



Outdoor Cabinet Ex-Factory Inspection Report

Sample description

The sample is a communication power cabinet for outdoor purposes, which is built in with an internal power supply, battery and communication device. The sample cabinet is empty with no power supply or battery installed.

Design basis 1: This sample is developed for orientation and the design is based on *TAWAL Electromechanical Technical Specification for GSM Sites V1.23, Part VI*, provided by the customer.

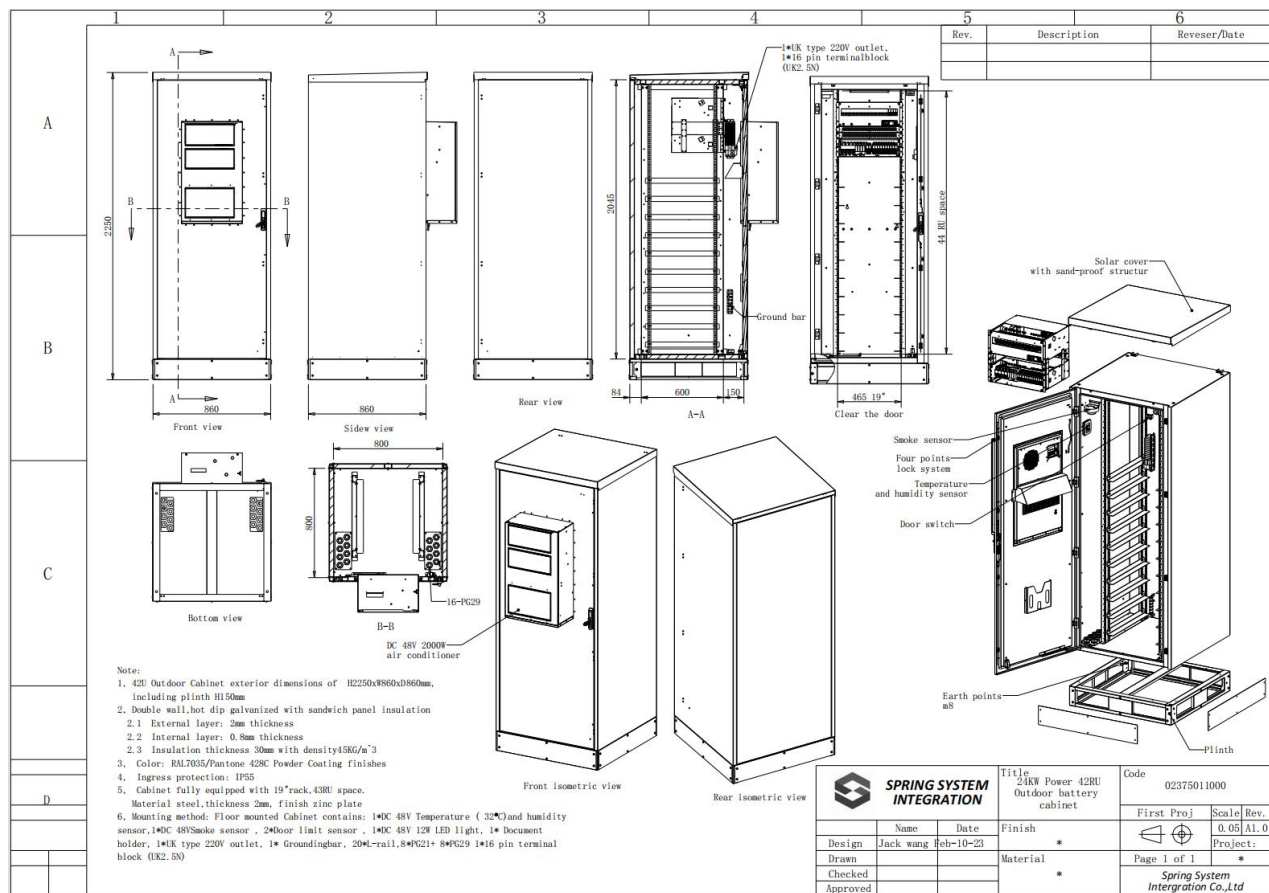
Design basis 2: YD/T15372015 communication system user outdoor cabinet

Test basis 1: As per *TAWAL Electromechanical Technical Specification for GSM Sites V1.23, Part VI*, provided by the customer.

