Simplewell昇微

Introduction of low pressure test chamber

Simplewell technology Co., LTD

Products Advantages:

1. The humidity can be controlled at 25 KPa to atmospheric pressure.

2. Good uniformity of high and low temperature under low pressure (up to 1.2℃ or even lower)

3. The humidity can be controlled stably when temperature at - 20℃ and low pressure, such as 70% humidity at 25 kpa, -20℃.

4. The pressure go up and down speed can be controlled linearly, any pressure point is stable.

5. The air pressure, temperature can rapid change at the same time, the real simulation of high-speed temperature change.

6. Comply with standards: RTCADO-160G：2010 《Airborne Equipment Environmental Conditions and Test Procedures》 Chapter 24 icing

7. Comply with SIMPLEWELL Freeze test mode (low temperature low pressure high humidity ~ atmospheric pressure high temperature and humidity alternating test).

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Introduction

1.1 Product Introduction (Application)

Application of Low Pressure (Temperature & humidity)Test Chamber

- Application range: suitable for quality inspection and material screening of electronic, electrical, communication, instrument, vehicle, plastic products, metal, food, chemical, building materials, medical, aerospace ect. products.
- Used to determine the performance characteristics of airborne equipment, aircraft, spacecraft, unmanned aerial, etc. products that must working exposed to icing environments, such as constant temperature, altitude, and humidity, as well as rapid humidity changes.

1.1 Product Introduction (Appearance)

The front

electricity box

picture of real products

Inner cabin

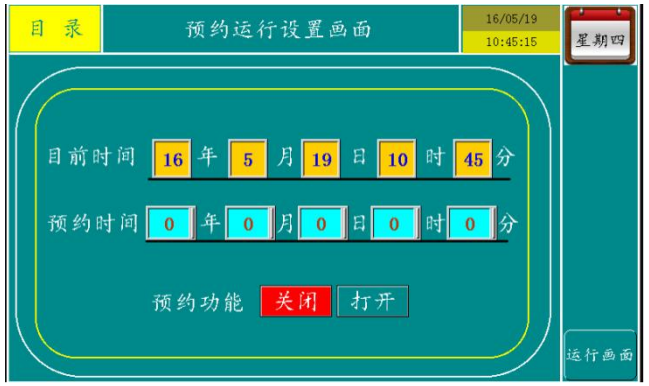
Plug-in screen

Shelf

1.1 Product Introduction (Operation interface)

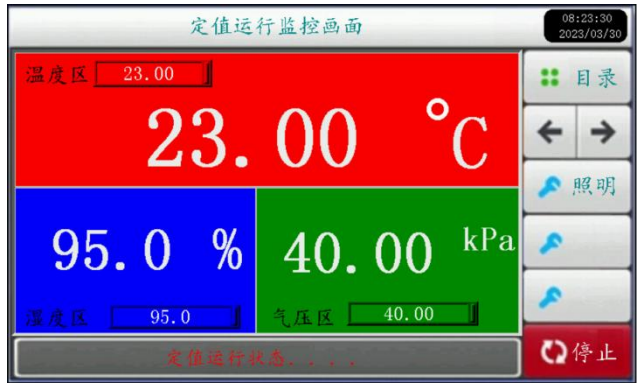
Function selection interface

Program Setup Interface

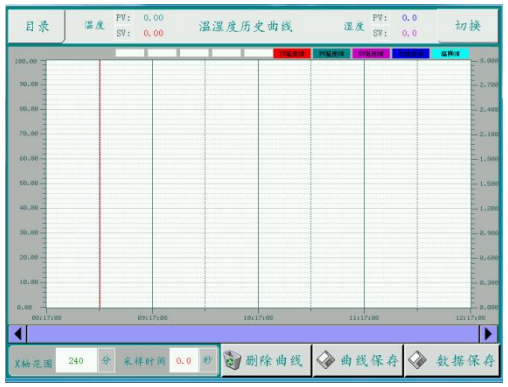


Appointment run setting interface

Run Setup Interface



Fixed value running interface



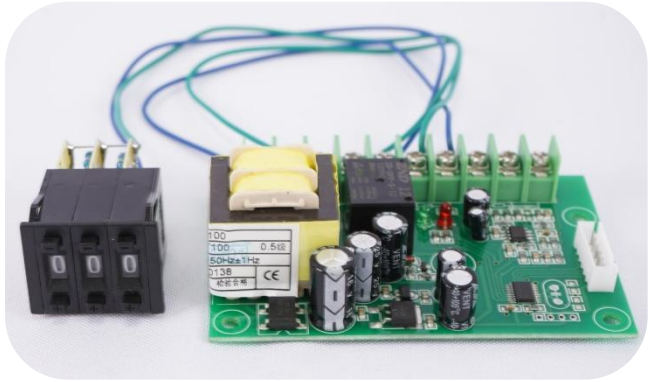
Curve interface

1.1 Product Introduction (Electronic control system components)

Control screen

Flame retardant wire

Mitsubishi PLC

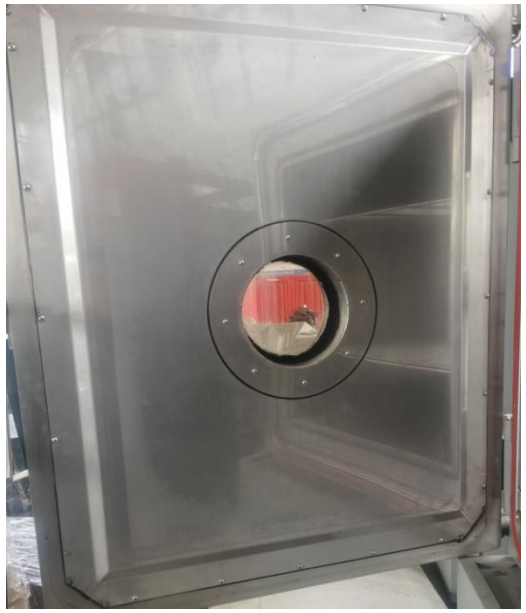


Overtemperature protector

RS232-C joints

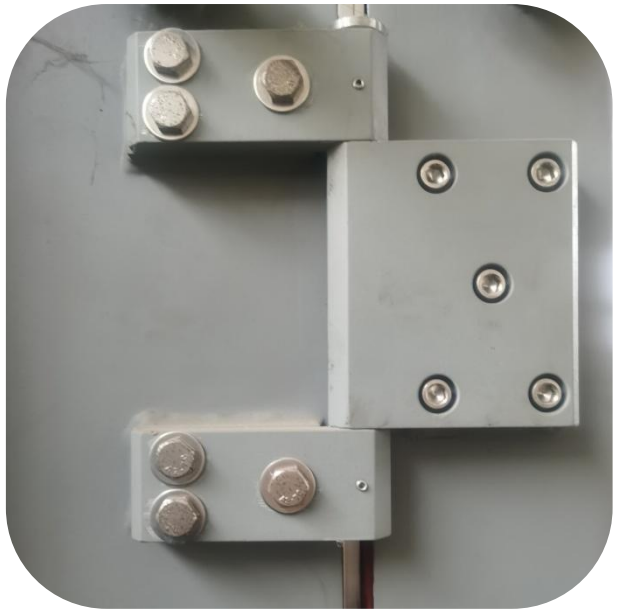
Schneider electric leakage switch

1.1 Product Introduction (Pressure bearing system)



Door of chamber

Pressure chamber body



Door of chamber hinge

The equipment adopts external pressure structure and adopts custom heavy-duty door hinge design.

