Simplewell昇微

Thermal shock test chamber

Simplewell Technology Co., Ltd

Address：No.221, Shuixin Road, Dalang Town, Dongguan City

Tel：0769-88887909 Fax：0769-88885229

Website：www.simplewell.com.cn

Email：sales01@simplewell.com.cn

Contents

01

Part

Production introduction

1.1 Scope of application

This equipment is suitable for all kinds of electrical and electronic products and other products, parts and materials for reliability tests of constant high and low temperature, various temperature shocks and rapid temperature changes

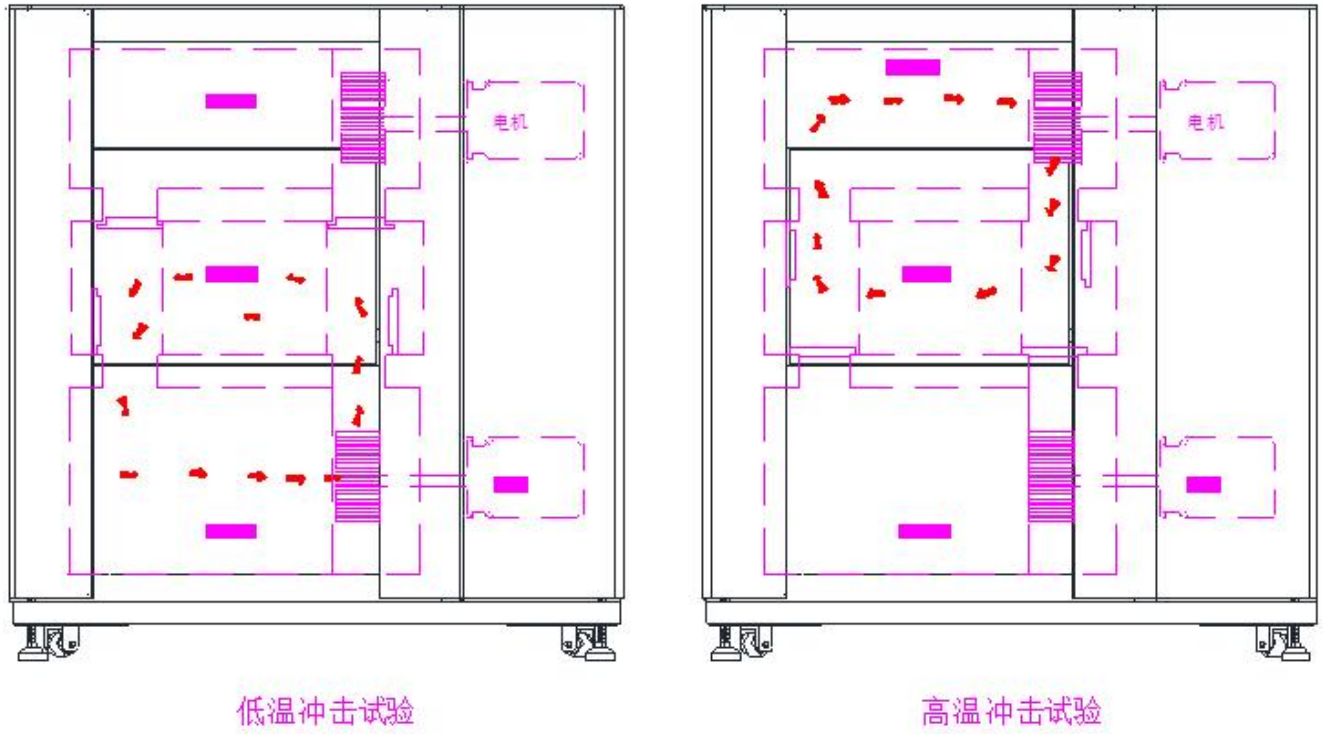
Two zone thermal shock chamber

Two zone thermal shock chamber

3 zone thermal shock chamber

1.2 Structural features

3 zone thermal shock test chamber：3 zone thermal shock chamber adopts the air duct structure with upper and lower air intake and middle return air. The high and low temperature tank performs forced convection circulation with the test tank through the damper switch.



Air duct structure

Working principle:

Adopt the method shown in the figure to transfer heat to ensure the temperature uniformity of the test space.The centrifugal fan placed at the rear of the air conditioning channel is the source for air circulation. The air enters the channel from the bottom of the regulating channel, passes through the standard evaporator and the heater for heat exchange, is blown out by the centrifugal wind wheel, and then passes through the split air outlet evaporator and enters the inner box.

