

Temperature and humidity test chamber

Technical proposal



SOLUTION

1. Product Name

1. 1. Product Name	Energy saving programmable temperature and humidity test chamber
Product model	SMC-CC series
Cooling mode	Air-cooling
1. 2. Sample limit	<p>Prohibitions:</p> <p>Test or storage of samples with easy-burning, easy-explosion and volatile</p> <p>Test or storage of samples with corrosion</p> <p>Test or storage of Biological specimen</p> <p>Test or storage of a sample of a strong electromagnetic emission source</p> <p>Test or storage of Radioactive material</p> <p>Test or storage of Highly toxic substances</p> <p>Test or storage of samples which will produce Highly toxic substances when testing and storage</p>

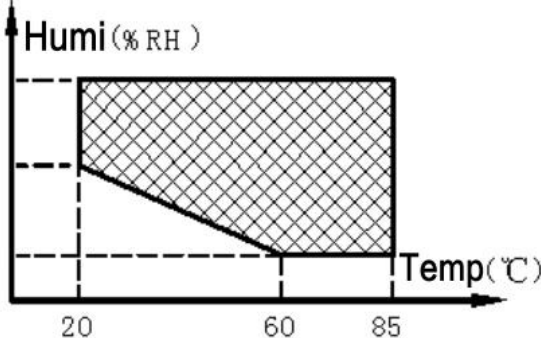
2. Basic parameters

Parameters /Model	Unit	SMC-64-CC	SMC-80-CC	SMC-150-CC	SMC-225-CC	SMC-408-CC	SMC-800-CC	SMC-1000-CC	SMC-1500-CC
Test volume	L	64L	80L	150L	225L	408L	800L	1000L	1500L
Temperature range	℃	(-)40℃~+150℃							
Humidity range	%RH	10~98							
Dew -point temperature	℃	10~95							
Dew -point temperature range	℃	4℃ (-3℃) ~ 94℃							
Humidity fluctuation	%RH	±1.0~±3.0							
Temperature change	℃	Fluctuation ±0.1 ~±0.5; Uniformity±0.5~±2.0							
Heating rate	℃/min	3.0℃~5.0℃							
Cooling rate	℃/min	1.0℃~2.0℃							
Highest thermal compensation	W	200W	200W	200W	200W	200W	200W	200W	200W
Inner size	W	400	400	500	500	800	1000	1000	1200
	D	400	400	500	600	600	800	1000	1000
	H	400	500	600	750	850	1000	1000	1250
Outer size	W	680	700	800	800	1300	1300	1300	1500
	D	900	1220	1320	1420	1620	1620	1820	2300
	H	625	1450	1550	1800	1800	1980	1980	1600
Power supply		230V±10%, 1/N, 50HZ				400V±10%, 3/N/PE, 50HZ			
Power	KW	4.8	5.8	6.5	8.5	8.9	11.6	13.5	15.5
Noise level	dB(A)	50	52	54	55	56	60	60	65
Weight	kg	270	280	380	450	620	380	840	955
Cooling mode		AIR-COOLED							
Control system	Pcs	2 pcs South Korea SANWON TEMI controller							

3. Performance index

3.1. Environment conditions	<p>Equipment using ambient temperature: +5℃ ~+35℃ ± 5℃</p> <p>Equipment using ambient relative humidity ≤ 85%RH</p> <p>Equipment using ambient pressure: 86 kPa ~ 106kPa</p>
-----------------------------	--










We aim to be the leading brand in climatic chamber industry.