1.1 Product Introduction (circulation system)

Magnetic motor

Seal wiring column

Wind wheel

Germany Leible vacuum pump

Vacuum filter

Using the internationally famous vacuum pump and customized magnetic motor; using sealed terminal design, to ensure that the customer sample can be powered on under low pressure, greatly improve the air tightness of the chamber

1.1 Product Introduction (Humidification system)

Humidification tube

Humidification water tank

Adopting Vaisala electronic humidity sensors that ensure the humidity detection under low pressure.

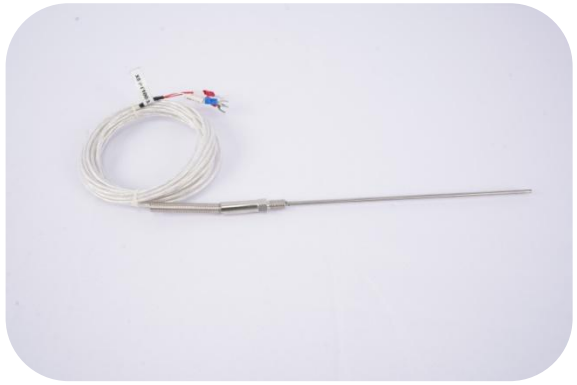
Humidity sensor

Electric ball valve

1.1 Product Introduction (Heating system)

Heating tube

Gas switch

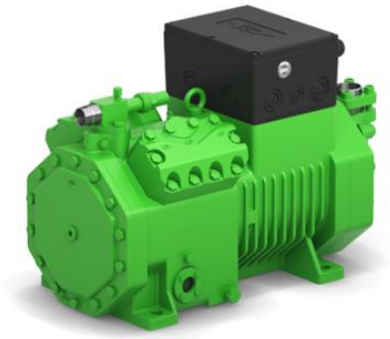


Temperature sensor

Solid state relay

The temperature sensor is adopted the international famous brands, and the heating system adopts rainbow gas switch and CARLO Solid-state relay for multiple protection.

1.1 Product Introduction (Refrigeration system)



BITZER Compressor

Danfoss oil separator

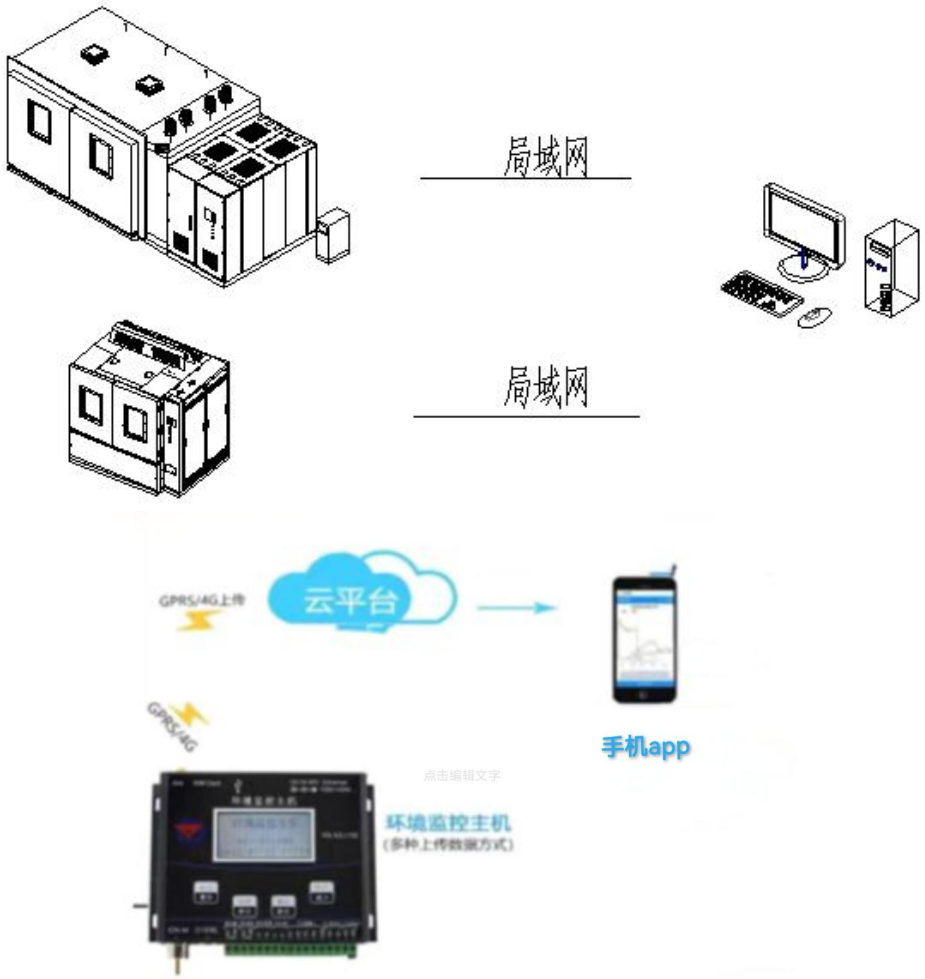
Condensator

Heron Palace, Casto solenoid valve

plate heat exchanger

Danfoss expansion valve

1.1 Product Introduction (Optional function)



Remote monitoring

The operation of the device can be monitored from a browser on the PC that connected through the LAN.

Through the LAN connection device and PC, only need to set the IP address, no special software or driver.

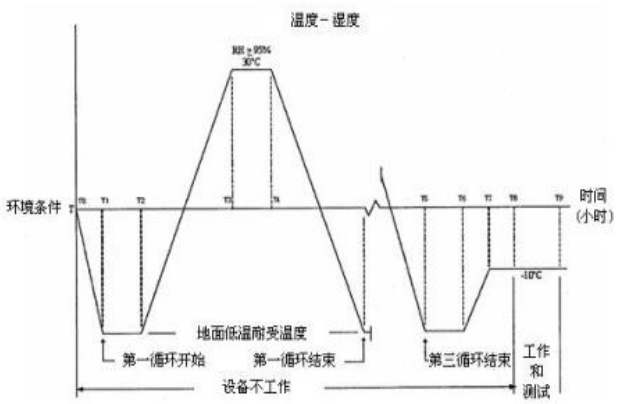
1.2 Product Introduction (Standards)

Low pressure test chamber comply with the standards (Includes, but is not limited to):

- **GB-T2423.25-2008**
- **GB-T2423.26-2008**
- **GJB150.2-2009**
- **GJB150.2A-2009RTCADO-160G：2010**
- **RTCADO-160G：2010**
- **GJB360B－2009**
- **GJB548B-2005**
- **GB/T2423.21-2008**
- **GB/T4857.13-2005**