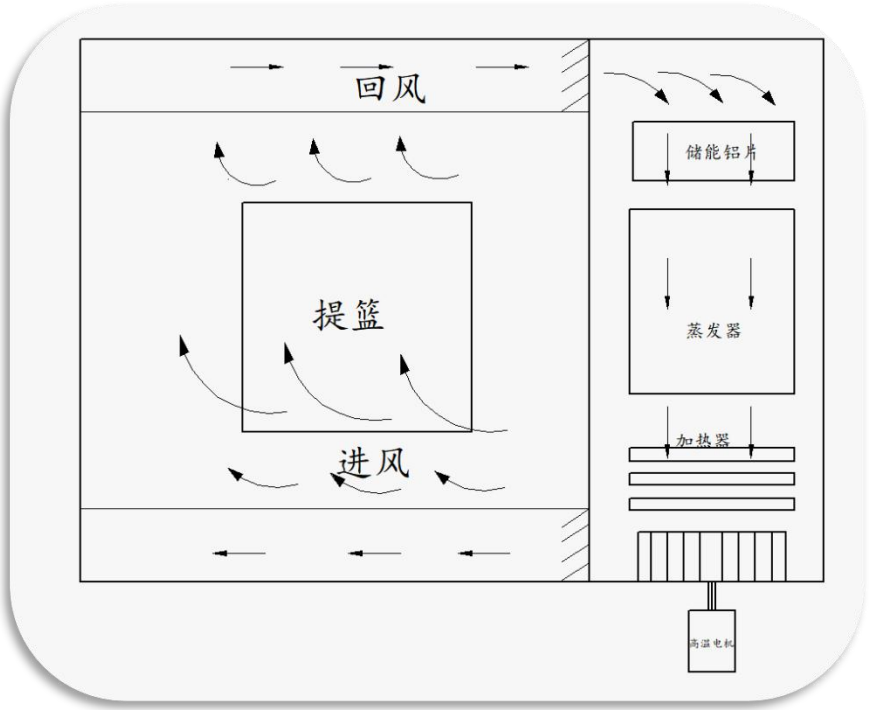
Inner box

1.2 Structural features

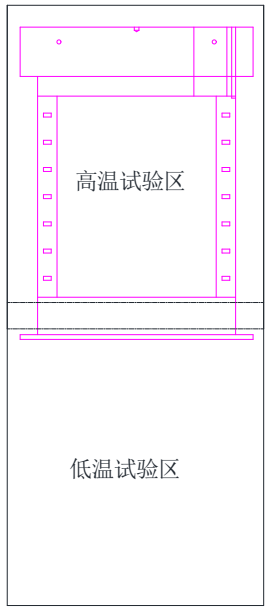
Two zone thermal shock test chamber adopts the air duct structure of side air intake and return air, and the lifting device of the top cylinder controls the up and down movement of the basket to the high and low temperature area.

Working principle:

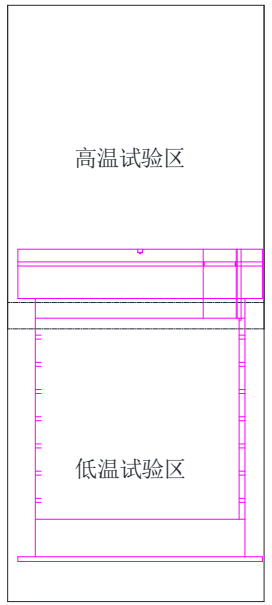
Adopt the method shown in the figure to transfer heat to ensure the temperature uniformity of the test space.The centrifugal fan placed on the right side of the air conditioning channel is the power source for air circulation.



