

Quality is more than a word

ESPEC

# Bench-Top Type Temperature (& Humidity) Chamber

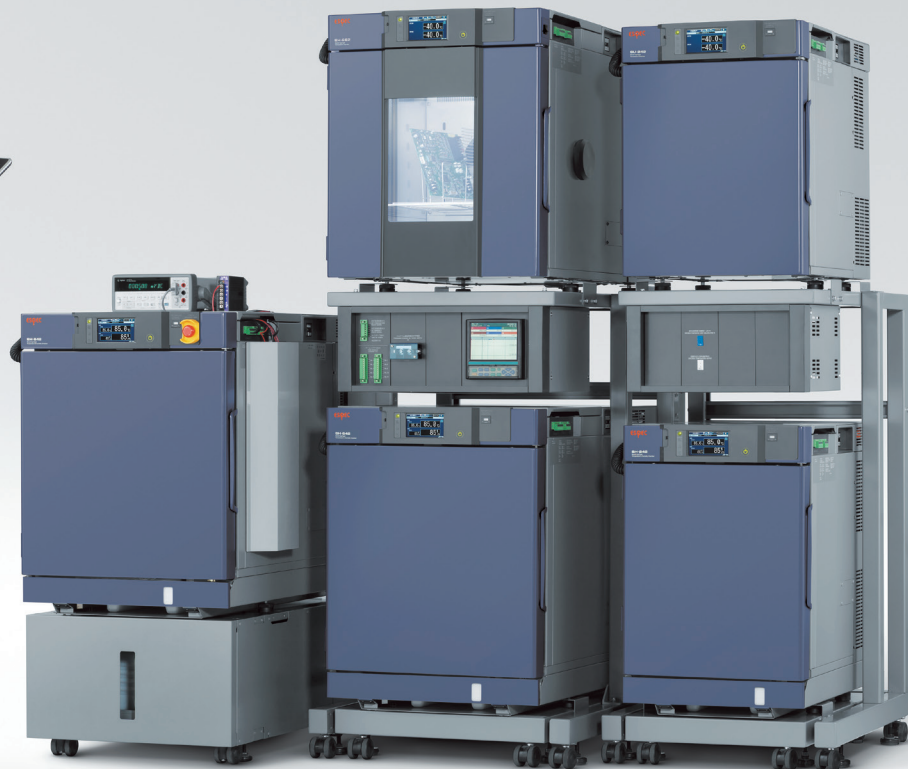
SH·SU



DESIGN  
AWARD  
2016



GOOD  
DESIGN



3 YEAR WARRANTY



# Compact design for personal use, to network with your computer.

The bench-top type temperature and humidity chamber series feature environmental testing performance in a compact design. The 12 available models combine various temperature and humidity ranges with internal capacities (22.5L and 64L), including a type with a temperature change rate of 5.0°C/min

## Contents

|                                              |         |
|----------------------------------------------|---------|
| • Features                                   | P.3–4   |
| • Controller                                 | P.5     |
| • Network                                    | P.6     |
| • Installation simulation (AR)               | P.7–8   |
| • Specifications                             | P.9–11  |
| • Options                                    | P.12–20 |
| • Bench-Top Type temperature chamber Options | P.21    |
| • For 5G communication equipment             | P.22    |

SH-242



SH-662



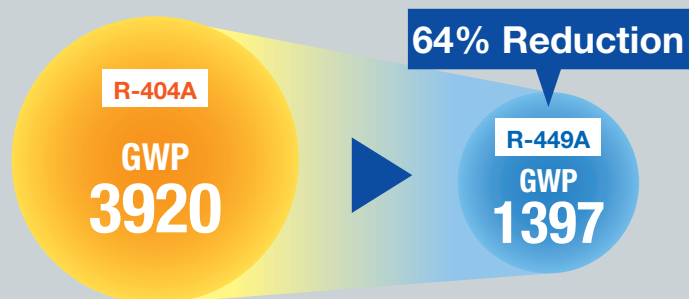
## To minimize our chambers' potential environmental impact

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

Low-GWP refrigerant R-449A



\* R-449A is available on request



## Chamber configurations

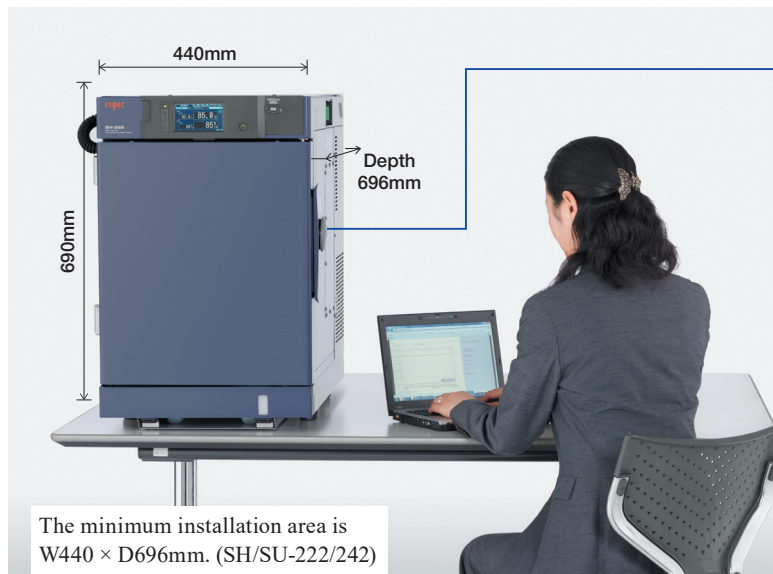
|                                  | Model    | Capacity | Temperature range | Humidity range                                                                     | Temperature change rate (pull down) |
|----------------------------------|----------|----------|-------------------|------------------------------------------------------------------------------------|-------------------------------------|
| Temperature and humidity chamber | SH-222   | 22.5 L   | –20 to +150°C     | 30%rh to 95%rh<br>(See the “Temperature and humidity control range chart” on P.10) | 2.1°C/min                           |
|                                  | SH-242   |          | –40 to +150°C     |                                                                                    |                                     |
|                                  | SH-262   |          | –60 to +150°C     |                                                                                    |                                     |
|                                  | SH-642   | 64 L     | –40 to +150°C     |                                                                                    | 1.7°C/min                           |
|                                  | SH-662   |          | –60 to +150°C     |                                                                                    |                                     |
|                                  | SH-242-5 | 22.5 L   | –40 to +150°C     |                                                                                    | 5°C/min                             |
| Temperature chamber              | SU-222   | 22.5 L   | –20 to +150°C     | —                                                                                  | 2.1°C/min                           |
|                                  | SU-242   |          | –40 to +150°C     |                                                                                    |                                     |
|                                  | SU-262   |          | –60 to +150°C     |                                                                                    |                                     |
|                                  | SU-642   | 64 L     | –40 to +150°C     |                                                                                    | 1.7°C/min                           |
|                                  | SU-662   |          | –60 to +150°C     |                                                                                    |                                     |
|                                  | SU-242-5 | 22.5 L   | –40 to +150°C     |                                                                                    | 5°C/min                             |

Expanded high-temperature control range

■ +180°C

## Features

### Compact enough for desktops



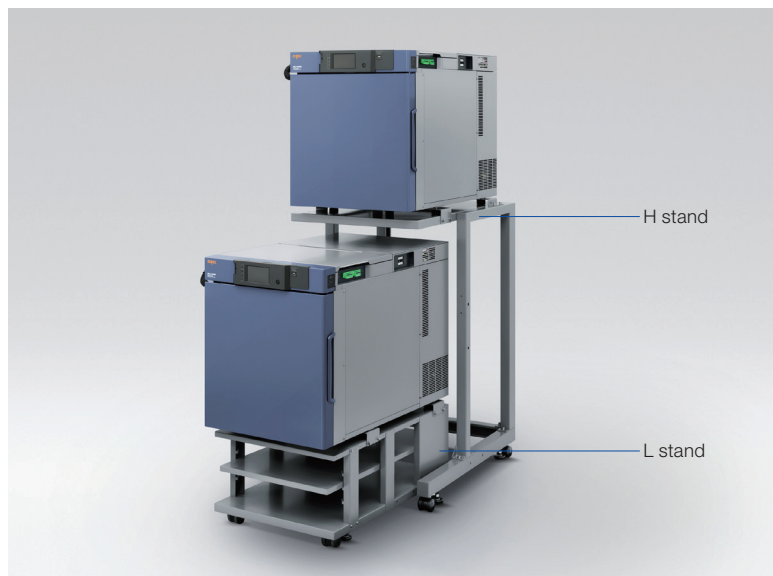
The cable port (standard) can be changed to a hand-in port (option)



When the chamber is equipped with both the viewing window and hand-in port, the specimen can be manipulated while viewing the inside of the chamber without opening the door. The inner glass door provides an enlarged view of the inside of the container.

