

Quality is more than a word

ESPEC

Environmental Stress Chamber

AR series



Rapid Temperature Changes of 18K/min.

Environmental stress chambers that carve a path into the future of environmental testing. The pursuit of reliability requires speed in providing results within limited periods of time and the accurate reproduction of environments.

This chamber series support heat load from specimens, and provide superior levels of temperature change performance and wide temperature & humidity control range.

The lineup consists of twenty chambers that can be selected in accordance with temperature & humidity range, inside capacity and temperature change rate.

Temperature change rate is between 4K/minute and 18K/minute, which conforms to IEC standards and test standards for automotive parts.

The processing speed of the new instrumentation has been greatly improved, and connecting the chambers to an Ethernet enables the operation status to be monitored and managed remotely from your desk.

Contains all areas of performance demanded by constant temperature & humidity chambers.

Contents

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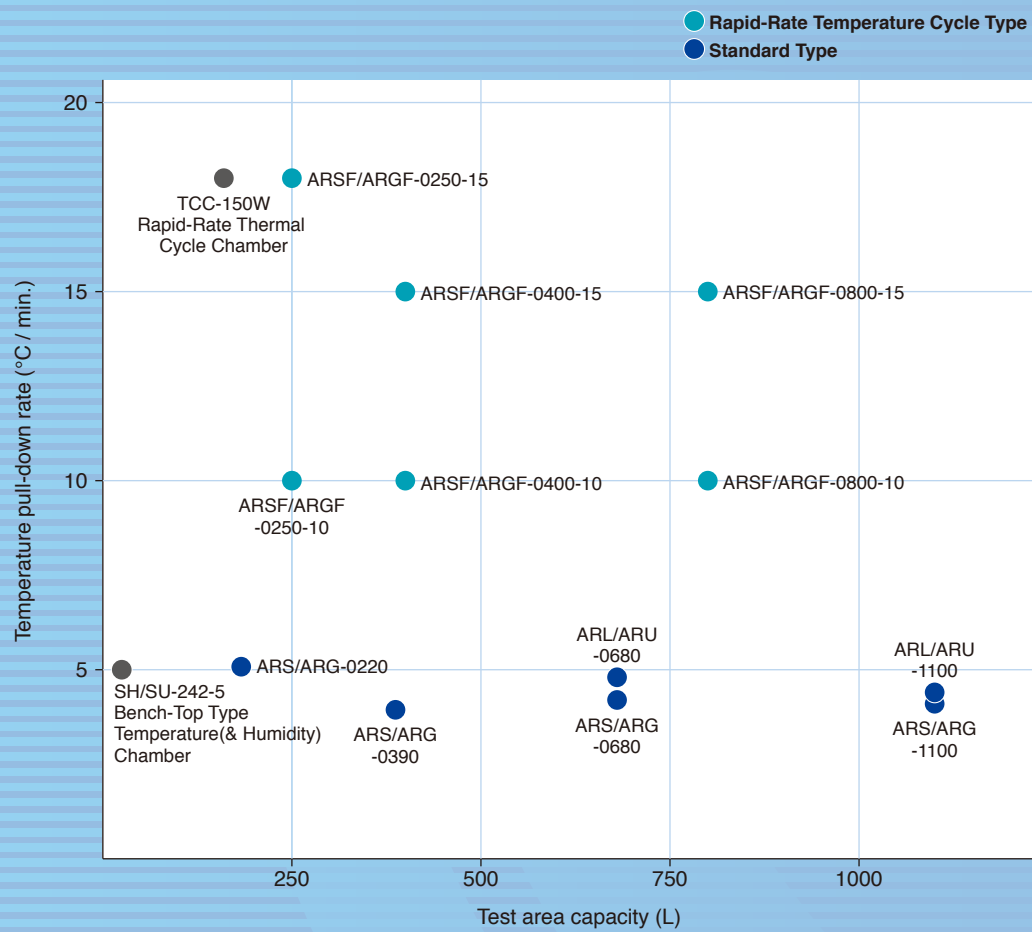


ARSF-0250-15

ARSF-0400-15

ARSF-0800-15

Model Lineup Boasting Superior Temperature Change Performance



Features

ARSF·ARGF

Rapid-Rate Temperature Cycle Type

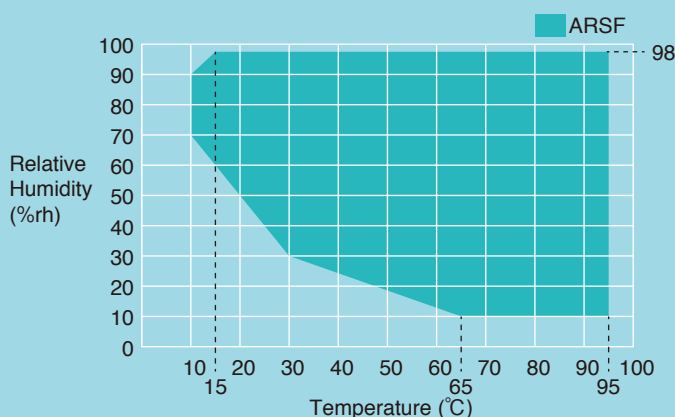


Temperature Change Rate

Capacity	249L		398L		784L	
Temp. range	-45⇔+155°C					
Heat up	10K/min.	18K/min.	10K/min.	15K/min.	10K/min.	15K/min.
Pull down	10K/min.	18K/min.	10K/min.	15K/min.	10K/min.	15K/min.

* ARSF: temperature & humidity, ARGF: temperature only

● Temperature & Humidity Control Range (In environment of ambient temperature of +23°C, no specimen.)



* Totally frost free, no limitation of continuous operation.

● Temperature & Humidity Range

Minimum temp.: -70°C
Maximum temp.: +180°C
Humid. (ARSF only): 10 to 98%rh

● Temperature Change Rate

Three variations: 10K/min., 15K/min. and 18K/min. between -45°C ⇔ +155°C. Perfect for tests in conformance with IEC and other official standards, as well as automotive part standards.

● Totally Frost-Free (ARSF)

Frosting will not appear on any part of the unit despite the temperature & humidity control range of range from 10 to 98%rh. Eradicating the need to remove frosting provides stable and continuous operations.