3.2. Test methods	<ul style="list-style-type: none"> ● GB/T5170.2-2008 temperature test equipment ● GB/2423.1-2008(IEC60068-2-1:2007)low temperature test method AB。 ● GB/2423.2-2008(IEC60068-2-2:2007)high temperature test method BA。 ● GB/T5170.5-2008 Damp heat test equipment ● GJB150. 4(MIL-STD-810D)low temperature test method。 ● GB2423. 3-93(IEC68-2-3)Test Ca: constant damp heat test method ● GB2423. 4-93(IEC68-2—30)Test Db: alternating damp heat test method
<p>3.3. Temperature range</p> <p>3.4. Temperature fluctuation</p> <p>3.5. Temperature deviation</p> <p>3.6. Temperature uniformity</p>	<p>-40~+150°C (SMC-CC series)</p> <p>≤ ± 0.5°C (note: if in accordance with GB/T5170.2-1996, the fluctuation ≤ ± 0.25°C)</p> <p>≤ ± 2°C</p> <p>≤ ± 2°C</p> <p>≤ ± 1°C (Temp at 20°C ~ 80°C, Humi at 60% ~ 90%RH)</p> <p>≤ ± 2°C (Temp at 100°C ~ 150°C)</p> <p>≤ ± 1.5°C (Temp at 20°C ~ -70°C)</p>
<p>3.7. Heating rate</p> <p>3.8. Cooling rate</p> <p>3.9. Standard load</p>	<p>-70→+150°C within 50mins (Mechanical refrigeration with standard load)</p> <p>+25→-70°C within 60mins (Mechanical refrigeration with standard load)</p> <p>5kg aluminum sheet, 300W heat</p>
<p>3.10. Humidity range</p> <p>3.11. Humidity deviation</p>	<p>(20%~98%)RH(Temperature and humidity can be controlled with reference to the following figure)</p> <p>(we can do 10% humidity at +60~+85°C)</p>  <p>≤ ± 3.0%RH (humidity > 85%RH)</p> <p>≤ ± 3.0%RH (humidity ≤ 85%RH)</p>
3.12. Work noise	<p>A sound level ≤ 65dB(A)</p> <p>(measured in free space from 1.2m height on the ground)</p>
<h2>4. Structure</h2>	
4.1. Thermal insulation retaining structure	1. Outer wall: double-sided galvanized steel plate, surface spray treatment (SANWOOD standard color: blue)

	<p>2.External structure reinforcement: double-sided galvanized steel plate, the surface spray or Q235 type steel, pickling, phosphating, surface spray treatment</p> <p>3.Inner wall: SUS304 (1.2mm) stainless steel plate</p> <p>4.Internal structure reinforcement: 2mm think SUS304 stainless steel reinforcement</p> <p>5.Thermal insulation material: rigid polyurethane foam + ultra fine glass fiber</p> <p>6.Bearing capacity: 160kg/m2 (uniform load)</p> <p>7.Total load weight of the chamber (bottom plate and sample frame together) no more than: 160kg</p>
4.2. Air conditioning channel	Fan, heater, evaporator, drainage device
4.3.Standard configuration	<p>1.Humidifier, dry burning prevention device, wet bulb temperature sensor, a wet bulb tank</p> <p>2.Technology holes: diameter ϕ 100mm , 2pcs for left side and right side of chamber</p> <p>3.Preparation of the active sample shelf (2 layers), 4.load-bearing capacity (uniform distribution):40kg/ layer</p> <p>5.Air pressure balancing device</p>
4.4. Door	<p>1.door with hinge,the hinge is one the left of the chamber(faced to front of chamber)</p> <p>2.With one anti-frozen and anti-condensation glass observation window(W310*h420 mm), the heat on the glass can be adjusted automatically by electric heat.</p> <p>3.With high effective and long life LED inner chamber good for test state inspection</p>
4.5.Control panel (on the door)	<p>1.Controller display screen</p> <p>2.Operation button, super temperature protection setting device</p> <p>3.USB interface + R232 interface</p>
4.6. Machinery room parts	<p>1.Machinery room contains:</p> <p>2.Refrigeration unit, water supply and drainage equipment, fan, power distribution control cabinet</p> <p>3.Humidification barrel and water measuring control device</p>
4.7.Power distribution control cabinet	<p>1.Cooling fan</p> <p>2.Buzzer</p> <p>3.Distribution board</p> <p>4.RS-485, RJ-45 Ethernet physical interface</p> <p>5.Total power leakage circuit breaker</p>
4.8.Heater	<p>1.Nichrome heater</p> <p>2.Heater control method: SSR (solid state relay)</p>
4.9.Humidifier	<p>1.Water heating and humidifying method</p> <p>2.Stainless steel sheathed heater control mode: contactless periodic pulse width modulation, SSR</p>