\* See “Options” on P.13 for details.

### Stackable for enhanced space efficiency



L stand and H stand (option)

Caster-equipped stands are easy to move and are available in low types (C stand/L stand), H stand for storing these low types underneath, and M stand that comes in the same height as commonly used office desks.



H stand with option box and C stand (option)



M stand with water supply and drain tank (option)

\*See “Options” on P.19 for stand variations.

## Features

### Three-way access

Chamber comes with a  $\phi$  50mm cable port on the right side as a standard, but you can enlarge and or add more cable ports on the right, left and the top.

### Instrumentation Interlock I/O Terminals

Chamber comes with instrumentation interlock I/O terminals as a standard, which allow the chamber to work in synchronization with measuring instruments.

Using an input terminal enables chamber-specified program patterns to be run or stopped depending on measuring instrument operation.



Instrumentation interlock terminals

### Utilizing unused space (Japanese patent No.5906225)

The top of the chamber has space, which was unused previously. But now it is redesigned as a storage space to store running cables neatly, store measuring instrument, or to store whatever equipment you feel necessary close to the chamber.  
(not available on 242-5 models & 115V AC & 200V AC with NEC spec.)



Chamber top free space (SH-262)

### Viewing window with LED light

The window of the glass incorporating heat generator is designed to not fog up during testing.

It is also equipped with LEDs to facilitate viewing specimens inside the chamber. The viewing window on the roof enables specimens to be viewed from above.

### Conforms to international standard

Complies with the following standards:

|                 |                     |
|-----------------|---------------------|
| ISO 12100       | Safety of Machinery |
| IEC 60204-1     | Low Voltage         |
| IEC 61000-6-2   | EMC                 |
| EN 55011        | EMC                 |
| RoHS directives |                     |



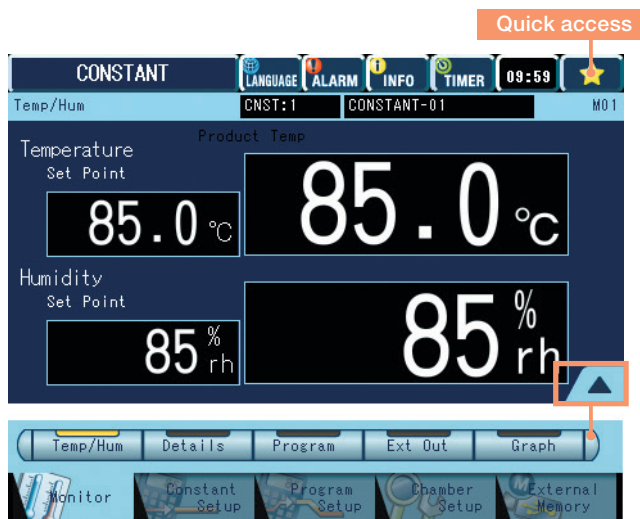
Viewing window (option)

**3** YEAR WARRANTY

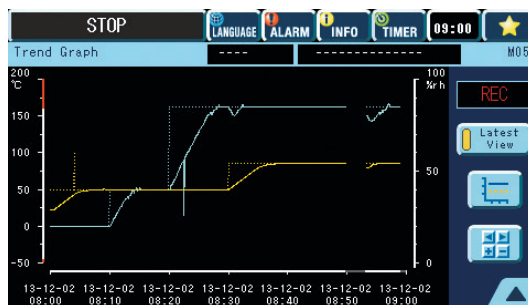
## User-friendly touch-screen operation



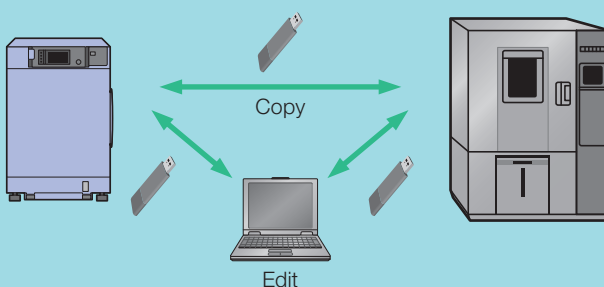
User-friendly stylus pen operation



### ● Trend-graph



### ● Program copy and computer editing



### ● Quick access icon

The star (★) mark on the top-right corner is a short-cut or quick access button, which you can assign by yourself. Once you assign it, you can access the function with a single push, instead of navigating through layers of menus.

### ● The controller allows you to register three constant test profiles, and eight program test profiles with a maximum of 99 steps per program.

### ● Output of temperature and humidity data

Sampling data (temperature and humidity settings and measurements) are saved in the internal memory.

Measurement intervals can also be changed.

\* Recording can be performed for 113 days and 18 hours at 30 second intervals.

### ● Multilingual support

The controller supports: Japanese / English / Korean / Chinese (Traditional / Simplified)

### ● Information notification

The chamber flashes the INFO icon to notify the user of information, such as inspection intervals for the humidifying tray. Notification periods and types can be configured as desired.

### ● Trend-graph display

The trend graph enables users to check test area settings and measurements.

### ● Copy test profiles

Share the test profiles among chambers via USB memory\* instead of PC.

Program patterns and graph displays can also be edited using a PC (via Pattern Manager Lite).

\* USB memory not included.

### Pattern Manager Lite

This is PC application software.

It can be downloaded from the Test Navi Product members-only site.

## Chambers can be operated from PC and tablet

### 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.

### Program patterns can be edited, started, or stopped using a web browser.

Program patterns registered to the chamber can also be edited using a web browser, which can also be used to start operation and turn power off.

### Displaying data in trend-graph

Settings and measured data saved in the chamber can be displayed in 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.

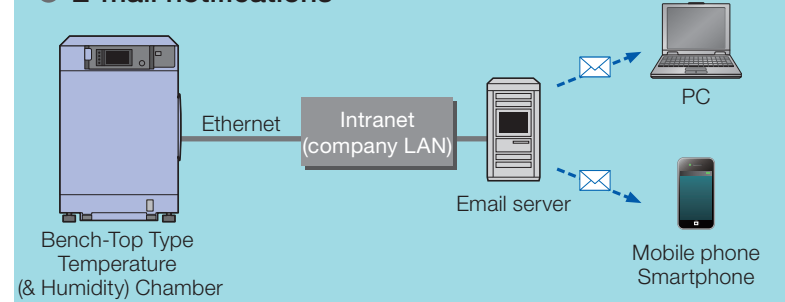
\* An Intranet environment is required to transmit e-mails.



### Login privileges

| Privileges    | Screen | Chamber monitor | Constant/<br>Program setup | Run/Stop | Configuration |
|---------------|--------|-----------------|----------------------------|----------|---------------|
| Administrator |        | ✓               | ✓                          | ✓        | ✓             |
| Operator      |        | ✓               | ✓                          | ✓        | —             |
| User          |        | ✓               | —                          | —        | —             |

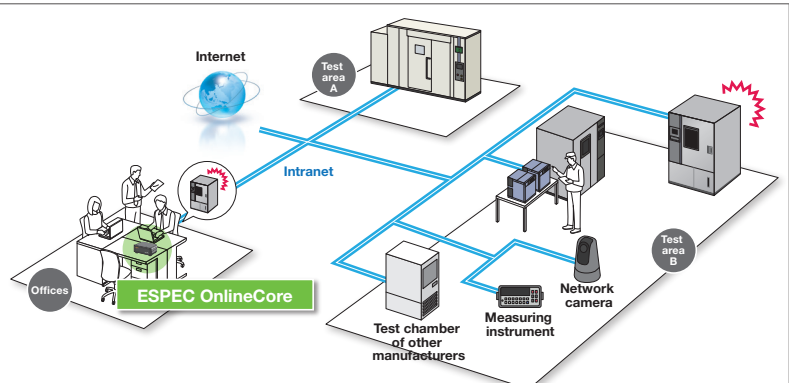
### E-mail notifications



### ESPEC OnlineCore (Sold separately)

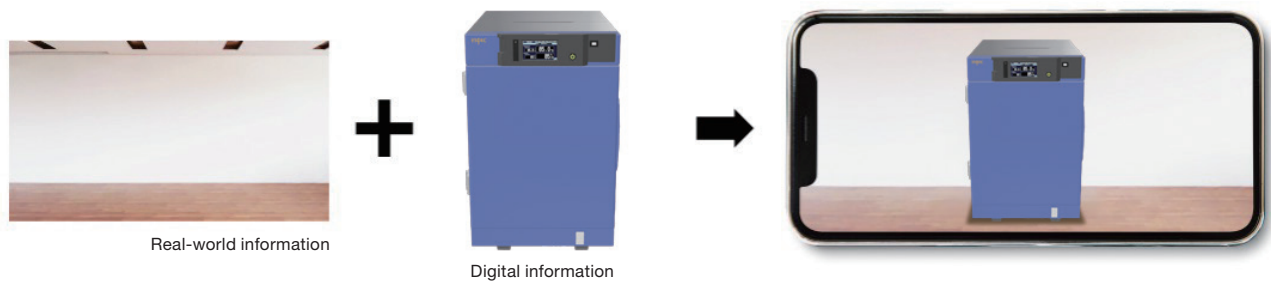
Central control system recommended for multiple environmental test chamber installations

Operating status can be checked via a web browser just by connecting to an existing Intranet environment.



