85%rh		
350 W		300 W	500 W			
Construction	Exterior material	18 Cr-stainless steel plate (Hairline finish)				
	Test area material	18-8 Cr-Ni Stainless steel plate (BA finish)				
	Heater	Nichrome strip wire heater				
	Humidifier	Sheathed heater				
	Cooler	Plate fin cooler and dehumidifier				
	Water tank capacity	40L				
	Refrigeration unit	System	Mechanical cascade and compression refrigeration system			
		Condenser	Air-cooled condenser			
		Expansion system	Electronic expansion valve			
		Refrigerant	R-404A [R-449A] ^{*3} R-508A		R-404A [R-449A] ^{*3} R-23	
Air circulator	Sirocco fan					
Capacity	220 L	390 L	680 L	1100 L		
Chamber total load resistance	50 kg	80 kg	80 kg	150 kg		
Inside dimensions mm ^{*4}	W700×H800×D400	W700×H800×D700	W850×H1000×D800	W1100×H1000×D1000		
Outside dimensions mm ^{*4}	W900×H1742×D1455	W900×H1742×D1705	W1050×H1955×D1805	W1300×H1955×D2005		
Weight	390 kg	405 kg	615 kg	700 kg		
Utility requirements	Allowable ambient conditions	0 to +40°C (+32 to +104°F) / Up to 75%rh				
	Power supply ^{*5}	200V AC 3 φ 50/60Hz	—	—	63 A	70 A
		220V AC 3 φ 60Hz	38 A	38 A	58 A	64 A
		380V AC 3 φ 50Hz	24 A	24 A	28 A	32 A
	400V AC 3 φ 50Hz ^{*6}	23 A	23 A	27 A	29 A	
Noise level ^{*7}	57 dB	58 dB	62 dB	63 dB		
Exhaust heat quantity kJ/h (kcal/h)	26600 (6357)	26600 (6357)	39600 (9464)	46800 (11185)		

*1: At ambient temperature +20°C, no specimen. Performance shown above conforms to IEC 60068-3-5:2001 and IEC 60068-3-6:2001.

*2: Temperature rate of change in the temperature range excluding ±10% of max/min. temperature.

*3: Available on request

*4: Excluding protrusions.

*5: Power supply voltage fluctuation to be ±10% of rated value.

*6: Conforms to CE marking based on EU directives.

*7: Measurements are to be taken in an anechoic room at a height of 1.2m from the floor and a distance of 1m from the chamber front panel (ISO 1996-1:2003 _ A-weighted sound pressure level).

Model		ARL-0680	ARL-1100	
System		Balanced Temperature & Humidity Control (BTHC) system		
Temp. performance ^{*1}	Temp. range	-45 to +180°C (-49 to +356°F)		
	Temp. fluctuation	±0.3K		
	Temp. variation in space	3.0K		
	Temp. rate of change ^{*2}	Heat up rate	6.3 K/min	4.7 K/min
		Pull down rate	4.8 K/min	4.4 K/min
	Temperature extremes achievement time	Heat up time	+20 to +180°C	
		Pull down time	Within 30 min.	Within 40 min.
Allowable heat load	Test area temperature: +20°C 4500 W			
Temp. & humid. performance ^{*1}	Temp. & humid. range	+10 to +95°C / 10 to 98% rh		
	Humid. fluctuation	±2.5%rh		
	Allowable heat load	Test area conditions: +85°C /85%rh 500 W		
Construction	Exterior material	18 Cr-stainless steel plate (Hairline finish)		
	Test area material	18-8 Cr-Ni Stainless steel plate (BA finish)		
	Heater	Nichrome strip wire heater		
	Humidifier	Sheathed heater		
	Cooler	Plate fin cooler and dehumidifier		
	Water tank capacity	40L		
	Refrigeration unit	System	Mechanical single-stage refrigeration system	
		Condenser	Air-cooled condenser	
		Expansion system	Electronic expansion valve	
		Refrigerant	R-404A [R-449A] ^{*3}	
Air circulator	Sirocco fan			
Capacity	680 L	1100 L		
Chamber total load resistance	80 kg	150 kg		
Inside dimensions mm ^{*4}	W850×H1000×D800	W1100×H1000×D1000		
Outside dimensions mm ^{*4}	W1050×H1955×D1805	W1300×H1955×D2005		
Weight	510 kg	600 kg		
Utility requirements	Allowable ambient conditions	0 to +40°C (+32 to +104°F) / Up to 75%rh		
	Power supply ^{*5}	200V AC 3φ 50/60Hz	53 A	56 A
		220V AC 3φ 60Hz	49 A	52 A
		380V AC 3φ 50Hz	23 A	25 A
		400V AC 3φ 50Hz ^{*6}	22 A	23 A
Noise level ^{*7}	61 dB	62 dB		
Exhaust heat quantity kJ/h (kcal/h)	32400 (7743)	39600 (9464)		

*1: At ambient temperature +20°C, no specimen. Performance shown above conforms to IEC 60068-3-5:2001 and IEC 60068-3-6:2001.