	3. Water level control device, anti drying device for heater
5. Refrigeration system	
5.1. Work method	Binary-type refrigeration systems
5.2. Condensation mode	Air-cooled (equipped with pressure automatic regulating device) at the outlet of the machine heat by the installation of the exhaust fan, so as to avoid the indoor environment temperature influence
5.3. Refrigeration compressor	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(France Tecumseh compressor)</p> </div> <div style="text-align: center;">  <p>(Germany Bock compressor)</p> </div> </div>
5.4. Evaporator	Fin type heat exchanger (or could be dehumidifier)
5.5. Throttling device	Electronic expansion valve and capillary
5.6. Evaporative condenser	Brazed plate heat exchanger
5.7. Control mode of refrigerator	<ol style="list-style-type: none"> 1. The control system automatically adjusts the optimal energy saving conditions of the refrigerator according to the test conditions 2. Compressor return air cooling circuit 3. Energy regulating circuit 4. Evaporation pressure regulating valve
5.8. Refrigeration system working condition display	The mechanical table shows the high, low pressure, exhaust temperature and the operating current of the compressor.
5.9. Refrigerant	American DuPont green refrigerant R404a and R23 (Ozone depletion index was 0)
5.10. Other	<p>The main components come from the international brands</p> <p>The air inlet of the condenser is provided with a metal filtering net, which is convenient for maintenance and use.</p>

- 1. 20-year manufacturing and R&D experience
- 2. South Korea SANWON TEMI control system
- 3. Energy saving 40%
- 4. Exported to 36 countries

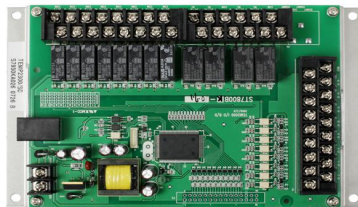
		Parts name	Brand name	Note
5.11.Refrigeration system (components list)		Refrigeration compressor	France Tecumseh	Low noise piston compressor
		Oil separator	American ALCO、	
		Plate type heat exchanger	Danmark DANFOSS	
		Pressure relay	Danmark DANFOSS	
		Condenser	Taiwan Zhongli	customized
		Evaporator	Taiwan Zhongli	customized
		Dry filter	Danmark DANFOSS	
		Capillary	Danmark DANFOSS	
		Expansion valve	Danmark DANFOSS	
		Solenoid valve	Italy CASTEL	
		Exhaust pressure regulating valve	Japan Saginomiya	
		Condensation pressure regulating valve	Danmark DANFOSS	

6.Control system

6.1.Controller
6.2.Model



South Korea SANWON
TEMI-1500
























6.3. Monitor
6.4. Operation mode
6.5.Setting method
6.6.Program capacity

640X480 dot matrix, 5.6 inch TFT color LCD display
Program mode,fixing mode
Chinese,English and Russian menu,touch screen input
Program edit:

6.7.Setting range	<p>No: 99 max</p> <p>Step no: 999 steps max</p> <p>Cycle no: 99 max (the steps of per cycle is 99 max)</p> <p>Fixed program: 99 program</p> <p>Program can be linked (serial number of linked program can be selected)</p> <p>Temperature: adjusted according to the temperature range of the equipment(upper limit: +5 C, lower limit: -5C)</p> <p>Humidity: 0~100%RH</p>
6.8.Display resolution	<p>temperature: 0.01 °C</p> <p>time: 0.01min</p> <p>humidity: 0.1%RH(temperature and humidity test equipment)</p>
6.9.Input	PT100 Thermocouple
6.10.Communication function (standard)	<p>RS-485 Port、RJ-45 Ethernet port, equipped with local and remote communication functions (need to be equipped with RAS-2003 monitoring software, RS-485/RS-232 converter, need to occupy the COM port and USB port of PC port for each); can connect up to 16 devices, the maximum length of the cable 800m</p>
6.11.Control mode	<p>Anti integral saturation PID</p> <p>BTC balanced temperature control mode + DCC (intelligent cold control) +DEC (intelligent electrical control) (temperature test equipment)</p>
6.12.Curve recording function	<p>BTHC balanced temperature humidity control + DCC (intelligent cooling control) +DEC (intelligent electrical control) (temperature and humidity test equipment)</p> <p>Equipped with RAM for battery protection,which can save the setting value, the sampling value and the time of the sampling time of the device,the maximum record time is 350 days (when the sampling period is 1.5min)</p>
6.13.USB function	<p>Equipped with one U disk(Capacity is not less than 1G,no warranty)</p> <p>PC use disk</p> <p>Edit test program and saved in U disk through PC use software,then pick the program and save it to controller, ; the program or record in controller also can be saved to disk and then save to PC for analysis and management。The record can be showed and printed though PC use software(The print data with non-modifiable mark.Or convert the record data to readable access data file</p> <p>The test curve recorded in controller is: 2 kinds temperature — setting temperature and actual temperature ; 2 kinds humidity — Setting humidity and actual humidity(Temperature and humidity test equipment)</p>
6.14.Extra function	<p>Fault alarm and reason, processing function</p> <p>Power - off protection function</p>

We aim to be the leading brand in climatic chamber industry.