Installation Simulation (AR [Augmented Reality])

Read the QR code with a smartphone or tablet camera to start the web browser.\*1  
View the intended installation location (a floor or desk) through the camera to check the installation image in the web browser.\*2, \*3



| SH               |              |                |              |
|------------------|--------------|----------------|--------------|
| With door closed |              | With door open |              |
| SH-222/242       |              | SH-222/242     |              |
|                  | SH-242-5/262 |                | SH-242-5/262 |
| SH-642/662       |              | SH-642/662     |              |

| SU               |              |                |              |
|------------------|--------------|----------------|--------------|
| With door closed |              | With door open |              |
| SU-222/242       |              | SU-222/242     |              |
|                  | SU-242-5/262 |                | SU-242-5/262 |
| SU-642/662       |              | SU-642/662     |              |

\*1 This service is designed specifically for use on smartphones. It will also work on some tablets. Operation has been confirmed in the Safari and Google Chrome browsers. Use the camera function of your smartphone or tablet to read the 2D codes.

#### Recommended environment

- OS: iOS 14 or higher, Android 9.0 or higher
- Browser: Safari (latest version), Google Chrome (latest version)
- Even if you meet the above conditions, this service may not operate normally on your terminal.
- Not all Android terminals support AR. For details on terminals that support AR, access the following URL.  
<https://developers.google.com/ar/discover/supported-devices>



Check list of  
devices that can  
use this function.

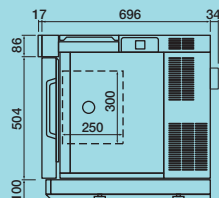
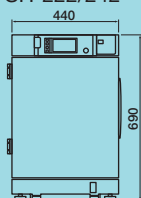
#### \*2 Precautions

- These contents can be used free of charge, but you will be charged communication fees to access them.
- Possible causes for the contents not being displayed properly include the camera capturing a location with no flat surfaces, objects being present on the flat surfaces, and insufficient brightness in the location.
- This service may not operate properly due to the communication environment.
- Before using AR to capture images, thoroughly check the surrounding area to make sure it is safe.

\*3 Initially, models are displayed with roughly their actual sizes. Stretch and pinch to change the dimensions of displayed models.  
Use this service only as a reference. It does not provide any guarantees for actual installation of chambers.

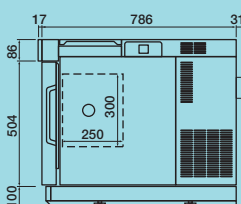
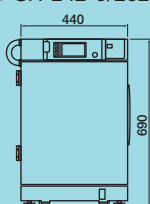
## Dimensions

### ● SH-222/242

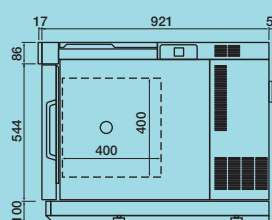
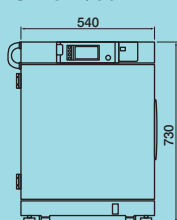


(Unit: mm)

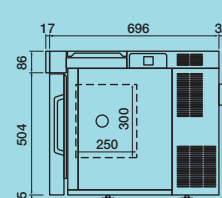
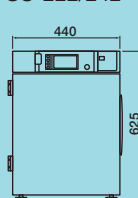
### ● SH-242-5/262



### ● SH-642/662

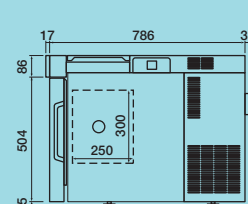
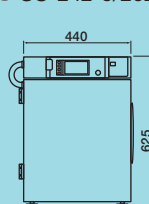


### ● SU-222/242

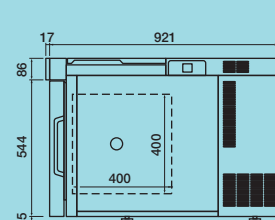
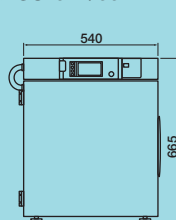


(Unit: mm)

### ● SU-242-5/262



### ● SU-642/662



**SH****– 20/– 40/– 60 to +150°C (+180°C) / 30 to 95%rh****Temperature & Humidity Chamber**

|                                               |                                               |                                                              |                                                                                                  |                                                           |                                                           |                                                           |                                                           | Rapid-rate Temperature Cycle Type                         |
|-----------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| Model                                         |                                               | SH-222                                                       | SH-242                                                                                           | SH-262                                                    | SH-642                                                    | SH-662                                                    | SH-242-5                                                  |                                                           |
| System                                        |                                               | Balanced Temperature & Humidity Control system (BTHC system) |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                                           |
| Temp. performance <sup>*1</sup>               | Temp. range                                   |                                                              | −20 to +150°C<br>(−4 to +302°F)                                                                  | −40 to +150°C<br>(−40 to +302°F)                          | −60 to +150°C<br>(−76 to +302°F)                          | −40 to +150°C<br>(−40 to +302°F)                          | −60 to +150°C<br>(−76 to +302°F)                          | −40 to +150°C<br>(−40 to +302°F)                          |
|                                               | Temp. fluctuation                             |                                                              | ±0.3°C<br>(−20 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C)                                        | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−60 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−60 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) |
|                                               | Temp. variation in space                      |                                                              | 2.5°C<br>(−20 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)                                          | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−60 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−60 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   |
|                                               | Temp. rate of change                          | Heat up rate                                                 | 3.2°C/min                                                                                        |                                                           |                                                           | 2.9°C/min                                                 |                                                           | 5.0°C/min                                                 |
|                                               |                                               | Pull down rate                                               | 2.1°C/min                                                                                        |                                                           |                                                           | 1.7°C/min                                                 |                                                           | 5.0°C/min                                                 |
|                                               | Temp. extreme achievement time Heat up time   |                                                              | From −20 to +150°C within 55 min.                                                                | From −40 to +150°C within 60 min.                         | From −60 to +150°C within 70 min.                         | From −40 to +150°C within 70 min.                         | From −60 to +150°C within 80 min.                         | From −40 to +150°C within 40 min.                         |
|                                               | Temp. extreme achievement time Pull down time |                                                              | From +20 to −20°C within 20 min.                                                                 | From +20 to −40°C within 50 min.                          | From +20 to −60°C within 70 min.                          | From +20 to −40°C within 60 min.                          | From +20 to −60°C within 90 min.                          | From +20 to −40°C within 20 min.                          |
|                                               | Lowest attainable temp.                       |                                                              | −20°C                                                                                            | −40°C                                                     | −60°C                                                     | −40°C                                                     | −60°C                                                     | −40°C                                                     |
| Humid. performance <sup>*1</sup>              | Humid. range                                  |                                                              | 30 to 95%rh (Refer to chart on P.10)                                                             |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               | Humid. fluctuation                            |                                                              | ±3.0%rh                                                                                          |                                                           |                                                           |                                                           |                                                           |                                                           |
| Construction                                  | Heater                                        |                                                              | Nichrome strip wire heater                                                                       |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               | Humidifier                                    |                                                              | Stainless steel cartridge heater                                                                 |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               | Refrigeration unit                            | System                                                       | Mechanical single-stage refrigeration system                                                     | Mechanical cascade refrigeration system                   |                                                           |                                                           |                                                           |                                                           |
|                                               |                                               | Cooler                                                       | Plate fin cooler                                                                                 |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               |                                               | Refrigerator                                                 | Hermetically sealed compressor, Air-cooled condenser, Expansion mechanism: Capillary tube system |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               |                                               | Refrigerator capacity                                        | 400W                                                                                             | [Unit 1: 400W ×1, Unit 2: 400W ×1]                        |                                                           |                                                           |                                                           |                                                           |
|                                               |                                               | Refrigerant                                                  | R-404A                                                                                           | R-404A, R-508A (R-23 for 100V type)                       |                                                           |                                                           | R-404A, R-23                                              |                                                           |
| R-449A is available on request except SH-242. |                                               |                                                              |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                                           |
| Capacity                                      |                                               | 22.5 L                                                       |                                                                                                  |                                                           | 64 L                                                      |                                                           | 22.5 L                                                    |                                                           |
| Chamber total load resistance                 |                                               | 20 kg                                                        |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                                           |
| Inside dimensions mm (inch) <sup>*2</sup>     |                                               | W300×H300×D250<br>(W11.8×H11.8×D9.8)                         |                                                                                                  |                                                           | W400×H400×D400<br>(W15.7×H15.7×D15.7)                     |                                                           | W300×H300×D250<br>(W11.8×H11.8×D9.8)                      |                                                           |
| Outside dimensions mm (inch) <sup>*2</sup>    |                                               | W440×H690×D696<br>(W17.3×H27.1×D27.4)                        |                                                                                                  | W440×H690×D786<br>(W17.3×H27.1×D30.9)                     | W540×H730×D921<br>(W21.2×H28.7×D36.2)                     |                                                           | W440×H690×D786<br>(W17.3×H27.1×D30.9)                     |                                                           |
| Weight                                        |                                               | 83 kg (78 for 100V type)                                     |                                                                                                  | 105 kg                                                    | 130 kg                                                    |                                                           | 106 kg                                                    |                                                           |
| Utility requirements                          | Allowable ambient conditions                  |                                                              | +5 to +35°C (+41 to +95°F)                                                                       |                                                           |                                                           |                                                           |                                                           |                                                           |
|                                               | Power supply <sup>*3</sup>                    | 100V AC 1φ50/60Hz                                            | 11.3 A                                                                                           |                                                           | 15.0 A                                                    | 17.5 A                                                    |                                                           | 16.7 A                                                    |
|                                               |                                               | 115V AC 1φ60Hz (NEC)                                         | 12.8 A                                                                                           |                                                           | —                                                         | —                                                         |                                                           | —                                                         |
|                                               |                                               | 200V AC 1φ50/60Hz <sup>*4</sup>                              | —                                                                                                |                                                           | 14.0 A                                                    | 14.5 A                                                    |                                                           | 10.6 A                                                    |
|                                               |                                               | 220V AC 1φ50/60Hz <sup>*5</sup>                              | 5.4 A                                                                                            |                                                           | 13.5 A                                                    | 14.0 A                                                    |                                                           | 9.3 A                                                     |
|                                               |                                               | 230V AC 1φ50Hz <sup>*5</sup>                                 | 5.3 A                                                                                            |                                                           | 13.5 A                                                    | 14.0 A                                                    |                                                           | 9.2 A                                                     |
| Noise level <sup>*6</sup>                     |                                               | Between 42 and 50 dB                                         |                                                                                                  | Between 42 and 54 dB                                      | Between 48 and 53 dB                                      |                                                           | Between 42 and 54 dB                                      |                                                           |
| Exhaust heat quantity                         |                                               | 3500 kJ/h                                                    |                                                                                                  | 4200 kJ/h                                                 | 5040 kJ/h                                                 |                                                           | 5700 kJ/h                                                 |                                                           |

