Simplewell昇微

Thermal shock test chamber

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01Part

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



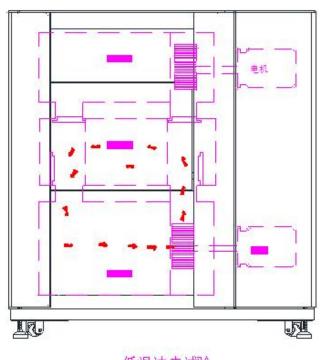
Two zone thermal shock chamber

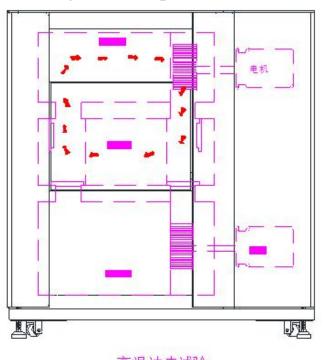


3 zone thermal shock chamber

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:

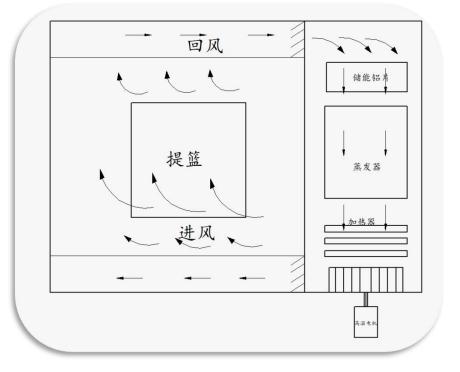
Adopt the method shown in the figure to transfer heat to ensure the temperature uniformity of the test space. The centrifugal fan placed at the rear of the air conditioning channel is the source for air circulation. The air enters the channel from the bottom of the regulating channel, passes through 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.



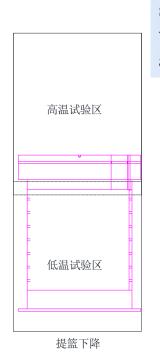
Inner box

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.



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)

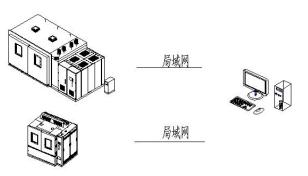
1.5 Electrical control system

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.

0







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

l



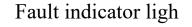
Main power switch (Schneider)



Communication Interface



Emergency stop switch





Over-temperature protector



HMI

1.7 Circuit accessories



Electronic Humidity Sensor (Swizerland / Finland))



Solid State Relay (Carlo gavazzi)



Overload protector (Schneider)



Contactor (Schneider)



PLC controller (Mitsubishi)



Flame retardant wire



No fuse switch (Schneider)

1.8 Refrigeration system







1.Tecumseh/Bitzer、
Bock" Full/semi-hermetic lownoise 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 pump









Water temperature gauge



Ball valve



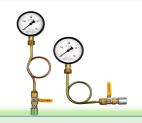
Check Valve



water filter (optional)



Y type strainer



Pressure gauge



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)



V pulley



F.R.L (AirTAC)

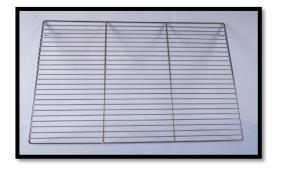


Solenoid valve (AirTAC)



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 $\Phi 50$, $\varphi 100$, $\varphi 150$ (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.



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.

