063

GGF series Isolation Power Cabinet

User Manual V1.4

Acrel Co., Ltd.

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The equipment is professional electrical equipment, any related operation, need to be carried out by special electrical technicians. Acrel is not responsible for personal injury or financial loss resulting from the error of non-professional personnel.

The contents of this description will be updated and amended constantly, and it is inevitable that there will be a slight discrepancy between the physical product and the description in the product function upgrading. Please refer to the physical product purchased and obtain the latest version of the description through www.acrel-electric.com or sales channels.

Modified Records

No.	Time	Versions	Reasons for revision
1	2012.05.24	V1.0	Primary version
2	2014.08.12	V1.1	Correct errors and omissions
3	2018.10.15	V1.2	Modify some contents
4	2022.12.08	V1.3	Change format, add content, English version
5	2025.02.20	V1.4	Add overview image, 4 chapter, parameters of environment; Update dimensions, wiring methods, typical applications; Delete AID120, 8 environments; Update bottom
Notes:			

Contens

GGF series Isolation Power Cabinet

1 Introduction

The GGF series isolation power cabinet (Hereinafter referred to as "the power cabinet") is suitable for the power distribution system of the medical 2 class place or other IT systems, such as clean operation room, ICU/CCU intensive care unit, and emergency room. These places have high requirements on the reliability and security of the power supply system, so IT is necessary to use IT system for power supply.

According to the different conditions of the operating room and intensive care unit, the corresponding power distribution scheme is provided.

The power cabinet adopts the cabinet color that is relatively coordinated with the medical place, making it consistent with the environment of the medical place.

The power cabinets can be installed in three ways, respectively, floor mounted, embedded in the wall mounted and split mounted, according to the site conditions flexible choice, recommended close to the use of places with floor mounted.

2 Product Model

GGF – O 8 G D A L

- L: Fault Locate: L-set Null-not set
- A: Automatic Transfer Switch: A-set Null-not set
- D: System Number: D-multiple Null/S-single
- G: Installation Type: G-Grounding Q-Embedded F-Separate
- 8: Rated Capacity: 3-3.15kVA …10-10kVA
- O: Input Type: O-Three Phase I-Single Phase
- GGF: Model Name: Acrel Isolated Power Cabinet

Note: The product model is used to distinguish the specific configuration internally. The nameplate of the cabinet only shows GGF.

3 Function Features

- The power cabinets can be installed in a variety of ways, the cabinet body is made of Q235A high quality cold rolled steel plate, stable structure is not easy to deformation;

- The power supply cabinet has good heat dissipation, the cabinet body isolation transformer is installed in the heat dissipation fan, constitute the air duct, heat dissipation effect is obvious;
- The power cabinet has a high level of protection, the heat dissipation part has dustproof measures to meet the requirements of protection level;
- The power cabinet generally adopts the upper and lower wiring mode. The internal wiring is complete. The installation personnel only need to connect the incoming and outgoing wires to the corresponding wiring terminals, which is convenient for engineering construction;
- The transformer in power cabinet will transform TN-S system into IT system, improve power supply stability, safety, and continuity;
- The insulation monitors in power cabinet can monitor the IT system to the ground insulation condition, when the insulation reduction or single-phase grounding situation, timely alarm, to remind the staff to troubleshoot;
- The insulation monitors in power cabinet can monitor the temperature and current of the isolation transformer, when the temperature is too high or current overload, timely alarm, remind the staff;
- The power cabinet if contains insulation fault location, insulation monitor can show the specific fault phase line and loop after alarm, staff should remove the fault loop in time.

4 Reference Standard

■ IEC 61439-2 *Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies*

■ IEC 60364-7-710 *Low-voltage electrical installations - Part 7-710: Requirements for special installations or locations - Medical locations*

■ Q31/0114000129C009 *GGF series Medical Isolation Power Cabinet*

5 Technical Parameters

The power cabinet can be divided into two types and three installation methods, including: GGF-OXG (X is code for omitting, same as above), GGF-IXG floor isolation power cabinet; GGF-OXQ, GGF-IXQ embedded isolation power cabinet and GGF-OXF, GGF-IXF split isolation power cabinet.

Technical parameters are shown in the following table:

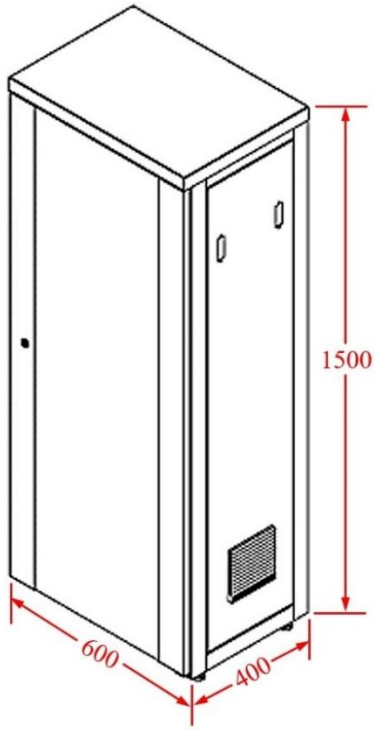
Model / Items	Single Phase - I			Three Phase - O		
	GGF-IXG	GGF-IXQ	GGF-IXF	GGF-OXG	GGF-OXQ	GGF-OXF
Rated voltage	AC220V			AC380V/220V		
Rated capacity	3.15kVA, 5kVA, 6.3kVA, 8kVA, 10kVA			8kVA, 10kVA		
Rated current	16A, 25A, 32A, 40A, 50A			40A, 50A		
Rated frequency	50/60Hz			50/60Hz		
Distribution Circuit	IT system: 4 loops, 8 loops or other loops (Customized)			IT system: 8 loops AC220V (Customized) TN-S system: 1 loop AC380V, 8 loops AC220 (Customized)		

