Quality is more than a word

ESPEC

5K/min・10K/min・15K/min

# Environmental Stress Chamber

## AR series Rapid-Rate Temperature Cycle Type

GOOD DESIGN


3 YEAR WARRANTY

LOW GWP REFRIGERANT

CAT.NO.E20141

# Temperature & humidity chamber for rapid temperature cycle tests that can be selected from a wealth of lineups

The Environmental stress chamber AR series supports heat load and provides faster temperature cycling performance with a wide temperature and humidity control range. Customers can select the optimal model for their needs based on performance and test area capacity. A chamber is now available that achieves a temperature change rate of 15K/min for specimens that comply with IEC 60068-2-14Nb/2-30/2-38.
Faster temperature cycling type with change rate of 20K/min and 25K/min is also available, which is capable of meeting the performance requirements for simulation of extreme and changing environmental conditions.

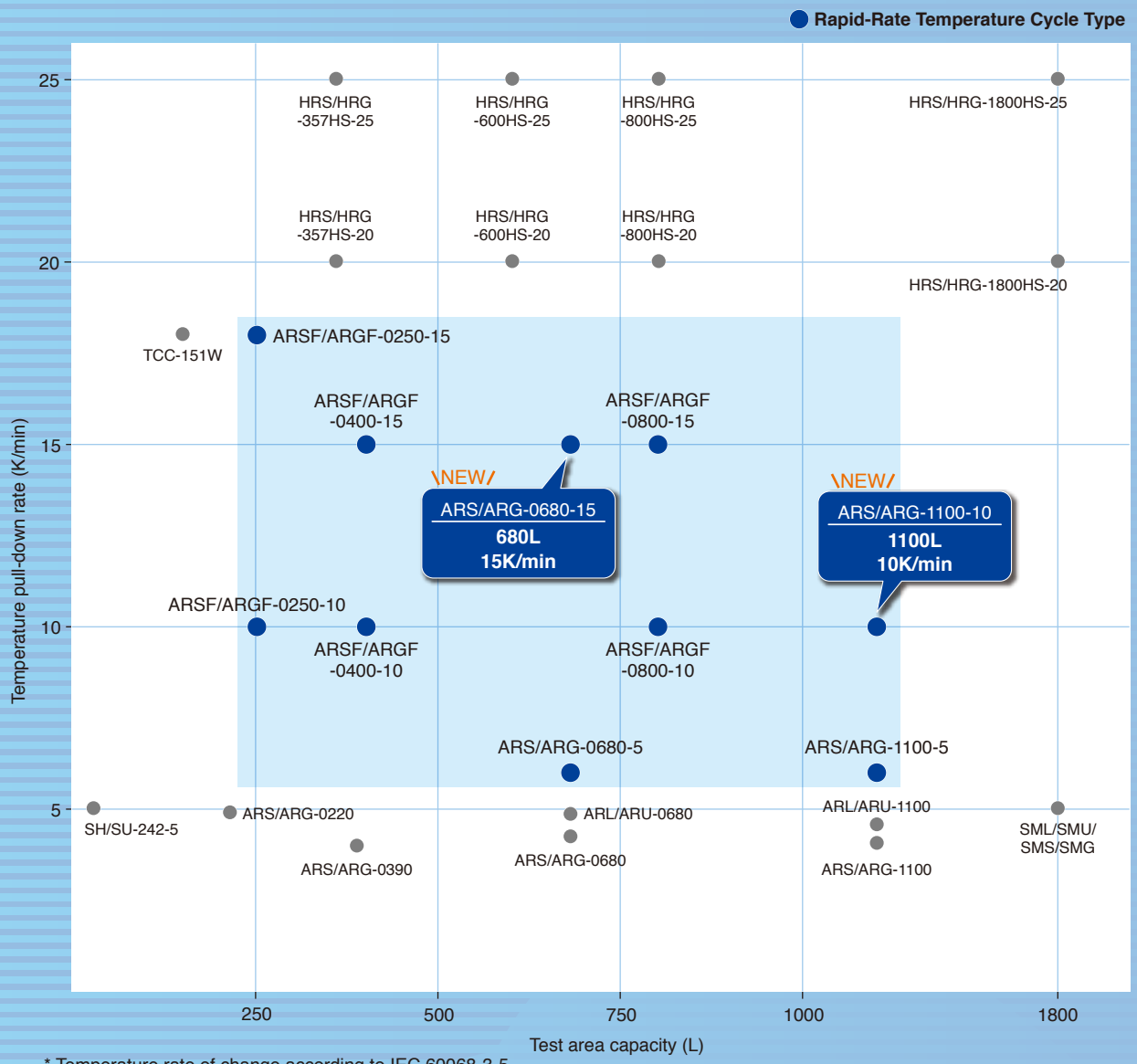
**3 YEAR WARRANTY**

## To minimize our chambers potential environmental impact

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


*R-449A is available on request

## Wide range of models in a variety of sizes and performance




* Temperature rate of change according to IEC 60068-3-5

## Contents

# Features

## Meets IEC 60068-2-14Nb, 2-30 and 2-38! Five interior volumes from 250 to 1100 liters with temperature change rate from 5K/min to 18K/min