	Upper and lower temperature protection function Calendar timer function (auto start and auto stop) Self diagnostic function																											
6.15. Software use condition (User offer)	IBM compatible PC, P II and above CPU, 128M and above storage, Chinese and English Windows2000 or Windows XP operation system																											
6.16. temperature and humidity measurement	Temperature: A class PT100 type sheathed thermocouples Humidity: wet and dry temperature measure method (Only work under humidity control condition)																											
6.17. APP function (optional)	Using a mobile phone APP control machine to start, stop and modify operation data, also can use mobile phone to remotely monitor the equipment, support Apple software and Android Software. Can also realize a mobile phone monitor 20 sets of equipment, anywhere can be accessed through the WiFi network and 4G network environment and can be run in parallel with the existing Client the S / W																											
6.18. Circuit system components brands	<table border="1"> <thead> <tr> <th>Name</th> <th>Brands</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>Controller</td> <td>South Korea SANWON</td> <td>TEMI-1500 touch screen</td> </tr> <tr> <td>Leakage protection switch</td> <td>French Schneider</td> <td></td> </tr> <tr> <td>AC contactor</td> <td>French Schneider</td> <td></td> </tr> <tr> <td>Thermal relay</td> <td>French Schneider</td> <td></td> </tr> <tr> <td>Phase sequence relay</td> <td>Carlo Gavazzi</td> <td></td> </tr> <tr> <td>Time relay</td> <td>Carlo Gavazzi</td> <td></td> </tr> <tr> <td>Solid state relay</td> <td>Carlo Gavazzi</td> <td></td> </tr> <tr> <td>Temperature fuse</td> <td>Carlo Gavazzi</td> <td></td> </tr> </tbody> </table>	Name	Brands	Note	Controller	South Korea SANWON	TEMI-1500 touch screen	Leakage protection switch	French Schneider		AC contactor	French Schneider		Thermal relay	French Schneider		Phase sequence relay	Carlo Gavazzi		Time relay	Carlo Gavazzi		Solid state relay	Carlo Gavazzi		Temperature fuse	Carlo Gavazzi	
	Name	Brands	Note																									
	Controller	South Korea SANWON	TEMI-1500 touch screen																									
	Leakage protection switch	French Schneider																										
	AC contactor	French Schneider																										
	Thermal relay	French Schneider																										
	Phase sequence relay	Carlo Gavazzi																										
	Time relay	Carlo Gavazzi																										
	Solid state relay	Carlo Gavazzi																										
Temperature fuse	Carlo Gavazzi																											
7. Water supply of damp heat system (only W type)																												
7.1. External water supply 7.2. Water storage device 7.3. Storage tank capacity	Distilled water, pure water, distilled water can be (resistivity greater than 500 m) (user provided) The drawer type water tank is located in front of the machine room. Hand held 18 liters (800L above the box using 36L water tank)																											

7.4. Water filtering device
(optional accessories)

Ensure that the equipment does not need to manual add water for 365 days a year



8. Safety protection device

8.1.Refrigeration system

Compressor over-pressure protection
Compressor motor overheat protection
Over current protection of compressor motor
Cooling water supply under pressure protection (for water cooled type)

8.2.Humidification system

Dry burning protection of humidification tube
Abnormal protection of water supply
Drainage anomaly protection
Water shortage anomaly protection

8.3.Test chamber protection

Adjustable over temperature protection
Temperature fuse wire protection
Air conditioning channel limit over temperature protection
Temperature protection within the controller
Fan motor overheat protection
Inside and outside pressure balancing device protection
Box door open (running) prompt alarm

8.4.Other

The total power phase sequence and lack of phase protection
Leakage protection of the whole machine
Load short circuit protection

9. Other

9.1.Power cable

One 5-Core cable with six meters (4-core cable+protective ground cable,Total power leakage circuit breaker