Installation	Floor	Embedded	Embedded	Floor	Embedded	Embedded
Protection Class	IP30					
Wire in and out	Top wire in, top wire out (Customized)					
Communication	RS485 interface, Modbus-RTU protocol					
Temperature Ambient	-10 ~ +40℃					
Operating Temperature	-10 ~ +55℃					
Relative Humidity	50%, non-condensing					
Above Sea Level	<2000m					

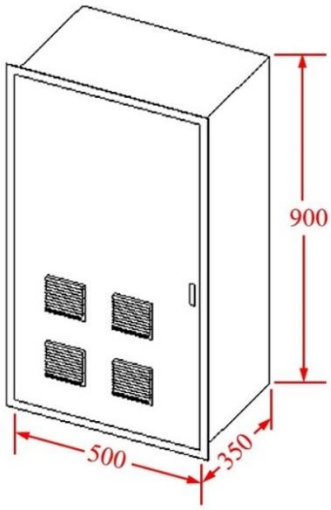
6 Installation and Wiring

6.1 Overall Dimensions

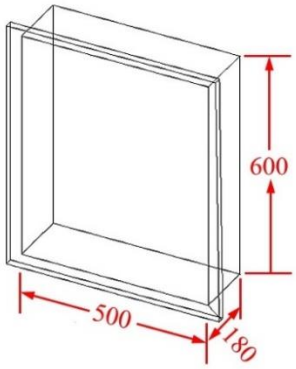
The appearance dimensions of various standard power cabinets are shown in the following figure. (unit: mm)