● Heat Load up to 9000W

Allowable heat load is different depends on models and operation conditions. (Page 6 to 7)

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

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

● High-Accuracy Temperature & Humidity Control

Temperature and humidity is stable as well as during constant operation as during gradient operation. This provides peace of mind during temperature & humidity cycle testing.

● Energy-Saving with Dual PID Control

Dual PID Control (Proportional-Integral-Differential: control that enables the segmentation of refrigeration capacity) mostly controls only the refrigerator at 0°C or lower, thereby saving energy.

● Specimen Temperature Control (Option)

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.

● Easy Access to Specimens

Equipped with ø50mm cable ports on both right & left sides as standard. 100mm, 150mm or ports with other diameters can also be added or modified on an optional basis, and it is also possible to arrange for door notches in order to enable specimen cables or other apparatus to be installed within the chamber.



Inside of the ARSF-0800 chamber

● Viewing Windows as Standard

Equipped with viewing windows as standard, and chamber lamp (LED lamps) provide greater visibility.

Size of Viewing Window

ARSF/ARGF-0250/0400: W180×H260mm
ARSF/ARGF-0800: W295×H380mm



Viewing window

● Drawer-type Water Tank

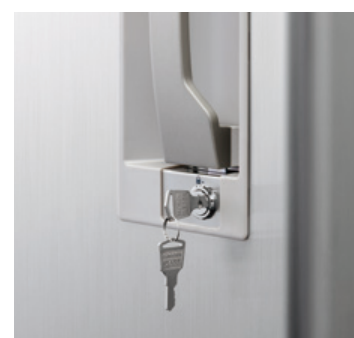
A large-capacity water tank is located on the front of the chamber. Water can also be supplied directly from a water purifier on an optional basis.

● Door Locks

Locks have been fitted on the doors for convenience in order to prevent the door from opening during testing and to ensure careful management of specimens and tests.



Water tank



Key

● Global Safety Standards

ISO12100 (Safety of machinery)
ISO14121 (Risk assessment)
IEC61000-6-2, IEC61000-6-4 (EMC)
EN50581 (RoHS)
CE marking (For marked models & power voltage, see page 6 to 7.)

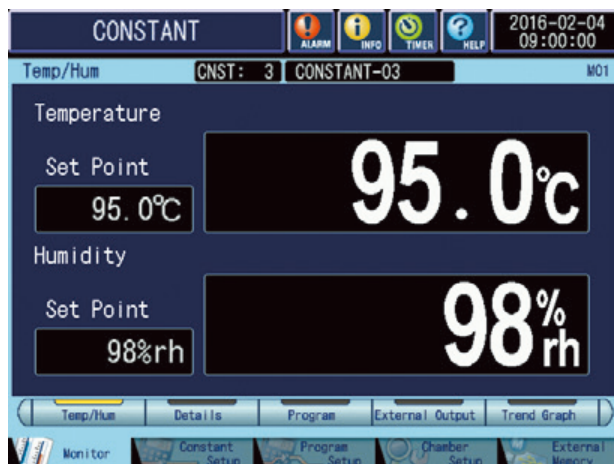
● Test Standard Conformance

- IEC 60068-2-1: Cold
- IEC 60068-2-2: Dry heat
- IEC 60068-2-14: Change of temperature with specified rate of change
- IEC 60068-2-30: Damp heat, cyclic
- IEC 60068-2-38: Composite temperature/humidity cyclic test
- IEC 60068-2-78: Damp heat, steady state
- IEC 61747 (5.2.7): Liquid crystal and solid-state display devices
- Environmental, endurance and mechanical test
- ISO 16750-4 (5.3): Road vehicles (Temperature cycling)

Controller

ARSF-ARGF

N instrumentation P-300



Color LCD Touch Panel

A 6.5-inch wide color LCD fitted with LED backlight. Tabs are displayed at the bottom of the screen to facilitate access to other screens.

Multilingual Support

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

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.

• Inspection Notifications

When the monitoring value goes over the threshold, this notifications encourage inspection.

Monitor objects:

compressor amperage & condenser cooling-water temperature.

Information	Help / Action
Refrig-1 Inspection	Current value is higher-than-normal. Call for service if the same ALM recurs.
Refrig-2 Inspection	Current value is higher-than-normal. Call for service if the same ALM recurs.
INSPECT CONDENSER	Condenser outlet temp is high. Inspect the strainer and condenser.

At the bottom, there are buttons for 'INFORMATION', 'ACCESSORY', and 'CLOSE'.

Information



USB flash drive port

Registering Test Patterns

Program operation: 40 patterns (99 steps per program)

Constant operation: 3 patterns

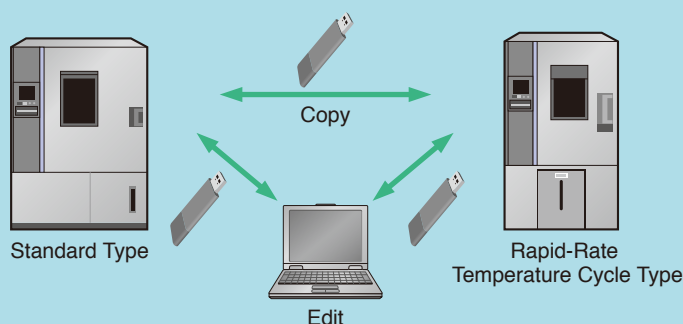
Test Data Records

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

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.)