Air duct structure



提篮上升



提篮下降

Basket

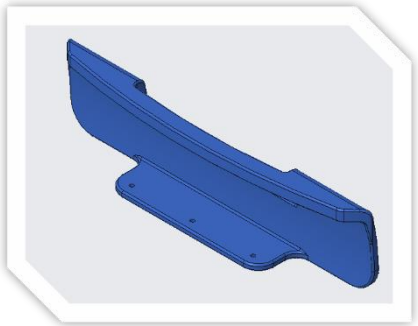
1.3 Door structure

Door： Left single door with 3 layers of hollow tempered glass

Handle： 3D printed plastic handle

Two zone thermal shock chamber

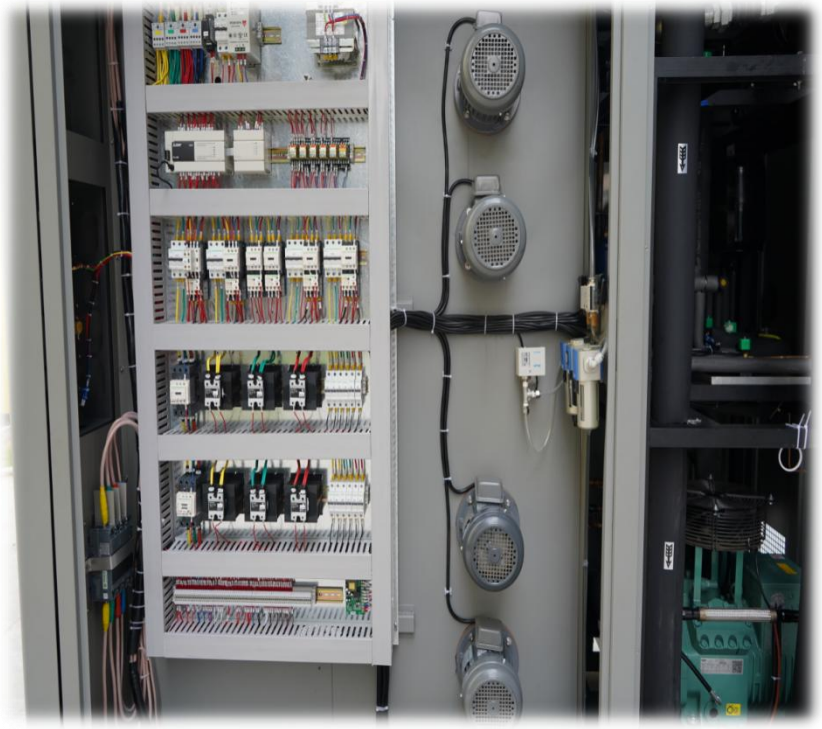
Hollow tempered glass



Customized handle

3 zone thermal shock chamber

1.4 Electric Cabinet and Refrigeration Unit



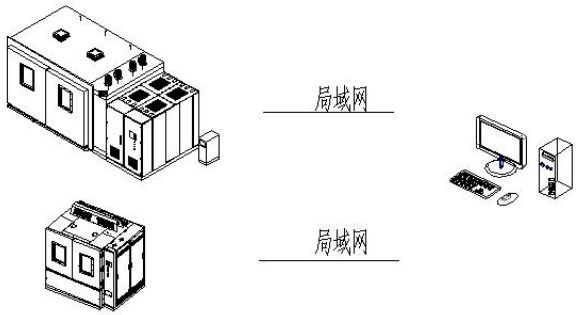
Electric Cabinet（at the right side of the chamber）

Refrigeration Unit（at the rear of the chamber）

1.5 Electrical control system

Controller: Adopt Japanese Mitsubishi new generation high-performance FX3U series PLC, 7.0 inches 600×480 dot matrix TFT color LCD display, Chinese/English menu, touch-type man-machine dialogue.The control unit adopts Japanese Mitsubishi PLC module to enter each system control, the control temperature is accurate and the equipment runs stably.

。



1.6 Control Box and Panel

The electrolytic plate is sprayed with plastic, and the color is standard color. The panel is equipped with touch-type man-machine dialogue interface, power switch, over-temperature protector, USB data exchange interface, fault indicator light etc

Control panel

Main power switch（Schneider）

Communication Interface

Emergency stop switch

Fault indicator ligh

Over-temperature protector

HMI

1.7 Circuit accessories

Electronic Humidity Sensor
(Swizerland / Finland))

Overload protector
(Schneider)

PLC controller
（Mitsubishi）

Solid State Relay
(Carlo gavazzi)

Contactor
(Schneider)

Flame retardant wire

No fuse switch (Schneider)

1.8 Refrigeration system

1.Tecumseh/Bitzer、Bock”Full/semi-hermetic low-noise piston compressor with reliable and stable performance

2、Emerson's high-efficiency oil separator is used to separate the lubricating oil in the high-pressure steam discharged from the refrigeration compressor to ensure the safe and efficient operation of the refrigeration system.

3、UAR water cooled condenser

4、Danfoss solenoid valve/thermostatic expansion valve is adopted to effectively prevent the migration of refrigerant in the refrigeration system during shutdown

1.9 Circulating waterway accessories (optional)

Water tower

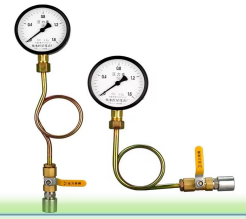
Water pump

Ball valve

Y type strainer

Ball valve

Check Valve



Pressure gauge

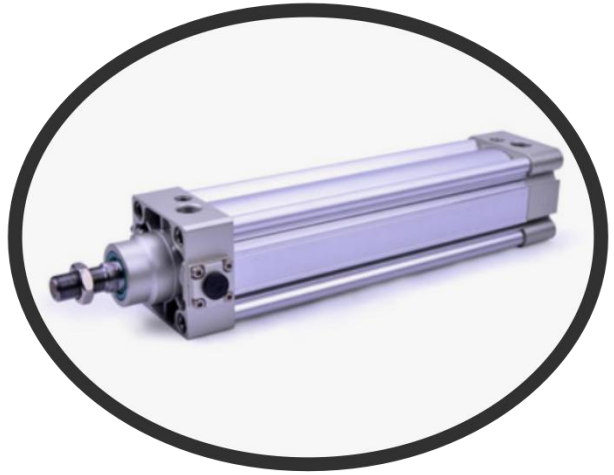
Water temperature gauge

water filter (optional)

Flow meter (optional)

GLT series circular counter-flow cooling tower is a glass fiber reinforced plastic cooling tower, which adopts counter-flow air heat exchange technology. The filler is made of high-quality PVC oblique wave film. Reliable, durable and easy to assemble.Widely used in various cooling and heat dissipation places, especially suitable for cooling water circulation systems such as air conditioning refrigeration, air compressor stations, heating furnaces and condensation processes.