Test basis 2: Design basis 2: *YD/T15372015 Communication System User Outdoor Cabinet*

1 Technical requirements

2.1 Design drawings



2.2 Design requirements

2.2.1 Cabinet outline dimensions: H*W*D:2250*860*86 mm; Total equipment space: 42U

2.2.2 The cabinet is of a sandwich structure, with a 2.0 mm thick hot dipped galvanized plate as the external material and a 0.8 mm thick hot dipped galvanized plate as the internal material, and PIR heat insulation cotton with aluminum foil (30 mm thick, 45KG/M³ density) overlayed on both sides in the middle.

2.2.3 The surface of the cabinet is sprayed with polyester outdoor powder, which is UV resistant and corrosion resistant, with a color number of RAL7035 428C.

2.2.4 Cabinet protection grade IEC 605292001 IP55

2.2.5 The cabinet is cooled by 2KW 48VDC air conditioner. Adaptive to outdoor environments in the Middle East; ambient temperature: -5°C to 55°C; relative humidity: 5 to 100%R;

Flushable with sand and dust.

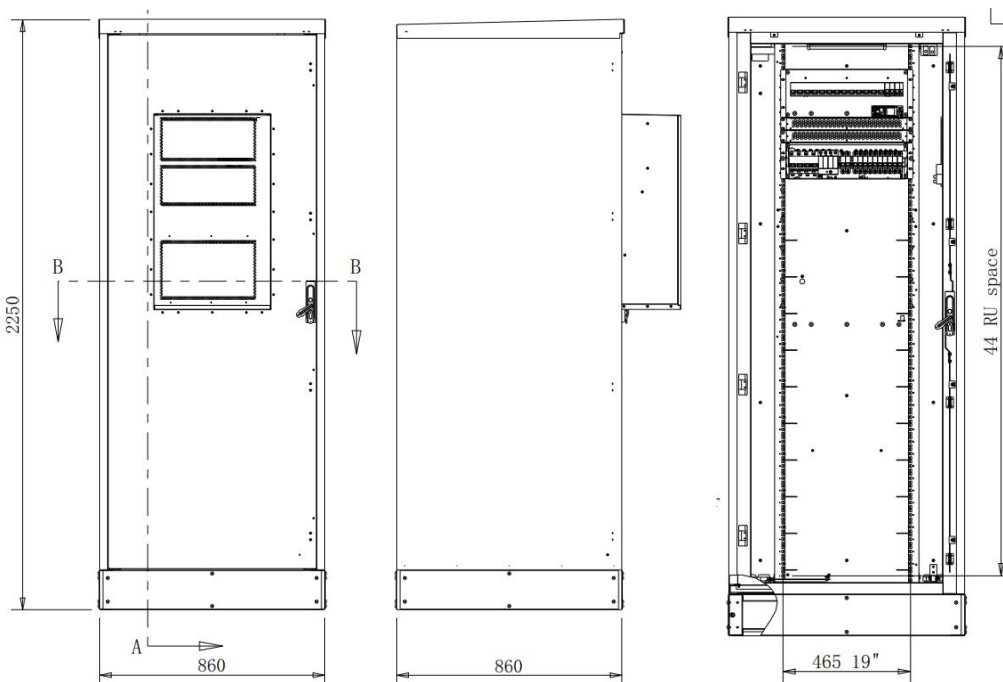
2.2.6 Design maximum wind speed at the windward surface: 45m/sec.

2.2.7 Other design requirements are shown in the test sub-items.

2 Test items and evaluation criteria

3.1 Cabinet outline dimensions

3.1.1 Outline dimension drawing:



3.1.2 Dimension test results:

Dimensions	860	860	2,250	465	44RU
Measured	861	861.5	2,251	465.5	44
Judgment	√	√	√	√	√
Test results	PASS				

3.2 Cabinet material inspection

3.2.1 Cabinet material inspection:

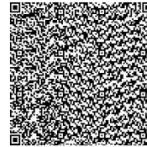
According to the design requirements, the material should be hot-dipped galvanized plate. View the following material report for actual inspection results: The material actually used is grade DX51D+Z hot-dipped coil, which is in line with the design requirements. According to the design requirements, the material should be 2.0 mm thick for the housing and 0.8 mm for the liner plate. After actual measurements, the sample door is 2.0 mm thick, the liner plate is 0.8 mm thick and the rack is 2.0 mm thick, which is in line with the design requirements.

