

# Thermal Shock Test Chamber(Two Zones)


## Technical Specification





(Pictures are for reference only, the final in kind shall prevail)

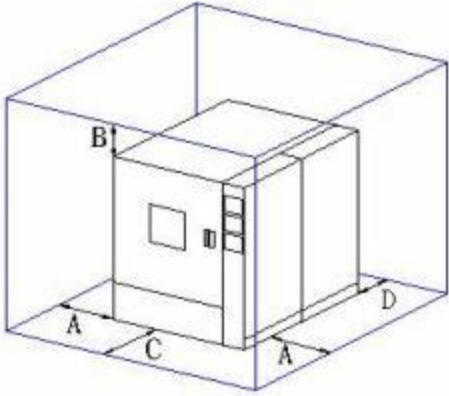
1 Product name, model number and restrictions on use	
1.1. Product names	Thermal Shock Test Chamber(Two Zones)
1.2. Product type	CZ-C2-150A
1.3 This product is prohibited	<p>Testing or storage of specimens of flammable, explosive or volatile substances</p> <p>Testing or storage of specimens of corrosive substances</p> <p>Testing or storage of harmful biological specimens</p> <p>Testing or storage of specimens for strong electromagnetic emission sources</p> <p>Testing or storage of specimens of radioactive material</p> <p>Testing or storage of specimens of highly toxic substances</p> <p>Testing or storage of specimens which may produce such substances or objects during testing or storage.</p>
2 Volume, dimensions and weight	
2.1 Nominal inner volume	150L
2.2 Basket size (mm)	650×460×500 W×H×D
2.3 Outside space (mm)	Approx. 1470×2020×2170 W×H×D (The external dimensions are estimated, and the final dimensions are subject to the layout plan determined by both parties.)
2.4 Weight	About 1300 kg
2.5 Operating noise	≤75dB(A), the noise value is measured at 1m from the front of the equipment and at a height of 1.2m (in free space).
3 Performance indicators	
3.1 High greenhouse	<p>Preheating temperature upper limit: 200°C</p> <p>Temperature rise time: room temperature → 200 °C about 40 minutes</p> <p>Note: Ramp-up time is the performance of the high temperature room when it is operated separately</p>
3.2 Low greenhouse	<p>Lower limit of pre-cooling temperature: -55°C</p> <p>Temperature drop time: room temperature → -55°C about 60min</p> <p>Note: Cooling time is the performance of the cryogenic chamber when it is operated alone</p>
3.3 Test area (basket)	<p>(1) Temperature impact range: high temperature +60°C~+150°C, low temperature -40°C~0°C.</p> <p>(2) Temperature fluctuation: ±0.5°C (at no-load steady state);</p> <p>(3) Temperature deviation: ±2.0°C (at no-load steady state);</p> <p>(4) Temperature uniformity: ≤2.0°C (at no-load steady state).</p>