### Test Standard Conformance

| International Standard | LV 124 | |
|---|---|---|
| — | K-01 | High-/low-temperature storage |
| — | K-02 | Incremental temperature test |
| IEC 60068-2-1 | K-03 | Low-temperature operation |
| — | K-04 | Repainting temperature (+130°C⇒+110°C) |
| IEC 60068-2-30 | K-08 | Damp heat, cyclic |
| IEC 60068-2-38 | K-09 | Damp heat, cyclic (with frost) |
| IEC 60068-2-78 | K-14 | Damp heat, constant |
| — | L-01 | Life test - mechanical/hydraulic endurance test |
| IEC 60068-2-2 | L-02 | Life test – high-temperature endurance test |
| IEC 60068-2-14Nb | L-03 | Life test - temperature cycle test |
| ISO 16750-4 (5.3) | | |

* Some models do not conform to the standard depending on test conditions. For further information, please contact ESPEC

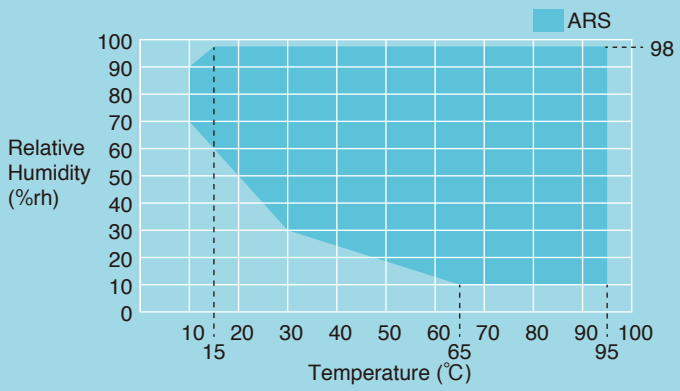
### Model Lineup Rapid-Rate Temperature Cycle Type

| Temp. range | Temp. rate of change | Capacity | Model * |
|---|---|---|---|
| –70 to +180°C | 18K/min | 249L | ARSF/ARGF-0250-15 |
| | 15K/min | 398L | ARSF/ARGF-0400-15 |
| | | 680L | ARS/ARG-0680-15 \NEW/ |
| | | 784L | ARSF/ARGF-0800-15 |
| | 10K/min | 249L | ARSF/ARGF-0250-10 |
| | | 398L | ARSF/ARGF-0400-10 |
| | | 784L | ARSF/ARGF-0800-10 |
| | | 1100L | ARS/ARG-1100-10 \NEW/ |
| | 6K/min | 680L | ARS/ARG-0680-5 |
| | | 1100L | ARS/ARG-1100-5 |

* ARSF/ARS: Temperature & humidity, ARGF/ARG: Temperature only

### Temperature & Humidity Control Range

**(In environment of ambient temperature of +23°C, no specimen.)**




* Totally frost free, no limitation of continuous operation.

### Best suited for fast temperature cycling of global testing standard

Temperature change rate of 15K/min to meet IEC standard and automotive testing standards is possible.

* ARS-0680-15: 15K/min is possible with specimen 10kg during −40 ⇔ 125°C

### Temperature & Humidity Range

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

Testing at a high temperature range of +200°C is also possible.

* Specific parts shall be subject to replacement depending on operation duration and condition within the warranty period.

### Heat Load up to 9500W

AR series is desirable for testing large heat loads at temperature cycling test and at 85°C/85%rh test.
Heat compensation at +20°C is up to 9500 W (ARS/ARG-0680-15, 1100-10)

* Refer to Page 6 to 10 for allowable heat load of each model.
* For your safety, please be sure to connect the power through specimen power supply control terminal.
* Temperature-triggered circuit breaker is available (customized option).

### Totally Frost-Free

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.

### 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.

# 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.


Door notch (option)


Inside of the ARS-1100-5 chamber

## Viewing Window

A viewing window comes with Eco-friendly and energy efficient LED light with an exterior switch, that gives you a clear view inside test area. The window is heated to prevent moisture and ice build-up.

**Size of Viewing Window**

W295×H380 mm

* ARSF/ARGF-0250/0400: W180×H260mm


Viewing window

## 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

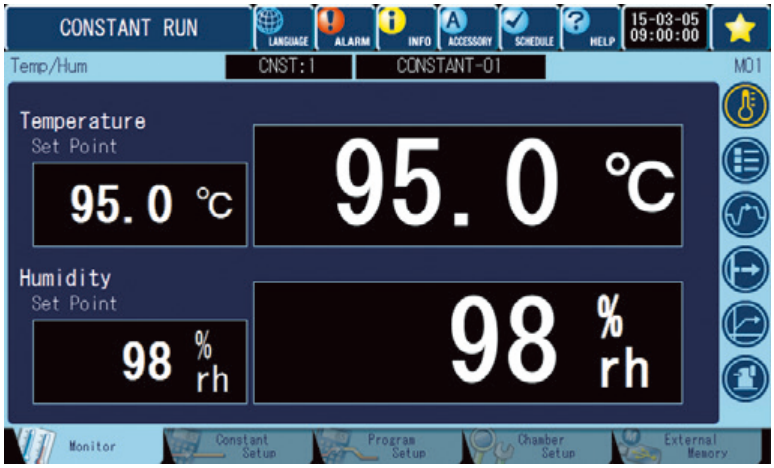
3 YEAR WARRANTY

ARS-1100-10

# Controller

*The instrumentation screens are ARS/ARG spec. (P-310)

## Comfortable touchscreen operation




* The instrumentation screens are ARS spec.