<sup>\*1</sup> The performance values are based on IEC 60068-3-5:2001 for the temperature chamber, IEC 60068-3-6:2001 for the humidity chamber. Performance figures are given for a +23°C ambient temperature, 65%rh, rated power supply and no specimens inside the test area. However, the lowest attainable temperature is given for a max. ambient temperature of +30°C. Heat-up time is the achieved time from lowest temperature to highest temperature within temperature range.

<sup>\*2</sup> Excluding protrusions.

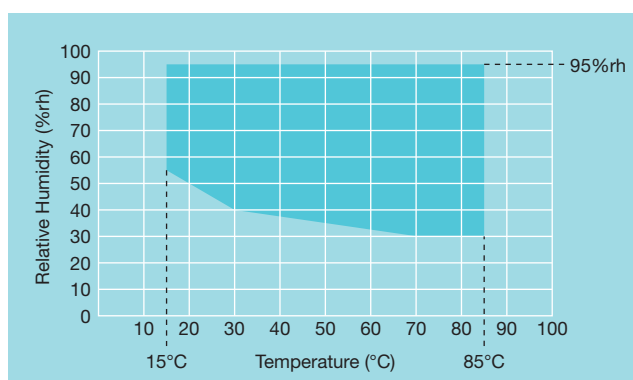
<sup>\*3</sup> At ambient temperature +23°C.

<sup>\*4</sup> 200V AC available with or without NEC specifications. SH-242-5 not available with NEC specification.

<sup>\*5</sup> Compliance with CE marking.

<sup>\*6</sup> 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)

## TEMPERATURE & HUMIDITY CONTROL RANGE (SH)



\* At ambient temperature +23°C

## FITTINGS

- Temperature (Humidity) recorder terminal
- Specimen power supply control terminal
- Alarm output terminal
- External output terminal
- Cable port ( $\phi$  50 mm  $\times$  1)
- Power cable (except 222, 242 model)
- Water supply tank (SH only)
- Humidifying tray drain plug (SH only)
- Drain hose
- Drain socket for water sensor box (SH only)
- Ethernet port (LAN)
- USB memory port
- Instrumentation interlock output terminal
- Instrumentation interlock input terminal



### Safety precautions

- Do not use specimens which are explosive or inflammable, or which contain such substances. To do so could be hazardous, as this may lead to fire or explosion.
- Do not place corrosive substances in the chamber. If corrosive substances are generated by the specimen, the life of the chamber may be significantly shortened specifically because of the corrosion of stainless steel and copper and because of the deterioration of resin and silicon.
- Do not place life forms or substances that exceed allowable heat generation.
- Be sure to read the user's manual before operation.

## SAFETY DEVICES

- Control circuit overcurrent protection (except SH/SU-222, 242)
- Cartridge fuse for control circuit short-circuit protection
- System error (Error)
- Room temperature compensation burnout detection circuit
- Dry bulb temperature burnout detection circuit
- Absolute upper/lower temperature limit alarm (w/ built-in T/H controller)
- Expansion analog board sensor burnout detection circuit (SH/SU-242-5 only)
- Temperature switch for air circulator
- Thermal fuse
- Temperature switch for condenser fan
- Overheat protector
- Wet bulb temperature burnout detection circuit (SH only)
- Refrigerator-1 error detection
- Refrigerator-2 error detection (except SH/SU-222, 242)
- Humidifier dry heat protector (SH only)
- Humidifier water level detection (SH only)
- Temperature upper limit deviation alarm (w/ built-in T/H controller)
- Absolute upper/lower humidity limit alarm (SH only) (w/ built-in T/H controller)
- System error (Alarm)
- Water tank drought switch (SH only)
- Chamber door switch
- Water tank low-level switch (SH only)
- Specimen power supply control terminal

## ACCESSORIES

- Shelf (Stainless steel)  
Load capacity (evenly distributed)  
SH/SU-222, 242, 262, 242-5 .....0.5kg  
SH/SU-642, 662 .....5kg  
Max. number of shelves  
SH/SU-222, 242, 262, 242-5 .....5 stages (pitch 35mm)  
SH/SU-642, 662 .....5 stages (pitch 50mm)
- Connector (For temperature/humidity recorder terminals)  
SH: 2/ SU: 1
- Cable port plug (rubber) .....1 ( $\phi$  50 mm)
- Cartridge fuse  
SH/SU-222, 242, 262 (B type, 250V 7A) .....1  
SH/SU-642, 662, 242-5 (B type, 250V 7A, 6A) .....1 of each
- Wet-bulb wick .....1 box (SH only)
- Humidifying tray drain hose 2m .....1 (SH only)
- Drain hose for water sensor box (0.3m) .....1
- Stylus pen (For touch panel operation) .....1
- Operation manual .....1 set
- Warranty card .....1