Inspection results: PASS



产品质量证明书

INSPECTION CERTIFICATE



首钢集团地址:中国北京市石景山区
ADD. OF SHOUGANG GROUP : SHUIGANGSHAN DISTRICT,
BEIJING, CHINA
邮政编码 POST CODE : 100041
电话 TEL : 15832551757
制造厂地址: 中国河北省唐山市曹妃甸工业区
ADD. OF MANUFACTURER: CAOFEIDIAN INDUSTRY PARK,
TANGSHAN, HEBEI, P.R. CHINA 063200

制造厂: 首钢集团:首钢京唐钢铁联合有限责任公司

Manufacturer: SHOUANG GROUP: SHOUANG JINTANG UNITED IRON & STEEL CO.,LTD

订货单位 CUSTOMER	宁波首钢浙金钢材有限公司	合同编号 CONTRACT NO.	F2209425/FJ22010573	许可证编号 LICENSE NO.	
收货单位 PURCHASER	物产中大金属集团有限公司	产品名称 PRODUCT	热镀锌 Hot-dip coil	证明书编号 CERTIFICATE NO.	JTF2209260107
标准 SPECIFICATION	Q/SGZGS 0329-2020 FB(较高)、纯锌(Zn)、三价铬钝化、PTA、PWA	牌号 STEEL GRADE	DX51D+Z	认证标志 AUTHENTICATIO N MARK	
规格 (mm) NOMINAL DIMENSION	厚度THICK×宽度WIDTH×长度LENGTH=2*1250*C	签发日期 DATE OF DELIVERY	20220926		

钢卷号/捆包号 COIL NO./PACK NO.	熔炼号 HEAT NO.	件数 PCS	重量 WT. TON	化学成分CHEMICAL COMPOSITION % (1=×10 2=×100 3=×1000 4=×10000 5=×100000)										拉伸试验 TENSILE TEST (标距 G.L.= B6) ③										硬度 HARDNESS	杯突 BH值	杯突 ERICHSEN	Ra	R _{Pc}	镀层重量 COATING MASS			锌层 弯曲 BEND TEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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备注 REMARKS										
注释 NOTES	① 分析区分 (ANALYSIS): RF=熔炼分析 (LADLE ANALYSIS), CF=成品分析 (PRODUCT ANALYSIS)。② 方向 (ORIENTATION): 1=纵向 (LONGI); 2=横向 (TRANS); 4=与轧制方向成30° (30° TO THE ROLLING DIRECTION); 6=与轧制方向成45° (45° TO THE ROLLING DIRECTION); 7=与轧制方向成60° (60° TO THE ROLLING DIRECTION)。③ 标距 G.L.= (GAUGE LENGTH): 矩形试验片 (RECTANGULAR); A:比例标距,其中1=5.65×SQRT(F0), 2=11.35QRT(F0); B:定标距, 2=50mm, 3=50.8mm, 6=80mm, 8=200mm。④ YR=屈强比 (YIELD RATIO YS/T.S)。									
会验者 SURVEYOR TO	1. 本产品已按上述要求进行制造和检验,其结果符合要求,特此证明。WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE MATERIAL SPECIFICATION。 2. 本质量证明书中空白项目均不作为交货条件。THE BLANK ITEMS SHOULDN'T BE REGARDED AS DELIVERY CONDITIONS.									
	质量负责人: QUALITY MANAGER 刘明									

3.2.2 Thermal insulation material inspection:

The thermal insulation material of the cabinet is designed as PIR thermal insulation cotton with aluminum foil (30 mm thick, 45KG/M³ density) overlaid on both sides.

View the material report on the right. The thermal conductivity actually measured is 0.024 W/(m·K). The measured thickness is 31 mm. From the visual appearance inspection, there are aluminum films applied to both sides and the surface is completely intact, free of exposures of styrofoam.

Test result: PASS.