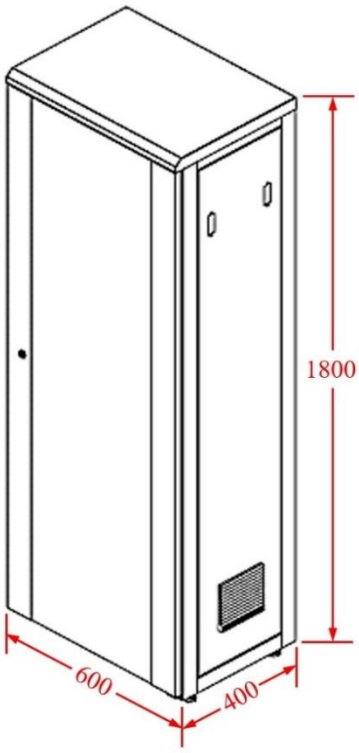
GGF-IXG series



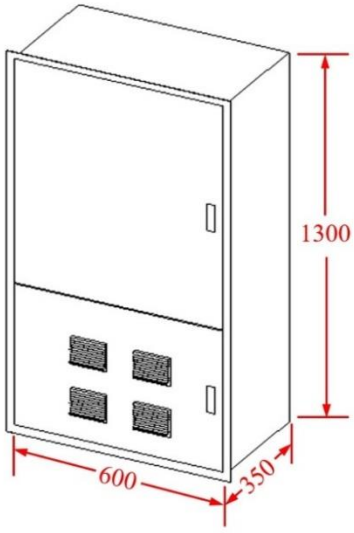
GGF-IXQ series



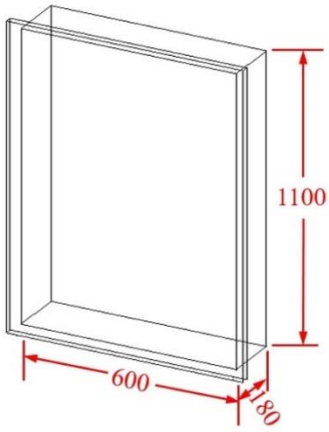
GGF-IXF series



GGF-OXGA/GGF-OXG series



GGF-OXQ series

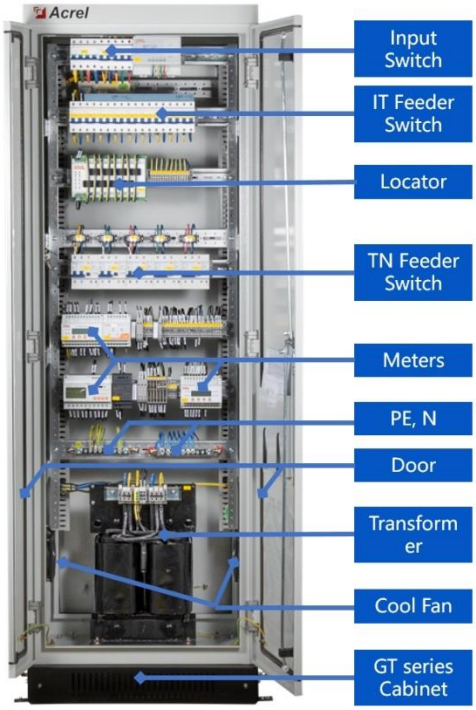


GGF-OXF series

The internal layout and component configuration of the power cabinet are designed according to the actual project site. The following takes GGF-OXGA as an example, and its internal layout is shown in the figure below. (unit: mm)

Front view

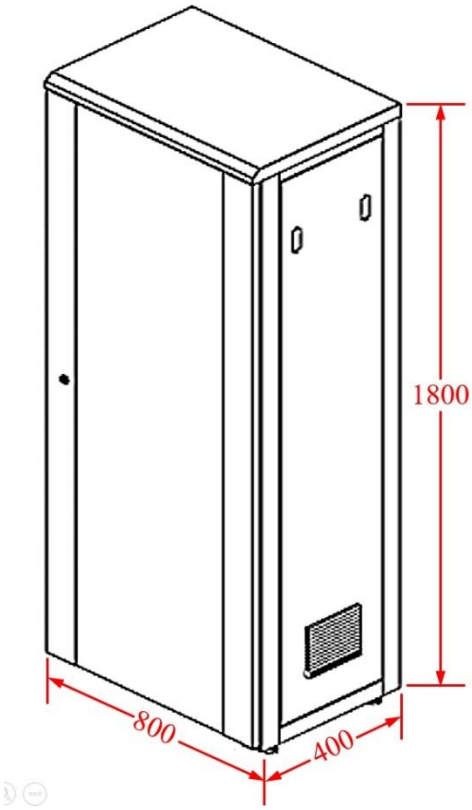
Back view



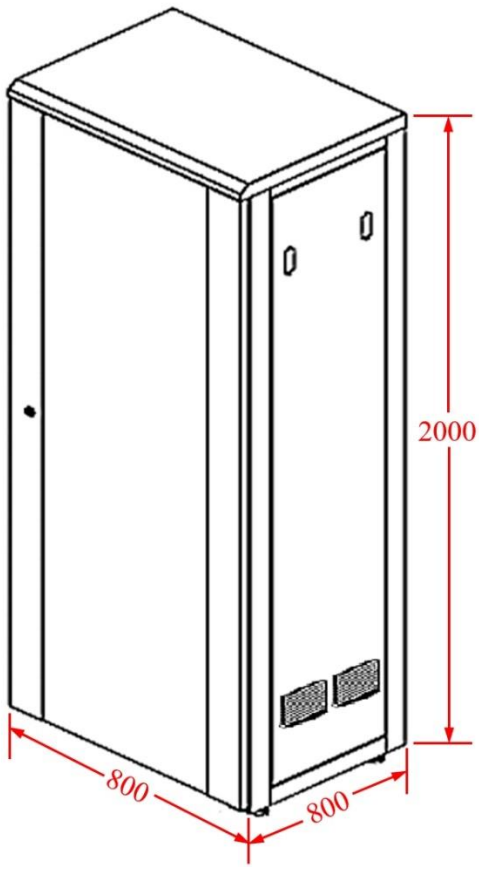
Inside layout

If multiple sets of IT systems are used on the practical project site, multiple sets of IT systems can be placed in a cabinet, usually no more than 4 sets. The cabinet is installed on the floor. The general cabinet model is GGF-O. Check the system diagram for the specific number of systems. The size of the cabinet

is shown in the following figure. (unit: mm)



2 AITRs in GGF-O8G



3~4 AITRs in GGF-O8G

6.2 Installation Method

The power cabinet should be installed near the use place. Minimizing the capacity of the system, using fewer distribution loops, and shortening the length of the system's distribution lines can effectively reduce the ground leakage capacitance of the IT system.

The power cabinet should be equipotential connection. For operating rooms that perform human heart surgery or are in contact with the human body, adequate electrical insulation measures should be taken so that all conductive parts within the extension range of the protected area are at the same potential level.

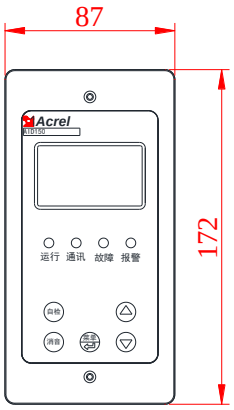
The power cabinet floor cabinet should be installed against the wall, with fans on both sides reserved for effective cooling operation space; The embedded cabinet should be installed vertically, with space reserved on the front; Separate cabinet type contain transformer cabinet and component cabinet should be installed close to each other, transformer cabinet should reserve heat dissipation space.