|                                               |                                               |                                                           |                                                                                                  |                                                           |                                                           |                                                           | Rapid-rate Temperature Cycle Type                         |                                   |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------|
| Model                                         |                                               | SU-222                                                    | SU-242                                                                                           | SU-262                                                    | SU-642                                                    | SU-662                                                    | SU-242-5                                                  |                                   |
| System                                        |                                               | Balanced Temperature Control system (BTC system)          |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                   |
| Temp. performance <sup>*1</sup>               | Temp. range                                   | −20 to +150°C<br>(−4 to +302°F)                           | −40 to +150°C<br>(−40 to +302°F)                                                                 | −60 to +150°C<br>(−76 to +302°F)                          | −40 to +150°C<br>(−40 to +302°F)                          | −60 to +150°C<br>(−76 to +302°F)                          | −40 to +150°C<br>(−40 to +302°F)                          |                                   |
|                                               | Temp. fluctuation                             | ±0.3°C<br>(−20 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C)                                        | ±0.3°C<br>(−60 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−60 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) | ±0.3°C<br>(−40 to +100°C)<br>±0.5°C<br>(+100.1 to +150°C) |                                   |
|                                               | Temp. variation in space                      | 2.5°C<br>(−20 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)                                          | 2.5°C<br>(−60 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−60 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   | 2.5°C<br>(−40 to +100°C)<br>4.0°C<br>(+100.1 to +150°C)   |                                   |
|                                               | Temp. rate of change                          | Heat up rate                                              | 3.2°C/min                                                                                        |                                                           |                                                           | 2.9°C/min                                                 |                                                           | 5.0°C/min                         |
|                                               |                                               | Pull down rate                                            | 2.1°C/min                                                                                        |                                                           |                                                           | 1.7°C/min                                                 |                                                           | 5.0°C/min                         |
|                                               | Temp. extreme achievement time Heat up time   |                                                           | From −20 to +150°C within 55 min.                                                                | From −40 to +150°C within 60 min.                         | From −60 to +150°C within 70 min.                         | From −40 to +150°C within 70 min.                         | From −60 to +150°C within 80 min.                         | From −40 to +150°C within 40 min. |
|                                               | Temp. extreme achievement time Pull down time |                                                           | From +20 to −20°C within 20 min.                                                                 | From +20 to −40°C within 50 min.                          | From +20 to −60°C within 70 min.                          | From +20 to −40°C within 60 min.                          | From +20 to −60°C within 90 min.                          | From +20 to −40°C within 20 min.  |
|                                               | Lowest attainable temp.                       |                                                           | −20°C                                                                                            | −40°C                                                     | −60°C                                                     | −40°C                                                     | −60°C                                                     | −40°C                             |
| Construction                                  | Heater                                        |                                                           | Nichrome strip wire heater                                                                       |                                                           |                                                           |                                                           |                                                           |                                   |
|                                               | Refrigeration unit                            | System                                                    | Mechanical single-stage refrigeration system                                                     |                                                           | Mechanical cascade refrigeration system                   |                                                           |                                                           |                                   |
|                                               |                                               | Cooler                                                    | Plate fin cooler                                                                                 |                                                           |                                                           |                                                           |                                                           |                                   |
|                                               |                                               | Refrigerator                                              | Hermetically sealed compressor, Air-cooled condenser, Expansion mechanism: Capillary tube system |                                                           |                                                           |                                                           |                                                           |                                   |
|                                               |                                               | Refrigerator capacity                                     | 400W                                                                                             |                                                           | [Unit 1: 400W ×1, unit 2: 400W ×1]                        |                                                           |                                                           |                                   |
|                                               |                                               | Refrigerant                                               | R-404A                                                                                           |                                                           | R-404A, R-508A (R-23 for 100V type)                       |                                                           |                                                           | R-404A, R-23                      |
| R-449A is available on request except SU-242. |                                               |                                                           |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                   |
| Capacity                                      |                                               | 22.5 L                                                    |                                                                                                  |                                                           | 64 L                                                      |                                                           | 22.5 L                                                    |                                   |
| Chamber total load resistance                 |                                               | 20 kg                                                     |                                                                                                  |                                                           |                                                           |                                                           |                                                           |                                   |
| Inside dimensions mm (inch) <sup>*2</sup>     |                                               | W300×H300×D250<br>(W11.8×H11.8×D9.8)                      |                                                                                                  |                                                           | W400×H400×D400<br>(W15.7×H15.7×D15.7)                     |                                                           | W300×H300×D250<br>(W11.8×H11.8×D9.8)                      |                                   |
| Outside dimensions mm (inch) <sup>*2</sup>    |                                               | W440×H625×D696<br>(W17.3×H24.6×D27.4)                     |                                                                                                  | W440×H625×D786<br>(W17.3×H24.4×D30.9)                     | W540×H665×D921<br>(W21.2×H26.1×D36.2)                     |                                                           | W440×H625×D786<br>(W17.3×H24.6×D30.9)                     |                                   |
| Weight                                        |                                               | 78 kg (73 for 100V type)                                  |                                                                                                  | 100 kg                                                    | 123 kg                                                    |                                                           | 101 kg                                                    |                                   |
| Utility requirements                          | Allowable ambient conditions                  |                                                           | +5 to +35°C (+41 to +95°F)                                                                       |                                                           |                                                           |                                                           |                                                           |                                   |
|                                               | Power supply <sup>*3</sup>                    | 100V AC 1ϕ50/60Hz                                         | 9.3 A                                                                                            |                                                           | 15.0 A                                                    | 17.5 A                                                    |                                                           | 16.7 A                            |
|                                               |                                               | 115V AC 1ϕ60Hz (NEC)                                      | 11.0 A                                                                                           |                                                           | ——                                                        | ——                                                        |                                                           | ——                                |
|                                               |                                               | 200V AC 1ϕ50/60Hz <sup>*4</sup>                           | ——                                                                                               |                                                           | 14.0 A                                                    | 14.5 A                                                    |                                                           | 10.6 A                            |
|                                               |                                               | 220V AC 1ϕ50/60Hz <sup>*5</sup>                           | 4.5 A                                                                                            |                                                           | 13.5 A                                                    | 14.0 A                                                    |                                                           | 9.3 A                             |
|                                               |                                               | 230V AC 1ϕ50Hz <sup>*5</sup>                              | 4.4 A                                                                                            |                                                           | 13.5 A                                                    | 14.0 A                                                    |                                                           | 9.2 A                             |
| Noise level <sup>*6</sup>                     |                                               | Between 42 and 50 dB                                      |                                                                                                  | Between 42 and 54 dB                                      | Between 48 and 53 dB                                      |                                                           | Between 42 and 54 dB                                      |                                   |
| Exhaust heat quantity                         |                                               | 3500 kJ/h                                                 |                                                                                                  | 4200 kJ/h                                                 | 5040 kJ/h                                                 |                                                           | 5700 kJ/h                                                 |                                   |

<sup>\*1</sup> The performance values are based on IEC 60068-3-5:2001 for the temperature chamber. Performance figures are given for a +23°C ambient temperature, 65%rh, rated power supply and no specimens inside the test area. However, the lowest attainable temperature is given for a max. ambient temperature of +30°C. Heat-up time is the achieved time from lowest temperature to highest temperature within temperature range.

<sup>\*2</sup> Excluding protrusions.

<sup>\*3</sup> At ambient temperature +23°C.

<sup>\*4</sup> 200V AC available with or without NEC specifications. SU-242-5 not available with NEC specification.

<sup>\*5</sup> Compliance with CE marking.

<sup>\*6</sup> 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

## Utility

### Power plug (220V AC only)

- C type
  - O type
- \* For SH/SU-222, 242, 262 only

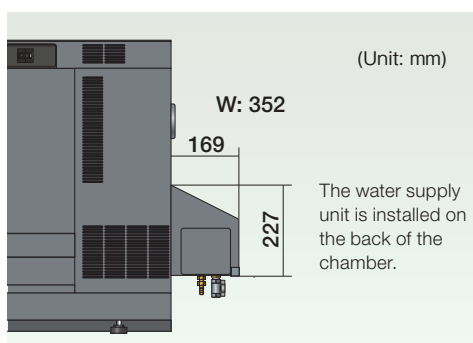
### Continuous water supply

Equips the chamber with a connection for purifying water supply system. There are 2 types available:

- Connection port without pressure-reducing valve
- Connection port with pressure-reducing valve (See following illustration.)

#### Advantage

Eliminates the hassle of filling the fixed tank.



\* A water purifier (sold separately) is also available.

To prevent damage in the event of water leakage, a dew tray (P.18) and other preventive measures can be prepared.

### Roof top water tank

An additional tank that supplements the volume of the standard cartridge tank is provided to carry out continuous operation.

Effective water volume: 5L

Location: Chamber ceiling

\*The connection port without pressure-reducing valve is required when selecting this option.

#### Advantage

Capable of continuous operation without water supply for approx. 10 days  
\* Varies depending on conditions.

### Automatic water refill

Automatically refill water to the humidifying tray and the wick pan periodically.

If the sample produces corrosive gases that dissolve easily in water, periodically replacing the water prevents corrosion of the refrigerators and prevents silica from adhering to the humidifier.

#### Advantage

Reduces refrigerator and humidifier maintenance costs while extending equipment service life.

### Wet-bulb wick

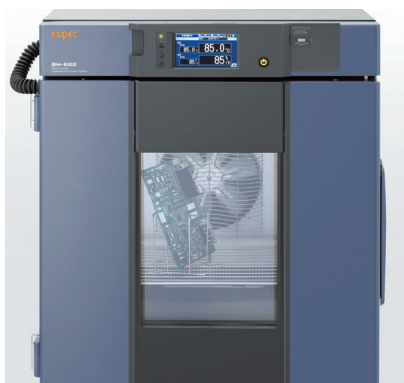
Consumables

1 pack (24 wicks)

# Options

## Observation

### Door with viewing window



SH-662

|                 |                                                                                 |
|-----------------|---------------------------------------------------------------------------------|
| <b>Aims</b>     | Specimen observation during testing                                             |
| <b>Features</b> | Equipped with LED lights on the door to facilitate viewing inside the test area |

Effective view:

SH/SU-222-242-262-242-5 W215×H190mm

SH/SU-642-662 W215×H290mm

\* Standard performance may not be met under certain conditions. Inquire for details.