<p>3.4 Temperature Recovery Performance</p>	<p>(1) Temperature recovery time: ≤5min;                  (2) Basket movement changeover time: ≤10sec;                  (3) Restoration conditions:                      High temperature exposure:                      +150°C for 30min Low                      temperature exposure: -                      40°C for 30min Sample                      weight: 5kg Aluminum ingot                      Location of the sensor: Carrying case air inlet.</p>
<p>3.5 Satisfaction of test methods</p>	<p>GB/T 5170.2-2008 Temperature test equipment                  GB/T 2423.1-2001 Test A: Low temperature test method                  GB/T 2423.2-2001 Test B: High temperature test method                  GB/T 2423.22-2002 Test N: Temperature change test method                  GJB/150.3-1986 High temperature test                  GJB/150.4-1986 Low temperature test                  GJB/150.5-1986 Temperature impact test</p>
<p><b>4 Equipment Structure Components</b></p>	
<p>4.1 Structural approach</p>	<p>Integral, divided into left and right parts, the left side of the high greenhouse and low greenhouse, high greenhouse and low greenhouse up and down structure, can quickly move the basket to achieve rapid temperature change, the left side of the rear of the refrigeration unit, electrical control box and basket lifting control device installed in the right side of the equipment, the operation panel is located in the right side of the equipment right in front of the</p>
<p>4.2 Insulation structure</p>	<p>(1) Outer wall material: high-quality anticorrosive cold-rolled plate, thickness ≥ 1.2mm, surface electrostatic powder baking paint, the color of the standard color <b>RAL7035 white</b>;                  (2) Inner wall material: stainless steel plate SUS304, thickness ≥ 1.0mm ;                  (3) Box and door insulation: rigid polyurethane foam + fiberglass.</p>
<p>4.3 Air Conditioning Channels</p>	<p>(1) High greenhouse: fan, heater, temperature sensor;                  (2) Low greenhouse: fan, heater, evaporator, accumulator, temperature sensor.</p>
<p>4.4 Doors</p>	<p>(1) The high-temperature and low-temperature zones open their doors separately, both of which are single doors;                  (2) With explosion-proof handle;                  (3) Double-layer high-tension silicone rubber seals with good resistance to high-temperature aging and low-temperature hardening.</p>

4.5 Test area (basket)	<p>(1) Material: stainless steel plate SUS304;</p> <p>(2) Structure: the frame adopts mesh plate structure, and the vertical setting of the sample rack height adjustment indexing frame can adjust the spacing of the sample rack;</p> <p>(3) Sample rack: stainless steel sample rack 2 layers, can be moved to adjust the height, load-bearing (uniform): 25KG / layer.</p>
4.6 Basket drives	Adopting cylinder-driven chain lifting to push the basket to move between high and low greenhouses, so as to achieve rapid temperature change.
4.7 Control Panel	Liquid crystal touch programmable controller, basket initial position switch High greenhouse over-temperature, low greenhouse over-temperature, emergency stop, defrost indicator light
<b>5 Air conditioning system</b>	
5.1 Heat transfer methods	Air circulation forced convection heat transfer
5.2 Air circulation units	High greenhouse/low greenhouse: centrifugal fan, long shaft external motor drive
5.3 Air heating method	<p>(1) High temperature room: nickel-chromium alloy electric wire type heater;</p> <p>(2) Low greenhouse: nickel-chromium alloy electric wire type heater;</p> <p>(3) Heater control method: non-contact isocyclic pulse broadening, SSR (solid state relay).</p>
5.4 Air Cooling Method	Direct evaporator cooling
<b>6 Electrical control systems</b>	
6.1 Controller	<p>7-inch 800X480 dot matrix TFT color touch screen</p> 
6.2 Screen display function	<p>(1) Chinese/English language switching display, true color touch input;</p> <p>(2) Each box temperature setting (SV), the actual (PV) value is directly displayed;</p> <p>(3) It can display the execution program number, the current segment function, the remaining time and the number of cycles, and the operation time display;</p> <p>(4) Program editing and graphic curve display;</p> <p>(5) Defrost automatic prompt;</p> <p>(6) Real-time graphic curves can be displayed when the program is</p>