*2: Temperature rate of change in the temperature range excluding ±10% of max/min. temperature.

*3: Available on request

*4: Excluding protrusions.

*5: Power supply voltage fluctuation to be ±10% of rated value.

*6: Conforms to CE marking based on EU directives.

*7: Measurements are to be taken in an anechoic room at a height of 1.2m from the floor and a distance of 1m from the chamber front panel (ISO 1996-1:2003 _ A-weighted sound pressure level).

Model		ARG-0220	ARG-0390	ARG-0680	ARG-1100	
System		Balanced Temperature Control (BTC) system				
Temp. performance *1	Temp. range	-75 to +180°C (-103 to +356°F)				
	Temp. fluctuation	±0.3 K				
	Temp. variation in space	3.0 K				
	Temp. rate of change *2	Heat up rate	6.0 K/min	5.0 K/min	6.0 K/min	4.7K/min
		Pull down rate	5.2 K/min	4.0 K/min	4.2 K/min	4.1K/min
	Temperature extremes achievement time	Heat up time	+20 to +180°C			
			Within 35 min.	Within 45 min.	Within 35 min.	Within 45 min.
	Pull down time	+20 to -75°C				
		Within 40 min.	Within 50 min.	Within 50 min.	Within 50 min.	
Allowable heat load		Test area temperature: +20°C				
		3000 W		4500 W		
Construction	Exterior material	18 Cr-stainless steel plate (Hairline finish)				
	Test area material	18-8 Cr-Ni Stainless steel plate (BA finish)				
	Heater	Nichrome strip wire heater				
	Cooler	Plate fin cooler				
	Refrigeration unit	System	Mechanical cascade refrigeration system			
		Condenser	Air-cooled condenser			
		Expansion system	Electronic expansion valve			
		Refrigerant	R-404A [R-449A] *3 R-508A		R-404A [R-449A] *3 R-23	
Air circulator	Sirocco fan					
Capacity	220 L	390 L	680 L	1100 L		
Chamber total load resistance	50 kg	80 kg	80 kg	150 kg		
Inside dimensions mm *4	W700×H800×D400	W700×H800×D700	W850×H1000×D800	W1100×H1000×D1000		
Outside dimensions mm *3	W900×H1742×D1455	W900×H1742×D1705	W1050×H1955×D1805	W1300×H1955×D2005		
Weight	385 kg	400 kg	615 kg	700 kg		
Utility requirements	Allowable ambient conditions	0 to +40°C (+32 to +104°F) / Up to 75%rh				
	Power supply *5	200V AC 3 φ 50/60Hz	—	—	63 A	70 A
		220V AC 3 φ 60Hz	38 A	38 A	58 A	64 A
		380V AC 3 φ 50Hz	24 A	24 A	28 A	32 A
	400V AC 3 φ 50Hz *6	23 A	23 A	27 A	29 A	
Noise level *7	57 dB	58 dB	62 dB	63 dB		
Exhaust heat quantity kJ/h (kcal/h)	26600 (6357)	26600 (6357)	39600 (9464)	46800 (11185)		

*1: At ambient temperature +20°C, no specimen. Performance shown above conforms to IEC 60068-3-5:2001.

*2: Temperature rate of change in the temperature range excluding ±10% of max/min. temperature.

*3: Available on request

*4: Excluding protrusions.

*5: Power supply voltage fluctuation to be ±10% of rated value.

*6: Conforms to CE marking based on EU directives.

*7: Measurements are to be taken in an anechoic room at a height of 1.2m from the floor and a distance of 1m from the chamber front panel (ISO 1996-1:2003 _ A-weighted sound pressure level).

