SANWOOD®
Environmental Test Chambers

Technical Specification

www.amtest-tm.ro

Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro

Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro

Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

Content

www.amtest-tm.ro

Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro

Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro

Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

1. Equipment Appearance (For reference)

2. Product description

2.1 Product applications

The constant temperature and humidity test chamber is widely used in scientific research, research institutes, quality inspection institutes and other industries to do warm and humid heat tests of electronic and electrical products, materials, parts, equipment, etc., alternating heat test and constant temperature test, etc. Also could do high and low temperature routine tests, low temperature storage, in order to evaluate the performance of the sample under given environmental conditions.

2.2 Product Positioning

Apply to aerospace, aviation, electronics, automotive, battery and other products and quality inspection institutes, research institutes, universities and other test units, providing virtual space to simulate the real environment, verify product inspection, research and development results, test chamber is a powerful assistant to shorten the development cycle and improve product quality and reliability.

3. Technical indicators

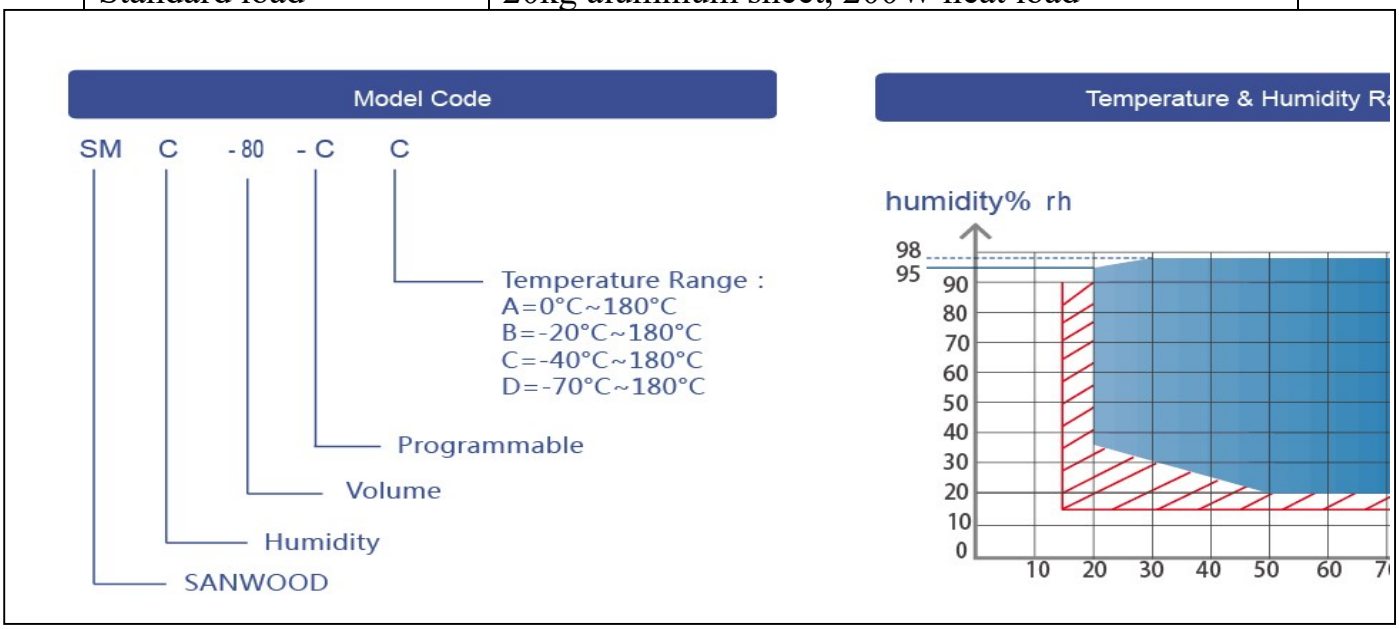
3.1 Basic information

Model	SMC-225-CC
Temperature control range	-40℃～150℃
Humidity control range	20%RH～98%RH
Condenser	Air-cooling
Refrigerant	R449A
Interior size(mm)W*H*D	600x750x500
Outer size(mm) W*H*D	800x1870x1315
Volume(L)	225L
Operating ambient temperature	+5℃ ~ 35℃
Power supply	220V AC, 50Hz single phase
Controller	Sanwood programmable controller with USB port

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

3.2 Temperature test

Temperature range	-40℃～150℃
Temperature fluctuation	≤±0.5℃
Temperature deviation	≤±2℃
Temperature uniformity	≤1.5℃
Temperature resolution	0.01℃
Heating rate	25℃→+100℃/within 25 mins (with standard load)
Cooling rate	150.0℃～25.0℃ Cooling rate 2.0～3.0℃/min 25.0℃～-40.0℃ Cooling rate 1.0～2.0℃/min
Standard load	20kg aluminum sheet, 200W heat load