	<p>executed, and it can jump segments and keep the function;</p> <p>(7) Faults are automatically prompted, and there are corresponding solution prompts.</p>
6.3 Program capacity	<p>(1) The amount of programs that can be used: the maximum number of groups &gt; 100, the program can be set between the use of linkage;</p> <p>(2) Time setting: Every time &gt; 500 hours;</p> <p>(3) Repeatable commands: each command can be up to &gt; 10,000 cycles.</p>
6.4 Communication interfaces	<p>(1) USB interface: external storage of measurement data and programs;</p> <p>(2) One RJ-45 Ethernet interface;</p> <p>(3) One RS-485 interface.</p>
6.5 Interface Converter	RS-232 interface: RS-485/ RS-232 interface converter (optional)
6.6 USB memory sticks	1G-32G USB flash disk can be inserted to download historical curves, historical data, control system parameters, and can be hot-plugged.
6.7 Setting method	Human-machine dialogue mode with touch input and control
6.8 Mode of operation	<p>program cycle mode</p> <p>High temperature to low temperature or Low temperature to high temperature</p>
6.9 Setting ranges	Adjustment according to the temperature operating range of the equipment (upper limit +5°C, lower limit -5°C)
6.10 Display resolution	Temperature: 0.1°C; Humidity: Time: 1min.
6.11 Power failure memory function	Power failure recovery mode can be set to: hot start/cold start/stop
6.12 Appointment opening function	You can arbitrarily set the power-on time, turn on the power when the time comes to run the machine automatically
6.13 Temperature Sensors	T-Type Thermocouple
6.14 Curve Recording Function	With a battery-protected RAM, can save the device settings, sampling values and sampling time of the moment; curve recording period can be set 1 ~ 300 sec, the maximum memory time to store 90 days of continuous storage of historical curves, historical data (when the sampling time of 1min), no continuous use, the data can be saved for up to more than 10 years
6.15 Software utilization environment	Simplified Chinese Windows XP or Simplified Chinese Windows 7/WIN8/WIN10 Operating System
6.16 Network Connections	It can be connected to the Ethernet network through specialized software, and can be remotely controlled and remotely assisted through the network, and can also collect test data through the network, and can control multiple machines at the same time.

6.17 Subsidiary functions	Stop after defrost, hold function, interrupt function, automatic parameter error correction function, over-temperature multi-protection function, etc.
<b>7 Refrigeration control system</b>	
7.1 Refrigeration method	<p>In order to ensure the cooling rate and the minimum temperature requirement of the chamber, a binary refrigeration system is used in the chamber, which consists of a high-temperature stage refrigeration cycle and a low-temperature stage refrigeration cycle, with the heat exchange realized through evaporative condensers.</p>  <p>SCHEMA IMPIANTO FRIGORIFERO TH -70°C +180°C CON CONDENSAZIONE AD ACQUA</p>
7.2 Refrigeration compressors	Imported brand mechanical compressor
<b>7.3 Cooling method</b>	<b>Air-cooled</b>
7.4 Energy efficient design	Cold balance control mode, can stepless regulation of refrigeration output, with independent cold end and hot end PID continuous regulation, to avoid the energy waste caused by the cooling capacity and heating capacity hedge; thus reducing the actual energy consumption.
7.5 Evaporator	Finned tube heat exchanger
7.6 Condensation evaporators	<p>High-temperature copper brazed plate heat exchanger with small surface area, low energy loss and high heat transfer efficiency.</p> 
7.7 Throttling devices	Thermal Expansion Valves/Capillary Tubes
7.8 Refrigerants	R404a/R23

8 Security protection system	
8.1 Refrigeration systems	Compressor overheat, overload, overpressure, over-temperature protection
8.2 Test chambers	Extreme over-temperature, pressure auto-balance protection, bottom anti-accumulation protection
8.3 Heating systems	Heating tube limit over-temperature, heating tube short circuit protection
8.4 Power supply	Mains phase sequence and phase loss protection Leakage protection, total power overload, short circuit protection; control line overload or short circuit protection
8.5 Circulation fans	Fan overload, fan short circuit, fan reversal protection
9 Space requirements: in-situ handling, installation footprint and placement environment requirements	
9.1 Positioning access	It can be passed according to the external dimensions of the test chamber, but it is necessary to pay attention to the corners, the size of the entrance door, the size of the elevator and other special links.
9.2 Floor location	For the upstairs site or underground vacant installation site, the site floor loading requirements $\geq 600\text{kg/m}^2$
9.3 Site and Related Surrounding Dimensions	
	Maintenance space around the equipment, according to: A: $\geq 80\text{cm}$ B: $\geq 60\text{cm}$ C: $\geq 170\text{cm}$ D: $\geq 110\text{cm}$
	The ground is level, well ventilated and free of flammable and explosive corrosive gases and dust.