河北省建筑机械材料设备产品质量监督检验站						
检 验 报 告			共 2 页 第 2 页			
报告编号: Z210425023						
序号	检验项目		标准要求	实测结果	判定	
1	外观		表面基本平整, 无严重凹凸不平。	符合要求	合格	
2	长度和宽度极限偏差, mm	长度	±10	+3	合格	
		宽度	±8	+1	合格	
3	厚度和对角线极限偏差, mm		厚度±2, 对角线≤5	0, 4	合格	
4	芯密度, kg/m ³		≥35	35.9	合格	
5	压缩强度, kPa		≥120	135	合格	
6	导热系数, W/(m·K)		≤0.024	0.024	合格	
7	尺寸稳定性, %	高温	长度	≤1.5	0.8	合格
			宽度	≤1.5	0.9	合格
			厚度	≤1.5	0.8	合格
		低温	长度	≤2.5	0.7	合格
			宽度	≤2.5	0.7	合格
			厚度	≤2.5	1.2	合格
8	水蒸气透过系数, ng/(Pa·m·s)		≤6.5	4.3	合格	
9	压缩蠕变, %		≤5	3	合格	
10	吸水率, %		≤3	2	合格	

3.3 Cabinet structure inspection

3.3.1 The cabinet body is an integral welded construction. As the sides and rear are fully welded with no separation, the cabinet has a higher overall strength and a longer service life, making it suitable for use in strong wind conditions. See the wind resistance simulation diagram at 54 m/sec for details.

Test result: PASS

3.3.2 The cabinet adopts a built-in door structure, with the door folds concealed inside the cabinet, and there is no junction of door and cabinet at the outside, which realizes a higher anti-theft level.

Test result: PASS

3.3.3 The cabinet uses 4 concealed hinges in zinc alloy with a black painted finish. There is no exposed hinge, the anti-theft grade reaches WC2.

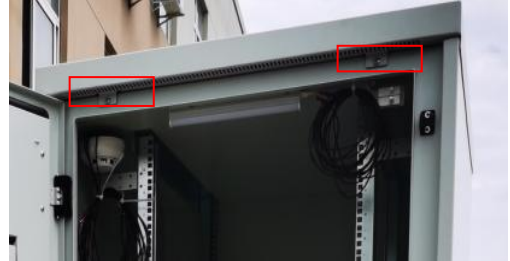
Test result: PASS

3.3.4 The locking system adopts a multi point locking with 4 locking points at the top and bottom internally, producing a good locking and seal performance. See IP55 waterproof test below for more details. The stainless steel locking bar will not rust in the long-term use. The zinc alloy lock handles have a higher strength and provide better anti-theft performance.



Test result: PASS

3.3.5 Removable sunshade. Once the front is locked, no screw is exposed when the door is closed and the sunshade cannot be removed before opening the door. The heat dissipation vents in the sunshade prevent high temperatures from being generated inside when the ambient temperature is high. The sunshade is set with a slope of running water, which is designed to be 1° and measured to be 1.5°



Test result: PASS

3.3.6 The door can be opened up to 120° and rotates flexibly without interference scraping or sluggishness. The door is square in shape and not distorted. After closing the door, it fits evenly and uniformly with the cabinet door and is free of missing corners, producing good sealing. See IP55 waterproof test below for more details.



Test result: PASS

3.3.7 Door windproof tie device. With it, the door can stop at 0° and 120° . In the test, the door was opened and closed 10 times, in which the opening and closing were smooth and the limit is accurate.

Test result: PASS

3.3.8 File folder. The design requires that the folder is not less than $300L*200$ mmH and is 200 mm from the air conditioner. The sample is measured to be $235L*200$ mmH, 375 mm from the air conditioner. L is not qualified, and an improvement is required.

Test result: POK

3.3.9 The interior of the door is mounted with a PU polyurethane seal with dotted foam. The sealing material is UL approved and has a life expectancy of 25 years with a good seal. See IP55 waterproof test below for more details.

Test result: PASS

Rampf materials go back on 30 years of experience in polyurethanes.

Our materials such as RAKU PUR 32-3250-8 and RAKU PUR 32-3250-11 have a permanent temperature resistance from minus 40 degrees Celsius to plus 100 degrees Celsius. Furthermore, even a short-term service temperature of 160 degrees Celsius is possible.

Resistance to grease, such as mineral oils, derivatives, and paraffins, oils such as aqueous solutions such as aqueous urea, alkaline and slightly acidic solutions, alcohols such as butanediol, butylene glycol, solvents such as heptane, hexane, detergents such as soap and detergent substances, lecithin, carboxylic acid such as adipic, phosphoric acid esters, acids such as benzoic acid, boric acid, acetic acid, salts such as sodium chloride, Magnesium salt and gases such as acetylene, argon. We guarantee optimum sealing performance.

Both materials RAKU PUR 32-3250-8 and RAKU PUR 32-3250-11 are UL50-listed. You stand out among other things, even by very low assembling forces, creating a simple shoring is guaranteed, so 25 years quality can be guaranteed also..