1.2 Product Introduction (Standards)

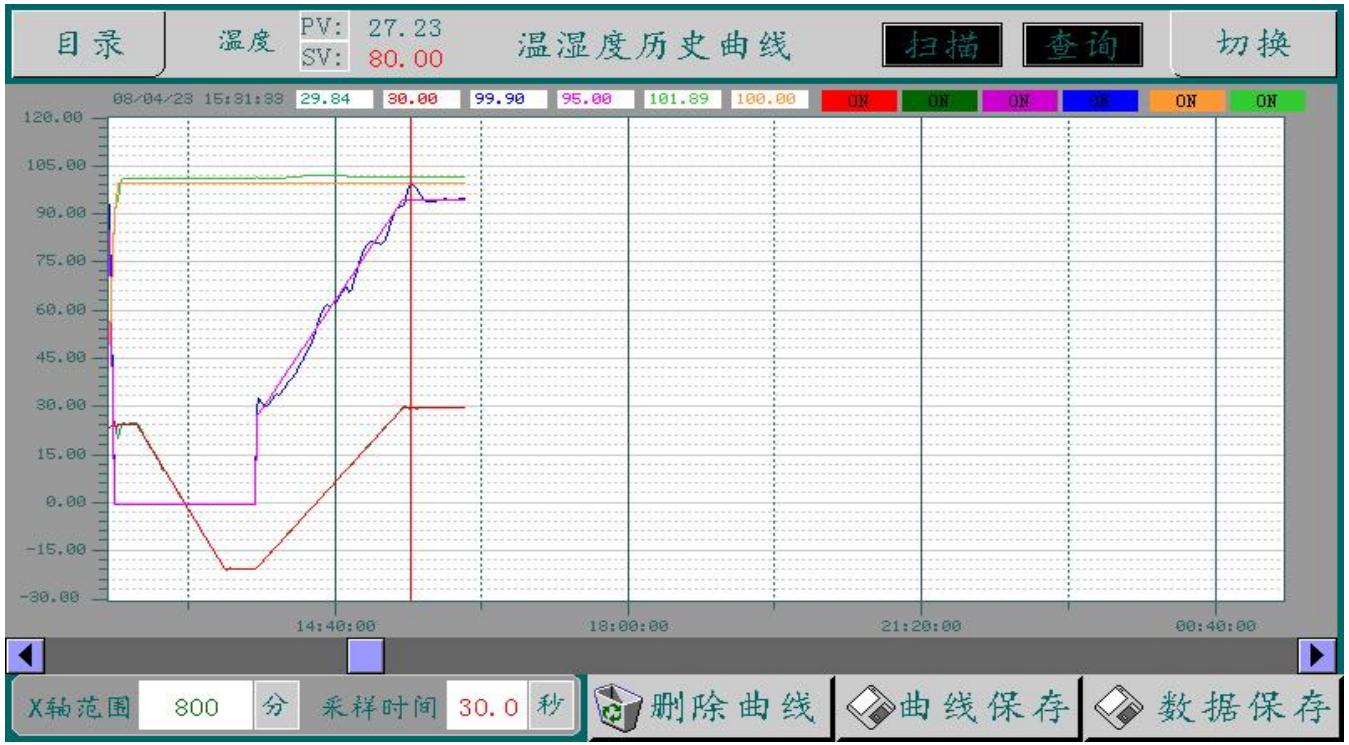
Class A icing test curve



注：

1. 除非另有规定，温度和湿度变化速率可任选
2. T1 到 T2 和 T5 到 T6 为设备温度达到稳定的时间
3. T2 到 T3 和 T4 到 T5 应按实际可能尽快完成
4. T3 到 T4 为设备表面温度达到 5℃的时间
5. T7 到 T8 为设备表面温度达到－10℃的时间

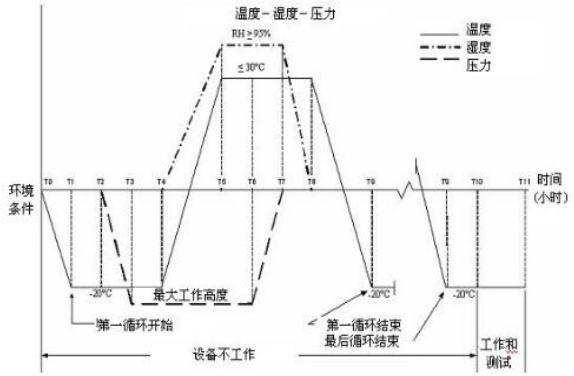
Class A test: This kind of test is used for the equipment installed outside the aircraft or uncontrolled temperature area. The equipment installed in the cold temperature and then encounters the humid air with the temperature above the freezing point, which can form ice or frost.



No.	Temperature (℃)	Humidity (%r.h)	Pressure（kPa）	Time（Min）
1	25	0	101	1
2	25	0	101	10
3	-20	0	101	60
4	-20	0	101	30
5	30	95	101	100
6	30	95	101	30

1.2 Product Introduction (Standards)

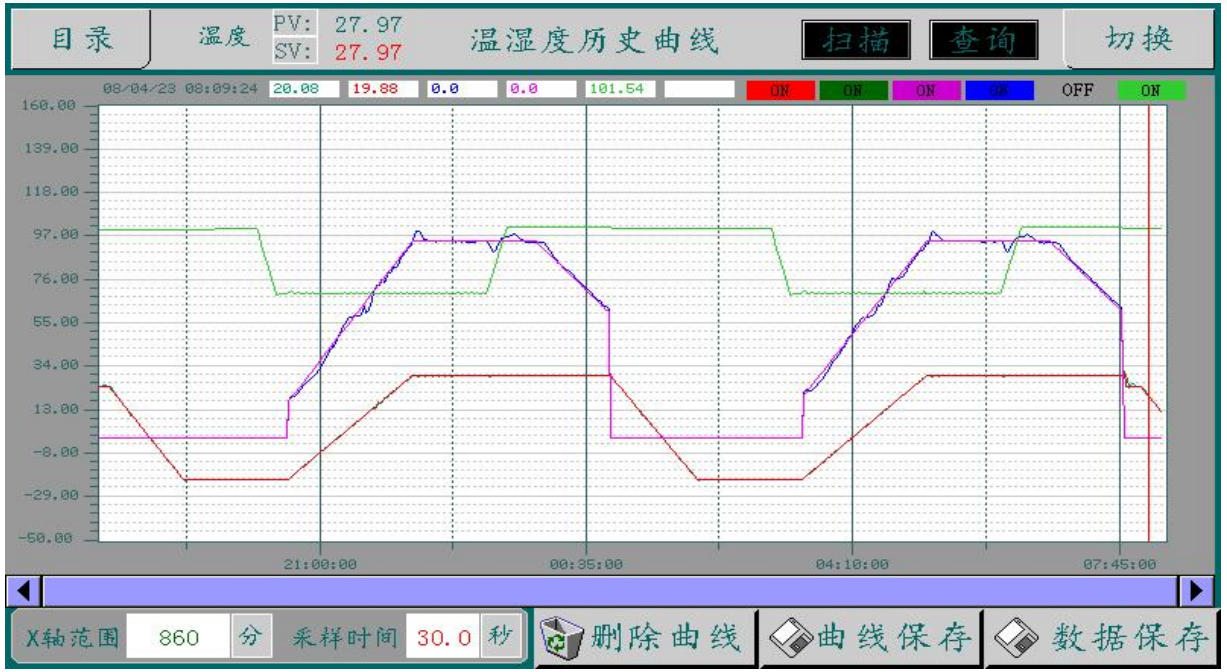
Class B icing test curve



注：

1. 除非另有规定，温度、湿度和压力变化速率可任选
2. T1 到 T2 和 T9 到 T10 为设备温度达到稳定的时间
3. T3 到 T4 最小为 10min
4. T4 到 T5 温度变化速率最大为 3℃/min
5. T5 到 T6 是冰和霜融化的最少时间
6. T5 到 T8 试验箱应不超过 30℃
7. T6 到 T7 为 15~30min

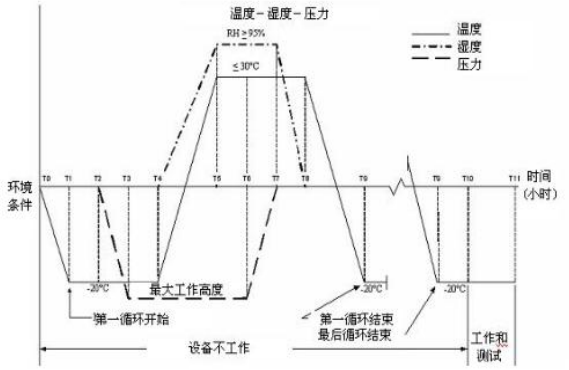
Class B tests: Such tests apply to equipment with moving parts whose activity may be affected or hindered by ice formation or by damage to their structural and functional parts due to forces caused by ice expansion. The ice formed inside and outside of the device is formed by condensation, freezing, melting, and (or) refreezing, and the ice may gradually accumulate in water or ice inside the unsealed housing.