Japanese


French


Chinese (simplified)


Hungarian ※


Chinese (traditional)


Romanian ※


Korean


Russian ※


German


Czech ※

※ Available on request


Maintenance monitor screen

### 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.

### Multilingual screen

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

* Hungarian, Romanian, Chez, Polish and Russian are also available on request.

### Temp. rate of change input available (Patent pending)

The step time can be calculated automatically just by inputting the temperature change rate (first decimal point) using gradient control settings.


### Easy and flexible

USB memory and Ethernet ports give flexibility for managing programming, operation, and data logging.

### Preventive maintenance support

Maintenance monitor screen keeps your test chamber in top condition and protect you from unexpected downtime. You can monitor the heater output, cooling water temperature and refrigeration pressure on the controller panel.
Also Ethernet connection allows remote monitoring via any PC on your network.

# 5K/min

## −70～+180℃ (10～98%rh)

## TEMPERATURE (& HUMIDITY) CHAMBER

| Model | | | ARS-0680-5 | ARS-1100-5 | ARG-0680-5 | ARG-1100-5 |
|---|---|---|---|---|---|---|
| System | | | Balanced Temperature & Humidity Control (BTHC) system | | Balanced Temperature Control system (BTC) system | |
| Temperature performance *1 | Temperature range | | −70 to +180°C (−94 to +356°F) | | | |
| | 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 | 6K/min | | | |
| | | Pull down rate | 6K/min | | | |
| | Temperature extremes achievement time | Heat up time | +20°C to +180°C 40 min. | | | |
| | | Pull down time | +20°C to −70°C 40 min. | | | |
| | Allowable heat load | | Test area temperature: +20°C | | | |
| | | | 4500W | 5500W | 4500W | 5500W |
| Humidity performance *1 | Temp. & humid. range | | +10 to 95°C / 10 to 98%rh | | ——— | |
| | Humidity fluctuation | | ±2.5%rh | | ——— | |
| | Allowable heat load | | Test area conditions: +85°C / 85%rh 500W | | ——— | |
| 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 | | | |
| Heater | | | Nichrome strip wire heater | | | |
| Humidifier | | | Sheathed heater | | | |
| Cooler / Dehumidifier | | | Plate fin cooler | | | |
| Water tank capacity | | | 40L (20L×2) | | ——— | |
| Refrigerator | System | | Mechanical cascade refrigeration | | | |
| | Compressor | | Scroll-type | | | |
| | | | 4.47kW×4.47kW | 5.59kW×5.59kW | 4.47kW×4.47kW | 5.59kW×5.59kW |
| | Condenser | | Water-cooled condenser | | | |
| | Expansion system | | Electronic expansion valve | | | |
| | Refrigerant | | R-449A/R-508A | | | |
| Capacity | | | 680L | 1100L | 680L | 1100L |
| Chamber total load capacity | | | 680L: 80kg (shelf support pole: 80kg, floor: 80kg) 1100L: 150kg (shelf support pole: 100kg, floor: 150kg) | | | |
| Inside dimensions W×H×Dmm *2 | | | 850×1000×800 | 1100×1000×1000 | 850×1000×800 | 1100×1000×1000 |
| Outside dimensions W×H×Dmm *2 | | | 1050×1955×2255 | 1300×1955×2455 | 1050×1955×2255 | 1300×1955×2455 |
| Weight | | | 780kg | 900kg | 770kg | 890kg |
| Utility requirements | Ambient conditions | | 0 to +40℃ (+32 to +104℉) / Up to 75%rh | | | |
| | Power supply | 220V AC 3φ60Hz *3 | 55A | 77A | 55A | 77A |
| | | 380V AC 3φ50Hz *3 | 30A | 33A | 30A | 33A |
| | | 400V AC 3φ50Hz *3 | 30A | 32A | 30A | 32A |
| | Cooling water flow rate (Reference water temp. +25°C) | | 2000L/h | 2700L/h | 2000L/h | 2700L/h |
| Noise level *4 | | | 58dB | 61dB | 58dB | 61dB |

*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: Dimensions do not include protrusions.
*3: Conforms to CE marking based on EU directives.
*4: 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-weigted sound pressure level).