3.3 Humidity test

Humidity range	20%R.H～98%R.H when temperature from 20℃ ~ 85℃ (in above map of blue area)
Humidity deviation	≤±2%R.H
Humidity fluctuation	±2%R.H
Humidity resolution	0.1%R.H
Verify conditions	1) Condition 1: -40℃±2 ℃ 2) Condition 2: 22℃±2 ℃, 95%±2%RH 3) Condition 3: 105℃±2 ℃ 4) Condition 4: 22℃±2 ℃, 95%±2%RH 5) Change over time from condition 1 to 2, condition 2 to

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

	condition 3, condition 3 to 4 within 60±5 minutes.

3.4 Sample limit and test method

Prohibitions	Testing and storage of explosive, flammable, volatile materials Testing and storage of corrosive substances Testing or storage of biological samples Test and storage of strong electromagnetic emission source samples Testing and storage of radioactive material samples Testing and storage of samples of highly toxic substances Testing and storage of samples that may produce highly toxic substances during testing or storage
Test standard	GB/2423.1-2008 (IEC60068-2-1:2007) low temperature test method AB. GB/T5170.5-2008 damp heat test equipment. GJBl50.4 (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

4. Machine structure

Structure	One piece assembled type
Inner chamber material	SUS#304 heat-resistant and cold-resistant stainless steel plate (1.2mm); full seamless welding
Internal structure strengthening	SUS304 (2mm) stainless steel reinforcement
Outer chamber material	Electrolytic steel sheet 1.2mm, pickling phosphating high-grade powder baking varnish
Insulation material	Germany Bayer refractory grade high strength PU polyurethane foam insulation material 100mm and ultra-fine glass fiber 10mm
Door edge	Double-layer high-tension silicone rubber seal, temperature resistant -90~180℃, lifespan up to 15 years
Observation window	multi-layer hollow tempered glass belt with automatic defrosting function, which can guarantee the frost-free and condensation of the glass surface during any test. Internal lighting over the window.
Sample rack	Stainless steel sample holder 2 units, height is adjustable load-bearing (uniform): 20kg/unit
Moving and position mode	4 high load-bearing pulleys and PU horizontal angle wheels at the bottom for moving and fixing the equipment
Cable port	Two cable ports, on the chamber's left and right side,φ100mm. with screwed plastic cover, silicone plug
Floor bearing	≤ 100kg/m2 (uniform load)

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

Circulating motor	Stainless steel extended shaft circulating motor ensures long-term operation and sufficient air volume operation
Circulating wind wheel	The multi-wing centrifugal circulating wind wheel is used to strengthen the shaft and aluminum alloy to make high and low temperature resistant rotating blades, so as to achieve forced convection and effectively avoid looping dead angles.
Circulating air duct	The temperature-adjusting and conditioned air duct is designed as a double air duct, which is connected to the studio but isolated. The wind path from up to down and returning. The partition plate is formed by cold-bending processing of high-quality stainless steel plates, and adjustable louvers are used at the air outlet. Indirect heater, saturated humid air inlet, refrigeration dehumidification evaporator and circulating blast wind wheel are arranged in the temperature regulation air passage.