No.	Temperature (℃)	Humidity (%r.h)	Pressure（kPa)	Time（Min)	
1	25	0	101	1	4-11 Cycle 2 times
2	25	0	101	10	
3	-20	0	101	60	
4	-20	0	101	60	
5	-20	0	70	15	
6	-20	0	70	10	
7	30	95	70	100	
8	30	95	70	60	
9	30	95	101	15	
10	30	95	101	30	
11	30	60	101	60	

1.3 Other low temperature andpressure and humidity curve

Class B icing test curve



注：

1. 除非另有规定，温度、湿度和压力变化速率可任选
2. T1 到 T2 和 T9 到 T10 为设备温度达到稳定的时间
3. T3 到 T4 最小为 10min
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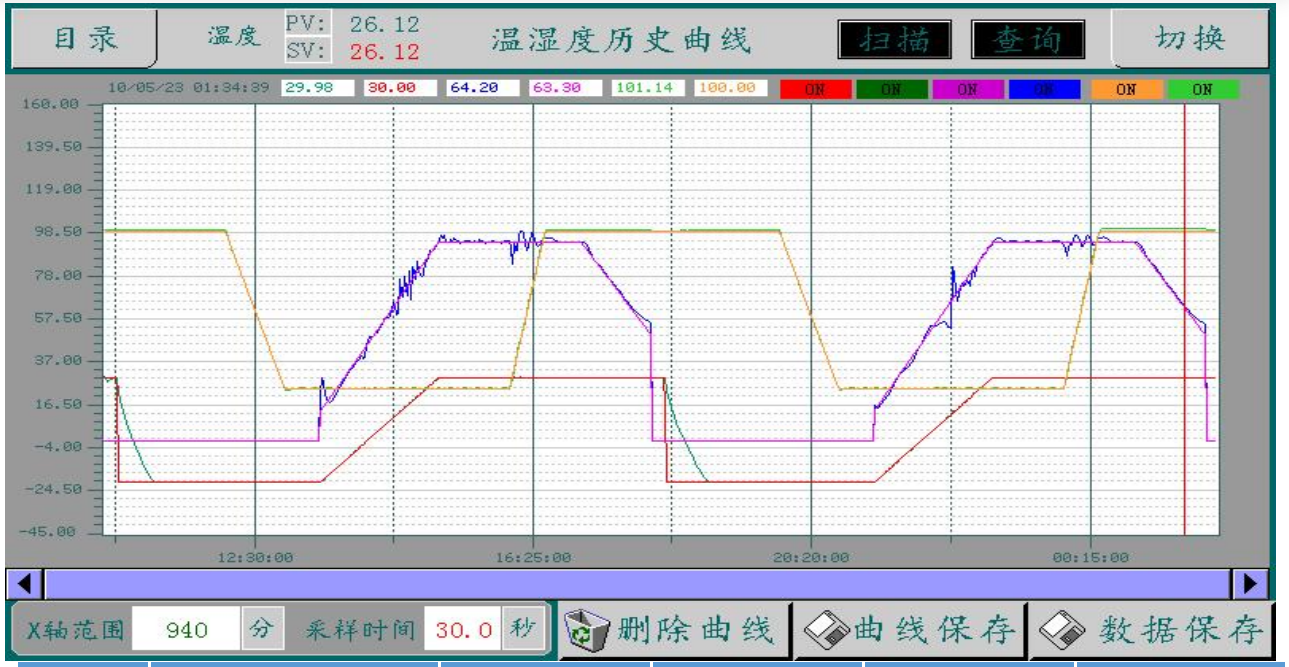
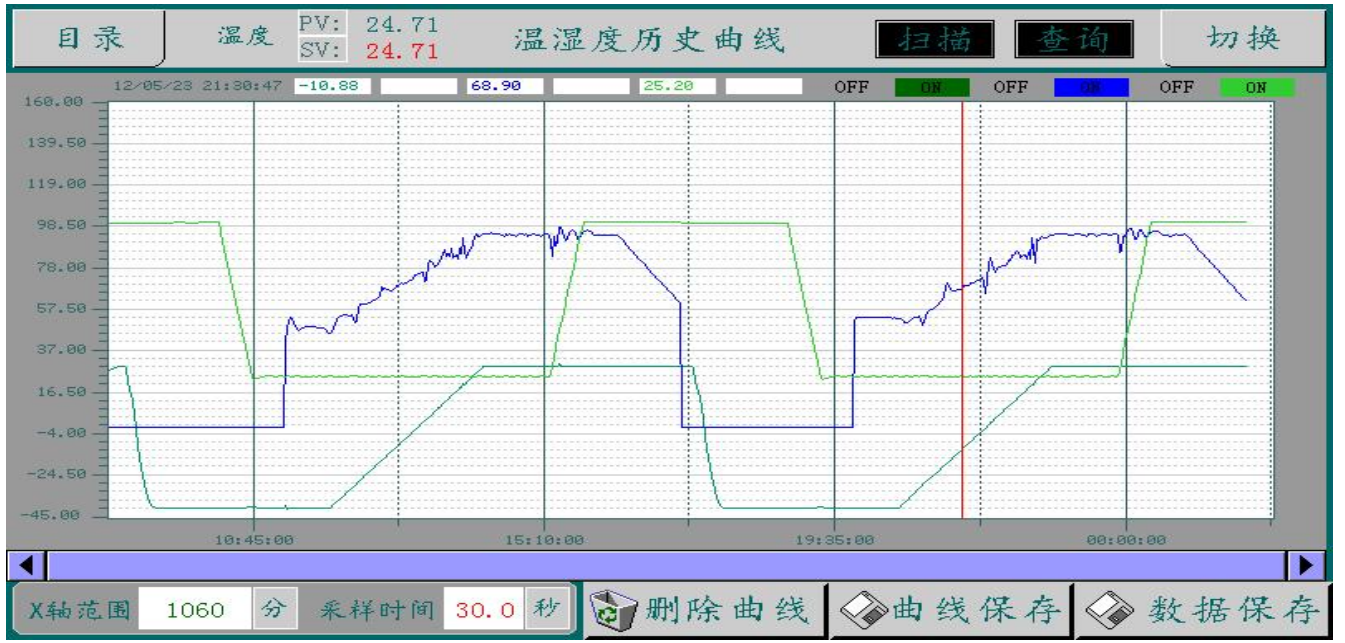


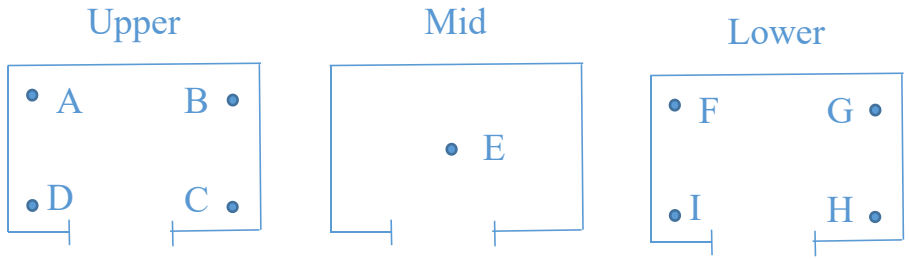
No.	Temperature (℃)	Humidity (%r.h)	Pressure（kPa）	Time（Min）	
1	30	0	101	1	Cycle 2 times
2	30	0	101	10	
3	-20	0	101	1	
4	-20	0	101	60	
5	-20	0	25	50	
6	-20	0	25	30	
7	30	95	25	100	
8	30	95	25	60	
9	30	95	101	30	
10	30	95	101	30	
11	30	50	101	60	