# 10K/min

## −70～+180℃ •10～98%rh

## TEMPERATURE & HUMIDITY CHAMBER

| Model | | | ARSF-0250-10 | ARSF-0400-10 | ARSF-0800-10 | ARS-1100-10 |
|---|---|---|---|---|---|---|
| System | | | Balanced Temperature & Humidity Control (BTHC) system | | | |
| Temperature performance *1 | Temperature range | | −70 to +180°C (−94 to +356°F) | | | |
| | 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 | | | |
| | | Pull down rate | 10K/min | | | |
| | Temperature extremes achievement time | Heat up time | +20°C to +180°C<br>20 min. | | | |
| | | Pull down time | +20°C to −70°C<br>20 min. | | | |
| | Allowable heat load | | Test area temperature: +20°C | | | |
| | | | 6000W | | | 9500W |
| Humidity performance *1 | Humidity range | | 10 to 98%rh | | | |
| | Humidity fluctuation | | ±2.5%rh | | | |
| | Allowable heat load | | Test area conditions: +25 to 95°C/ 90%rh | | | Test area conditions: +85 °C/ 85%rh |
| | | | 350W | | 550W | 600W |
| 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 | | | |
| Heater | | | Nichrome strip wire heater | | | |
| Humidifier | | | Sheathed heater | | | |
| Cooler / Dehumidifier | | | Plate fin cooler | | | |
| Water tank capacity | | | 16L | | 32L | 40L |
| Refrigerator | System | | Mechanical cascade refrigeration | | | |
| | Condenser | | Water-cooled condenser | | | |
| | Expansion system | | Electronic expansion valve | | | |
| | Refrigerant | | R-404A [R-449A] *2<br>R-508A | | | R-449A<br>R-508A |
| Capacity | | | 249L | 398L | 784L | 1100L |
| Chamber total load capacity | | | 100kg (shelf support pole: 90kg, floor: 70kg) | | | 150kg (shelf support pole: 100kg, floor: 150kg) |
| Inside dimensions W×H×Dmm *3 | | | 600×830×500 | 600×830×800 | 1000×980×800 | 1100×1000×1000 |
| Outside dimensions W×H×Dmm *3 | | | 800×1703×1900 | 800×1703×2200 | 1200×1853×2200 | 1300×1955×2455 |
| Weight | | | 725kg | 750kg | 910kg | 1050kg |
| Utility requirements | Ambient conditions | | 0 to +40℃ (+32 to +104℉) / Up to 75%rh | | | |
| | Power supply | 200V AC 3φ50/60Hz | 60A | 60A | 86A | 114A |
| | | 220V AC 3φ60Hz *4 | 58A | 58A | 83A | 111A |
| | | 380V AC 3φ50Hz *4 | 27A | 27A | 36A | 53A |
| | | 400V AC 3φ50Hz *4 | 27A | 27A | 36A | 52A |
| | Cooling water flow rate (Reference water temp. +32°C) | | 3300L/h | 3300L/h | 4740L/h | 5100L/h *6 |
| Noise level *5 | | | 65dB | | | 60dB |

*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: Available on request
*3: Dimensions do not include protrusions.
*4: Conforms to CE marking based on EU directives.
*5: 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-weigted sound pressure level).
*6: Reference water temp. +25°C

# 10K/min

## −70～+180℃

## TEMPERATURE CHAMBER

| Model | | | ARGF-0250-10 | ARGF-0400-10 | ARGF-0800-10 | ARG-1100-10 |
|---|---|---|---|---|---|---|
| System | | | Balanced Temperature Control system (BTC) system | | | |
| Temperature performance *1 | Temperature range | | −70 to +180°C (−94 to +356°F) | | | |
| | 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 | | | |
| | | Pull down rate | 10K/ min | | | |
| | Temperature extremes achievement time | Heat up time | +20°C to +180°C<br>20 min. | | | |
| | | Pull down time | +20°C to −70°C<br>20 min. | | | |
| | Allowable heat load | | Test area temperature: +20°C<br>6000W | | | 9500W |
| 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 | | | |
| Heater | | | Nichrome strip wire heater | | | |
| Cooler | | | Plate fin cooler | | | |
| Refrigerator | System | | Mechanical cascade refrigeration | | | |
| | Condenser | | Water-cooled condenser | | | |
| | Expansion system | | Electronic expansion valve | | | |
| | Refrigerant | | R-404A [R-449A] *2<br>R-508A | | | R-449A<br>R-508A |
| Capacity | | | 249L | 398L | 784L | 1100L |
| Chamber total load capacity | | | 100kg (shelf support pole: 90kg, floor: 70kg) | | | 150kg (shelf support pole: 100kg, floor: 150kg) |
| Inside dimensions W×H×Dmm *3 | | | 600×830×500 | 600×830×800 | 1000×980×800 | 1100×1000×1000 |
| Outside dimensions W×H×Dmm *3 | | | 800×1703×1900 | 800×1703×2200 | 1200×1853×2200 | 1300×1955×2455 |
| Weight | | | 715kg | 740kg | 900kg | 1040kg |
| Utility requirements | Ambient conditions | | 0 to +40°C (+32 to +104°F) / Up to 75%rh | | | |
| | Power supply | 200V AC 3φ50/60Hz | 60A | 60A | 86A | 114A |
| | | 220V AC 3φ60Hz *4 | 58A | 58A | 83A | 111A |
| | | 380V AC 3φ50Hz *4 | 27A | 27A | 36A | 53A |
| | | 400V AC 3φ50Hz *4 | 27A | 27A | 36A | 52A |
| | Cooling water flow rate (Reference water temp. +32°C) | | 3300L/h | | 4740L/h | 5100L/h *6 |
| Noise level *5 | | | 65dB | | | 60dB |