Program Copy and Computer Editing



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

Model			ARSF-0250-10	ARSF-0250-15	ARSF-0400-10	ARSF-0400-15	ARSF-0800-10	ARSF-0800-15
System			Balanced Temperature & Humidity Control (BTHC) system					
Temp. performance *1	Temperature range		-70 to +180°C					
	Temperature fluctuation		±0.3K					
	Temperature variation in space		-70 to +150°C: 1.5K, +150.1 to +180°C: 2.0K					
	Temp. rate of change	Heat up rate	10K/min.	18K/min.	10K/min.	15K/min.	10K/min.	15K/min.
		Pull down rate	10K/min.	18K/min.	10K/min.	15K/min.	10K/min.	15K/min.
	Temperature extremes achievement time	Heat up time	+20°C to +180°C					
			20 min.	15 min.	20 min.	15 min.	20 min.	15 min.
		Pull down time	+20°C to -70°C					
		20 min.	15 min.	20 min.	15 min.	20 min.	15 min.	
Allowable heat load *2		6000W						9000W
Temp. & humid. performance *1	Temp. & humid. range		+10 to 95°C/ 10 to 98%rh					
	Humid. fluctuation		±2.5%rh					
	Max. allowable heat load		350W (Test area conditions: +25 to 95°C/ 90%rh)					550W (Test area conditions: +25 to 95°C/ 90%rh)
Exterior material			Stainless steel plate: 18 Cr stainless steel plate, hairline finish					
Test area material			Stainless steel plate: 18-8 Cr-Ni stainless steel plate, 2B polish					
Heater			Nichrome strip wire heater					
Humidifier			Sheathed heater					
Cooler / Dehumidifier			Plate fin cooler					
Refrigerator	System		Mechanical cascade refrigeration					
	Compressor		Scroll-type					
			4.47kWx4.47kW	5.59kWx5.59kW	4.47kWx4.47kW	5.59kWx5.59kW		9.69kWx9.69kW
	Condenser		Water-cooled condenser					
	Expansion system		Electronic expansion valve					
Refrigerant			R404A/R508A					
Capacity			249L		398L		784L	
Chamber total load capacity			100kg (shelf support pole: 90kg, floor: 70kg)					
Inside dimensions mm *3			600×830×500		600×830×800		1000×980×800	
Outside dimensions mm *3			800×1703×1900		800×1703×2200		1200×1853×2200	
Weight			725kg	730kg	750kg	755kg	910kg	1000kg
Equipment			Drain hose, 50mm cable port (x2, one on the right & left sides), chamber lamp, casters x4 (with leveling feet), time signal terminal x2, specimen power supply control terminal, Ethernet port (LAN port), USB memory port, viewing window (effective view 0250,0480: W180×H260(mm) 0800: W295×H380(mm))					
Accessories *4			Shelves (18Cr-8Ni stainless steel), shelf brackets (18Cr-8Ni stainless steel), key (x2 For door), cable port rubber plug (φ 50mm x2), breaker handle stopper , wet bulb wick, cartridge fuse (7A x3, 3A x1), Operation manual					
Utility requirements	Ambient conditions		0 to +40°C (+32 to +104°F) / 75%rh max.					
	Power supply (selectable)	200V AC 3φ50/60Hz	60A	78A	60A	78A	86A	126A
		220V AC 3φ60Hz *5	58A	76A	58A	76A	83A	122A
		380V AC 3φ50Hz *5	27A	34A	27A	34A	36A	53A
		400V AC 3φ50Hz *5	27A	34A	27A	34A	36A	52A
Noise level *6			65dB					

*1: The performance values are based on IEC60068-3-5:2001 and IEC60068-3-6:2001; Performance figures are given for a +23°C, ambient temperature relative humidity of 65±20%rh, rated voltage, and no specimen inside the test area.

*2: Test area temperature: +20°C

*3: Dimensions do not include protrusions.

*4: Power cable is not included.

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

*6: Measured in anechoic room. Measurement points set 1m apart from the front of the chamber, and 1.2m above the floor (in compliance with JIS-Z-8731:1999 A-weighted sound pressure level).

ARGF

-70~+180°C

TEMPERATURE CHAMBER

Model			ARGF-0250-10	ARGF-0250-15	ARGF-0400-10	ARGF-0400-15	ARGF-0800-10	ARGF-0800-15
System			Balanced Temperature Control system (BTC) system					
Temperature Performance *1	Temperature range		-70 to +180°C					
	Temperature fluctuation		±0.3K					
	Temperature variation in space		-70 to +150°C: 1.5K, +150.1 to +180°C: 2.0K					
	Temp. rate of change	Heat up rate	10K/ min.	18K/ min.	10K/ min.	15K/ min.	10K/ min.	15K/ min.
		Pull down rate	10K/ min.	18K/ min.	10K/ min.	15K/ min.	10K/ min.	15K/ min.
	Temperature extremes achievement time	Heat up time	+20°C to +180°C					
			20 min.	15 min.	20 min.	15 min.	20 min.	15 min.
		Pull down time	+20°C to -70°C					
20 min.	15 min.		20 min.	15 min.	20 min.	15 min.		
Allowable heat load *2			6000W					9000W
Exterior material			Stainless steel plate: 18 Cr stainless steel plate, hairline finish					
Test area material			Stainless steel plate: 18-8 Cr-Ni stainless steel plate, 2B polish					
Heater			Nichrome strip wire heater					
Cooler			Plate fin cooler					
Refrigerator	System		Mechanical cascade refrigeration					
	Compressor		Scroll-type					
			4.47kWx4.47kW	5.59kWx5.59kW	4.47kWx4.47kW	5.59kWx5.59kW		9.69kWx9.69kW
	Condenser		Water-cooled condenser					
	Expansion system		Electronic expansion valve					
Refrigerant			R404A/R508A					
Capacity			249L		398L		784L	
Chamber total load capacity			100kg (shelf support pole: 90kg, floor: 70kg)					
Inside dimensions mm *3			600x830x500		600x830x800		1000x980x800	
Outside dimensions mm *3			800x1703x1900		800x1703x2200		1200x1853x2200	
Weight			715kg	720kg	740kg	745kg	900kg	990kg
Equipment			Drain hose, cable port (I.D. φ50 mm on the left/right side), chamber lamp, casters x4 (with leveling feet), time signal terminal x2, specimen power supply control terminal, Ethernet port (LAN port), USB memory port, viewing window (effective view 0250,0480: W180xH260(mm) 0800: W295xH380(mm))					
Accessories *4			Shelves (18Cr-8Ni stainless steel), shelf brackets (18Cr-8Ni stainless steel), key (x2 For door), cable port rubber plug (φ50mm x2), breaker handle stopper , wet bulb wick, cartridge fuse (7A x3, 3A x1), Operation manual					
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Noise level *6			65dB					

^{*1}: The performance values are based on IEC60068-3-5:2001 and IEC60068-3-6:2001; Performance figures are given for a +23°C, ambient temperature relative humidity of 65±20%rh, rated voltage, and no specimen inside the test area.

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^{*3}: Dimensions do not include protrusions.

^{*4}: Power cable is not included.