1.10 Airway accessories



Standard cylinder
（AirTAC）

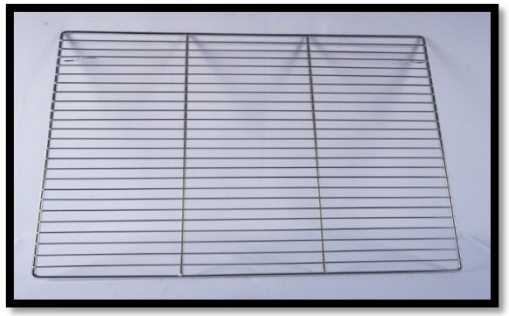
F.R.L （AirTAC）

Solenoid valve
（AirTAC）

V pulley

Pressure controller
（AirTAC）

1.11 Other accessories



Sample rack（stainless steel, custom made）

Axial fan
(for 3 zone test chamber)

High temperature motor (customized)

cable port Φ50、φ100、φ150（optional）

21.12 Process design

1. Pipeline welding process: high-quality copper tube nitrogen shielded welding method is adopted, which avoids the damage to the compressor caused by the oxide impurities on the inner wall of the copper tube entering the refrigeration system caused by the traditional welding method.

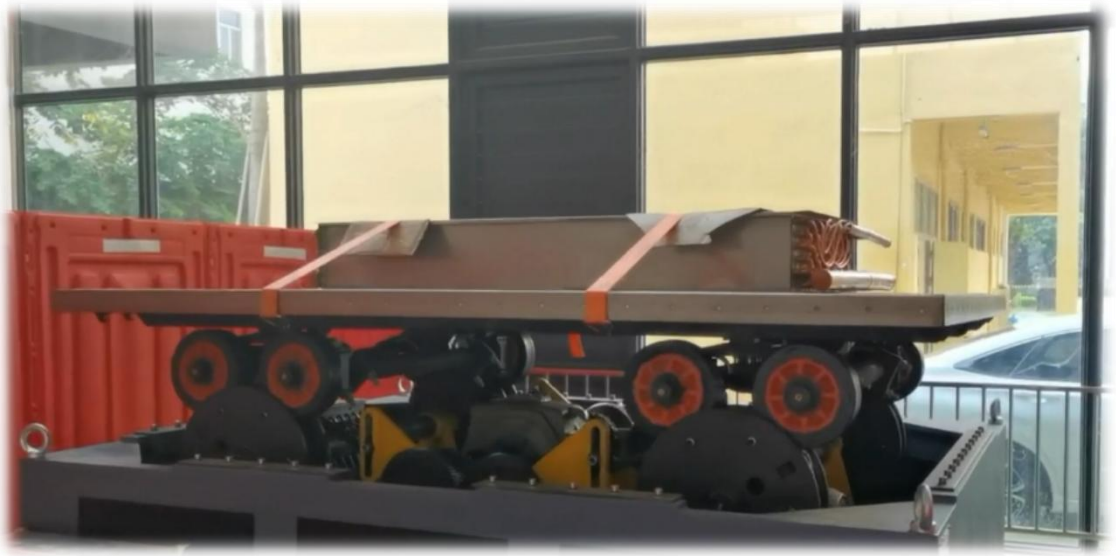
2. Damping measures: Install damping springs and anti-vibration soft rubber pads at the bottom of the compressor and pipeline to reduce vibration.

3.Pipeline protection measures: The pipeline of the refrigeration system adopts the method of adding anti-vibration hose and C-shaped elbow to avoid copper pipes and cracks caused by vibration and temperature changes.

5. When the equipment is running, detect the circuit temperature of the power distribution cabinet.

4. Noise control: The condenser adopts the German Marl low-speed high-air volume condensing fan, and installs wave-shaped sound-absorbing sponge around the refrigeration unit to achieve lower noise.