1.3 Other testing parameters（SIMPLEWELL）

No.	Temperature (℃)	Humidity (%r.h)	Pressure (kPa)	Time (Min)
1	30	0	101	1
2	30	0	101	10
3	-40	0	101	1
4	-40	0	101	60
5	-40	0	25	50
6	-40	0	25	30
7	-40	50	25	1
8	-40	50	25	40
9	30	95	25	140
10	30	95	25	60
11	30	95	101	30
12	30	95	101	30
13	30	60	101	60
Cycle 2 times				

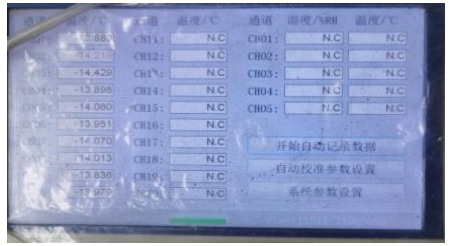


1.3 Simplewell measured curve



Distribution map of test points

Cabin pressure	Temperature display value (℃)	A	B	C	D	E	F	G	H	I	Evenness degree
20K Pa	-15	-13.88	-14.21	-13.89	-14.00	-13.95	-14.07	-13.95	-14.07	-13.84	0.33
	80	79.64	80.01	79.54	80.33	79.99	79.89	79.84	79.46	79.26	1.07
10K Pa	-10	-10.00	-9.86	-10.59	-10.54	-9.78	-9.65	-9.99	-10.03	-10.75	1.10
	-40	-40.32	-40.21	-39.85	-40.49	-39.58	-40.58	-39.65	-40.55	-39.69	1.00



Simplewell measured pictures

1.4 Equipment manufacturing process and requirements

1. Pipeline welding process: the high quality copper pipe nitrogen protection welding method is adopted, to avoid the damage to the compressor caused by the traditional welding method in the oxide impurities into the refrigeration system.

2. Shock: vibration damping spring and soft rubber cushion be installed at the bottom of the compressor and pipe.

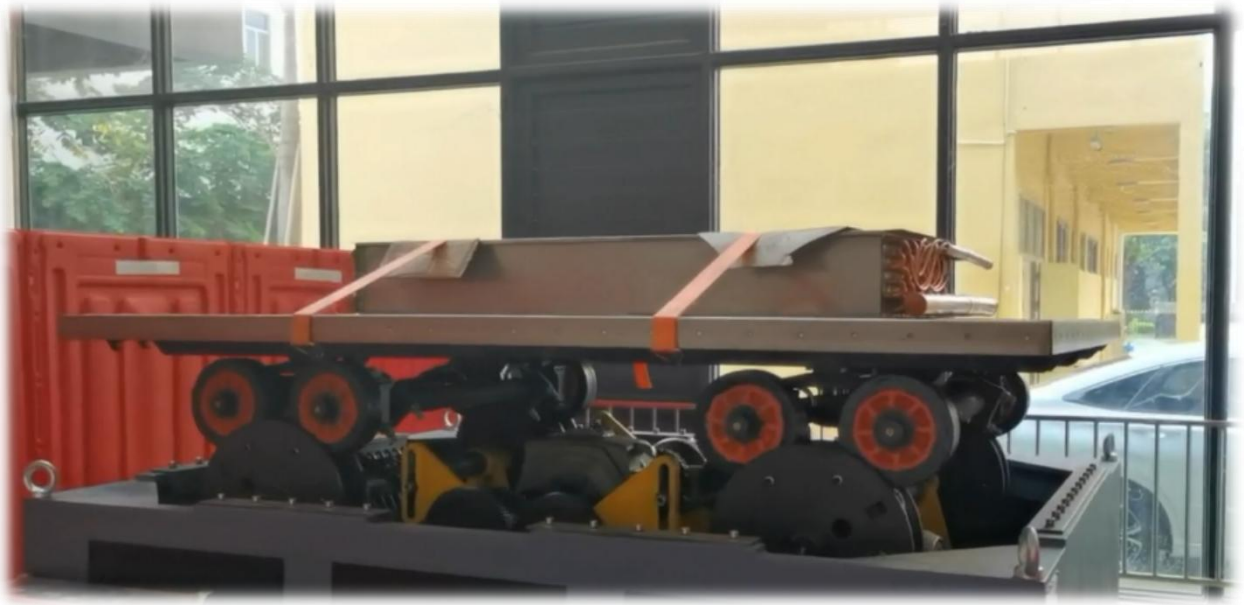
3. Pipe protection: the refrigeration system pipeline increases the anti-vibration hose and C-type elbow to avoid the copper pipe rupture caused by vibration and temperature changes.

4. Noise control: The condenser is equipped with low speed and high air volume condensing fan (German MAR), and a wave type sound-absorbing sponge is installed around the refrigeration unit to achieve a lower noise effect.

5. Check the temperature of the power distribution cabinet when the equipment is running.

1.4 Equipment manufacturing process and requirements

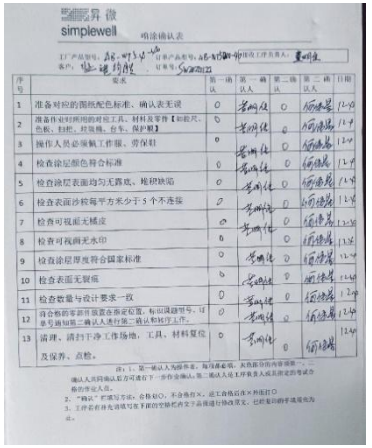
Simulated road vibration testing

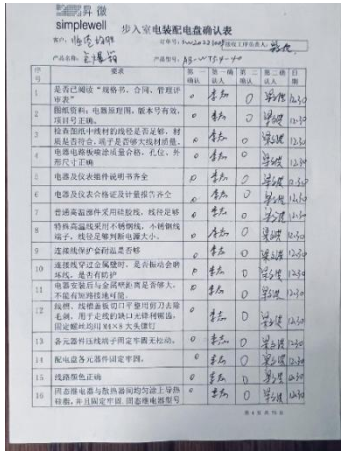


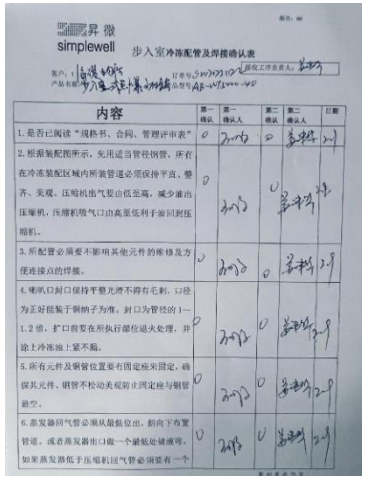
6. Vibration testing on components such as refrigeration evaporators before installation

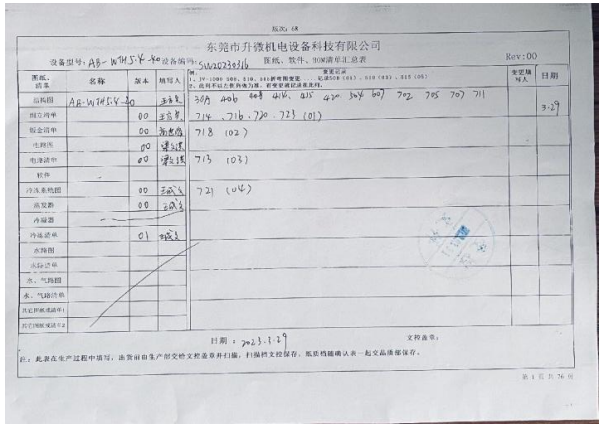
7. Vibration testing on small equipment before shipment