^{*5}: Conforms to CE marking based on EU directives.

^{*6}: Measured in anechoic room. Measurement points set 1m apart from the front of the chamber, and 1.2m above the floor (in compliance with JIS-Z-8731:1999 A-weighted sound pressure level).

Options

Power cable

- 2.5 m
- 5 m
- 10m
- * Not mounted 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 without pressure-reducing valve



Pure water coupling
(with pressure-reducing valve)

	Pure Water Coupling	
	With Pressure-Reducing Valve	Without Pressure-Reducing Valve
Water pressure	0.05 to 0.50MPa (Gauge)	0.03MPa (Gauge)
Flow rate	1.3 L/minute or more	
Conductivity	0.1 to 10μS/cm	
Location	Lower left rear side	Upper left rear side
Connectable items	Only a steel pipe (or a PVC pipe) can be connected.	Only a hose can be connected.

* Water supplier shall be connected by the customer.

Water purifier (WS-1)

Removes all impurities and constantly creates pure water suitable for humidifying purposes.

Conductivity: 10μS/cm or less

Water production capacity: 12 L/h

(Water temperature: 25°C)

Size: W400×H400×D280mm



Water leak detection system and dew tray (P.10) to catch dripping water are also available to detect and prevent water damages.

Water tank

For supplying water to the chamber's fixed tank.

- Tank with screw tap (stand included)
Capacity: 10 L×3
Stand size: W600×H920×D348 mm
- Tank with nozzle
Capacity: 10 L×1



Tank with screw tap
(stand included)



Tank with nozzle

Specimen basket

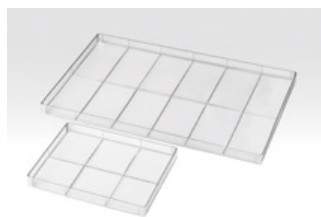
For small specimens that cannot be placed directly on the shelf.

Material: Stainless steel (4 mesh)

- Large
Dimensions: W750×H35×D450 mm
Load capacity: 5 kg (equally distributed load)
Baskets per shelf: Type 0250: 0
Type 0400: 1
Type 0800: 2
- Small
Dimensions: W350×H35×D270 mm
Load capacity: 3 kg (equally distributed load)
Baskets per shelf: Type 0250: 2
Type 0400: 4
Type 0800: 6

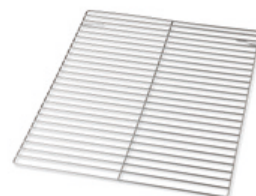
* Do not use when exceeding the shelf load capacity.

* Performance may not satisfy guaranteed values if the air flow is blocked, so please be sure to have sufficient space around the specimen baskets.



Shelf, shelf bracket

The same with standard accessory.



Model	0250	0400	0800
Shelf size (mm)	W567 D450	W567 D750	W967 D750
Shelf weight	1.4kg	2.2kg	6.6kg
Shelf load capacity (evenly distributed load)	10kg	10kg	30kg
Load capacity of shelf support pole*	90kg		

* Including shelf weight

Heavy-duty shelf

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

- Load capacity: 30kg
(Shelf support pole capacity: 90kg)
* The shelves fitted to the 0800 model as standard components have a load capacity of 30kg.
- Load capacity: 50kg
(Shelf support pole capacity: 100kg)

If heavy specimens are to be placed on the floor of the inner chamber in combination with this, please order the reinforcement of inner chamber's floor, too. chamber floor.

- up to 200kg
- up to 300kg
(Standard spec.: up to 100kg)

Floor reinforcement

Increase the floor load capacity of the inner chamber.

- 100 kg
- 200 kg
- 300 kg

Standard specification: 70 kg

Options

Additional cable port/Door notch

- ø50mm
- ø100mm
- ø150mm
- Flat cable port
- Door notch H100×D50mm



Cable port

Cable port rubber plug

Prevents air leakage from the cable port

- ø50mm
- ø100mm
- ø150mm
- Spiral-wrapped plug (5×50×2000mm)
- For the flat cable port
- For door notch



ø50 mm



Spiral-wrapped type



Flat cable port

Door without viewing window

Plain door ideal to test specimens affected by light.

* There is no lamp installed in the test area with this option.

Interface

Computer interface

- RS-485
- GPIB
- RS-232C

Communication cables

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

Specimen temperature control

Sensors are attached to the specimen to allow exposure tests that provide accurate temperature stress to the specimen.

- Insulated type
- Non-insulated type



Paperless recorder-portable type

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)



Recorder output terminal

- Temperature, humidity, and heater output *ARSF only

This terminals output the temperature and relative humidity in the test area.



- Dry bulb temperature *ARGF only
- Terminal board for dry-bulb sensors in the chamber.



Options

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



Power meter

This option displays the integral power consumption of the chamber.

Display range: 0 to 9999.99 kWh

External memory: SD memory card

Location: Instrumentation panel

* The SD memory card is not supplied.

Wet bulb wick

Fine wick of the same kind as the accessories.

FW-5 (24 wicks)



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.

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.



Status indicator light

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

No. of levels: 3

No. of light color: 3 (red, yellow, & green)

Height: 616 mm

Pole height: 287 mm



Rotating signal light

The rotating signal lights up when an error occurs.

Color of the signal:

- Red
- Yellow



Trouble buzzer

Buzzer notification when an error occurs.

Emergency stop pushbutton

Stops the chamber immediately.



With guard

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

Features

ARS·ARL·ARG·ARU

Standard Type



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 (Standard)

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

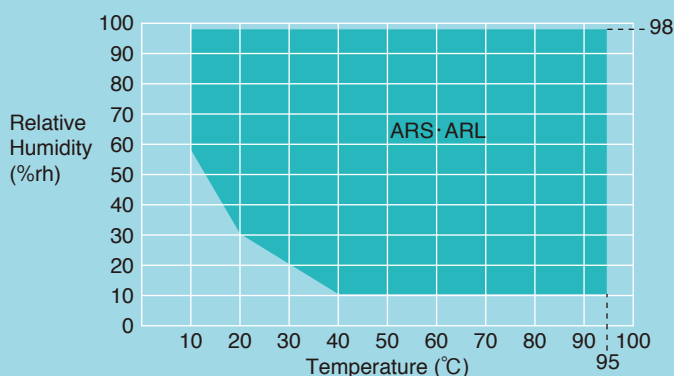
Allowable heat load is different depends on models and operation conditions.
(Page 14 to 17)

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

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

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.