The power cabinet generally adopts the upper and upper out connection mode. Lead the incoming cable into the cabinet, connect the incoming cable to the wiring terminal of the circuit breaker, and then connect the outgoing cable to the outgoing circuit breaker terminal. When connecting a conductor to a terminal, use a crimping connector to tighten the connection.

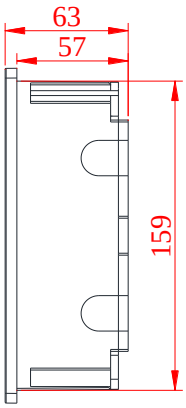
The AID series alarm and display device is not installed in the power cabinet, it can be installed in the wall, and it can also be installed on the panel, or on the rail. It can be installed on the inside wall of the operating room or on the wall of the nurse station. When installing, the installation position of the

corresponding size should be reserved, knock out the wire entry and wiring hole of the edvice back shell, and finally fix the panel on the back shell with screws.

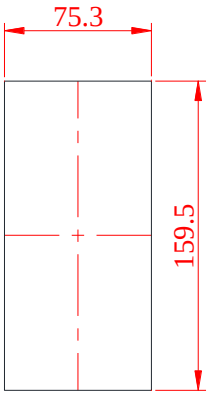
The AID series alarm and display device is installed outside the cabinet, usually installed in the operating room or nurses station wall. AID150 appearance dimensions as shown in the figure below. (unit: mm)



Front view

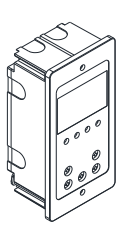


Side view

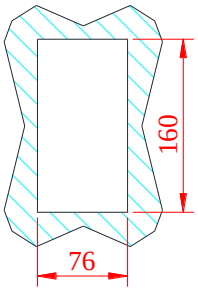


Hole size

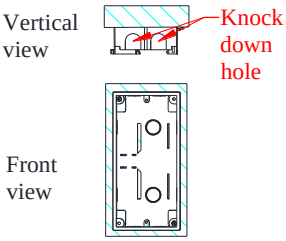
The AID series alarm display device usually adopts embedded installation, installation method is as follows:



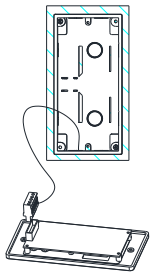
Product shape



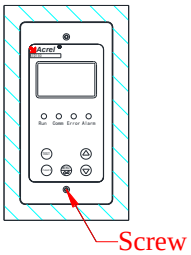
1. Size of wall openings



2. Insert the shell into the wall



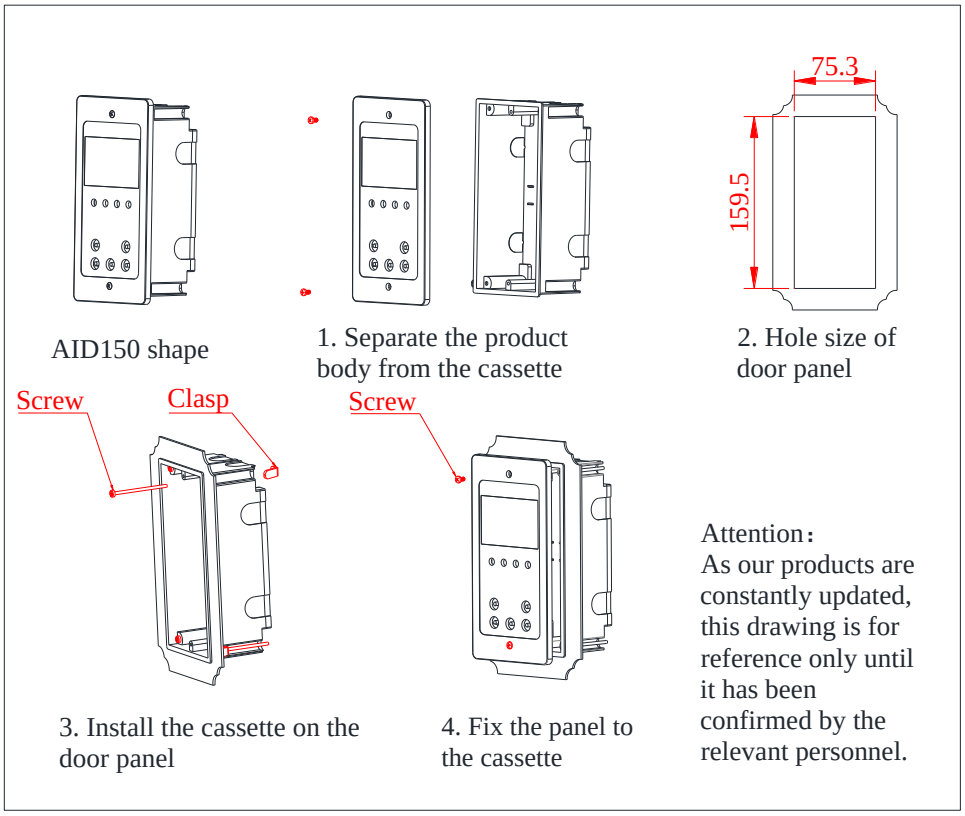
3. Connect to the LCD board through the terminal



4. Fixed LCD board and Shell

Attention：
As our products are constantly updated, this drawing is for reference only until it has been confirmed by the relevant personnel.