*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: Available on request
*3: Dimensions do not include protrusions.
*4: Conforms to CE marking based on EU directives.
*5: 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-weigted sound pressure level).
*6: Reference water temp. +25°C

# 15K/min

## −70～+180℃ •10～98%rh

## TEMPERATURE & HUMIDITY CHAMBER

| Model | | | ARSF-0250-15 | ARSF-0400-15 | ARS-0680-15 | ARSF-0800-15 |
|---|---|---|---|---|---|---|
| System | | | Balanced Temperature & Humidity Control (BTHC) system | | | |
| Temperature performance *1 | Temperature range | | −70 to +180°C (−94 to +356°F) | | | |
| | 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 | 18K/min | 15K/min | | |
| | | Pull down rate | 18K/min | 15K/min | | |
| | Temperature extremes achievement time | Heat up time | +20°C to +180°C<br>15 min. | | | |
| | | Pull down time | +20°C to −70°C<br>15 min. | | | |
| | Allowable heat load | | Test area temperature: +20°C<br>6000W | | 9500W | 9000W |
| Humidity performance *1 | Humidity range | | 10 to 98%rh | | | |
| | Humidity fluctuation | | ±2.5%rh | | | |
| | Allowable heat load | | Test area conditions: +25 to 95°C/ 90%rh<br>350W | | Test area conditions: +85°C/ 85%rh<br>600W | Test area conditions: +25 to 95°C/ 90%rh<br>550W |
| 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 | | | |
| Heater | | | Nichrome strip wire heater | | | |
| Humidifier | | | Sheathed heater | | | |
| Cooler / Dehumidifier | | | Plate fin cooler | | | |
| Water tank capacity | | | 16L | | 40L | 32L |
| Refrigerator | System | | Mechanical cascade refrigeration | | | |
| | Condenser | | Water-cooled condenser | | | |
| | Expansion system | | Electronic expansion valve | | | |
| | Refrigerant | | R-404A [R-449A] *2<br>R-508A | | R-449A<br>R-508A | R-404A [R-449A] *2<br>R-508A |
| Capacity | | | 249L | 398L | 680L | 784L |
| Chamber total load capacity | | | 100kg (shelf support pole: 90kg, floor: 70kg)<br>680L: 80kg (shelf support pole: 80kg, floor: 80kg) | | | |
| Inside dimensions W×H×Dmm *3 | | | 600×830×500 | 600×830×800 | 850×1000×800 | 1000×980×800 |
| Outside dimensions W×H×Dmm *3 | | | 800×1703×1900 | 800×1703×2200 | 1050×1955×2255 | 1200×1853×2200 |
| Weight | | | 730kg | 755kg | 950kg | 1000kg |
| Utility requirements | Ambient conditions | | 0 to +40℃ (+32 to +104℉) / Up to 75%rh | | | |
| | Power supply | 200V AC 3φ50/60Hz | 78A | 78A | 114A | 126A |
| | | 220V AC 3φ60Hz *4 | 76A | 76A | 111A | 122A |
| | | 380V AC 3φ50Hz *4 | 34A | 34A | 53A | 53A |
| | | 400V AC 3φ50Hz *4 | 34A | 34A | 52A | 52A |
| | Cooling water flow rate (Reference water temp. +32°C) | | 4740L/h | 4740L/h | 5100L/h *5 | 6360L/h |
| Noise level *6 | | | 65dB | | 61dB | 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: Available on request
*3: Dimensions do not include protrusions.
*4: Conforms to CE marking based on EU directives.
*5: Reference water temp. +25°C
*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-weigted sound pressure level).