Temperature Change Rate

Capacity	220L	390L	680L	1100L	680L	1100L
Temp. range	-49.5⇔+154.5°C				-22.5⇔+157.5°C	
Heat up	6.0K/min.	5.0K/min.	6.0K/min.	4.7K/min.	6.3K/min.	4.7K/min.
Pull down	5.2K/min.	4.0K/min.	4.2K/min.	4.1K/min.	4.8K/min.	4.4K/min.

* In environment of ambient temperature of +20°C, no specimen.

Features

ARS·ARL·ARG·ARU

● **ø100mm Cable Ports on Both Sides**

ø100mm cable ports are fitted as standard to enable easy access to the inside of the chamber from the left and the right.

● **Large Viewing Window (Option)**

Equipped as standard. The chamber lamp (halogen lamp) facilitates visibility within the chamber.

Size of Viewing Window

W340×H440mm

● **Water Supply System**

The back of the chamber is fitted with a water suction port connected directly to the pure water, and the front of the chamber is fitted with a water tank.

● **Door Locks**

Locks have been fitted on the doors for convenience in order to prevent the door from opening during testing and to ensure careful management of specimens and tests.

● **International Test Standards**

Conforms to IEC60068-2, ISO16750-4 (5.3) and other representative environmental testing standards. (Test standard list below)

● **Global Safety Standards**

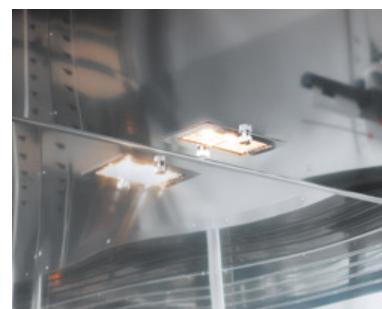
ISO12100 (Safety of machinery)
ISO14121 (Risk assessment)
IEC61000-6-2, IEC61000-6-4 (EMC)
EN50581 (RoHS)
CE marking (For marked models & power voltage, see page 14 to 17.)



Cable ports on both sides



Viewing window (option)



Chamber lamp



Water tank



Key

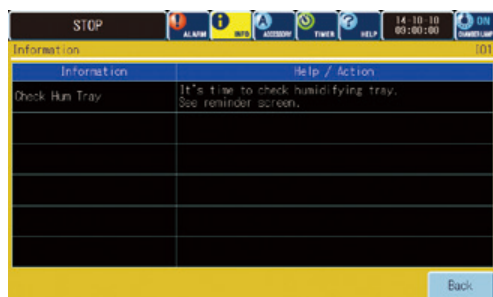
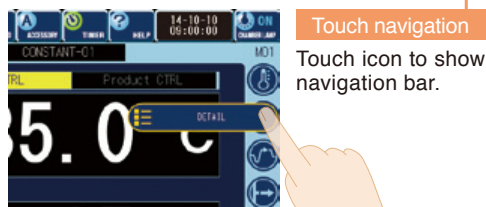
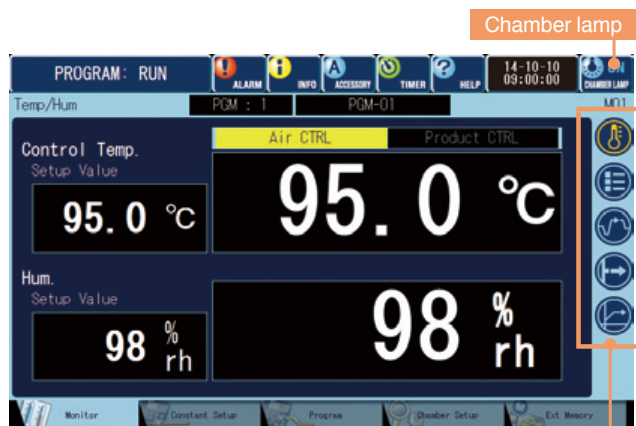
● **Test Standard Conformance**

- IEC 60068-2-1: Cold
- IEC 60068-2-2: Dry heat
- IEC 60068-2-14: Change of temperature with specified rate of change
- IEC 60068-2-38: Composite temperature/humidity cyclic test
- IEC 60068-2-78: Damp heat, steady state
- ISO 16750-4 (5.3): Road vehicles (Temperature cycling)

Controller

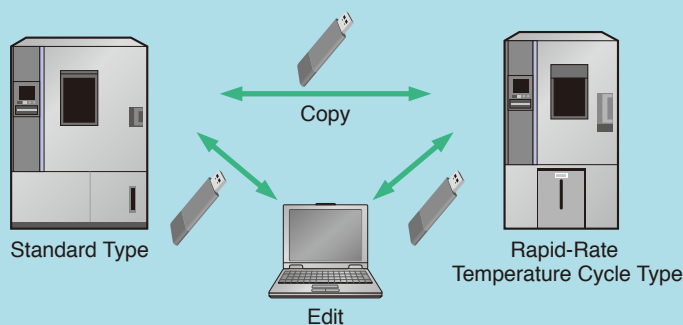
ARS·ARL·ARG·ARU

N instrumentation P-310



Information

● Program Copy and Computer Editing



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

● Color LCD Touch Panel

A 7-inch wide color LCD fitted with LED backlight. Tabs are displayed at the bottom of the screen to help access to other screens.

● Chamber Lamp ON/OFF

The chamber lamp can be switched ON and OFF from all screens.

● Multilingual Support

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

● 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.

● Registering Test Patterns

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.

● 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.)