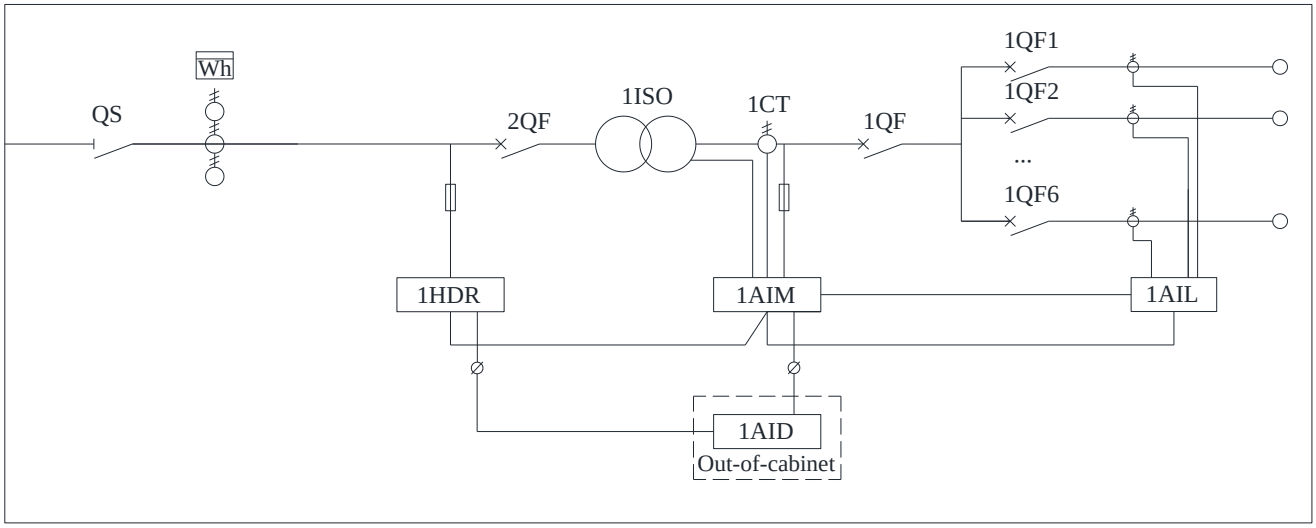
If the cabinet door is installed with a hole, the installation method is as follows:



During the decoration, first open holes in the appropriate wall position or cabinet door position, and then pull out the connecting wire (two 1.5 mm^2 cable and one 2*1.5 mm^2 shielded twisted pair cable) from the power cabinet into the opening position, knock out the knock hole close to the pipeline, and then embed the alarm and display device shell into the wall and fix it. Connect the wire to the external terminal according to certain rules, and then connect it to the corresponding terminal of the front cover circuit board. After the power supply and communication cables are connected to the power cabinet, install the panel on the shell and fasten it with the attached self-tapping screws.