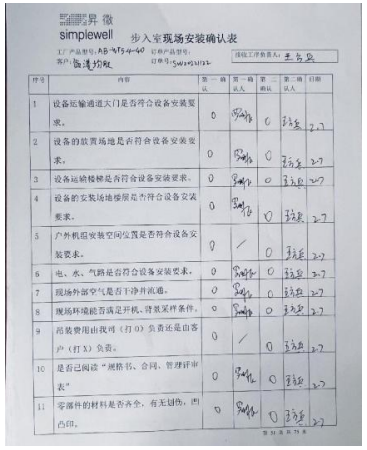
1.4 Equipment manufacturing process and requirements





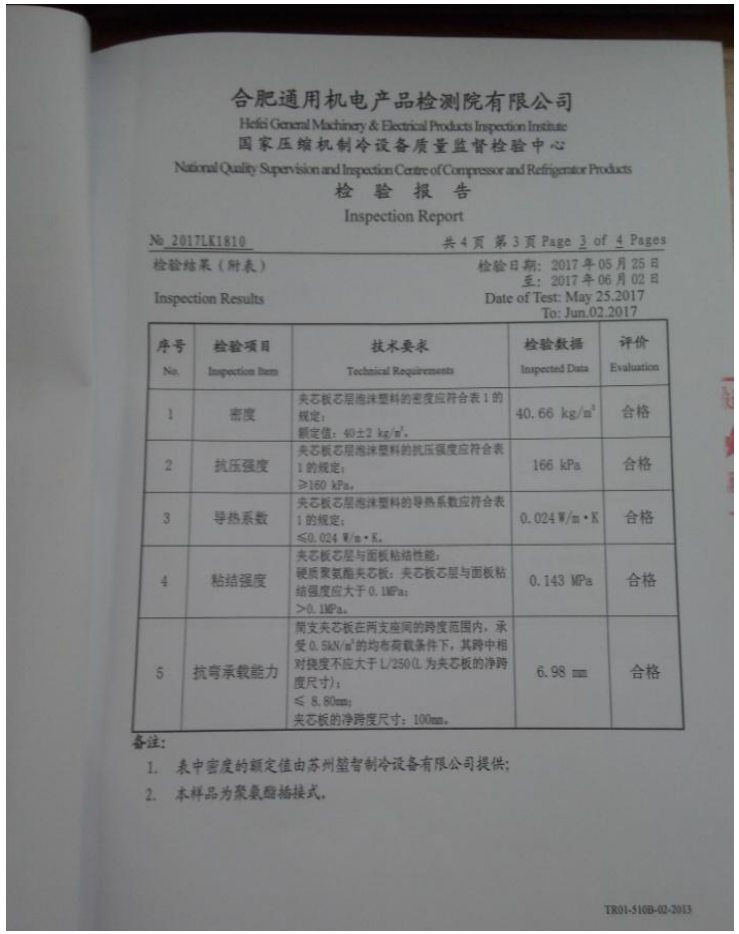






8. Production process confirmation: after the equipment starts production, the person in charge shall carefully fill in the confirmation form for each process, timely correct the problems in the production process, trace back to the source, optimize the production process, improve the production efficiency, and ensure the quality of each equipment produced.

1.4 Equipment manufacturing process and requirements



合肥通用机电产品检测院有限公司
Hefei General Machinery & Electrical Products Inspection Institute
国家压缩机制冷设备质量监督检验中心
National Quality Supervision and Inspection Centre of Compressor and Refrigerator Products
检 验 报 告
Inspection Report

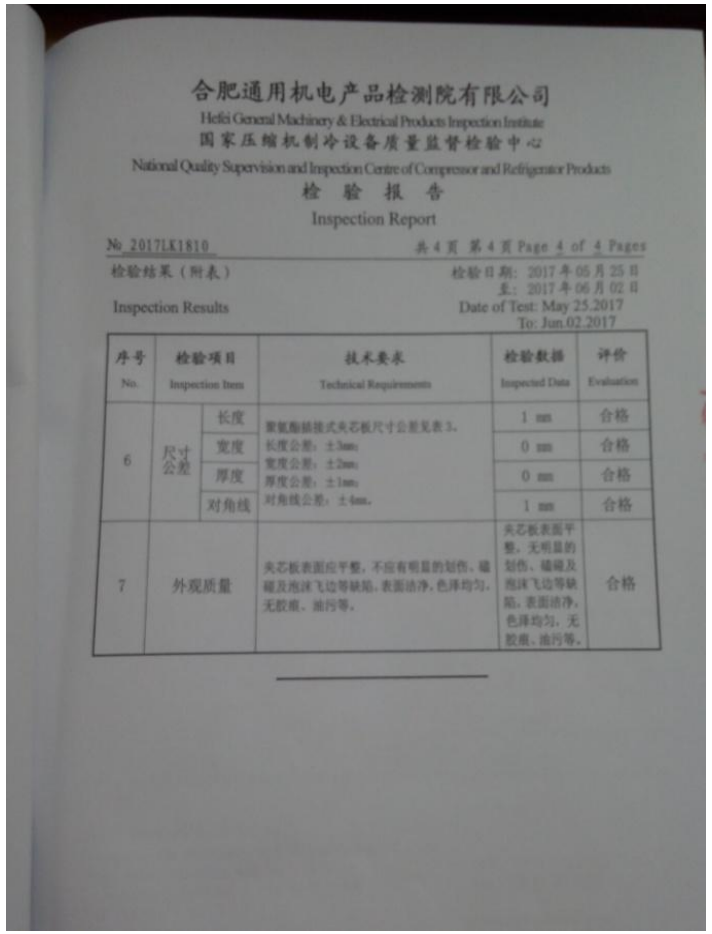
No. 2017LK1810 共 4 页 第 3 页 Page 3 of 4 Pages

检验结果（附表） 检验日期：2017 年 05 月 25 日 至：2017 年 06 月 02 日
Inspection Results Date of Test: May 25.2017 To: Jun.02.2017

序号 No.	检验项目 Inspection Item	技术要求 Technical Requirements	检验数据 Inspected Data	评价 Evaluation
1	密度	夹芯板芯层泡沫塑料的密度应符合表 1 的规定：额定值：40±2 kg/m³。	40.66 kg/m³	合格
2	抗压强度	夹芯板芯层泡沫塑料的抗压强度应符合表 1 的规定：≥160 kPa。	166 kPa	合格
3	导热系数	夹芯板芯层泡沫塑料的导热系数应符合表 1 的规定：≤0.024 W/m·K。	0.024 W/m·K	合格
4	粘结强度	夹芯板芯层与面板粘结性能：硬质聚氨酯夹芯板：夹芯板芯层与面板粘结强度应大于 0.1MPa；>0.1MPa。	0.143 MPa	合格
5	抗弯承载能力	简支夹芯板在两支座间的跨度范围内，承受 0.5kN/m² 的均布荷载条件下，其跨中相对挠度不应大于 L/250(L 为夹芯板的净跨度尺寸)：≤ 8.80mm；夹芯板的净跨度尺寸：100mm。	6.98 mm	合格