9.4 Other requirements for the environment in which the test chamber is to be used	Ambient Temperature Requirements	5~25℃ to ensure the best performance, 25~35℃ can be normal operation (for air-cooled test chamber)
	Humidity requirements	≤85%RH
	Air Pressure Requirements	86KPa~106KPa
	electromagnetic environment	No strong sources of electromagnetic radiation nearby
	Site drainage	Drainage floor drains are provided next to the test chamber
9.5 Requirements for the storage environment	<p>The ambient temperature of the equipment should be kept within 0℃~+45℃.</p> <p>When the ambient temperature is lower than 0℃, (equipment stops for a long time) the water stored in the equipment should be drained to avoid the water in the pipeline from freezing and damaging the pipeline.</p>	
<b>10 Conditions of use (the following conditions are guaranteed by the user)</b>		
10.1 Cooling circulating water (for Water-cooled test chamber)	Water temperature:	
	Flow:	
	Plumbing fittings:	
	Water pressure:	
10.2 Air source (air compressor) (Optional as an accessory)	Pressure: 0.5MPa~0.7MPa	
	Flow rate: ≥0.1m <sup>3</sup> /min	
	Air supply interface: quick-plug pneumatic tube straight through	
	Air connection specification: φ8mm	
10.3 Electricity supply conditions	<b>Power supply:</b> (1) AC380V/50Hz three-phase four-wire + protective ground; (2) Allowable voltage fluctuation range: AC (380±38) V ; (3) Allowable frequency fluctuation range: (50±0.5) Hz; (4) Grounding resistance of the protective earth wire is less than 4 Ω; TN-S mode power supply or TT mode power supply; (5) The user is required to equip the equipment with an air or power switch of appropriate capacity at the installation site, and this switch must be independently available for use by the equipment.	
	Installed power: 30KW	
	Maximum current: 55A	



**12 Equipment factory fittings and information**

No.	Name	QTY	Remark
1	Equipment factory packing list	1 PCS	Standard
2	Electrical schematic diagram of the equipment	1 PCS	Standard
3	Equipment instruction manuals	1 PCS	Standard
4	Equipment Certificate of Conformity	1 PCS	Standard
5	Equipment Warranty Card	1 PCS	Standard
6	Equipment factory test report	1 PCS	Standard
7	Controller Monitoring Software CD-ROM	1 PCS	Standard
8	Test Specimen Holder Tray	2 PCS	Standard
9	Test Specimen Holder Support Rail Strip	4 Strip	Standard

**13 List of major spare parts**

No.	Name	QTY	Remark
1	Compressor	Tecumseh / Copeland / Hitachi / Bitzer	France/USA/ Japan/Germany
2	Plate heat exchanger	Harle/Yuanzhuo	China
3	Condenser	Zhongzhi	China
4	Evaporator	Zhongzhi	China
5	Controller	Zhongzhi	China
6	Oil separator	Emerson	USA
7	Filter drier	Emerson	USA
8	Refrigerant	DuPont	USA
9	Leakage circuit breaker	Schneider/Mitsubishi	France/Japan
10	Solenoid valve	Saginomiya/Sporlan	Japan/USA
11	Thermal expansion valve	Danfoss	Denmark
13	Relay	Omron	Japan
14	AC contactor	Schneider or Siemens	France/Germany
15	Breaker	Schneider or Siemens	France/Germany
16	Solid state	Carlo Gavazzi or FOTEK	Switzerland/ Taiwan,China

Note: Due to the supply cycle and other reasons, the above components, except for the compressor and controller, other materials do not exclude the replacement of accessories of the same grade brand.

### 15 Layout of equipment structure