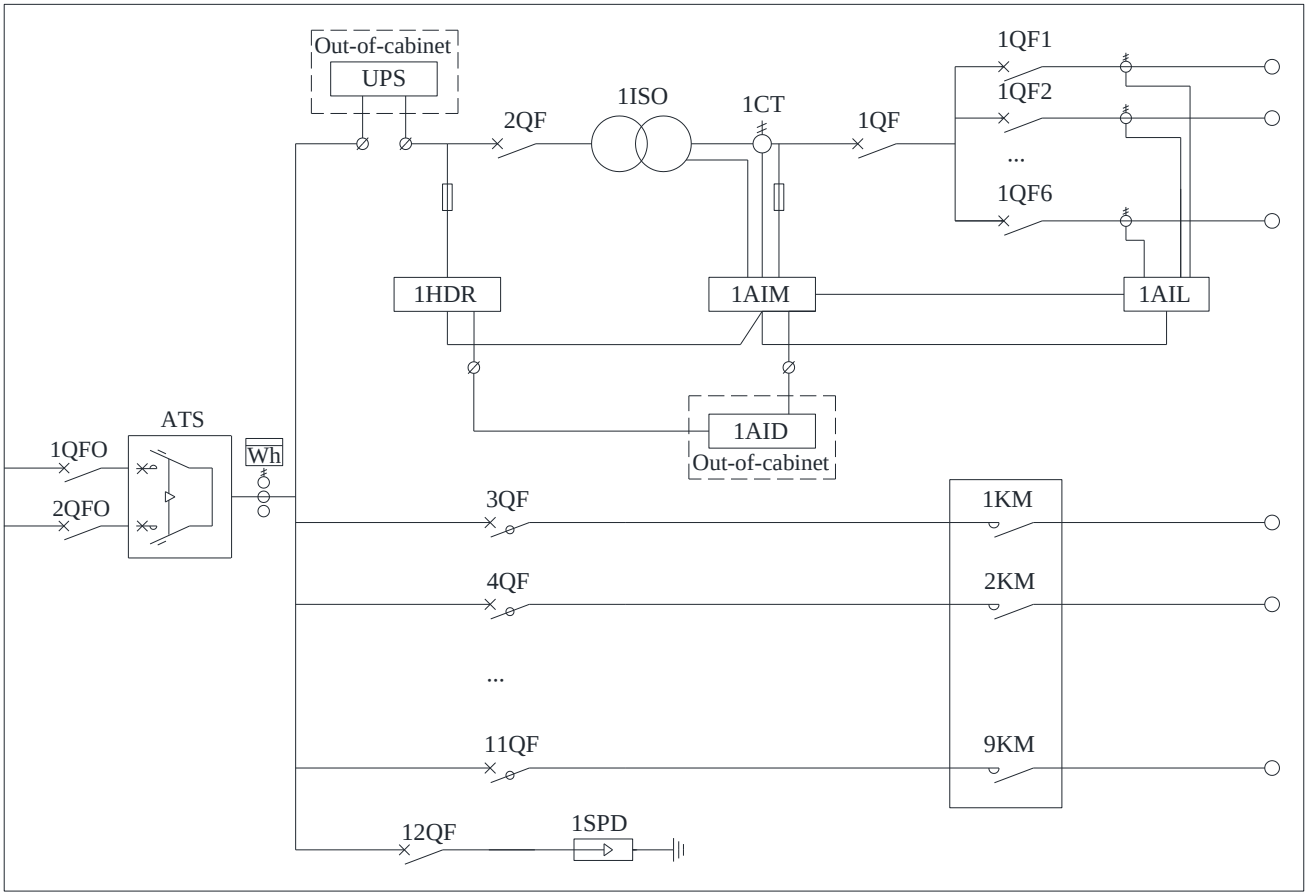
6.3 Connection Methods

The power cabinet has flexible configuration and needs to be configured according to the actual project site. The attached accessories of the cabinet include primary system diagram and wiring schematic diagram. Typical primary system diagram is shown as the figure below:



In the primary system diagram of GGF-I cabinet, the left side is the Input Switch and the right side is the Feeder Switch.

When wiring, find out the incoming terminal of **QS load switch** in the cabinet and connect to the incoming line of the project site; find out the outgoing terminals of **1QF1~1QF6 and 2QF1~2QF6** in the cabinet, and connect the feeder circuit of the project site to the outgoing terminal of the circuit breaker.



In the primary system diagram of GGF-O cabinet type, the left side is the Input Switch and the right side is the Feeder Switch.

When wiring, find out the incoming terminals of **1QF0 and 2QF0** circuit breakers in the cabinet, and connect to the incoming line; if there is no dual power switching device, find out the corresponding three-phase incoming circuit breaker in the diagram, and connect to the incoming line; the UPS is reserved for accessing the position, and the wiring can be introduced from outside the cabinet and connected to the terminals. Find out the outgoing terminals of **1QF1~1QF6** in the cabinet, and connect the feeder circuit to the outgoing terminals of the circuit breaker.

The power cabinet is reserved terminals for DC24V and RS485, usually called **XT**, as shown below.

	XT1		
	…		
1HDR:3	8	+	1AID:24V
1AIM:1/1AIL:1	9		
1HDR:4	10	–	1AID:G
1AIM:2/1AIL:2	11		

	XT2		
	…		
1AIM:15	16	A	1AID:A
1AIM:16	17	B	1AID:B

Lead the power supply and communication from the terminals to the installation position of the alarm and display device, and connect the wires according to the order of the terminals, and the alarm and display device terminals are shown in the following figure:

Power RS485

After connecting the wiring terminals, fix the alarm and display device panel with screws.

Make sure that the inlet and outlet lines, alarm and display device are connected properly, open the upper switch, open the circuit breaker in the cabinet, and the isolation power cabinet starts to run.

The components and meters in the power cabinet have been debugged before delivery. If the meters are damaged or have other problems, contact the manufacturer.

6.4 Matters Need Attention

(1) When installing the power cabinet, it is necessary to strictly abide by the national electrical operation rules. No live operation is allowed. Please ask professional electrician to install, otherwise there may be electric shock accident.

(2) The power cabinet shall be installed in strict accordance with the electrical specifications. It is necessary to connect the equipotential terminal block of the isolation power cabinet to the equipotential terminal box on site to ensure reliable grounding of the cabinet.

(3) The power cabinet can be installed indoors in different ways, the shell protection level is IP30, ensure safe operation. Power distribution devices such as circuit breakers in the power cabinet can be selected according to the actual situation. Pay attention to the specifications and models. Any isolation transformer will generate impulse current when starting up. Therefore, when selecting the circuit breaker of the inlet circuit of the isolation transformer, the circuit breaker with the trip curve of D curve or the circuit breaker with the C and D trip curve of the national standard IEC 60947.2 should be selected. The rated current of the circuit breaker is determined according to the capacity of the isolation transformer as follows: 10kVA - 63A; 8kVA - 50A; 6.3kVA-40A; 5kVA-40A; 3.15kVA-20A. The circuit breaker used in the inlet and outlet circuit of the isolation transformer should only have short circuit protection, without overload protection. If the appropriate circuit breaker is not selected according to the above requirements, the company shall not assume any responsibility for the medical accident caused by the circuit breaker's difficulty in closing or the interruption in the operation process.