Model		ARU-0680	ARU-1100	
System		Balanced Temperature Control (BTC) system		
Temp. performance ^{*1}	Temp. range	-45 to +180°C (-49 to +356°F)		
	Temp. fluctuation	±0.3 K		
	Temp. variation in space	3.0 K		
	Temp. rate of change ^{*2}	Heat up rate	6.3 K/min	4.7 K/min
		Pull down rate	4.8 K/min	4.4 K/min
	Temperature extremes achievement time	Heat up time	+20 to +180°C	
		Pull down time	Within 30 min.	Within 40 min.
Allowable heat load	Test area temperature: +20°C 4500 W			
Construction	Exterior material	18 Cr-stainless steel plate (Hairline finish)		
	Test area material	18-8 Cr-Ni Stainless steel plate (BA finish)		
	Heater	Nichrome strip wire heater		
	Cooler	Plate fin cooler		
	Refrigeration unit	System	Mechanical single-stage refrigeration system	
		Condenser	Air-cooled condenser	
		Expansion system	Electronic expansion valve	
		Refrigerant	R-404A [R-449A] ^{*3}	
Air circulator	Sirocco fan			
Capacity	680 L	1100 L		
Chamber total load resistance	80 kg	150 kg		
Inside dimensions mm ^{*4}	W850×H1000×D800	W1100×H1000×D1000		
Outside dimensions mm ^{*4}	W1050×H1955×D1805	W1300×H1955×D2005		
Weight	505 kg	595 kg		
Utility requirements	Allowable ambient conditions	0 to +40°C (+32 to +104°F) / Up to 75%rh		
	Power supply ^{*5}	200V AC 3 φ 50/60Hz	53 A	56 A
		220V AC 3 φ 60Hz	49 A	52 A
		380V AC 3 φ 50Hz	23 A	25 A
400V AC 3 φ 50Hz ^{*6}		22 A	23 A	
Noise level ^{*7}	61 dB	62 dB		
Exhaust heat quantity kJ/h (kcal/h)	32400 (7743)	39600 (9464)		

*1: At ambient temperature +20°C, no specimen. Performance shown above conforms to IEC 60068-3-5:2001.

*2: Temperature rate of change in the temperature range excluding ±10% of max/min. temperature.

*3: Available on request

*4: Excluding protrusions.

*5: Power supply voltage fluctuation to be ±10% of rated value.

*6: Conforms to CE marking based on EU directives.

*7: Measurements are to be taken in an anechoic room at a height of 1.2m from the floor and a distance of 1m from the chamber front panel (ISO 1996-1:2003 _ A-weighted sound pressure level).

Options

Power cable

- 2.5 m
- 5 m
- 10m

* A power cable is not equipped as standard.

Continuous water supply

A water circuit to supply pure water continuously to the chamber.

- Pure water coupling with pressure-reducing valve



Pure water coupling
(with pressure-reducing valve)

	Pure Water Coupling
	With Pressure-Reducing Valve
Water pressure	0.05 to 0.50MPa (Gauge)
Conductivity	0.1 to 10 μ S/cm
Connectable items	Only a steel pipe (or a PVC pipe) can be connected.

* Water supplier shall be connected by the customer.

Water purifier (WS-1)

Use to continuously supply pure water.
Produced water capacity: 12 L/h
(Water temperature: 25 $^{\circ}$ C)
Size: W480 \times H400 \times D280 mm (20kg)



Water leak detection system and dew tray to catch dripping water are also available to detect and prevent water damages.

Viewing window

Used for observation of the specimens inside the chamber.

Dimensions: W340 \times H440 mm



Additional cable port/Door notch

- ϕ 50mm
- ϕ 100mm
- ϕ 150mm
- Door notch H100 \times D50mm

* Each cable port is equipped with a silicone sponge rubber plug.



ϕ 50mm

Door notch

Cable port rubber plug

- ϕ 50mm
- ϕ 100mm
- ϕ 150mm
- With slits ϕ 50mm
- With slits ϕ 100mm
- With slits ϕ 150mm
- Spiral-wrapped plug (5 \times 50 \times 2000mm)
- For door notch



ϕ 50 mm



With slits ϕ 150 mm



Spiral-wrapped type

Shelf/shelf bracket

The same with standard accessory.

Heavy-duty shelf

Used to hold heavy specimens exceeding the load capacity of the standard shelf.

- Load capacity: 50kg

Model	0220	0390	0680
Floor load resistance (kg)	50	80	80
Support strength (kg)	50	80	80
Weight / shelf (kg)	3	4	8

Floor reinforcement

Increase the floor load capacity of test area.