Model			ARL-0680		ARL-1100	
System			Balanced Temperature & Humidity Control (BTHC) system			
Temp. performance *1	Temp. range		− 45 to +180℃ (− 49 to +356℉)			
	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℃			
			Within 30 min.		Within 40 min.	
		Pull down time	+20 to − 45℃			
	Within 50 min.		Within 50 min.			
Temp. & humid. performance *1	Max. allowable heat load		4500 W Test area temperature: +20℃			
	Temp. & humid. range		+10 to +95℃ / 10 to 98% rh			
	Humid. fluctuation		±2.5%rh			
	Max. allowable heat load		500 W Test area conditions: +85℃ /85%rh			
Construction	Exterior material		18 Cr-stainless steel plate (Hairline finish)			
	Test area material		18-8 Cr-Ni Stainless steel plate (BA finish)			
	Insulation		Foamed phenol, glass wool			
	Heater		Nichrome strip wire heater (3 kW×2)			
	Humidifier		Sheathed heater			
	Cooler		Plate fin cooler and dehumidifier			
	Refrigeration unit	System	Mechanical single-stage refrigeration system			
		Compressor	Scroll-type			
			3.0 kw	3.75 kw		
		Expansion system		Electronic expansion valve		
	Refrigerant		R404A			
	Air circulator		Sirocco fan			
Capacity			680 L		1100 L	
Chamber total load resistance			80 kg		150 kg	
Inside dimensions mm (inch) *3			W850×H1000×D800 (W33.5×H39.4×D31.5)		W1100×H1000×D1000 (W43.3×H39.4×D39.4)	
Outside dimensions mm (inch) *3			W1050×H1955×D1805 (W41.3×H77.0×D71.1)		W1300×H1955×D2005 (W51.2×H77.0×D78.9)	
Weight			510 kg		600 kg	
Equipment			100mm cable port (x2, one on the right & left sides), specimen power supply control terminal, condenser filter, specimen temperature input terminal, time signal (×2), casters with levelling feet (×4)			
Accessories *4			Cable port rubber plug (φ100mm×2), Shelf brackets (18-8 Cr-Ni stainless steel), Shelf (18-8 Cr-Ni stainless steel), Door key (×2 For door), Cartridge fuse (250V 0.4A, 5A, 8A), Wet-bulb wick (ARL, ARS), Specimen temperature measuring thermocouple (type T, 3m), Specimen temperature input connector, Operation manual			
Utility requirements	Allowable ambient conditions		0 to +40℃ (+32 to +104℉) / 75%rh max.			
	Power supply *5	200V AC 3φ50/60Hz	53 A		56 A	
		220V AC 3φ60Hz	49 A		52 A	
		380V AC 3φ50Hz	23 A		25 A	
		400V AC 3φ50Hz *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: Excluding protrusions.

*4: Power cable is not included.

*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).

ARS

–75 to +180°C • 10 to 98%rh
TEMPERATURE & HUMIDITY CHAMBER

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.				
Max. 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								
	Max. 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)								
	Insulation		Foamed phenol, glass wool								
	Heater		Nichrome strip wire heater								
				(1.75 kW×2)				(3 kW×2)			
	Humidifier		Sheathed heater								
	Cooler		Plate fin cooler and dehumidifier								
	Refrigeration unit	System		Mechanical cascade and compression refrigeration system							
		Compressor	Rotary-type					Scroll-type			
			Unit 1: 2.2 kw ×1, Unit 2: 2.2 kw ×1					Unit 1: 3.0 kw ×1, Unit 2: 3.0 kw ×1		Unit 1: 3.75 kw ×1, Unit 2: 3.75 kw ×1	
		Expansion system		Electronic expansion valve							
Refrigerant		R404A, R508A				R404A, R23					
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 (inch) ^{*3}			W700×H800×D400 (W27.6×H31.5×D15.8)		W700×H800×D700 (W27.6×H31.5×D27.6)		W850×H1000×D800 (W33.5×H39.4×D31.5)		W1100×H1000×D1000 (W43.3×H39.4×D39.4)		
Outside dimensions mm (inch) ^{*3}			W900×H1742×D1455 (W35.4×H68.6×D57.3)		W900×H1742×D1705 (W35.4×H68.6×D67.1)		W1050×H1955×D1805 (W41.3×H77.0×D71.1)		W1300×H1955×D2005 (W51.2×H77.0×D78.9)		
Weight			390 kg		405 kg		615 kg		700 kg		
Equipment			100mm cable port (x2, one on the right & left sides), specimen power supply control terminal, condenser filter, specimen temperature input terminal, time signal (x2), casters with levelling feet (x4)								
Accessories ^{*4}			Cable port rubber plug (φ100mm×2), Shelf brackets (18-8 Cr-Ni stainless steel), Shelf (18-8 Cr-Ni stainless steel), Door key (x2 For door), Cartridge fuse (250V 0.4A, 5A, 8A), Wet-bulb wick (ARL, ARS), Specimen temperature measuring thermocouple (type T, 3m), Specimen temperature input connector, Operation manual								
Utility requirements	Allowable ambient conditions		0 to +40°C (+32 to +104°F) / 75%rh max.								
	Power supply ^{*5}	200V AC 3φ50/60Hz	————		————		63 A		70 A		
		220V AC 3φ60Hz	38 A		38 A		58 A		64 A		
		380V AC 3φ50Hz	24 A		24 A		28 A		32 A		
		400V AC 3φ50Hz ^{*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}: Excluding protrusions.

^{*4}: Power cable is not included.

^{*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			
			Within 30 min.		Within 40 min.	
		Pull down time	+20 to −45°C			
			Within 50 min.		Within 50 min.	
Max. allowable heat load		4500 W Test area temperature: +20°C				
Construction	Exterior material		18 Cr-stainless steel plate (Hairline finish)			
	Test area material		18-8 Cr-Ni Stainless steel plate (BA finish)			
	Insulation		Foamed phenol, glass wool			
	Heater		Nichrome strip wire heater (3kW ×2)			
	Cooler		Plate fin cooler			
	Refrigeration unit	System	Mechanical single-stage refrigeration system			
		Compressor	Scroll-type			
			3.0 kw	3.75 kw		
	Refrigeration unit	Expansion system	Electronic expansion valve			
	Refrigeration unit	Refrigerant	R404A			
Air circulator		Sirocco fan				
Capacity			680 L		1100 L	
Chamber total load resistance			80 kg		150 kg	
Inside dimensions mm (inch) *3			W850×H1000×D800 (W33.5×H39.4×D31.5)		W1100×H1000×D1000 (W43.3×H39.4×D39.4)	
Outside dimensions mm (inch) *3			W1050×H1955×D1805 (W41.3×H77.0×D71.1)		W1300×H1955×D2005 (W51.2×H77.0×D78.9)	
Weight			505 kg		595 kg	
Equipment			100mm cable port (x2, one on the right & left sides), specimen power supply control terminal, condenser filter, specimen temperature input terminal, time signal (x2), casters with levelling feet (x4)			
Accessories *4			Cable port rubber plug (φ100mm×2), Shelf brackets (18-8 Cr-Ni stainless steel), Shelf (18-8 Cr-Ni stainless steel), Door key (x2 For door), Cartridge fuse (250V 0.4A, 5A, 8A), Wet-bulb wick (ARL, ARS), Specimen temperature measuring thermocouple (type T, 3m), Specimen temperature input connector, Operation manual			
Utility requirements	Allowable ambient conditions		0 to +40°C (+32 to +104°F) / 75%rh max.			
	Power supply *5	200V AC 3φ50/60Hz	53 A		56 A	
		220V AC 3φ60Hz	49 A		52 A	
		380V AC 3φ50Hz	23 A		25 A	
		400V AC 3φ50Hz *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: Excluding protrusions.