备注：
1. 表中密度的额定值由苏州盟智制冷设备有限公司提供；
2. 本样品为聚氨酯插接式。

TR01-510B-02-2013

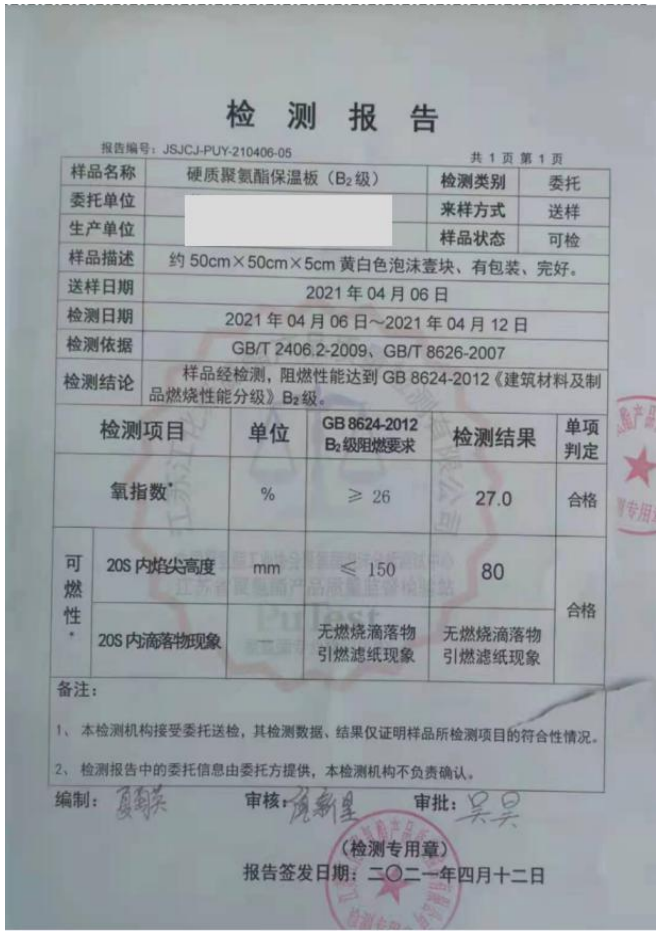


合肥通用机电产品检测院有限公司
Hefei General Machinery & Electrical Products Inspection Institute
国家压缩机制冷设备质量监督检验中心
National Quality Supervision and Inspection Centre of Compressor and Refrigerator Products
检 验 报 告
Inspection Report

No. 2017LK1810 共 4 页 第 4 页 Page 4 of 4 Pages

检验结果（附表） 检验日期：2017 年 05 月 25 日 至：2017 年 06 月 02 日
Inspection Results Date of Test: May 25.2017 To: Jun.02.2017

序号 No.	检验项目 Inspection Item		技术要求 Technical Requirements	检验数据 Inspected Data	评价 Evaluation
6	尺寸公差	长度	聚氨酯插接式夹芯板尺寸公差见表 3。长度公差：±3mm；宽度公差：±2mm；厚度公差：±1mm；对角线公差：±4mm。	1 mm	合格
		宽度		0 mm	合格
		厚度		0 mm	合格
		对角线		1 mm	合格
7	外观质量		夹芯板表面应平整，不应有明显的划伤、磕碰及泡沫飞边等缺陷。表面洁净，色泽均匀，无胶痕、油污等。	夹芯板表面平整，无明显的划伤、磕碰及泡沫飞边等缺陷，表面洁净，色泽均匀，无胶痕、油污等。	合格



检 测 报 告

报告编号：JSJCJ-PUY-210406-05 共 1 页 第 1 页

样品名称	硬质聚氨酯保温板（B_2级）	检测类别	委托
委托单位		来样方式	送样
生产单位		样品状态	可检
样品描述	约 50cm×50cm×5cm 黄白色泡沫壹块、有包装、完好。		
送样日期	2021 年 04 月 06 日		
检测日期	2021 年 04 月 06 日~2021 年 04 月 12 日		
检测依据	GB/T 2406.2-2009、GB/T 8626-2007		
检测结论	样品经检测，阻燃性能达到 GB 8624-2012《建筑材料及制品燃烧性能分级》B_2级。		

检测项目		单位	GB 8624-2012 B_2级阻燃要求	检测结果	单项判定
氧指数*		%	≥ 26	27.0	合格
可燃性*	20S 内焰尖高度	mm	≤ 150	80	合格
	20S 内滴落物现象		无燃烧滴落物引燃滤纸现象	无燃烧滴落物引燃滤纸现象	

备注：
1、本检测机构接受委托送检，其检测数据、结果仅证明样品所检测项目的符合性情况。
2、检测报告中的委托信息由委托方提供，本检测机构不负责确认。

编制： 审核： 审批：

（检测专用章）
报告签发日期：二〇二一年四月十二日

9. The flame retardant plate is adopted, the pictures show the performance test report of the flame retardant, compressive strength and bending bearing capacity of the plate.

1.4 Equipment manufacturing process and requirements


产品认证证书
防火产品认证
证书编号：CQC21011319060
发证日期：2021 年 11 月 02 日
有效期至：2024 年 11 月 02 日
委托人名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
制造商名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
生产企业名称及生产地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
产品名称和系列、规格、型号：建设工程用低烟无卤阻燃 1 级(B1)交联聚乙烯绝缘聚烯烃护套电力电缆 WDZ(A,B,C,D)(B1)-YJY、YJY23、YJY63，0.6/1kV 1.5-630(1 芯),1.5-400(2-5 芯);WDZ(A,B,C,D)(B1)N-YJY、YJY23、YJY63，0.6/1kV 1.5-630(1 芯),1.5-400(2-5 芯);
产品标准和技术要求：GB 31247-2014
认证模式：产品型式试验+获证后监督
上述产品符合 CQC17-463416-2020 认证规则的要求，特发此证。
证书有效期内本证书的有效性依据复证机构的定期监督获得保持。
可通过扫描下方二维码或登录国家认监委网站（www.cnca.gov.cn）查验证书信息
签发：谢肇煦
中国质量认证中心
http://www.cqc.com.cn 中国·北京·南四环西路188号9区 100070 电话：+86 10 83886666


产品认证证书
防火产品认证
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发证日期：2021 年 11 月 02 日
有效期至：2024 年 11 月 02 日
委托人名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
制造商名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
生产企业名称及生产地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
产品名称和系列、规格、型号：建设工程用低烟无卤阻燃 1 级(B1)交联聚乙烯绝缘聚烯烃护套控制电缆 WDZ(A,B,C,D)(B1)-KYJY-450/750V 0.75-2.5(2-61 芯),4-6(2-19 芯),10(2-10 芯);WDZ(A,B,C,D)(B1)-KYJY23-450/750V 0.75-1.0(7-61 芯),1.5-2.5(4-61 芯),4-6(4-19 芯),10(4-10 芯);WDZ(A,B,C,D)(B1)N-KYJY-450/750V 0.75-2.5(2-61 芯),4-6(2-19 芯),10(2-10 芯);WDZ(A,B,C,D)(B1)N-KYJY23-450/750V 0.75-1.0(7-61 芯),1.5-2.5(4-61 芯),4-6(4-19 芯),10(4-10 芯)；
产品标准和技术要求：GB 31247-2014
认证模式：产品型式试验+获证后监督
上述产品符合 CQC17-463416-2020 认证规则的要求，特发此证。
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签发：谢肇煦
中国质量认证中心
http://www.cqc.com.cn 中国·北京·南四环西路188号9区 100070 电话：+86 10 83886666