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





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

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*4	品名	图号	数量	是否 折弯	切割 确认	人人的	日期	折弯	确认人	ВМ	版金额认	确认人	日期
1	照明灯内框	302	1	不折	/	eks	74.1	V	物的色	11-15	V	74年本	11.27
2	照明灯罩	303	81	Bi	1/	Ash	7/11	V	3000	25-11	V	2425	11-21
3	漫压口外光	304	1	\$9	1	M334	2/1	1/	30016	11.35	1	2H 多龙	
4	淮压口内板	305	1	不折	V	in 3 de	13/4	L	3mm de		V	24.25	11.22
5	淮压口导风条	306-1	12	Mi.	V.	Lins 12	Ph.	V	录业格		V	计数元	11.22
6		306-2	10	折	1	112/2	12/2	V	300		V	HX+*	11-27
7	玻璃外框	307-1	1	折	U	Made	12/10	V	易中的	241	V	34季意	1/1/27
8		307-2	4	#i	1	white	7/n	V	Ser 13	11.24	V	344.48	11-27
9	玻璃內框	308	1	不折	V	103220	3/11	V	Fre 12	1655	V	74年五	11.27
10	屏幕盒子	309	1	新		white	23/10	1	Bed	1635	V	74t\$\$	11-27
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12	地槽封板	312-1	4	不折	1	Liber	27/1	V	300	11.25	V	胜转	1 1/27
13		312-2	4	折	1	Min	23/14	V	de la		V	744	4/1-27
14	传感器罩子	315	1	折	V	Asin	2/11	V	30世間		1	3H#	
15	回风挡板	401	3	Bi	1	Wiston	23/11	V	清田磨	11.25	V	344	
16	回风挡板2	402	3	折	1	white.		V	inel	102	SV	张老	
17	回风挡板骨架横1	403	1	折	V	MISTATE OF	2/4	V	3,40		5 /	2-tt 4	11-27
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19	回风挡板骨架模2	405	-1	折	1	103 Mz	13/1	V	700			344	
20	回风挡板骨架竖1	406	2	奶	1	Lingst	1/1	V	Be2		V	344	
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2	准备作业时所用的对应工具、材料及零件【如拉尺、 色版、扫把、垃圾桶、台车、保护模】	0	*walt	0	novalle	129
3	操作人员必须佩工作服、劳保鞋	0	0 - 16	0	KONAL	124
4	检查徐层颜色符合标准	0	8.00/4	0	(mark	124
5	检查涂层表面均匀无露底、堆积缺陷	0	12 100 11	D	何由此	14
6	检查表面沙拉每平方米少于5个不连接	0	M mile	0	40,40%	12.4
7	检查可视面无情皮	0	to all	0	16/10 %	124
8	检查可视而无水印	0	2091	0	10,484	12.5
9	检查涂层厚度符合国家标准	0	老頭し	0	杨晓	124
10	检查表面无製痕	6	Look	0	面线	124
11	检查数量与设计要求一致	0	Tork	0	何姓	129
12	将合格的零部件放置在指定位置、标识课题型号、订 单号通知第二确认人进行第二确认和转序工作。	0	* Mary	0	16133	124
13	清理、清扫干净工作场地,工具、材料复位 及保养、点检。	0	原明日	0	何離	124
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1	设备运输通道大门是否符合设备安装要求。	0	94h	0	孙	2.3		
2	设备的放置场地是否符合设备安装发来。	0	Sah	0	lis.	27		
3	设备运输楼梯是否符合设备安装要求。	0	Bar	0	330	207		
4	设备的安装场地楼层是否符合设备安装 要求。	0	Sep.	0	弦			
5	户外机组安装空间位置是否符合设备安 装要求。	0	/	0	五百五五			
6	电、水、气路是否符合设备安装要求。	0	Saga	0	335			
7	现场外部空气是否干净并流递。	0	844	0	332	27		
8	现场环境能否满足开机、背景采样条件。	0	Books	0	夏九年	2.7		
9	吊裝費用由我司(打①)负责还是由客户(打队)负责。	0	/	0	五次点	2.7		
10	是否己阅读"规格书、合同、管理评审 表"	0	34h	0	23年	27		
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	检查图纸中线材的线径是否足够。材 质是否符合。端子是否够大线材质量。	0	林	0	绿坡	1230
	电器电路板喷涂质量合格。孔位、外 形尺寸正确	0	表加	0	學被	12.39
	电器及仪表组件说明书齐全	p	李二	0	3240	230
	电器及仪表合格证及计量报告齐全	0	参加	0	BUN	1230
	普通高温部件采用硅胶线、线径足够	0	松	0	1200	121/-
	特殊高温线采用不锈钢线, 不锈钢线 端子, 线径足够判断电源大小。	0	Ato.	0	泉湖	
	连接线保护套耐温是否够	0	李志	0	38 5 14	1230
0	连接线穿过金属鹽时,是否振动会舱 坏线,是否有防护	P	袁志	0	454	
3	电器安装后与金属赋距离是否够大, 不能有短路接地可能。	D	弘	0	彩煤	130
2	线槽、线槽盖板切口平整用剪刀去除 毛刺,用于走线的映口无锋利嘴齿。 固定螺丝均用 M×8 大头镌钉	0	结	D	梨樓	1230
3	各元器件压线端子固定牢固无检动。	0	李二	0	岩山坡	1240
4	配电盘各元器件固定率图。	0	韩	0	X318	[21]0
15	线路族色正确	0	圭和	0	348	0.30
16	因志維电器与放热器间均匀除上导热 硅脂,并且固定率限。因志继电器型号	0	韩	0	野旗	1230

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1. 是否己阅读"规格书、合同、管理评审表"	0	2000	0	先生	2
2. 根據裴配國所示, 失用透当等各個管, 所有 在冷冻装配区域内所装管道必须保持平直、整 齐、美观。压缩机出气要由低重高, 減少補出 压缩机, 压缩机吸气口由截至低利于油回到压 縮机。	0	dup chie	0	\$44°	1
 所配管必須要不影响其他元件的維修及方便连接点的焊接。 	0	good	0	孙	19
4. 喇叭口到口保持平整光滑不得有毛刺, 口径 为正好能装于铜钠子为准、封口为管径的1— 1.2 倍, 扩口前要在所执行部位最火处理, 并 涂上冷冻油上紧不翻。	0	3-93	0	新和了	9
 所有元件及铜管位置要有固定極來固定,确 模其元件、铜管不松动美观防止固定壓与铜管 發空。 	0	343	0	多部分了	9
6. 蒸发器回气管必須从最低位出,斜向下布置 管道。或者逐发器出口做一个最低处储液等。 如果煮发器低于压缩机回气管必须要有一个	V	sale	U	1 page 2	3