3.3.10 Air conditioner hot/cold air circulation isolation device. Considering the close proximity of the air-conditioner cold air outlet to the hot air return outlet, to prevent the cooling efficiency of the air conditioner from being reduced due to the direct flow of cold air out of the return outlet, a circulation isolation device is added to the air conditioner. After the sample inspection, the device has been installed, 450 mm(L) x 115 mm(H).

Test result: PASS



3.3.11 Two front and rear EIA-310-D 19-inch standard racks are installed inside the cabinet, 44U high. The standard dimensions of the sample are as follows:

	Hole center distance	Rack inner hollow dimensions	Square hole dimensions
Standard dimensions	465±3 mm	450±3 mm	9.5x9.5 mm
Measured dimensions	Up: 465 Middle: 467 Down: 465	Up: 450 Middle: 452 Down: 450	9.5x9.5 mm
Judgment	√	√	√

Test result: PASS

3.3.12 Rack depth. According to the design requirements, the rack is built in with a 100A/150A rack lithium battery, up to 570 mm deep. The measured depth available of the sample is 650 mm, which is greater than that of the battery and meets the installation requirements.

Test result: PASS

3.3.13 Cabinet cable access hole. According to the design requirements, the cabinet is configured with two sets of 8PG29 GLANDS for cable access, which are installed on the bottom plate and both sides of the rack. After inspection, GLANDS have been installed.

Test result: PASS

3.3.14 According to the design requirements, 10 groups of L-shaped brackets are installed on the rack as the battery. One group of load-bearing brackets for the power supply is installed every 3U. After the sample inspection, the brackets have been installed.

Test result: PASS

3.3.15 According to the design requirements, the cabinet is configured with a 48V12W tubular lamp. After the sample inspection, a 48V 5W LED lamp of 250 * 34.6 * 22 (mm) is installed. The 12W lamp cannot be installed as its length exceeds 588.

Test result: PASS



3.3.16 According to the design requirements, the cabinet is configured with an access switch in series with the lamp, which goes out when the door is closed and lights up when the door is opened.

According to the design requirements, the cabinet is configured with an access control switch that is connected to remote monitoring.

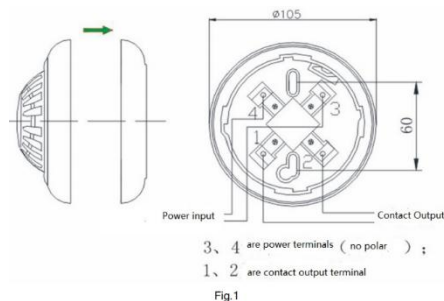


技术性能参数SPECIFICATION	
接触电阻 (初始值) Contact Resistance	≤50mΩ
绝缘电阻 (常态) Insulation Resistance	100MΩ
耐压 (常态) Dielectric Strength	KBM:1,500V, KBM-A:1000V
电气寿命 (次) Electronic Life(cycles)	10,000
机械寿命 (次) Mechanical Life(cycles)	50,000
工作环境温度 Operating temperature	-25℃~+55℃
防护等级 IP code	IP40
电气额定值Max. Rating Current & Voltage	
 	KBM:2A /250V AC KBM-A:4A /250VAC

After inspection, two access control have been installed, with a reservation of 2.5m bundled cable at the corresponding position.

Test result: PASS

3.3.17 According to the design requirements, the cabinet is internally configured with a photoelectric induction smoke sensor. It adopts a 48V DC power supply and a 4-wire system, with dry junction signal monitoring. After actual inspection, the smoke sensor has been installed and the 4-wire has been connected, with a reservation of 2.5 m bundled cable at the corresponding position.



Test result: PASS

3.3.18 According to the design requirements, there is a temperature and humidity sensor installed inside the cabinet, which adopts a 48V DC power supply and a 4-wire system, with dry junction signal monitoring. After actual inspection, the sensor has been installed but its voltage is 7-36V, which does not satisfy the requirements. The 4-wire has been connected, with a reservation of 2.5m bundled cable at the corresponding position.

Test result: POK



3.3.19 According to the design requirements, the cabinet is configured with a 16-bit terminal block, model UK2.5, which is equipped with a 220V socket, UK style. After inspection, the terminal block has been installed.