产品认证证书
防火产品认证
证书编号：CQC21011319059
发证日期：2021 年 11 月 02 日
有效期至：2024 年 11 月 02 日
委托人名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
制造商名称及注册地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
生产企业名称及生产地址：深圳市金环宇电线电缆有限公司 广东省深圳市宝安区松岗街道潭头西部工业区 14 栋
产品名称和系列、规格、型号：建设工程用低烟无卤阻燃 1 级(B1)交联聚烯烃绝缘无护套电缆电线 WDZ(A,B,C,D)(B1)-RYJ-125 450/750V 2.5-35;WDZ(A,B,C,D) (B1)-BYJ-125 450/750V 2.5-35;WDZ(A,B,C,D) (B1)N-RYJ-125 450/750V 2.5-35;WDZ(A,B,C,D) (B1)N-BYJ-125 450/750V 2.5-35;WDZ(A,B,C,D) (B1)-RYJ 450/750V 2.5-35;WDZ(A,B,C,D)(B1)-BYJ 450/750V 2.5-35;WDZ(A,B,C,D)(B1)N-RYJ 450/750V 2.5-35;WDZ(A,B,C,D)(B1)N-BYJ 450/750V 2.5-35;WDZ(A,B,C,D) (B1)N-BYJR 450/750V 2.5-35;
产品标准和技术要求：GB 31247-2014
认证模式：产品型式试验+获证后监督
上述产品符合 CQC17-463416-2020 认证规则的要求，特发此证。
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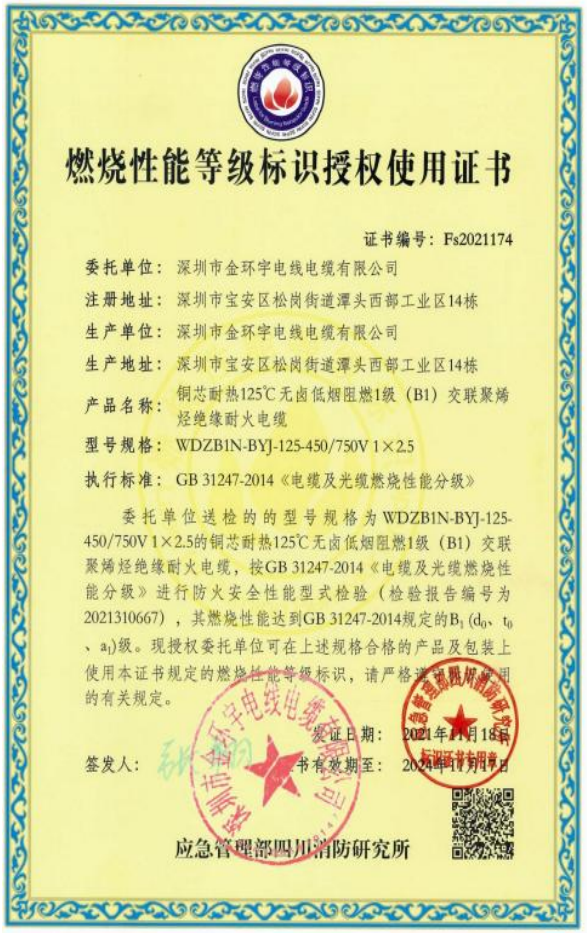
可通过扫描下方二维码或登录国家认监委网站（www.cnca.gov.cn）查验证书信息
签发：谢肇煦
中国质量认证中心
http://www.cqc.com.cn 中国·北京·南四环西路188号9区 100070 电话：+86 10 83886666

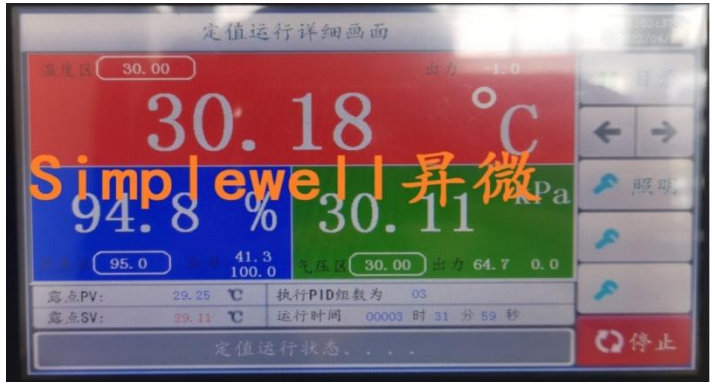

燃烧性能等级标识授权使用证书
证书编号：Fs2021174
委托单位：深圳市金环宇电线电缆有限公司
注册地址：深圳市宝安区松岗街道潭头西部工业区14栋
生产单位：深圳市金环宇电线电缆有限公司
生产地址：深圳市宝安区松岗街道潭头西部工业区14栋
产品名称：铜芯耐热125℃无卤低烟阻燃1级（B1）交联聚烯烃绝缘耐火电缆
型号规格：WDZB1N-BYJ-125-450/750V 1×2.5
执行标准：GB 31247-2014《电缆及光缆燃烧性能分级》
委托单位送检的的型号规格为WDZB1N-BYJ-125-450/750V 1×2.5的铜芯耐热125℃无卤低烟阻燃1级（B1）交联聚烯烃绝缘耐火电缆，按GB 31247-2014《电缆及光缆燃烧性能分级》进行防火安全性能型式检验（检验报告编号为2021310667），其燃烧性能达到GB 31247-2014规定的B_1 (d_0、t_0、a_1)级。现授权委托单位可在上述规格合格的产品及包装上使用本证书规定的燃烧性能等级标识，请严格遵守使用的有关规定。
签发人：
发证日期：2021年11月18日
证书有效期至：2024年11月17日
应急管理部四川消防研究所

10. Using the flame retardant wire, the pictures are the wire flame retardant certification certificate.

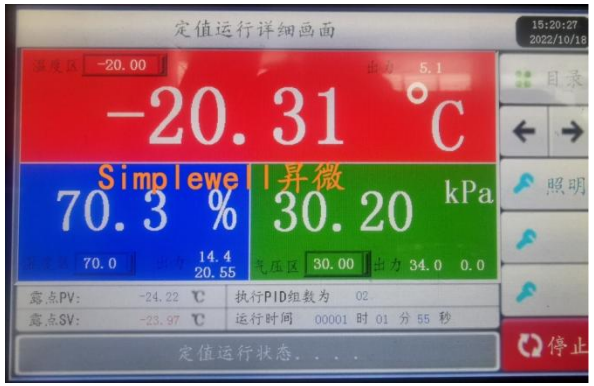
02
Part

Innovation Features

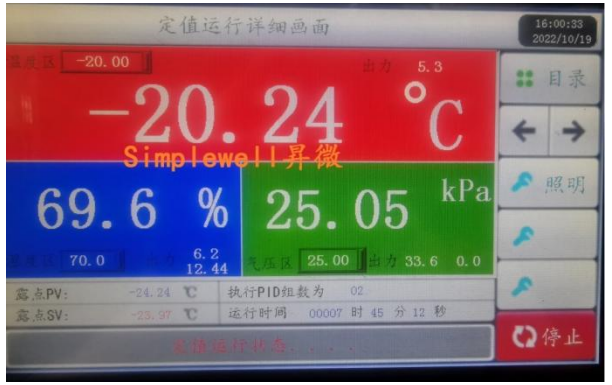
2.1 Simplewell product innovation characteristics



Measured Figure 1-Simplewell



Measured Figure 5-Simplewell



Measured Figure 2-Simplewell

Measured Figure 3-Simplewell

Measured Figure 4-Simplewell

03

Part

Progressiveness of technical indicators

3.1 Progressiveness of technical indicators

- Independently developed controller.
- The l humidity can be controlled at 25 KPa to atmospheric pressure.
- The inner wall temperature is controlled separately, so the radiation temperature uniformity under the low pressure is good.
- The humidity can be controlled stably when temperature at - 20℃ and low pressure, such as 70% humidity at 25 kpa, -20℃.
- The pressure go up and down speed can be controlled linearly.
- Any air pressure point is stable.
- The air pressure, temperature can rapid change at the same time, the real simulation of high-speed temperature change.

04

Part

Customer

4 Case

Simplewell can customized the appearance according to the customer's requirements

Front view

Side view

Simplewell昇微

Thank you

Simplewell technology Co., LTD

团队

合作

坚持

荣誉

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