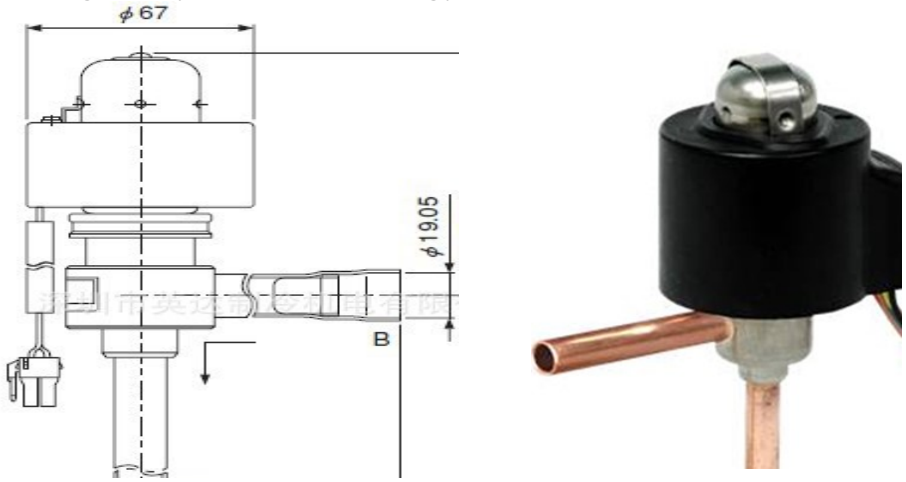
5. System introduction

Heating wire	High-quality explosion-proof nickel-chromium alloy heating wire (high resistivity, small temperature coefficient of resistance, small deformation at high temperature and not easy to embrittlement, self-heating temperature up to 1000-1500℃, long service life) rapid heat exchange, no hysteresis
Heating wire control	The solid state relay is used as a heating actuator, and there is no large current fluctuation and impact phenomenon, and the operation is stable.
Heating wire protection	The heating wire is provided with anti-dry protection to prevent the heater from continuously burning after the circulation fan stops for some reason, causing the heater itself to burn out or other accidents.
Humidification mode	Steam humidification method: using electronic parallel mode micro-motion humidification system
Humidifying heating pipe	All stainless steel embedded humidification tube with anti-dry explosion protection protector
Humidification system advantage	Humidification is rapid, saves water, saves electricity, and allows test products to heat up. The humidification and dehumidification system are completely independent, no need for extra drainage, faster than traditional surface humidification (water tray), high control precision, no scale pollution such as scale and scale, good low humidity performance, water level observation window, and easy cleaning
water for humidity	Distilled water, pure water or deionized water (resistivity greater than 500 Ω·m) to be used for humidity system (provided by the user)
Water storage	Drawer type water tank 1 unit, 15L, located in front of the machine,

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

device	under the door.

6. Refrigeration System

Compressor	France Tecumseh fully enclosed compressor
Evaporator	High-efficiency components adopts a slope type evaporator (AC&R compound spoiler aluminum fins)
Condenser	Air-cooled system for equipment easy movement,etc.
Heat exchanger	SWEP plate type refrigerant cold and heat exchange design, making higher efficiency compared with traditional internal spiral
Energy-saving device	Adopting throttle electronic expansion valve 1. The active control of the refrigeration system is realized, and the fixed proportional adjustment of the original thermal expansion valve is not controllable. The output can be adjusted in advance and optimized for different modes and operating conditions. 2. Due to the cyclic control feedback of the electronic expansion valve, the front end is a temperature-plus-pressure dual-sensor high-response direct control, which can provide the best evaporator liquid supply, so that the refrigeration system can achieve excellent cooling capacity in a wider working range. Output. 3. Energy saving: the full range of electronic expansion valve self-adjustment + active adaptation to adjust the cooling capacity output, making the system more energy efficient.  4. Energy-saving design: Adopting PID + PWM principle of VRF (refrigerant flow control) technology to achieve low-temperature energy-saving operation (electronic expansion valve according to thermal energy conditions refrigerant flow servo control technology) low temperature working state, the heater does not participate in the work, through PID + The PWM regulates the flow rate and flow

	direction of the refrigerant, and regulates the three-way flow of the refrigerant pipe, the cold bypass pipe, and the hot bypass pipe to achieve automatic constant temperature to the working chamber. This method can reduce energy consumption by 30% under low temperature conditions. The technology is based on Danish Danfoss' ETS series of electronic expansion valves, which can be used to smoothly adjust the cooling capacity for different cooling capacity requirements, that is, to achieve the compressor cooling capacity adjustment when different cooling rate requirements are met.
Refrigerant	Original American DuPont Environmental Refrigerant R449A

7. Control system

Controller	Sanwood program controller
Display	640x480 dot matrix, 5.7 inch TFT color LCD display
Running mode	Program mode, fixed value method
Setting mode	Chinese and English menu (free choice), touch screen input
Program capacity	Editable program Quantity: Max 120 Steps: Max 100 Number of cycles: Max 999 Program can be linked (link program serial number can be selected)
Setting range	Temperature: Adjust according to the operating temperature range of the equipment (upper limit +5℃, lower limit -5℃) Humidity: (0 ~ 100)% RH (temperature and humidity test equipment)
Display resolution	Temperature: 0.01℃ Time: 0.01min Humidity: 0.1% RH (temperature and humidity test equipment)
Communication function (standard)	Ethernet, RS485, RS232 interface; choose one from above three options;
Control mode	BTC balance temperature control mode + DCC (Intelligent Cooling Control) + DEC (Smart Electrical Control) (Temperature Test Equipment) BTHC balance temperature regulation and humidity control mode + DCC (smart cooling capacity control) + DEC (smart electrical control) (temperature and humidity test equipment)
Curve recording function	With battery-protected RAM, it can save the set value, sampling value and sampling time of the device; the maximum recording