1.13 Simulated road condition vibration test

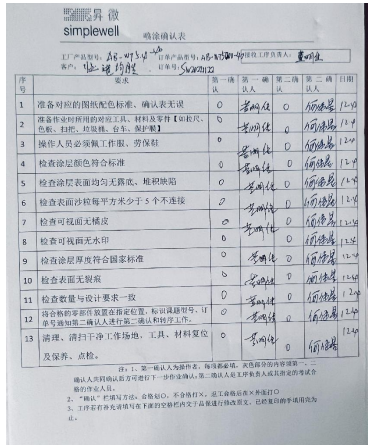


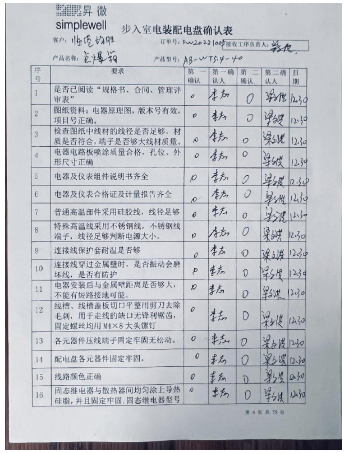
Parts such as evaporators are subjected to vibration tests before installation

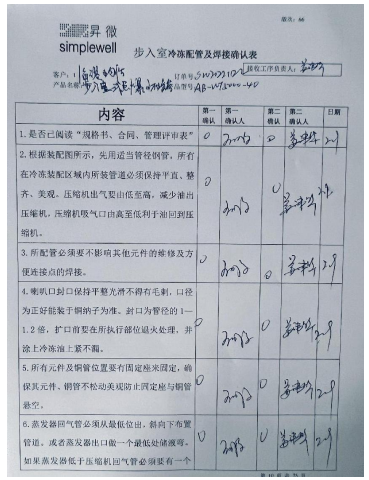
Vibration test for small equipment before shipment

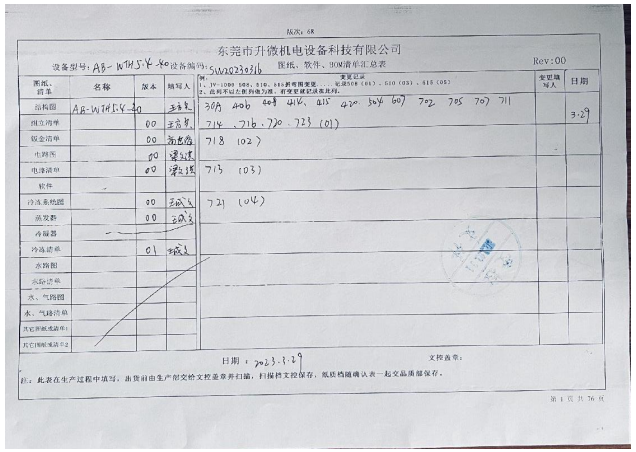
1.14 Confirmation of each process

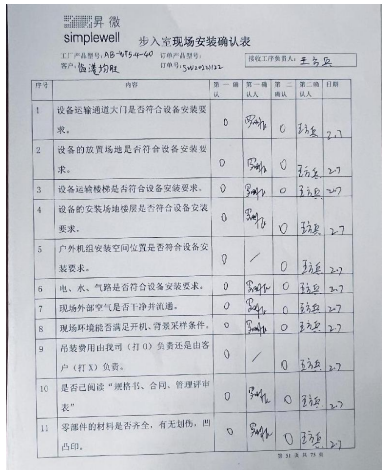

东莞市升微机电设备科技有限公司
simplewell 临港均胜AB-WT5000-40折弯确认表 REV:00

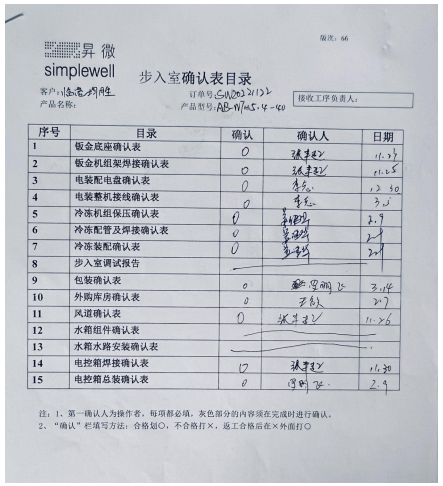

simplewell 喷涂确认表


simplewell 步入室电装配电盘确认表


simplewell 步入室冷冻配管及焊接确认表


东莞市升微机电设备科技有限公司 Rev:00


simplewell 步入室现场安装确认表


simplewell 步入室确认表目录

序号	目录	确认	确认人	日期
1	钣金底座确认表	0		
2	钣金机组架焊接确认表	0		
3	电装配电盘确认表	0		
4	电装整机接线确认表	0		
5	冷冻机组保压确认表	0		
6	冷冻配管及焊接确认表	0		
7	冷冻装配确认表	0		
8	步入室调试报告			
9	包装确认表	0		
10	外购库房确认表	0		
11	风道确认表	0		
12	水箱组件确认表			
13	水箱水路安装确认表			
14	电控箱焊接确认表	0		
15	电控箱总装确认表	0		