[Example]

- SH/SU-242 Temp. extreme achievement time  
(Pull down time)

From +20 to -35°C (Setting: -40°C)  
Within 60 min.

- SH/SU-242-5 Temp. rate of change  
(Heat up rate)

From -21 to +131°C 4.0°C/min

(Pull down rate)

From +131 to -21°C 4.0°C/min

### Inner glass door



Inner glass door without hand-in port (with wiper)



Inner glass door with hand-in port

|                 |                                                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Aims</b>     | Specimen observation during testing. A hand-in port can also be installed to enable access to specimens.                                     |
| <b>Features</b> | Reduces temperature and humidity disturbances during specimen observation. Provides a wider effective view than a viewing window.            |
| <b>Caution</b>  | Because viewing specimens for long periods may disturb the temperature and humidity inside the chamber, we recommend using a viewing window. |

A glass door is provided between the test area and the chamber door to observe specimens.

The glass door is equipped with a wiper for models with humidity.

\* Standard performance may not be met under certain conditions. Inquire for details.

[Example]

- SH/SU-242-5 Temp. rate of change  
(Heat up rate)

From -21 to +131°C 4.0°C/min

(Pull down rate)

From +131 to -21°C 4.0°C/min

### Roof top viewing window

The inside of the test area can be viewed from above.

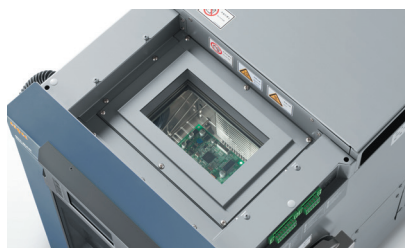
Effective view: W181×D107mm

\* Except SH/SU-242-5

\* Some variations from standard performance may occur. Contact ESPEC for details.

(Example)

- Temperature pull-down time of SH/SU-242  
+20 to -35°C (Setting: -40°C) within 60 min.

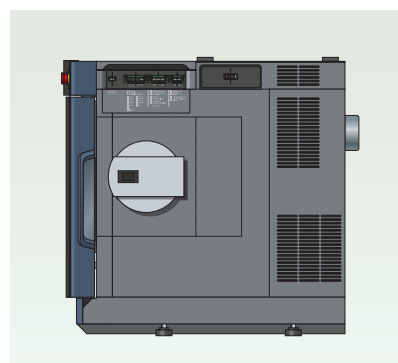


### Hand-in port

Specimens can be accessed from one of the sides.

φ 130mm×1

Installation location: Right or left side



# Options

## Specimen setting

### Additional cable port

Provided in addition/ replacement of the standard cable port (right side,  $\phi$  50mm).

Available location:

- Left side, right side
- Ceiling

Available dimensions:

- $\phi$  25 mm
- $\phi$  50 mm
- $\phi$  100 mm
- flat cable port (W100 x H25 mm)

\* Comes with a rubber plug and a cap.

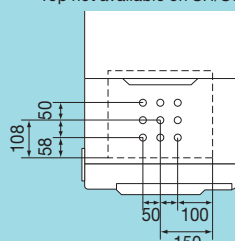
\* Standard performance may not be met under certain conditions. Inquire for details.



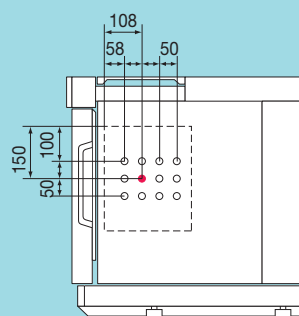
Left side  $\phi$  100 Cable port

### Additional cable port location

<SH/SU-222-242-262-242-5>  
\* Top not available on SH/SU-242-5



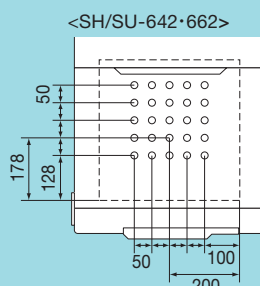
Top side



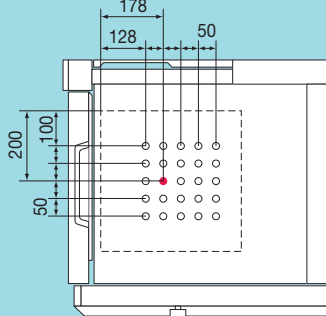
Right side

\* Same location points for left side

(Unit : mm)



Top side



Right side

\* Same location points for left side

● Standard equipped

### EZ connect cable port plug

Cable port plug w/ embedded terminals for power supply.

Cable port plug with embedded terminals (inside and outside) to ease specimen connection to an external device.

Spec.: AC 6 to 24V 0.1 to 3A

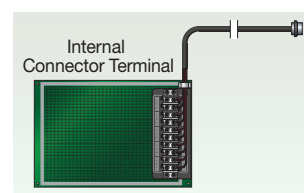
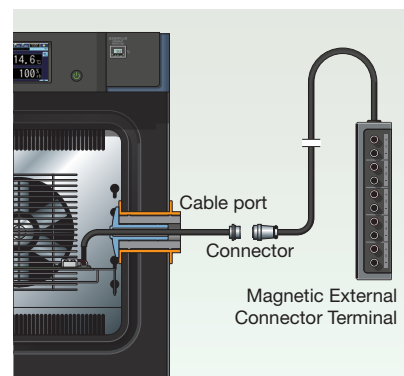
DC 1.5 to 60V 0.1 to 3A

Connector Type: Block 10P (+5P, -5P)

Enclosure: Magnetized box with isolator

Temperature Range:

-70 to +180°C 30 to 95%rh



### Cable port rubber plug

Comes with the cable port.

- for  $\phi$  25 mm
- for  $\phi$  50 mm
- for  $\phi$  100 mm
- spiral-wrapped plug (5 x 50 x 2000 mm)
- For flat cable port
- For  $\phi$  50 mm with slits
- For  $\phi$  100 mm with slits



for  $\phi$  50mm



spiral-wrapped plug



for flat cable port



with slits

# Options

## Specimen setting

### Shelf

Same as standard shelf.  
18-8 Cr-Ni Stainless steel

<SH/SU-222·242·262·242-5>

Effective holding area: W200×D150 mm

Load capacity: 0.5 kg



<SH/SU-642·662>

Effective holding area: W300×D300 mm

Load capacity: 5 kg



### Specimen basket

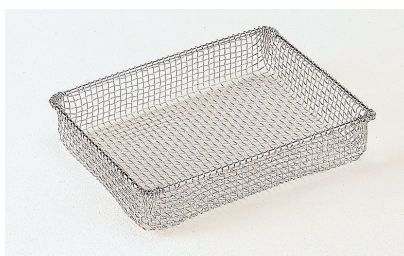
For small specimens that cannot be placed on the shelf.

Material: 18-8 Cr-Ni Stainless steel

Dimensions: W206×H40×D156 mm

\* Place the specimen on the shelf.

\* Do not use when exceeding the shelf load capacity.



### Cable organizer kit

The kit includes:

cable ties

magnetic cable cover

dew tray



### Noise reduction rear cover

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Advantage 1 | Soundproofed for less exhaust noise.                                                                                                               |
| Advantage 2 | Directs exhaust air from the back of the chamber towards the ceiling, making it possible for the back of the chamber to be placed closer to walls. |

A space of 160 mm is required from the back of the chamber.



# Options

## Network

### Interface

Communication ports to connect the chamber to a PC.

- RS-485
- RS-232C
- GPIB

### Communication cables

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

## Measurement

### Paperless recorder

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

- Portable type

■ Requires a stand or desk near the chamber on which to place the recorder.

- Option box with recorder

■ The recorder is incorporated in an option box.

\*See “Option box” on P.17 for details.

Display: 5.7inch color touch panel

Scan interval: 5 sec. (default)

Internal recording media:

Flash memory 8MB

External recording media:

CF memory card port

(Includes a 256 MB CF card)

USB memory port

< Temperature & humidity type >

No. of inputs:

Temperature 1, Humidity 1

(4 more channels can be turned ON)

< Temperature type >

No. of inputs:

Temperature 1

(5 more channels can be turned ON)



### Temperature (humidity) recorder

Portable type

Recording method: Dot

Recording paper: Effective width 100 mm

No. of inputs:

< Temperature & humidity type >

Temperature 5, Humidity 1

- -50 to +150°C/0 to 100%rh

- -100 to +150°C/0 to 100%rh

- -100 to +200°C/0 to 100%rh

< Temperature type >

Temperature 6

- -100 to +200°C

**External output terminal set (x3)** ■ The option box is required (P.17).

The following contact signals are installed on the option box, or stand with option box.