(4) Please read this manual carefully before use. When it comes to insulation monitor and insulation fault locator products in-cabinet, refer to *702 Intelligent Insulation Monitoring Products of Medical IT System (M300 Five-Piece Set) User Manual* and *627 Insulation Monitoring and Fault Location Products of Medical IT System (6-Piece Set) User Manual*.

7 Operation and Usage

After the product is installed, the following operations should be done:

If the power cabinet is equipped with a dual power automatic transfer switch, ensure the reliability of the dual power supply. The power cabinet should be able to quickly switch to the standby power supply when the current working power supply is cut off. For example, if the current working power supply is power A and the standby power supply is power B, cut off power supply A and switch on power supply B quickly to ensure continuous power supply.

The power cabinet is connected to the input line with the normal rated voltage, and the load switch, residual current protector, circuit breaker and other components can be switched off in turn. The circuit breaker should be correctly switched off.

After the power cabinet is powered on, check whether the display data of the device on the cabinet is normal. The total inlet line measurement can indicate the current voltage and current value (GGF-O series cabinet); Insulation monitoring device should show the current IT system insulation resistance value, and no alarm feature.

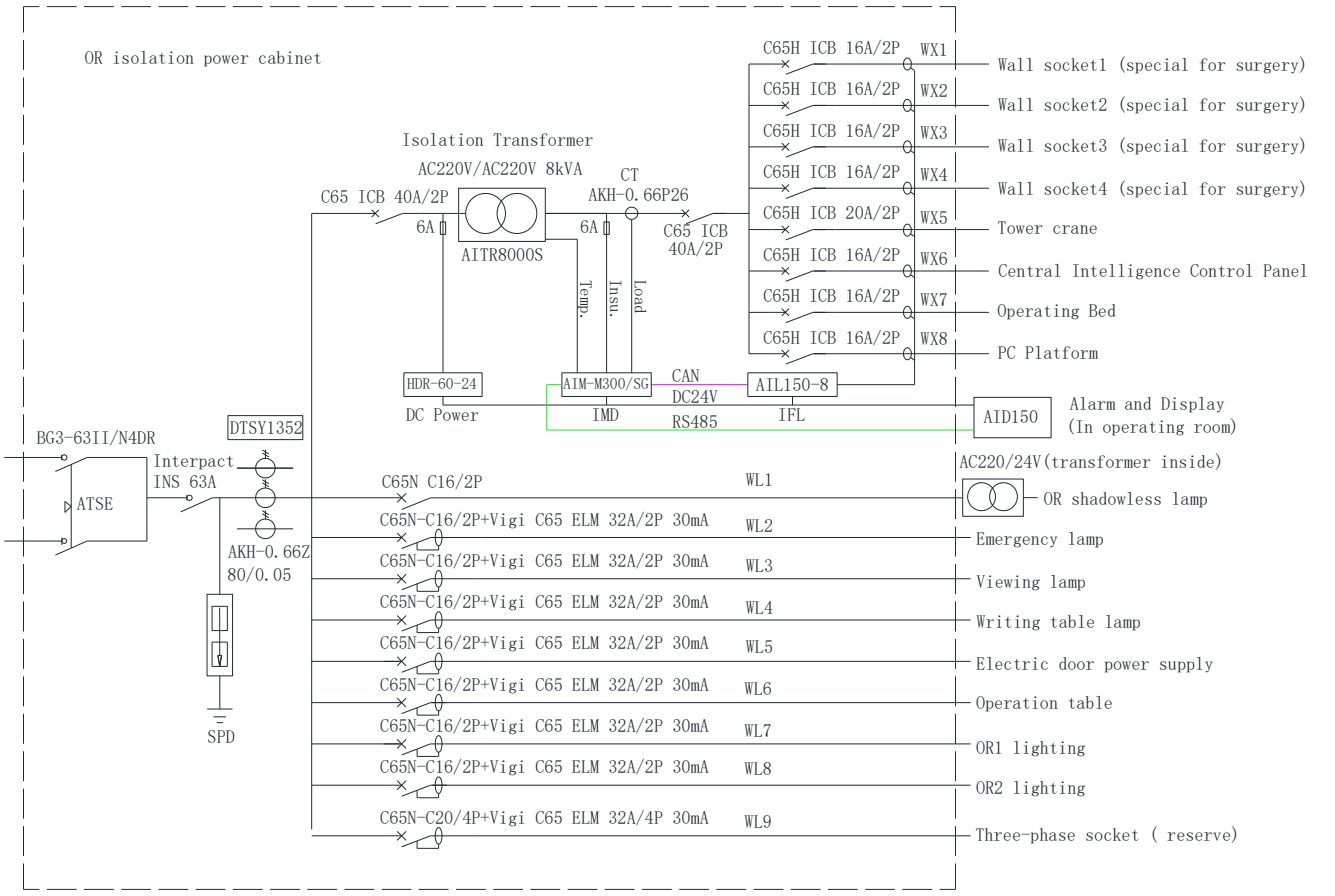
After the above confirmation, the power cabinet can be put into use.