*4: Power cable is not included.

*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).

ARG**–75 to +180°C****TEMPERATURE CHAMBER**

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.		
	Max. 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)					
	Insulation		Foamed phenol, glass wool					
	Heater		Nichrome strip wire heater					
			(1.75 kW×2)		(3 kW×2)			
	Cooler		Plate fin cooler					
	Refrigeration unit	System	Mechanical cascade refrigeration system					
		Compressor	Scroll-type					
			Unit 1: 2.2 kw ×1, Unit 2: 2.2 kw ×1		Unit 1: 3.0 kw ×1, Unit 2: 3.0 kw ×1		Unit 1: 3.75 kw ×1, Unit 2: 3.75 kw ×1	
			Expansion system		Electronic expansion valve			
Refrigerant		R404A, R508A		R404A, R23				
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 (inch) *3			W700×H800×D400 (W27.6×H31.5×D15.8)	W700×H800×D700 (W27.6×H31.5×D27.6)	W850×H1000×D800 (W33.5×H39.4×D31.5)	W1100×H1000×D1000 (W43.3×H39.4×D39.4)		
Outside dimensions mm (inch) *3			W900×H1742×D1455 (W35.4×H68.6×D57.3)	W900×H1742×D1705 (W35.4×H68.6×D67.1)	W1050×H1955×D1805 (W41.3×H77.0×D71.1)	W1300×H1955×D2005 (W51.2×H77.0×D78.9)		
Weight			385 kg	400 kg	615 kg	700 kg		
Equipment			100mm cable port (x2, one on the right & left sides), specimen power supply control terminal, condenser filter, specimen temperature input terminal, time signal (×2), casters with levelling feet (×4)					
Accessories *4			Cable port rubber plug (φ100mm×2), Shelf brackets (18-8 Cr-Ni stainless steel), Shelf (18-8 Cr-Ni stainless steel), Door key (×2 For door), Cartridge fuse (250V 0.4A, 5A, 8A), Wet-bulb wick (ARL, ARS), Specimen temperature measuring thermocouple (type T, 3m), Specimen temperature input connector, Operation manual					
Utility requirements	Allowable ambient conditions		0 to +40°C (+32 to +104°F) / 75%rh max.					
	Power supply *5	200V AC 3φ50/60Hz	——	——	63 A	70 A		
		220V AC 3φ60Hz	38 A	38 A	58 A	64 A		
		380V AC 3φ50Hz	24 A	24 A	28 A	32 A		
		400V AC 3φ50Hz *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: Excluding protrusions.

*4: Power cable is not included.

*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

* The chamber does not come with a power cable.

Water purifier (WS-1)

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



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

Additional cable port

Provided in addition / replacement of the standard cable ports.

- 50 mm diameter
- 100 mm diameter

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

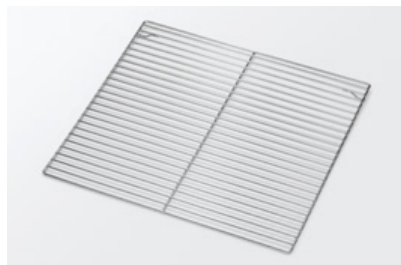


Cable port rubber plug

Prevents air leakage from the cable port.

Shelf, shelf bracket

Equivalent to standard accessory.



Model	0220	0390	0680	1100
Shelf size (W×Dmm)	667×350	667×650	817×750	1067×950
Shelf weight	2 kg	3 kg	6 kg	12 kg
Shelf load capacity (evenly distributed load)	30 kg	30 kg	40 kg	50 kg
Load capacity of shelf support pole *	50 kg	80 kg	80 kg	100 kg

* Including shelf weight

Heavy-duty shelf

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

Load capacity: 50kg (max. 2 shelves)

* Standard for 1100L model

Interface

Computer interface

- RS-485
- GPIB
- RS-232C

Communication cables

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

Viewing window

Used for observation of the specimens inside the chamber.

Dimensions: W340×H440 mm



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.

Options

Paperless recorder - portable type

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 recorder (digital)

Portable type

-100 to +200°C 6 dots

Temperature and humidity recorder (digital)

Portable type

-100 to +200°C / 0 to 100%rh 6 dots

Additional overheat protector

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



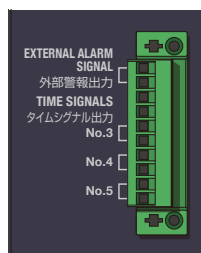
Overcool protector

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



External alarm terminal

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



Emergency stop switch

Stops the chamber immediately.



200V AC, 220V AC spec. 380V AC, 400V AC spec.

Trouble buzzer

If a trouble occurs, the buzzer will alert you of the situation.

Rotating signal lamp

The lamp lights up when alarm triggers. (Red or yellow)



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

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

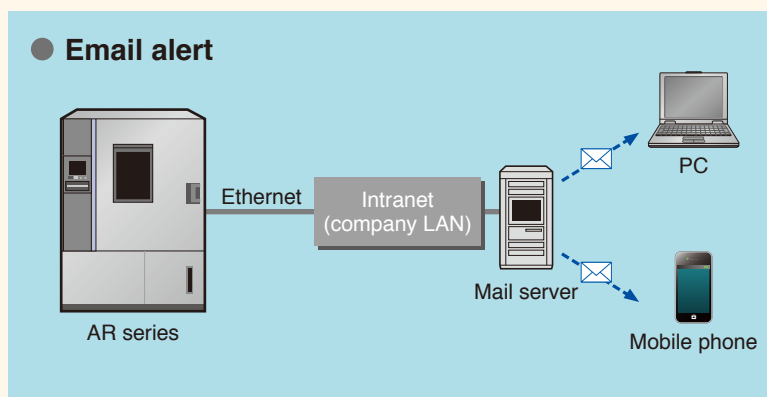
Details on alarms that have been triggered will be sent to pre-registered e-mail addresses. It is also possible to transmit e-mails when testing has finished.