9.2.Sample power control terminal

Relay contact control, AC220V、within 10A (When run normally,contact close; when stop or breakdown,contact off)

9.3.Data

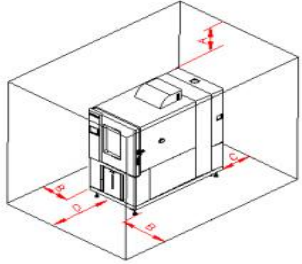
Offer User manual and technical specification in English

9.4.Test hole

There are $\phi 50$ 、 $\phi 100$ on both side for option,also can customize the position and hole diameter under no influence on machine structure and property

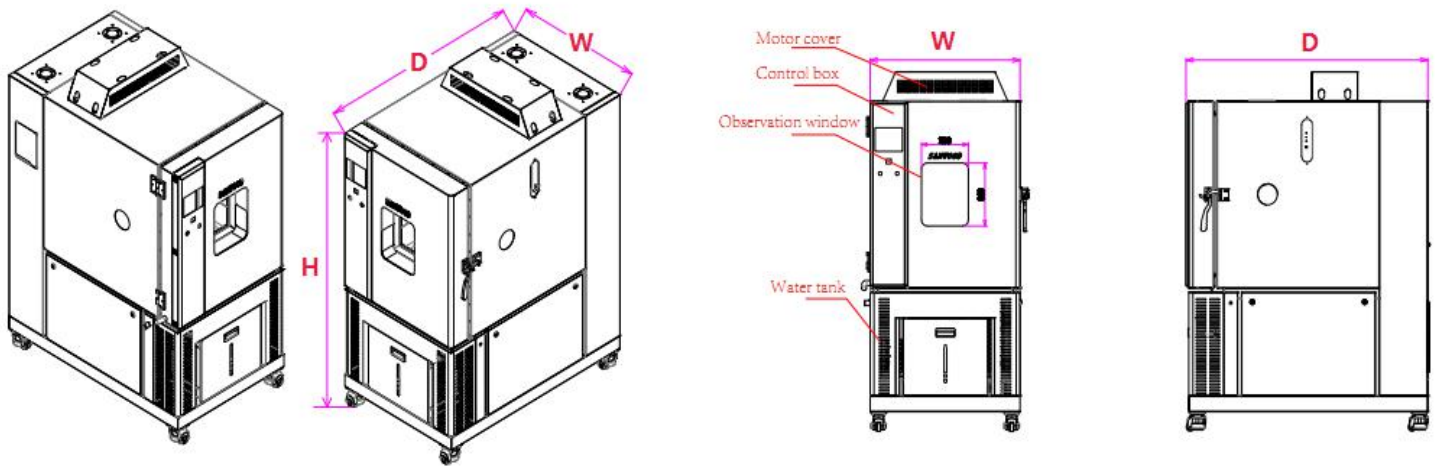
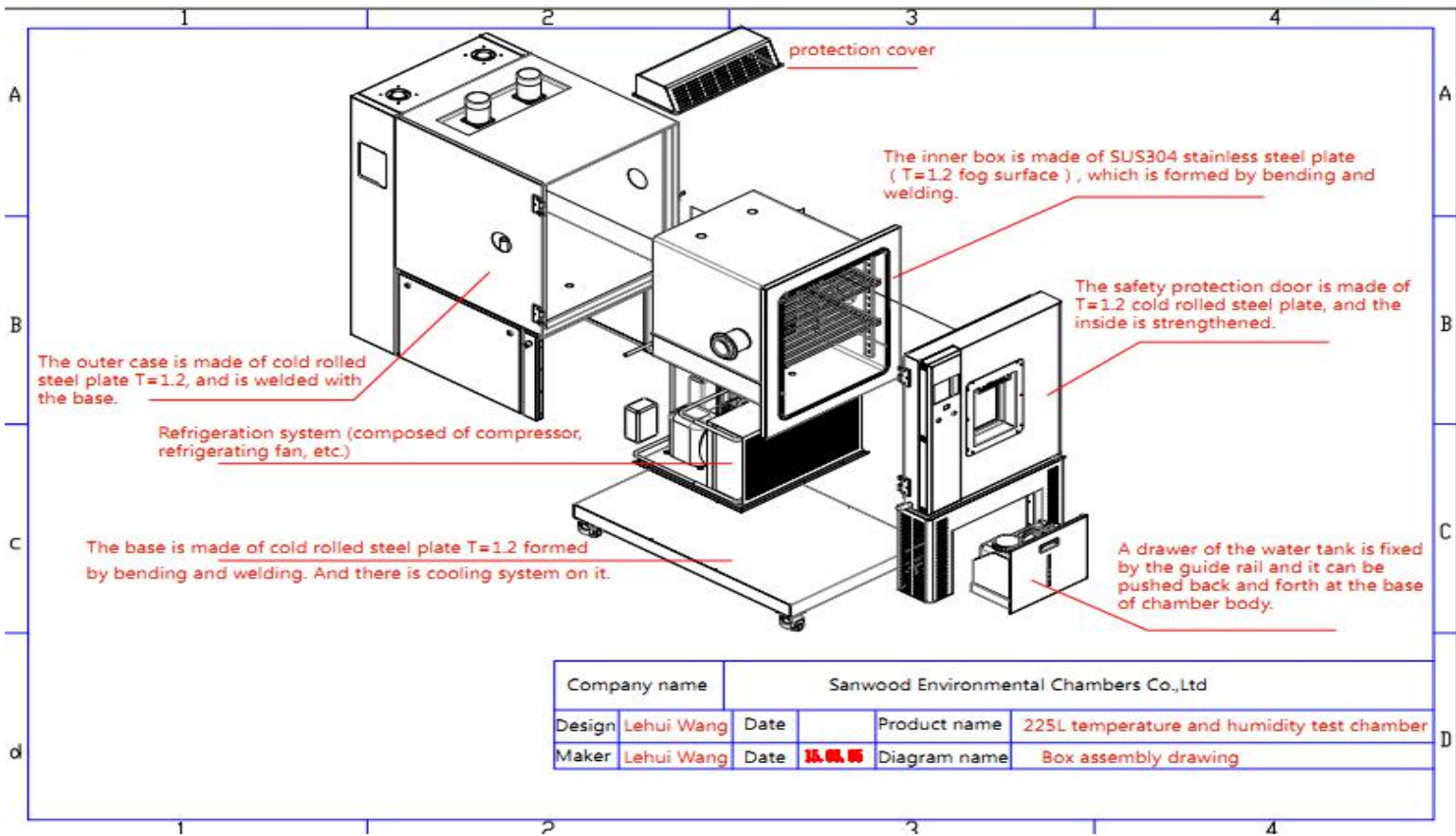
9.5.Centralized monitoring software