# 15K/min

−70～+180℃

## TEMPERATURE CHAMBER

| Model | | | ARGF-0250-15 | ARGF-0400-15 | ARG-0680-15 | ARGF-0800-15 |
|---|---|---|---|---|---|---|
| System | | | Balanced Temperature Control system (BTC) system | | | |
| Temperature performance *1 | Temperature range | | −70 to +180°C (−94 to +356°F) | | | |
| | 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 | 18K/ min | 15K/ min | | |
| | | Pull down rate | 18K/ min | 15K/ min | | |
| | Temperature extremes achievement time | Heat up time | +20°C to +180°C<br>15 min. | | | |
| | | Pull down time | +20°C to −70°C<br>15 min. | | | |
| | Allowable heat load | | Test area temperature: +20°C<br>6000W | | 9500W | 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 | | | |
| Heater | | | Nichrome strip wire heater | | | |
| Cooler | | | Plate fin cooler | | | |
| Refrigerator | System | | Mechanical cascade refrigeration | | | |
| | Condenser | | Water-cooled condenser | | | |
| | Expansion system | | Electronic expansion valve | | | |
| | Refrigerant | | R-404A [R-449A] *2<br>R-508A | | R-449A<br>R-508A | R-404A [R-449A] *2<br>R-508A |
| Capacity | | | 249L | 398L | 680L | 784L |
| Chamber total load capacity | | | 100kg (shelf support pole: 90kg, floor: 70kg)<br>680L: 80kg (shelf support pole: 80kg, floor: 80kg) | | | |
| Inside dimensions W×H×Dmm *3 | | | 600×830×500 | 600×830×800 | 850×1000×800 | 1000×980×800 |
| Outside dimensions W×H×Dmm *3 | | | 800×1703×1900 | 800×1703×2200 | 1050×1955×2255 | 1200×1853×2200 |
| Weight | | | 720kg | 745kg | 940kg | 990kg |
| Utility requirements | Ambient conditions | | 0 to +40°C (+32 to +104°F) / Up to 75%rh | | | |
| | Power supply | 200V AC 3φ50/60Hz | 78A | 78A | 114A | 126A |
| | | 220V AC 3φ60Hz *4 | 76A | 76A | 111A | 122A |
| | | 380V AC 3φ50Hz *4 | 34A | 34A | 53A | 53A |
| | | 400V AC 3φ50Hz *4 | 34A | 34A | 52A | 52A |
| | Cooling water flow rate (Reference water temp. +32°C) | | 4740L/h | | 5100L/h *5 | 6360L/h |
| Noise level *6 | | | 65dB | | 61dB | 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: Available on request
*3: Dimensions do not include protrusions.
*4: Conforms to CE marking based on EU directives.
*5: Reference water temp. +25°C
*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-weigted sound pressure level).

### 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.

# 20K/min·25K/min

## −70～+180℃ (20～98%rh)

### Hight-Rate Thermal Cycle Chamber

### Faster temperature change rate even with larger volume

Test area capacity can be customized to meet the requirements of specimen size, volume and test specifications. Also various safety options are available to perform testing as safely as possible.

## Temperature & Humidity Chamber

| Model | | HRS-357HS-20 | HRS-600HS-20 | HRS-800HS-20 | HRS-1800HS-20 | HRS-357HS-25 | HRS-600HS-25 | HRS-800HS-25 | HRS-1800HS-25 |
|---|---|---|---|---|---|---|---|---|---|
| Temperature range | | −70 to +180°C (−94 to +356°F) | | | | | | | |
| Temp. rate of change | Heat up rate | 20K/min | | | | 25K/min | | | |
| | Pull down rate | 20K/min | | | | 25K/min | | | |
| Temp. & humid. range | | +20 to 85°C/ 20 to 98%rh | | | | | | | |
| Inside dimensions (W×H×Dmm) * | | 700<br>850<br>600 | 1000<br>1000<br>600 | 1000<br>1000<br>800 | 1500<br>1200<br>1000 | 700<br>850<br>600 | 1000<br>1000<br>600 | 1000<br>1000<br>800 | 1500<br>1200<br>1000 |
| Capacity | | 357L | 600L | 800L | 1800L | 357L | 600L | 800L | 1800L |

## Temperature Chamber

| Model | | HRG-357HS-20 | HRG-600HS-20 | HRG-800HS-20 | HRG-1800HS-20 | HRG-357HS-25 | HRG-600HS-25 | HRG-800HS-25 | HRG-1800HS-25 |
|---|---|---|---|---|---|---|---|---|---|
| Temperature range | | −70 to +180°C (−94 to +356°F) | | | | | | | |
| Temp. rate of change | Heat up rate | 20K/min | | | | 25K/min | | | |
| | Pull down rate | 20K/min | | | | 25K/min | | | |
| Inside dimensions (W×H×Dmm) * | | 700<br>850<br>600 | 1000<br>1000<br>600 | 1000<br>1000<br>800 | 1500<br>1200<br>1000 | 700<br>850<br>600 | 1000<br>1000<br>600 | 1000<br>1000<br>800 | 1500<br>1200<br>1000 |
| Capacity | | 357L | 600L | 800L | 1800L | 357L | 600L | 800L | 1800L |

* Dimensions do not include protrusions.

# Options

## Low GWP refrigerant R-449A

Using refrigerant with Low Global warning potential (GWP) contributes to the reduction greenhouse gas emissions.

## Power cable

- 2.5 m
- 5 m
- 10 m

* 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 without pressure-reducing valve

Pure water coupling
(with pressure-reducing valve)

| | ARSF | | ARS |
|---|---|---|---|
| | With Pressure-Reducing Valve | Without Pressure-Reducing Valve | |
| Water pressure | 0.05 to 0.50MPa (Gauge) | 0.03MPa (Gauge) | 0.02 to 0.05MPa (Gauge) |
| Conductivity | 0.1 to 10μS/cm | | |
| Connectable items | Only a steel pipe (or a PVC pipe) can be connected. | Only a hose an 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℃)
Size: W480×H400×D280 mm (20kg)