Confirmation of the production process: After the production of the equipment begins, the person in charge of each link will carefully fill in the confirmation form to correct the problems in the production process in a timely manner. At the same time, trace the source, optimize the production process, improve production efficiency, and ensure the quality of each equipment produced

1.15 Wire Flame Retardant Certificate

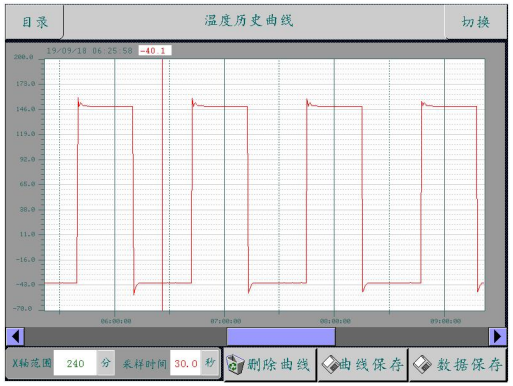
Adopt flame retardant wires, the picture shows the wire flame retardant certification

2.1 Feature

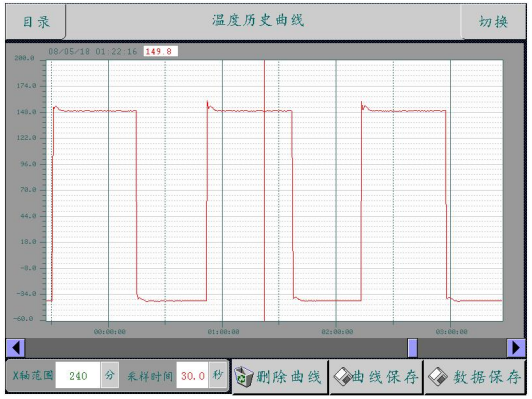
Good temperature uniformity and wide impact range.

running screen

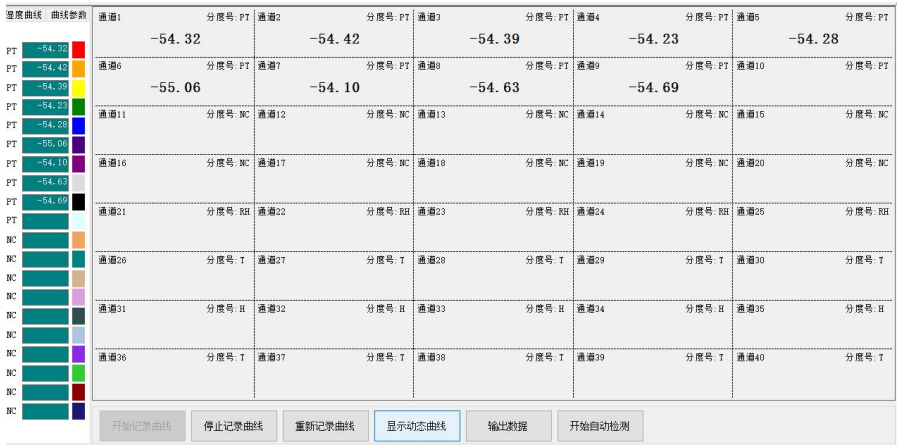
running screen



temperature curve



temperature curve



Uniformity test data chart (-55°C)

2.2 Standards compliant

Two zone thermal shock test chamber

- GB/T2423.1-2008 Environmental testing for electrical and electronic products - Part 2: Test A: Low temperature test method
- GB/T2423.2-2008 Environmental testing for electrical and electronic products - Part 2: Test B: High temperature test method
- GB/T2423.22-2012 Environmental testing part 2: Test N: temperature change
- GJB150.3A-2009 Environmental test method for military equipment laboratory part 3: high temperature test
- GJB150.4A-2009 Environmental test method of military equipment laboratory part 4: low temperature test
- GJB150.5A-2009 Environmental test method of military equipment laboratory Part 5: Temperature shock test

2.2 Standards compliant

3 zone thermal shock test chamber

- GB/T2423.1-2008 Environmental testing for electrical and electronic products - Part 2: Test A: Low temperature test method
- GB/T2423.2-2008 Environmental testing for electrical and electronic products - Part 2: Test B: High temperature test method
- GB/T2423.22-2012 Environmental testing part 2: Test N: temperature change
- GJB150.3A-2009 Environmental test method for military equipment laboratory part 3: high temperature test
- GJB150.4A-2009 Environmental test method of military equipment laboratory part 4: low temperature test
- GJB150.5A-2009 Environmental test method of military equipment laboratory Part 5: Temperature shock test
- ISO 16750-4 - Road vehicles --- Environmental conditions and tests for electrical and electronic equipment - Part 4 Climatic environment
- QC/T15-1992 General test method for automotive plastic products

GB/T28046.4-2011 Environmental conditions and tests for road vehicle electrical and electronic equipment - Part 4 Climatic loads

- UL1642-2009 (4 edition) temperature shock test
- GJB899-90 reliability identification and acceptance test

3.1 Advancement of related technology

Energy saving

The refrigeration system of related equipment (R404 and R23) adopts electronic expansion valve energy-saving control, and the temperature is stabilized by automatically adjusting the valve opening through software. The heater does not work during the stable process of low temperature (below 0° C), and the compressor consumes less with the cooling flow. The power is correspondingly reduced to achieve the purpose of energy saving. The energy-saving control effect of related equipment has passed the China CQC energy-saving product certification.