Use for remote centralized monitor, equipped with RS-485/RS-232 convertor

10. Installation condition	
10.1.Site	<p>Leveled ground , good ventilation,no flammable,explosive or aggressive gas and powder</p> <p>No strong electromagnetic radiation source</p> <p>With drainage near the machine(within 2 meters)</p> <p>Ground load-bearing capacity: not less than 800kg/m2</p> <p>Leave space around the machine for maintenance</p>
	<p>A: not less than 30cm</p> <p>B: not less than 50cm</p> <p>C: not less than 70cm</p> <p>D: not less than 90cm</p> 
10.2. Environment Requirement	<p>When machine no work, environment temperature keep 0~+35℃(No ice)</p> <p>When temperature is below 0℃, please discharge water leave in the chamber completely,lest the water frozen and damage pipes</p>
10.3.Other	<p>If open door during test,it will make fluctuation of temperature or humidity inner the chamber</p> <p>If open the door more than one time or open for a long time during test,the samples will discharge moisture,and it will make the refrigerating system frozen and can't work normally</p>

we determined to be a global brand of environmental chamber industry

- Manufacturing environmental test chambers with 20 years experience
- Independently developed controller
- Energy saving 40%
- Approved CE/ISO certification



Model	Unit	SMC-64-CC	SMC-80-CC	SMC-150-CC	SMC-225-CC	SMC-408-CC	SMC-800-CC	SMC-1000-CC	SMC-1500-CC
Test volume	L	64L	80L	150L	225L	408L	800L	1000L	1500L
Inner size	W	400	400	500	500	800	1000	1000	1200
	D	400	400	500	600	600	800	1000	1000
	H	400	500	600	750	850	1000	1000	1250
Outside size	W	680	700	800	800	1100	1300	1300	1500
	D	900	1220	1320	1420	1420	1620	1820	2300
	H	625	1450	1550	1700	1800	1980	1980	1600