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

Login privileges

Privileges \ Screen	Chamber monitor	Constant/ Program setup	Run/Stop	Configuration
Administrator	✓	✓	✓	✓
Operator	✓	✓	✓	
User	✓			

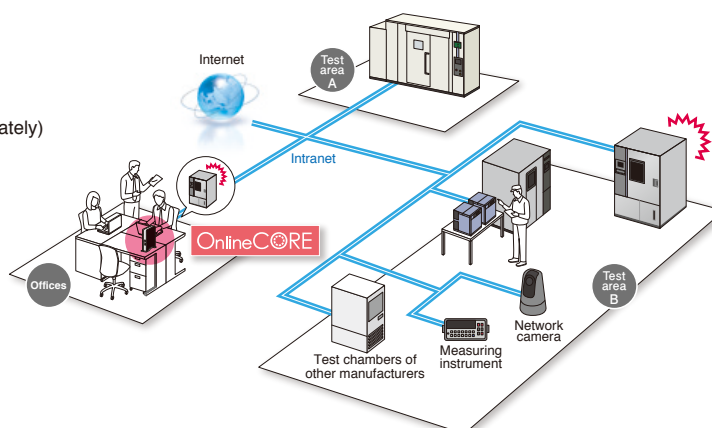
Email alert



ESPEC OnlineCore

OnlineCORE (Sold separately)

Central control system recommended for multiple environmental test chambers installations



OTHER PRODUCTS

RAPID-RATE THERMAL CYCLE CHAMBER



Model	Temperature range	Interior dimensions W×H×Dmm
TCC-150W	−70 to +180°C	800×500×400

FASTER TEMPERATURE (& HUMIDITY) CHAMBER



Model	Temperature & humidity range	Interior dimensions W×H×Dmm
SML-2	−40 to +180°C / 20 to 98%rh	1200×1000×1500
SMU-2	−40 to +180°C	
SMS-2	−70 to +180°C / 20 to 98%rh	
SMG-2	−70 to +180°C	

THERMAL SHOCK CHAMBER TSD (Elevator Type)



Model	Temperature range	Test area dimensions W×H×Dmm
TSD-101-W	High temp. chamber: +60 to +205°C	710×345×410
	Low temp. chamber: −77 to 0°C	

●+300°C specification is also available.

OTHER PRODUCTS

THERMAL SHOCK CHAMBER TSA (Damper Type)



Model	Temperature exposure range	Test area dimensions W×H×Dmm
TSA-43EL		240×460×370
TSA-73EL	High temp.: Ambient +50 to +200°C	410×460×370
TSA-103EL	Low temp.: −65 to 0°C	650×460×370
TSA-203EL		650×460×670
TSA-303EL		970×460×670
TSA-73ES	High temp.: +60 to +200°C	410×460×370
TSA-73EH		410×460×370
TSA-103ES	Low temp.: −70 to 0°C	650×460×370
TSA-203ES		650×460×670

●+300°C specification is also available.

THERMAL SHOCK CHAMBER WITH HUMIDITY TSA (Damper Type)



Model	Test area	Test area dimensions W×H×D mm
TSA-102D-W	Hot exposure ranfe: Thermal cycle test: +70 to +150°C Dew cycle test: −10 to +100°C	650×460×370
TSA-202D-W	Cold exposure ranfe: Thermal cycle test: −70 to +10°C Dew cycle test: −40 to +10°C	650×460×670

THERMAL SHOCK CHAMBER TSE (Elevator Type)



Model	Temperature range	Test area dimensions W×H×D mm
TSE-12	High temp. chamber: +60 to +200°C Low temp. chamber: −65 to 0°C	320×148×230

●+300°C specification is also available.

ESPEC CORP. <http://www.espec.co.jp/english>

Head Office

3-5-6, Tenjinbashi, Kita-ku, Osaka 530-8550, Japan
Tel: 81-6-6358-4741 Fax: 81-6-6358-5500

ESPEC NORTH AMERICA, INC.

Tel: 1-616-896-6100 Fax: 1-616-896-6150

ESPEC EUROPE GmbH

Tel: 49-89-1893-9630 Fax: 49-89-1893-96379

ESPEC ENVIRONMENTAL EQUIPMENT (SHANGHAI) CO., LTD.

Head Office

Tel: 86-21-51036677 Fax: 86-21-63372237

BEIJING Branch

Tel: 86-10-64627025 Fax: 86-10-64627036

TIANJIN Branch

Tel: 86-22-26210366 Fax: 86-22-26282186

GUANGZHOU Branch

Tel: 86-20-83317826 Fax: 86-20-83317825

SHENZHEN Branch

Tel: 86-755-83674422 Fax: 86-755-83674228

SUZHOU Branch

Tel: 86-512-68028890 Fax: 86-512-68028860

ESPEC TEST TECHNOLOGY (SHANGHAI) CO., LTD.

Tel: 86-21-68798008 Fax: 86-21-68798088

ESPEC SOUTH EAST ASIA SDN. BHD.

Tel: 60-3-8945-1377 Fax: 60-3-8945-1287

ESPEC ENGINEERING (THAILAND) CO., LTD.

Tel: 66-0-3-810-9353 Fax: 66-0-3-810-9356



ISO 9001/JIS Q 9001

Quality Management System Assessed and Registered

ESPEC CORP. has been assessed by and registered in the Quality Management System based on the International Standard ISO 9001:2008 (JIS Q 9001:2008) through the Japanese Standards Association (JSA).

* Registration : ESPEC CORP.
(Overseas subsidiaries not included)



ISO 14001 (JIS Q 14001)

Environmental Management System Assessed and Registered

ESPEC CORP.
(Overseas subsidiaries not included)