In the process of use, if the external alarm display device is found to emit abnormal alarm, you can find the corresponding isolation power cabinet according to the alarm information, confirm the alarm type, and then carry out load disconnection operation until the insulation monitor recovers normal.

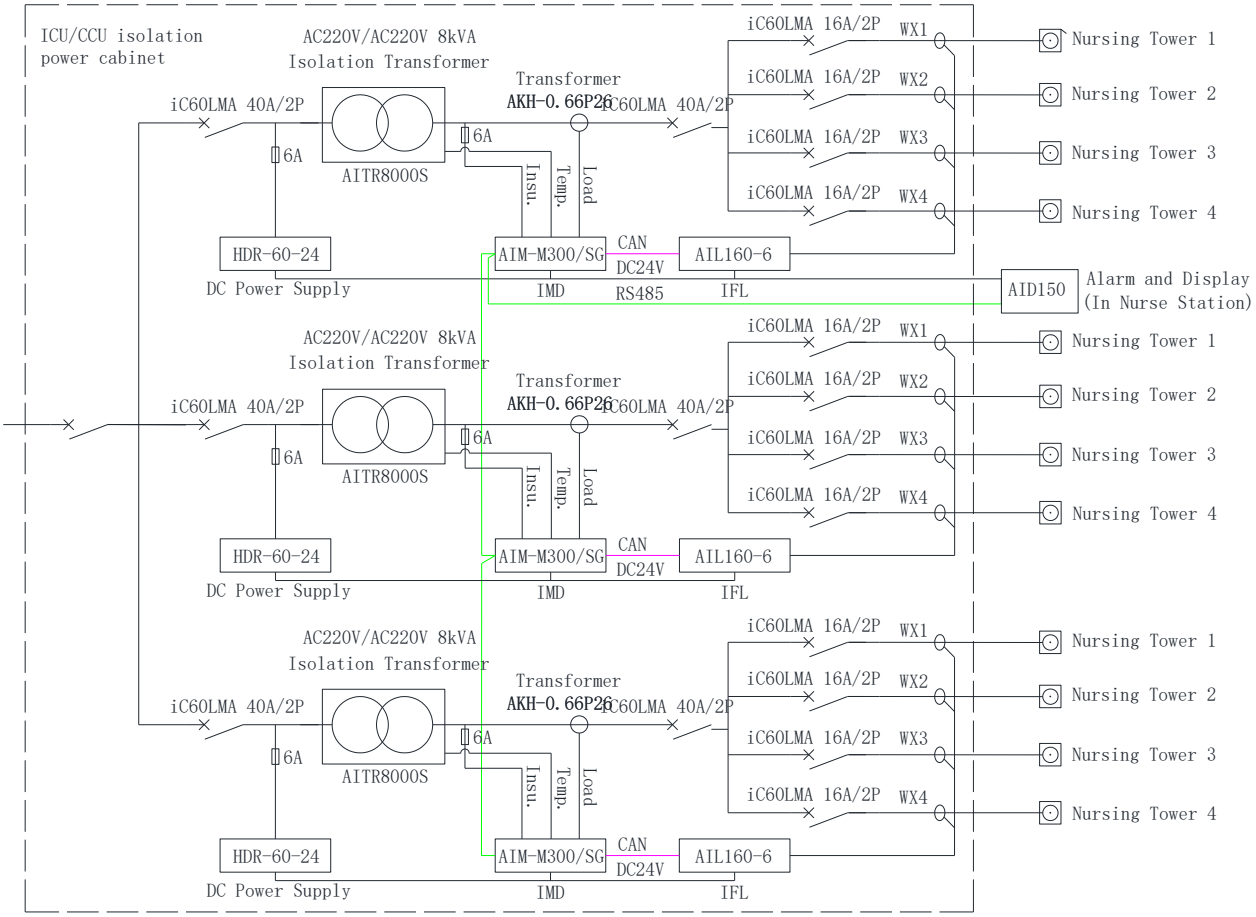
8 Typical Applications

The power cabinet is mainly applied to the operating room and ICU power distribution system.

Medical IT system insulation monitoring and fault location products (6-Piece Set) are used in operating room as shown below.



Medical IT system insulation monitoring and fault location products (6-Piece Set) are used in ICU/CCU as shown below.



9 Attached Information

The power cabinet should be delivered with the following documents:

a) Plastic-sealed *Isolation Power Cabinet - Customer Wiring Instructions*, including primary system diagram, wiring terminal description and manual QR code;

b) Factory inspection report;

c) Qualification certificate of cabinet;

d) Key of cabinet door.

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