中国节能产品认证

试验报告

Energy Conservation Certification Report

报告编号：20210103W00644X 第 4 页 共 5 页

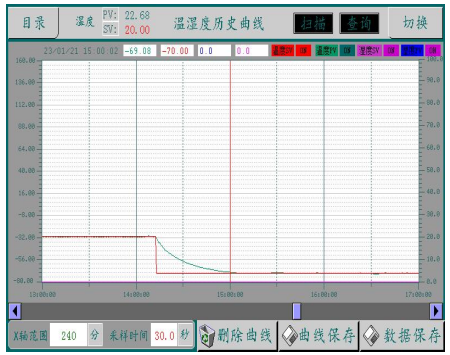
试验结果及判定

序号	检验项目	技术要求	型号	实测值
1	125℃耗电量（kW·h/h）	按照委托方技术要求进行检测。	NTH（AYH,ST）-420-（20～70）	0.785
2	25℃耗电量（kW·h/h）	按照委托方技术要求进行检测。	NTH（AYH,ST）-420-（20～70）	1.818
3	-25℃耗电量（kW·h/h）	按照委托方技术要求进行检测。	NTH（AYH,ST）-420-（20～70）	1.303

Energy saving test results and judgment

3.1 Advancement of related technology

Just set the temperature (humidity) conditions, the automatic control function can reach the set value with the maximum power before reaching the set value, and maintain the operation with the minimum power after reaching the set value.It can respond quickly to the opening and closing of the door and the change of heating load during the test to maintain a stable test environment



Running screen

3.1 Advancement of related technology

Temperature:

The refrigeration system can control the output refrigeration capacity with high precision to achieve high performance and greatly save electricity consumption; in the stable normal temperature and low temperature range, the energy saving can reach more than 50% compared with the traditional mode

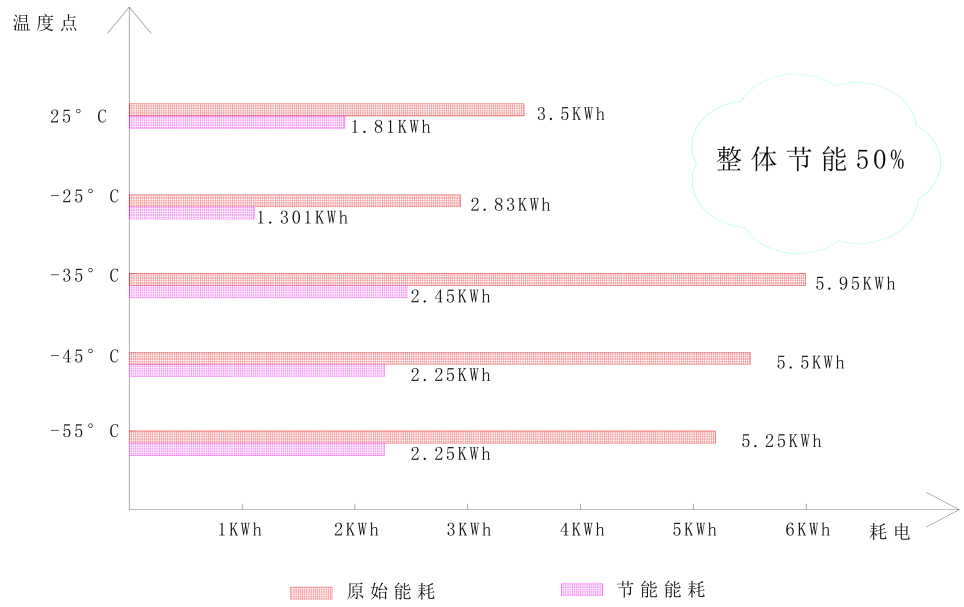
STH408-70 Comparison of Electricity Consumption of Cascade Refrigeration Units

Serial number	Temperature point	unit turned on	Old model power consumption	New model power consumption
1	25℃	R404A	3.5kWh	1.81kWh
2	-25℃	R404A	2.83kWh	1.303kWh
3	-35℃	R404A+R23	5.95kWh	2.45kWh
4	-45℃	R404A+R23	5.5kWh	2.25kWh
5	-55℃	R404A+R23	5.25kWh	2.25kWh