Up to

- 100 kg
- 200 kg
- 300 kg

Computer interface

- RS-485
- GPIB
- RS-232C

Communication cables

- RS-485 5m/ 10m/ 30m
- GPIB 2m/ 4m

Wet bulb wick

Consumable spares for wet bulb wick (standard accessories).

Fine wick FW-5 (24 wicks)

Options

Paperless recorder

A temperature & humidity recorder that utilizes a liquid-crystal display fitted with a touch-panel.

Display: 5.7inch color touch panel

Scan interval: 5 sec. (default)

Internal recording media:

Flash memory 8MB

External recording media:

CF memory card

(Supplies with a 256 MB CF card)

USB flash drive

< Temperature type >

No. of input channel:

Temperature 1

(5 more channels can be turned ON)

< Temperature & humidity type >

No. of input channel:

Temperature 1, Humidity 1

(4 more channels can be turned ON)



Temperature (humidity) recorder

Recording method: Dot

Chart paper: Effective width 100 mm

No. of inputs:

< Temperature & humidity type >

Temperature 5, Humidity 1

-100 to +200°C / 0 to 100%rh

< Temperature type >

Temperature 6

-100 to +200°C

Time signal terminal

Adds additional terminals to the standard time signal terminals.

(Standard : 2 terminals → 10 terminals)

Thermocouple

Attached to specimen to measure specimen temperature.

Thermocouple with a brass ball tip

Thermocouple type T (Copper/Copper-Nickel)

• 2 m

• 4 m

• 6 m

Additional overheat protector

Additional preventive measures can be taken for excessive temperature rise in the chamber, in addition to the standard equipped overheat protector.

Overcool protector

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



Alarm output terminal

If the safety device of the chamber is activated, alarm signal will be sent to remote location through this terminal.

Signal: terminal is closed on abnormal situation

Accessory: plug

Location: in the control board

*The circuit shall be connected by customer.

Status indicator light

Please select lighted or blinking, and requirement of buzzer sound.

No. of levels: 1 Heigh: 214 mm

No. of levels: 2 Heigh: 254 mm

No. of levels: 3 Heigh: 294 mm

No. of levels: 4 Heigh: 334 mm

Emergency stop pushbutton

Stops the chamber immediately.



380V AC, 400V AC spec.

Chamber dew tray

Prevents water leaks from the chamber onto the floor.



Image

Operation manual

- CD
- Booklet

Reports & certificates

- Testing and inspection report
- Test data
- Temperature (& humidity) uniformity measurement
- Calibration report
- Calibration certificate
- Traceability certificate
- Traceability system chart

AR Series Options

Standard type

Options	<input checked="" type="checkbox"/>	ARS/ARL Temperature & humidity chamber				ARG/ARU Temperature chamber			
		0220	0390	0680	1100	0220	0390	0680	1100
Power cable	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Continuous water supply with pressure-reducing valve	<input type="checkbox"/>	●	●	●	●	—	—	—	—
Water purifier WS-1	<input type="checkbox"/>	●	●	●	●	—	—	—	—
Viewing window	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Additional cable port	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Door notch	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Cable port rubber plug	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Shelf/shelf bracket	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Heavy-duty shelf Up to 50kg	<input type="checkbox"/>	●	●	●	standard	●	●	●	standard
Floor reinforcement	<input type="checkbox"/>	—	●	●	●	—	●	●	●
Computer interface	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Communication cables	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Wet bulb wick	<input type="checkbox"/>	●	●	●	●	—	—	—	—
Paperless recorder Portable	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Built-in	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Temperature (humidity) recorder Portable	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Built-in	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Time signal terminal	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Thermocouple	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Additional overheat protector	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Overcool protector	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Alarm output terminal	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Status indicator light	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Emergency stop pushbutton	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Chamber dew tray	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Operation manual	<input type="checkbox"/>	●	●	●	●	●	●	●	●
Reports & certificates	<input type="checkbox"/>	●	●	●	●	●	●	●	●



Safety precautions

- Do not use specimens which are explosive or flammable, or which contain such substances. To do so could be hazardous, as this may lead to fire or explosion.
- Do not place corrosive materials in the chamber. If corrosive substances or liquid is used, the life of the unit may be significantly shortened specifically because of the corrosion of stainless steel, resin and silicone materials.
- Do not use living organisms or items that exceed the allowable heat load as a specimen.
- Be sure to read the operation manual before operation.

Please contact us for non-standard specification.

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