Test result: PASS



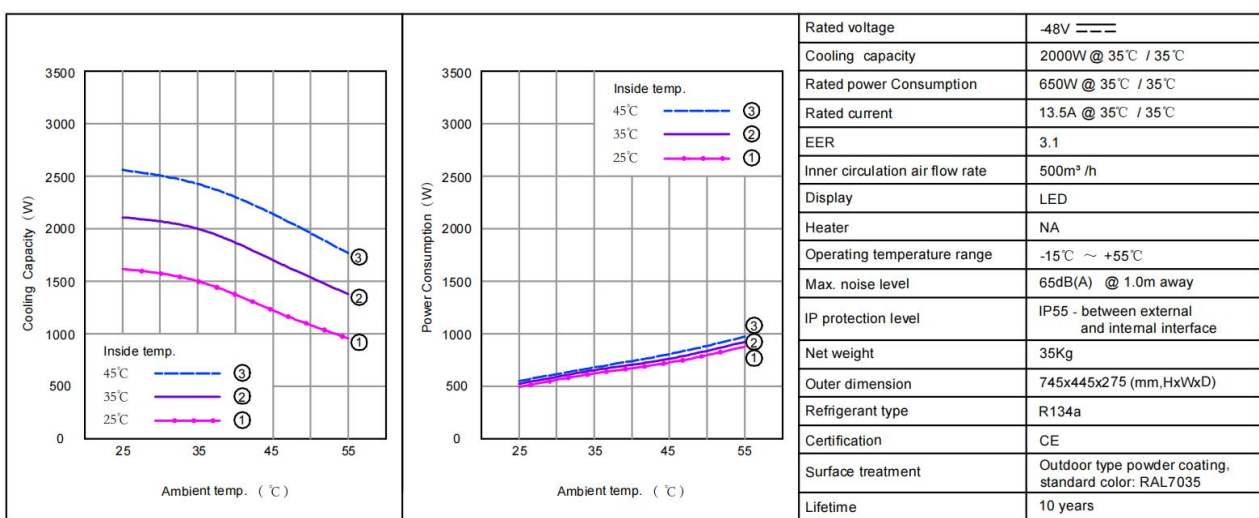
3.3.20 According to the design requirements, the cabinet is configured with an 8-bit grounding copper bar with tinned surface. There are two PE grounding points inside the base. After the sample inspection, all of them have been installed.

Test result: PASS

3.3.21 Refrigeration system testing. According to the design requirements, the cabinet is configured with one 2,00W 48VDC air conditioner operating at L35/35 working condition and is filled with R134a refrigeration fluid, and is flushable with sand and dust, in the dimensions of 745(H)x451(W)x300(D).

After the actual inspection, the air conditioner has been installed.

Test result: PASS



3.4 Functional testing

3.4.1 Waterproof test

According to the design requirements, the cabinet should meet the requirements of waterproof grade IP55. In the actual test, the cabinet is flushed water from top to bottom with a standard IP55 gun in the spray room, in which all seams are targeted, 1 mm for each seam. Then open the door to check, there is no water droplet in the cabinet. Therefore, the test is passed.

Test result: PASS

3.4.2 Air conditioner startup and power-on test.

After being connected to the cable and powered on by a 48V DC power supply, the air conditioner starts normally, and runs normally when the fan speed is changed from high to low, during which there is no fault alarm on the display. Therefore, the test is passed.

Test result: PASS



3.4.3 Smoke detection power-on test.

After 3 and 4 cables of the smoke sensor are connected and 48V DC is supplied, the red indicator lights up. The alarm light of the smoke sensor lights up and the artificial smoke is blown to the smoke sensor. Therefore, the test is passed.

Test result: PASS

3.4.4 LED lamps power-on test.

After the LED lamp is connected to the access control in series and is 48VDC powered, it goes out when observed from the inside when the door is closed and lights up when the door is opened. The test is passed.

3.4.5 Cabinet lifting test

After the cabinet is installed, place a heavy object inside it, and lift a total weight of 500 kg slowly by 0.3 m while opening the door to its maximum position, and stand it still for 30 min. Then lower the cabinet, and the test is passed if no crack or deformation is detected on the cabinet.