3.1 Advancement of related technology

Temperature:

The refrigeration system can control the output refrigeration capacity with high precision to achieve high performance and greatly save electricity consumption; in the stable normal temperature and low temperature range, the energy saving can reach more than 50% compared with the traditional mode



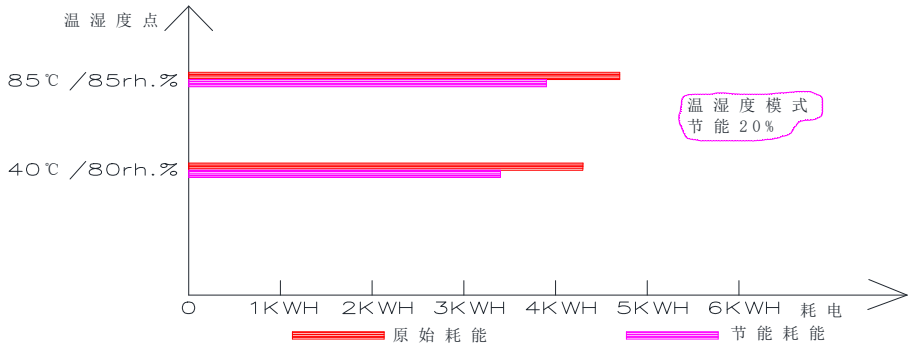
3.1 Advancement of related technology

Temperature and humidity:

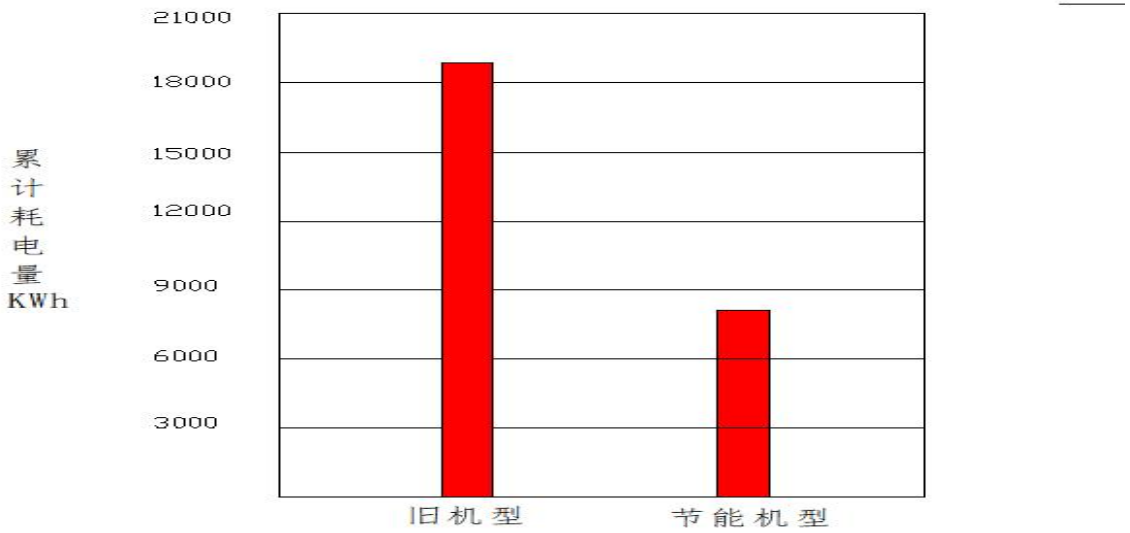
Adopt traditional control method at low humidity and high humidity extreme (Because the humidification output itself is small at the low humidity limit, and the heating tube output is small at the high humidity limit)

When the temperature and humidity are in other ranges, the evaporation pressure of the evaporator is adjusted according to the dew point corresponding to the set value to control the stability of the humidity, so that the output power of heating and humidification becomes smaller. The power becomes smaller accordingly to achieve the purpose of energy saving

	STH408-70 Comparison of Electricity Consumption			
Serial number	Temperature point	Humidity point	Old model power consumption	New model power consumption
1	85℃	85rh%	4.7kWh	3.9kWh
2	45℃	80rh%	4.3kWh	3.4kWh



3.1 Advancement of related technology



Device:ESTH408-70
Control temperature at -55℃ without load
Environment condition：25℃ 50%RH
Annual power consumption:
300 days*12*power consumption

4 部分客户案例

Simplewell昇微

Thanks for watching

Simplewell Technology Co., Ltd

Team

Cooperation

Persistence

Honor

Address：No.221, Shuixin Road, Dalang Town, Dongguan City

Tel：0769-88887909 Fax：0769-88885229

Website：www.simplewell.com.cn

Email：sales01@simplewell.com