- Time up output terminal

Enables power supply and/or temperature measurement of the specimen synchronised with the timer.

- Time signal terminal

Add up to 10 signal terminals to the 1 equipped as standard.

- Temp. & humid. SP attainment output

Sends out a contact signal when the chamber reaches temperature (humidity) set values.

# Options

## Measurement

### Temperature recorder output terminal (Wet-bulb temperature)

This terminal outputs the test area wet bulb temperature.

\* SH type only.

### 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



### Applying DC power supply ➡ The option box is required.

Capable of applying voltage to the specimen, used for bias testing. The DC power supply unit synchronizes with constant program operations, and can be set for each temperature and humidity program step.

- 5 V
- 12 V
- 15 V
- 24 V
- 48 V

\* Not available on SH/SU-242-5



### Option box

The option box can be installed inside H stand or L stand\* or put on the chamber top.

\* Refer to stand option variation on P.19.

Following specified options can be set in the option box. (Up to 3 options)

- Paperless recorder
- External output terminal set (x3)
- Specimen temperature control
- Program-synched DC power supply

Box size:

A: W435×D350×H224 mm

B: W525×D350×H224 mm



Option box B with a built-in paperless recorder option

\* The option box is required power supply.

## Performance

### Specimen temperature control ➡ The option box is required.

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

- Insulated type

\* Not available on SH/SU-242-5



### Electrostatic capacitance-type humidity sensor control

#### Advantage

No need to replace the wick during long-term continuous operation (approximate replacement period: once a month)

\* Please calibrate approximately once a year.

\* Testing with large changes in temperature and humidity may result in condensation on the sensor that prevents accurate measurement.

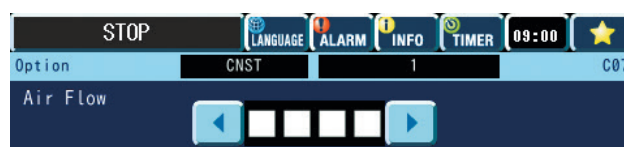
\* Accuracy will vary depending on the temperature and humidity range. Please check for details.



### Airflow adjuster

Used when tests require low airflow velocity or constant velocity.

Setting value range: 4 levels.



\* Standard performance may not be guaranteed at lower air speed.

# Options

## Safety

### Overcool protector

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

### External device alarm input terminal

A terminal that is used to stop operation of the chamber in the event that an external device linked to the chamber malfunctions.

#### Example

If the charge/discharge system detects a battery abnormality during the charge/discharge testing of the secondary battery, it will stop operating the chamber to reduce any risk of the secondary battery catching fire.

### Door opening signal output terminal

A terminal that outputs the door open status. Capable of controlling an external device that operates along with door operation and records the temperature disturbance history.

### Status indicator light

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

Displayed levels: up to level 4

Pole length: 226 mm

| Color |        |       |      |       |
|-------|--------|-------|------|-------|
| Red   | Yellow | Green | Blue | White |

| Chamber status                              |
|---------------------------------------------|
| • In operation                              |
| • Main power on                             |
| • Instrumentation power on                  |
| • Main power on or instrumentation power on |
| • Abnormality                               |

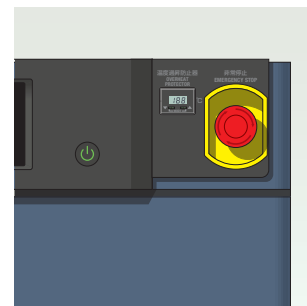
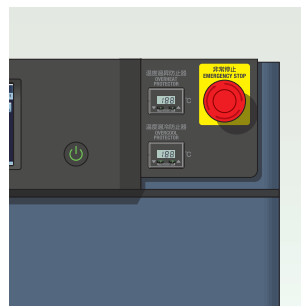


\* The pole length can be reduced by 10 mm (up to 56 mm).

\* Contact us if using a stand (option) or two-tiered stacking.

### Emergency stop pushbutton

Stops the chamber immediately.  
Available with or without guard.



With guard

### Chamber dew tray

Prevents water leaks from the chamber onto the floor.

- The dew tray for the chamber
- The dew tray for the stand

## Document

### Operation manual

- CD
- Booklet

### Reports & certificates

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

# Options

## Stand variation

The stand is equipped with casters for easy transfer or transportation and also provides storage for peripherals.  
(Equipped with adjustable feet.)  
Dimensions: mm For SH/SU-642-662 (For 222-242-262-242-5)

### Advantage

Casters enable the chamber to be moved smoothly. Two-tiered combinations are possible that allow for space-saving installation and improved workability.

## H stand

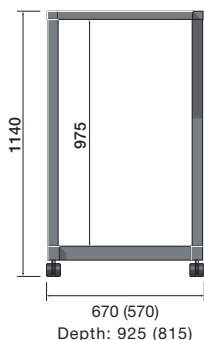
The C stand can be stored underneath.

### Advantage

Space-saving design.

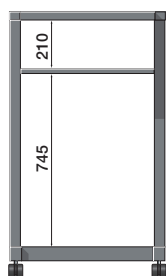
#### • Without shelf

The C stand and L stand can be stored underneath for two-tiered stacking.



#### • With shelf

Move the shelf to install instrumentation or measurement devices.

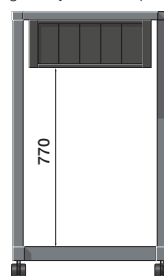


Shelf size: W577×D900 (W473×D790)

#### • With option box

Following options can be installed.

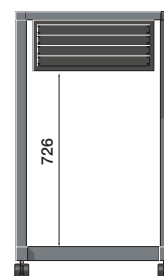
- Paperless recorder
- Output terminal set
- Specimen temperature control
- Program-synched DC power supply



### For 642/662

#### • With 19 inch rack

19 inch size instrumentation or controller can be set to the rack.

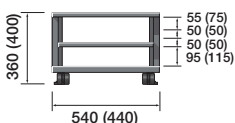


## L stand

Two-tiered stackable with H stand (no shelves).

#### • With shelf

Shelf : adjustable 3 pitches



Shelf size: W480×D850 (W378×D740)  
Depth: 860 (750)

#### • With water tank

Capacity: 18 L



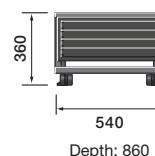
- \* Separate option for continuous water supply The connection port without pressure-reducing valve is required.
- \* Excluding NEC 115V AC, NEC 200V AC.

#### • With option box



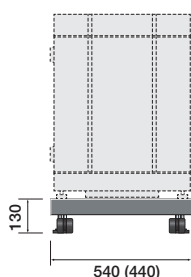
### For 642/662

#### • With 19 inch rack



## C stand

Two-tiered stackable with H stand.



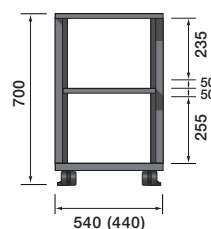
## M stand

### Advantage

The height can be set to facilitate specimen insertion and removal, in turn enhancing work efficiency.

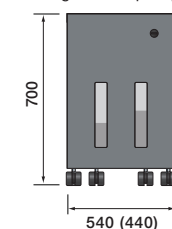
#### • With shelf

Shelf: adjustable 3 pitches



#### • With water and drainage tanks

Water tank capacity: 20L (10L)  
Drainage tank capacity: 20L (10L)



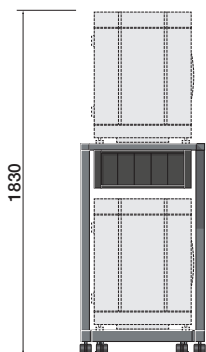
- \* Separate option for continuous water supply. The connection port without pressure-reducing valve is required.
- \* Excluding NEC 115V AC, NEC 200V AC.