Test result: PASS



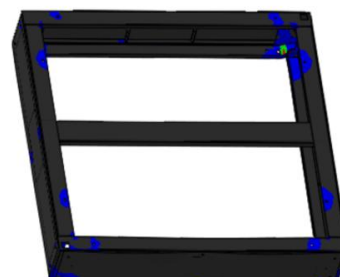
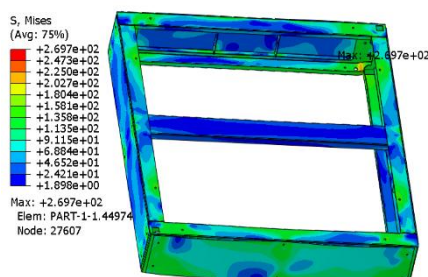
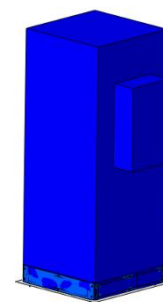
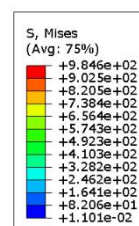
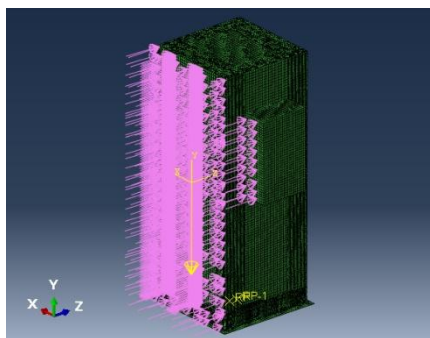
3.4.6 Wind load test

According to the design requirements, the maximum windward surface of the cabinet should be able to withstand 45 m/sec wind speed. Mainly to test the base bearing capacity.

Simulation software is used in the test, and the wind speed is set to 54 m/sec.

Based on the simulation results, the equivalent plastic deformation cloud presents a large part of blackness, indicating no risk of deformation; partially colored, indicating higher forces and increased risk, but not beyond tolerable limits. Therefore, the simulation test is passed.

Test result: PASS



3.5 Sprayed surface quality inspection

3.5.1 The surface of the cabinet is sprayed with outdoor type RAL7035 orange powder.

3.5.2 The surface spraying film is 70~120 μm thick. Allowed to repaint once.

3.5.3 For corrosion resistance, a 5% neutral salt spray test with a test cycle of 720H is performed as per ASTM B-117, and it is judged that the grade reaches 7 or above on the basis of ASTM B-610.

3.5.4 An UV resistance UV test with a test cycle of 1000H or more is performed as per ASTM G53.

3.5.5 The sprayed surfaces are graded and judged by the different positions. Sprayed surfaces of the cabinet are classified as grade A/B/C, as follows:

The front and left and right sides of the cabinet are grade A, the roof and the back are grade B, and the downward concealed surface and the inside of the cabinet are grade C.

3.5.6 Surface judgment conditions: Place the cabinet under normal natural daylight or 1000 lm incandescent lamp, and the inspector who stands at 1.0 m directly in front of the cabinet, with the line of sight perpendicular to the surface under test, visually inspects the surface at a speed of 3 m/min. The quality defects are judged according to the standard table.

3.5.7 Definition of surface defects:

1. Sagging: Hanging tool marks
2. Bottom exposures: The metal substrate is exposed and no powder is attached.
3. Particles: Debris on the sprayed surface in the form of dots.
4. Scratches: Scratches on painted surfaces caused by external impact or abrasion.
5. Bruises: Convex packs or dents or cracks in the painted surface caused by the impact of external forces.
6. Rivet marks: Rivet head press marks

3.5.8 Surface defects judgment table:

Defect category	Judgment standard		
	Grade A surface	Grade B surface	Grade C surface
Sagging	NO	NO	YES
Bottom exposures	NO	NO	YES
Particles	Visually visible, ϕ 0.5 or less, and the distance between the two points is greater than 100.	Visually visible, ϕ 0.8 or less, and the distance between the two points is greater than 50.	Visually visible, ϕ 1.0 or less, and the distance between the two points is greater than 50.

Defect category	Judgment standard		
	Grade A surface	Grade B surface	Grade C surface
Scratch	Visually visible, no metal substrate exposure, width 0.2 or less, and the distance between the two points is greater than 100.	Visually visible, no metal substrate exposure, width 0.3 or less, and the distance between the two points is greater than 50.	Visually visible, no metal substrate exposure, width 0.5 or less, and the distance between the two points is greater than 50.
Bruises	Visually invisible	Visually invisible	Visually invisible
Rivet marks	Visually invisible	Visually invisible	Not required

Test result: PASS

Sample photo