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

	time is 350 days (when the sampling period is 1.5min)
Subsidiary function	Fault alarm and cause, processing prompt function Power failure protection Upper and lower temperature protection Calendar timing function (automatic start and automatic stop operation) Self-diagnostic function

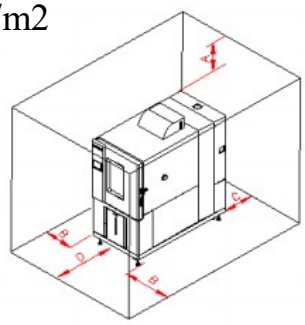
8. **Main parts**

Name	Brand	Note
Controller	Sanwood	
Compressors	France Tecumseh	
Oil separator	Emerson	
Heat exchanger	SANWOOD customized	
Condenser	SANWOOD customized	
Evaporator	SANWOOD customized	
Drying filter	Denmark Danfoss	
Non-return valve	Denmark Danfoss	
Solenoid valve	Denmark Danfoss	
Condensing pressure switch	Denmark Danfoss	
Leakage protection switch	France Schneider	
AC relay	France Schneider	
Thermal relay	France Schneider	
phase rotation relay	Switzerland Carlo Gavazzi	
solid-state relay	Switzerland Carlo Gavazzi	
Temperature humidity sensor	Taiwan Thermoway	
Circulating motor	Taiwan Yuzheng	
Over temperature protection	South Korea RAINBOW	

9. Equipment safety protection device

Refrigeration system	Compressor over-pressure protection Compressor motor overheat protection Over current protection of compressor motor
Humidifying system	Humidification tube dry burning protection Abnormal water supply protection Abnormal drainage protection Water shortage abnormal protection
Test chamber protection	Adjustable test product over temperature protection Test space temperature fuse protection Air conditioning channel limit over temperature protection Ultra-high temperature protection inside the controller Fan motor overheat protection Chamber inside and outside pressure balance protection
Other protection	Total power phase sequence and phase loss protection Whole machine leakage protection Load short circuit protection

10. Equipment safe use conditions

Site	Leveled ground, good ventilation, no flammable, explosive or aggressive gas and powder No strong electromagnetic radiation source With drainage near the machine (within 2 meters) Ground load-bearing capacity: not less than 800kg/m2 Leave space around the machine for maintenance A：not less than 30cm B：not less than 50cm C：not less than 70cm D：not less than 90cm 
Power supply	Voltage allowable fluctuation range: AC（1±10%）220V or AC（1±10%）380V Frequency allowable fluctuation range: (1 ± 1%) 50Hz Protective earthing wire grounding resistance is less than 4Ω Users are required to configure a device with a considerable capacity of air or power switch at the installation site, and this switch must be used exclusively for this device.

www.amtest-tm.ro
Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro
Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro
Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

Requirements for storage environment	When the equipment is not working, the ambient temperature should be kept within 0~+35°C (without freezing) When the ambient temperature is lower than 0 °C, the water remaining in the equipment should be drained to prevent the water in the pipeline from freezing and damaging the pipeline.
Other	Opening the door of the test chamber during the test will cause temperature or humidity fluctuations inside the box If the door is opened several times during the test or the door is opened for a long time or the test sample emits moisture, the heat exchanger of the refrigeration system may freeze and may not work properly.

11. Quality assurance

Warranty: 3-year warranty included, calculated from the date of production. Extension warranty is negotiable. **After-sale service**: 1) the equipment is free of charge during the warranty period, and the end user is in compliance with the conditions of custody, use and installation rules. 2) Due to the failure caused by the quality, design defects and/or core components of the chamber, AMTEST-TM România will provide the technical support and solutions until the chamber runs well. In-site service and consumable components are not included. 3) Natural disasters, abnormal power, improper use, damage caused by improper maintenance, etc are not in the warranty scope.
Documents and accessories:
Technical information: product certificate, instruction manual, warranty card and etc.;
Packaging and shipping methods
Packing: Shipping container that meets the requirements of QB/BWD008-2001 **Mode of transport**: by Sea, rail or land.
Training: Your operator can operate the machine skillfully according to the manufacturer manual. Video will be provided if required.
Installation: One piece assembled machine.
Maintenance: AMTEST-TM România will do the maintenance surcharge according to the manufacturer guidance.

www.amtest-tm.ro

Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8
+40 21 414 0401
office@amtest-tm.ro

Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro

Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro

Office:
Bucuresti, Romania
Cara Anghel 9, bl. C56, ap.8

+40 21 414 0401
office@amtest-tm.ro

Departament Vanzari:
+40 73 071 4926
ludmila.valcea@amtest-tm.ro

Departament Tehnic:
+40 73 071 4923
bogdan.valcea@amtest-tm.ro