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

## 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: 30 kg
- Load capacity: 50 kg

| Model | ARS/ARG | ARSF/ARGF | | | | |
|---|---|---|---|---|---|---|
| | 0680 | 0250 | | 0400 | | 0800 |
| Load resistance (kg) | 50 | 30 | 50 | 30 | 50 | 50 |
| Floor load resistance (kg) | 80 | 70 | 70 | 70 | 70 | 70 |
| Support strength (kg) | 80 | 90 | 100 | 90 | 100 | 100 |
| Weight / shelf (kg) | 8 | 2.7 | 3.2 | 4.3 | 5.1 | 12.1 |

## Floor reinforcement

Increase the floor load capacity of test area.
Up to

- 100 kg
- 200 kg
- 300 kg

# Options

## Additional cable port/Door notch

- ø50 mm
- ø100 mm
- ø150 mm
- Flat cable port
- Door notch H100×D50 mm

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


Flat cable port


Door notch

## Cable port rubber plug

- ø50 mm
- ø100 mm
- ø150 mm
- With slits ø50 mm
- With slits ø100 mm
- With slits ø150 mm
- For flat cable port
- Spiral-wrapped plug (5×50×2000 mm)
- For door notch


ø50 mm


With slits ø150 mm


Spiral-wrapped type


For flat cable port

## Computer interface

- RS-485
- GPIB
- RS-232C

## Communication cables

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

## 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


## Electrostatic capacitance-type humidity sensor control

## 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)


## Recorder output terminal

- Temperature, humidity, and heater output
  This terminals output the temperature and relative humidity in the test area.


- Dry (wet) bulb temperature
  Terminal board for dry-bulb sensors in the chamber.


## Time signal terminal

Adds additional terminals to the standard time signal 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

## Wet bulb wick

Consumable spares for wet bulb wick (standard accessories).

Fine wick FW-5 (24 wicks)

# Options

## 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 output terminal

When the chamber is setting operation such as “Error”, interlock with connecting devices.
Operation:
When connecting with N.O. contact (normally open contact), output “close” contact.
When connecting with N.C. contact (normally close contact), output “open” contact.
Current-carrying capacity: 250 V AC, 3 A
Accessory: Plug
*The circuit shall be connected by customer.

## 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
Location: Chamber top (right)
* For ARSF/ARGF
No. of levels: 3 Heigh: 614 mm

## 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

# AR Series Options

## Rapid-Rate Temperature Cycle Type

| Options | ✓ | ARS | | ARG | | ARSF | | | ARGF | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0680-5/15 | 1100-5/10 | 0680-5/15 | 1100-5/10 | 0250 | 0400 | 0800 | 0250 | 0400 | 0800 |
| Low GWP refrigerant R-449A | ☐ | standard | standard | standard | standard | ● | ● | ● | ● | ● | ● |
| Power cable | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Continuous water supply with pressure-reducing valve | ☐ | ● | ● | — | — | ● | ● | ● | — | — | — |
| without pressure-reducing valve | ☐ | ● | ● | — | — | ● | ● | ● | — | — | — |
| Water purifier WS–1 | ☐ | — | — | — | — | ● | ● | ● | — | — | — |
| Shelf/shelf bracket | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heavy-duty shelf Up to 30 kg | ☐ | — | — | — | — | ● | ● | standard | ● | ● | standard |
| Up to 50 kg | ☐ | ● | standard | ● | standard | ● | ● | ● | ● | ● | ● |
| Floor reinforcement | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Additional cable port | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Door notch | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Flat cable port | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Cable port rubber plug | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Computer interface | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Communication cables | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Specimen temperature control | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Electrostatic capacitance-type humidity sensor control | ☐ | ● | ● | — | — | — | — | — | — | — | — |
| Paperless recorder Portable | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Built-in | ☐ | ● | ● | ● | ● | — | — | — | — | — | — |
| Recorder output terminal Temperature, humidity, and heater output | ☐ | ● | ● | ● | ● | ● | ● | ● | — | — | — |
| Dry bulb temperature | ☐ | Dry/wet | Dry/wet | ● | ● | — | — | — | ● | ● | ● |
| Time signal terminal | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Thermocouple | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Wet bulb wick | ☐ | ● | ● | — | — | ● | ● | ● | — | — | — |
| Additional overheat protector | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Overcool protector | ☐ | ● | ● | ● | ● | ● | ● | ● | — | — | — |
| Status output terminal | ☐ | ● | ● | ● | ● | — | — | — | — | — | — |
| Alarm output terminal | ☐ | — | — | — | — | ● | ● | ● | ● | ● | ● |
| Status indicator light | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Emergency stop pushbutton | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Chamber dew tray | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Operation manual | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Reports & certificates | ☐ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

# Network

* Requires an intranet  Supported browser: Internet Explorer 11

## 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.

### 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.

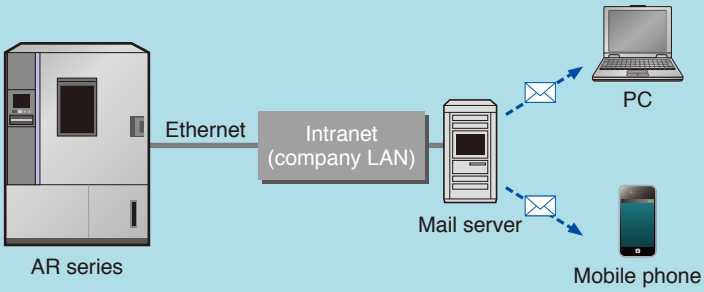
### E-mail Notifications

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.