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	少八土明明	5:2000371)	18歳工序の書人	
产品名		B: AB N745.		1
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1	饭金底座确认表	0	派をと	11.27
2	饭金机组架焊接确认表	p	36.332	11.25
3	电装配电盘确认表	0	15.	12.30
4	电装整机接线确认表	0	41.	3.3
5	冷冻机组保压确认表	0	A APOL	2.9
6	冷冻配管及焊接确认表	0	2 202	29
7	冷冻装配确认表	0	2215	21
8	步入室调试报告		711	+
9	包装确认表	0	8 12 and 15	3,14
10	外购库房确认表	0	781	217
11	风道确认表	0	4K # 3 V	11.76
12	水箱组件确认表		307 63	111111111111111111111111111111111111111
13	水箱水路安装确认表			
14	电控箱焊接确认表	12	みままと	11,30
15	电控箱总装确认表	0	347.	2.9

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









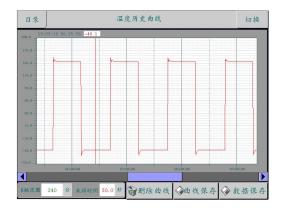
Adopt flame retardant wires, the picture shows the wire flame retardant certification

2.1 Feature

Good temperature uniformity and wide impact range.



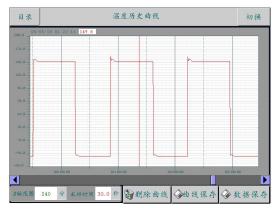
running screen



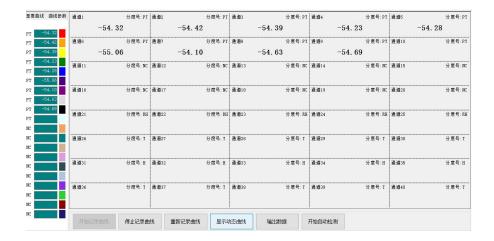
temperature curve



running screen



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

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.



Energy Conservation Certification Report

报告编号: 20210103W00644X 第 4 页 共 5 页 **试验结果及判定**

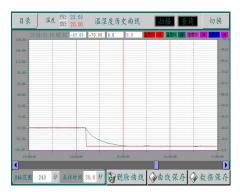
序号	检验项目	技术要求	型号	实测值
1	125℃耗电量 (kW•h/h)	按照委托方技术要求进行检测。	NTH (AYH,ST) -420- (20~ 70)	0. 785
2	25℃耗电量 (kW•h/h)	按照委托方技术要求进行检测。	NTH (AYH,ST) -420- (20~ 70)	1.818
3	-25℃耗电量 (kW•h/h)	按照委托方技术要求进行检测。	NTH (AYH,ST) -420- (20~ 70)	1. 303

Energy saving test results and judgment

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

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

\mathbf{S}	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°C	R404A	3.5kWh	1.81kWh					
2	-25°C	R404A	2.83kWh	1.303kWh					
3	-35°C	R404A+R23	5.95kWh	2.45kWh					
4	-45°C	R404A+R23	5.5kWh	2.25kWh					
5	-55°C	R404A+R23	5.25kWh	2.25kWh					

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

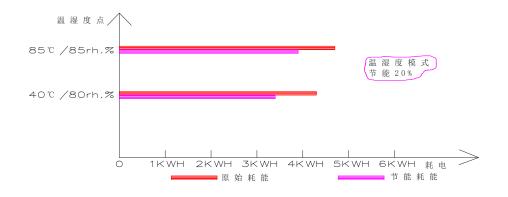


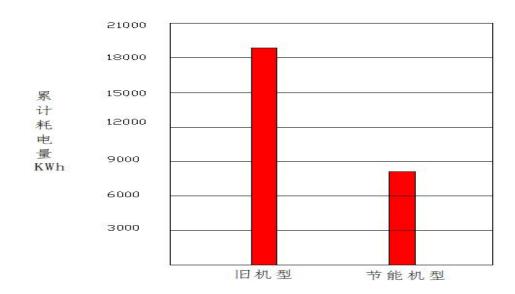
Temperature and humidity:

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	Temperature	Humidity	Old model power	New model power					
number	point	point	consumption	consumption					
1	85℃	85rh%	4.7kWh	3.9kWh					
2	45℃	80rh%	4.3kWh	3.4kWh					





Device:ESTH408-70

Control temperature at -55°C without load

Environment condition: 25°C 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



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