# Options

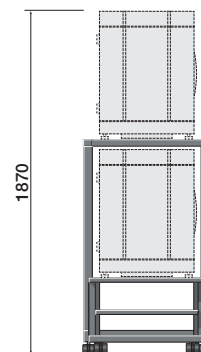
## Examples of two-tiered stacking

### H stand + L stand

|                                                                                   |
|-----------------------------------------------------------------------------------|
| SH-242×2 + H stand + L stand                                                      |
|  |
| SH-262×2 + H stand + L stand                                                      |
|  |

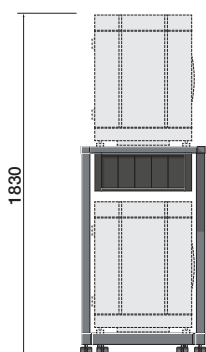


|                                                                                    |
|------------------------------------------------------------------------------------|
| SH-642×2 + H stand + L stand                                                       |
|  |

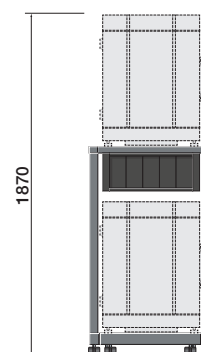


### H stand + C stand

|                                                                                     |
|-------------------------------------------------------------------------------------|
| SH-242×2 + H stand<br>(option box specification) + C stand                          |
|  |
| SH-262×2 + H stand<br>(option box specification) + C stand                          |
|  |

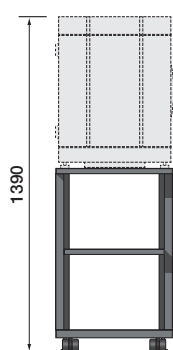


|                                                                                      |
|--------------------------------------------------------------------------------------|
| SH-642×2 + H stand<br>(option box specification) + C stand                           |
|  |

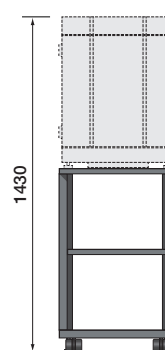


### M stand

|                                                                                     |
|-------------------------------------------------------------------------------------|
| SH-242 + M stand                                                                    |
|  |
| SH-262 + M stand                                                                    |
|  |



|                                                                                      |
|--------------------------------------------------------------------------------------|
| SH-642 + M stand                                                                     |
|  |



\* For safety reasons, make sure to use the included anchoring fixtures (for securing the chamber to the stand) and the fall-prevention fixtures (for securing the stand to the floor). Anchor bolts for securing to the floor are not included.

# Bench-Top Type temperature chamber Options

● Retrofit is not available ○ Retrofit is available

| Page | OPTION                                                 | SH                   |     |     |                 |                 |                 | SU  |     |     |                 |                 |                 |
|------|--------------------------------------------------------|----------------------|-----|-----|-----------------|-----------------|-----------------|-----|-----|-----|-----------------|-----------------|-----------------|
|      |                                                        | 222                  | 242 | 262 | 642             | 662             | 242-5           | 222 | 242 | 262 | 642             | 662             | 242-5           |
| 12   | Power plug (220V AC)                                   | ●                    | ●   | ●   | ● <sup>*3</sup> | ● <sup>*3</sup> | ● <sup>*3</sup> | ●   | ●   | ●   | ● <sup>*3</sup> | ● <sup>*3</sup> | ● <sup>*3</sup> |
|      | Continuous water supply <sup>*1</sup>                  | ○                    | ○   | ○   | ○               | ○               | ○               | —   | —   | —   | —               | —               | —               |
|      | Roof top water tank <sup>*1</sup>                      | ○                    | ○   | ○   | ○               | ○               | —               | —   | —   | —   | —               | —               | —               |
|      | Automatic water refill <sup>*1</sup>                   | ○                    | ○   | ○   | ○               | ○               | ○               | —   | —   | —   | —               | —               | —               |
|      | Wet-bulb wick                                          | ○                    | ○   | ○   | ○               | ○               | ○               | —   | —   | —   | —               | —               | —               |
| 13   | Door with viewing window <sup>*1</sup>                 | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Roof top viewing window <sup>*1</sup>                  | ●                    | ●   | ●   | ●               | ●               | —               | ●   | ●   | ●   | ●               | ●               | —               |
|      | Inner glass door                                       | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Hand-in port                                           | Inquire for details. |     |     |                 |                 |                 |     |     |     |                 |                 |                 |
| 14   | Additional cable port                                  | Inquire for details. |     |     |                 |                 |                 |     |     |     |                 |                 |                 |
|      | Cable port rubber plug                                 | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | EZ connect cable port plug                             | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
| 15   | Shelf                                                  | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Specimen basket                                        | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Cable organizer kit                                    | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Noise reduction rear cover                             | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
| 16   | Interface <sup>*1</sup>                                | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Communication cables                                   | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Paperless recorder                                     | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Temperature (humidity) recorder                        | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | External output terminal set (x3) <sup>*1 *2</sup>     | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
| 17   | Temperature recorder output terminal                   | ○                    | ○   | ○   | ○               | ○               | ○               | —   | —   | —   | —               | —               | —               |
|      | Thermocouple                                           | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Applying DC power supply <sup>*1 *2</sup>              | ○                    | ○   | ○   | ○               | ○               | —               | ○   | ○   | ○   | ○               | ○               | —               |
|      | Option box                                             | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Specimen temperature control <sup>*1 *2</sup>          | ○                    | ○   | ○   | ○               | ○               | —               | ○   | ○   | ○   | ○               | ○               | —               |
|      | Electrostatic capacitance-type humidity sensor control | ●                    | ●   | ●   | ●               | ●               | ●               | —   | —   | —   | —               | —               | —               |
|      | Airflow adjuster <sup>*1</sup>                         | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
| 18   | Overcool protector <sup>*1</sup>                       | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | External device alarm input terminal <sup>*1</sup>     | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Door opening signal output terminal <sup>*1</sup>      | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Status indicator light                                 | ●                    | ●   | ●   | ●               | ●               | ●               | ●   | ●   | ●   | ●               | ●               | ●               |
|      | Emergency stop pushbutton <sup>*1</sup>                | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Chamber dew tray                                       | ●                    | ●   | ●   | ●               | ●               | ●               | ●   | ●   | ●   | ●               | ●               | ●               |
|      | Operation manual                                       | ○                    | ○   | ○   | ○               | ○               | ○               | ○   | ○   | ○   | ○               | ○               | ○               |
|      | Reports & certificates                                 | ●                    | ●   | ●   | ●               | ●               | ●               | ●   | ●   | ●   | ●               | ●               | ●               |
| 19   | Stand variation                                        | Inquire for details. |     |     |                 |                 |                 |     |     |     |                 |                 |                 |

<sup>\*1</sup> except 115V AC NEC, 200V AC NEC

<sup>\*2</sup> The option box is required when selecting these options.

<sup>\*3</sup> C type only

Chamber performance may not satisfy specifications depending on the combination of options.

## Shielded specification

The demand for various communications devices in the 0.6 to 6 GHz frequency bands that correspond to “Sub6” for 5th generation mobile communications systems (5G) is increasing and these devices are being evaluated. However, in evaluations in which power is applied to the device, leaks of unnecessary radio waves must be prevented to suppress the impact on other peripheral equipment. ESPEC introduces a shielded test chamber that delivers a temperature environment which blocks radio waves from the outside and prevents the radio waves inside from leaking to the outside.



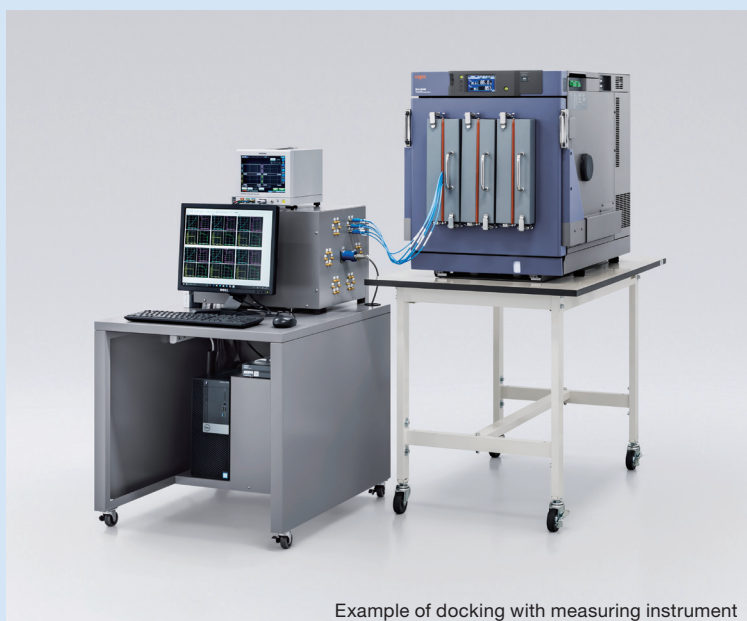
| Model                               | Shielded specification SU-642    |
|-------------------------------------|----------------------------------|
| Frequency band/<br>Attenuation rate | 4 GHz and 6 GHz/40 dB or greater |
| Temperature range                   | −40 to +100°C                    |
| Inside<br>dimensions (mm)           | 400 (W) × 400 (H) × 400 (D)      |

## Sliding door specification

**A compact environmental tester that simplifies connection and wiring work to specimens**

### Drawer featuring a wide range of interfaces

A wide range of expansion drawers are available according to the specimens and measuring instruments. Doors can be customized to suit your needs.



Example of docking with measuring instrument



|                    |                                             |
|--------------------|---------------------------------------------|
| List of door types | Flat cable port                             |
|                    | BNC connector                               |
|                    | Card edge connector + $\phi 25$ cable ports |
|                    | Sample holder                               |

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