Image

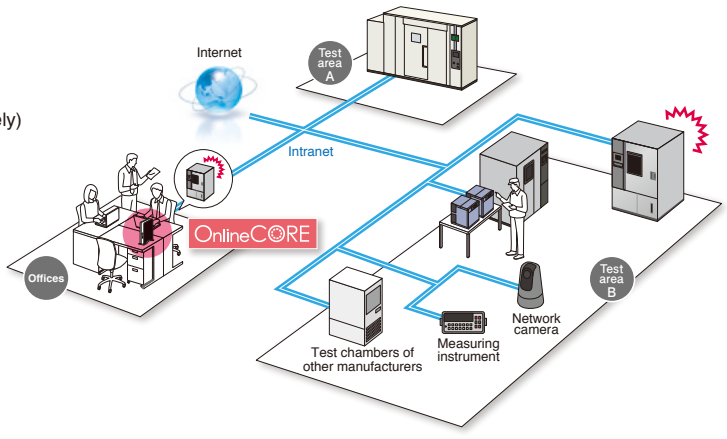
### Email alert




## ESPEC OnlineCore

OnlineCORE (Sold separately)

**Central control system recommended for multiple environmental test chambers installations**




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

# Rapid-Rate Thermal Cycle Chamber Lineup

## RAPID-RATE THERMAL CYCLE CHAMBER

The TCC provides very high-speed temperature change of the specimen to meet a wide variety of applications from JEDEC standards to screening. An outstanding temperature change rate makes it possible to subject specimens to uniform temperature stress.
An innovative high-speed controller that enables highly precise specimen temperature control for specimen temperature measurement.
For specimen temperature, the ramp rate is 15K/min.
For air temperature, the ramp rate is 23K/min (temperature heat-up average).


| Model | Temperature range | Interior dimensions W×H×Dmm |
|---|---|---|
| TCC-151W | −70 to +180℃ | 800×500×400 |

## FASTER TEMPERATURE (& HUMIDITY) CHAMBER

A 1800 liters test chamber large enough for testing large products.

High stress type temperature (& humidity) chamber with temperature change rate of 5K/min for large specimens.


| Model | Temperature & humidity range | Interior dimensions W×H×Dmm |
|---|---|---|
| SML-21 | −40 to +180℃ / 20 to 98%rh | 1200×1000×1500 |
| SMU-21 | −40 to +180℃ | |
| SMS-21 | −70 to +180℃ / 20 to 98%rh | |
| SMG-21 | −70 to +180℃ | |

## BENCH-TOP TYPE TEMPERATURE (& HUMIDITY) CHAMBER

High-accuracy control over a wide temperature range of −60°C to +150°C is possible using our newly developed N-instrumentation. System upgrades can also be performed easily thanks to its various functions and options, ensuring that support is provided for all types of customer testing, research and experimentation.


| Model | Power supply | Temperature & humidity range | Interior dimensions W×H×Dmm |
|---|---|---|---|
| SH-242-5 | 100/200V AC 1φ 50/60Hz<br>220V AC 1φ 50/60Hz*<br>230V AC 1φ 50Hz* | −40 to +150℃<br>30 to 95%rh | 300×300×250 |

- +180℃ specification is also available.
- Temperature models (SU) are also available.

* Compliance with CE Marking.

# Environmental Stress Chamber AR series

## Standard Type

## SPECIFICATIONS

| Model | Power supply | Temperature & humidity range | Interior dimensions W×H×Dmm |
|---|---|---|---|
| ARS-0220 | 220V AC 3φ 60Hz*<br>380V AC 3φ 50Hz*<br>400V AC 3φ 50Hz* | –75 to +180°C／<br>10 to 98%rh (+10 to +95°C) | 700×800×400 |
| ARS-0390 | | | 700×800×700 |
| ARG-0220 | | –75 to +180°C | 700×800×400 |
| ARG-0390 | | | 700×800×700 |
| ARS-0680 | 200V AC 3φ 50/60Hz<br>220V AC 3φ 60Hz<br>380V AC 3φ 50Hz<br>400V AC 3φ 50Hz* | –75 to +180°C／<br>10 to 98%rh (+10 to +95°C) | 850×1000×800 |
| ARS-1100 | | | 1100×1000×1000 |
| ARL-0680 | | –45 to +180°C／<br>10 to 98%rh (+10 to +95°C) | 850×1000×800 |
| ARL-1100 | | | 1100×1000×1000 |
| ARG-0680 | | –75 to +180°C | 850×1000×800 |
| ARG-1100 | | | 1100×1000×1000 |
| ARU-0680 | | –45 to +180°C | 850×1000×800 |
| ARU-1100 | | | 1100×1000×1000 |

* Compliance with CE Marking.

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