

PGH1 主配电板 Main switchboard

概述 Overview

PGH1型主配电板是我司自主研发的配电设备，是接受和分配船舶发电机组发出的电能，对发电机、电网、设备进行保护，并测量和管理电能的重要设备。

PGH1型主配电板适用于电力系统单机功率在3000kW以下的单台发电机或者多台发电机并联运行的电站，实现对全船电力系统发电和配电的控制、保护、监测及管理等功能，确保向全船电力系统负载稳定可靠地供电。

产品满足国内外船级社规范、船舶行业标准及国家标准。

PGH1 switchboard is a power distribution unit independently researched and developed by our company, and is an important equipment aiming to receive and distribute the power from the ship's generator set, provide protection for generator, power grid and equipments, and measure and manage the electric power.

PGH1 main switchboard applies to the management of a power station with single generator or multiple generators whose single power is less than 3000kW. It realizes the control, protection, monitoring, management and other functions of the whole ship power generation and distribution, and ensures to supply power to the whole ship feeders stably and reliably.

The product meets the requirements of specifications of domestic and foreign ship classifications, shipbuilding industry standard and national standard.

产品特点 Product features

- 拥有自主研发的RF31和西门子授权的8PT柜型，可为客户提供多元化的解决方案；
With self-developed RF31 and Siemens authorized 8PT cabinet type, can provide customers with diversified solutions;
- 结构统一，模块化设计，安装与维护方便，安全可靠；
With unified structure, modular design, easy to install and maintain, safe and reliable;
- 采用新型框架结构，框架强度高；
With new frame structure of high strength;
- 高防护等级，最高可以达到IP54；
With high protection grade, up to IP54;
- 具有灵活的进出线方式（底部或者顶部）；
With flexible incoming and outlet cables (bottom or top) ;
- 主汇流排采用高品质电解铜，镀锡处理，在配电板内水平布置；
Main busbar takes high quality electrolytic copper with tin plating treatment, and is arranged in the main switchboard horizontally;
- 设有通风散热措施，板内设防潮加热器；
With good ventilation and cooling measures, and with moisture-proof and heating equipment inside the panel;



RF31柜型（自主研发）
RF31 type (self-developed)



8PT柜型（西门子授权）
8PT type (Siemens authorized)

■ 电站管理系统、配电监控系统、绝缘监测定位系统、健康管理系统的核心部件自主研发，完全实现自主可控；
Power management system, distribution monitoring and management system, insulation monitoring and positioning system, health management system are independently developed, fully realize self-control;

■ 电站管理系统：对电力系统设备协同管理，实现能量供给最优化，并设有良好的人机界面，数据传输通信接口，可与船舶管理系统连接和数据交互；
Power management system: carry out the coordinated management of power system equipments to realize the optimization of energy supply, with a good human-computer interface and data transmission communication interface, be able to connect the ship management system and exchange data;

■ 配电监控系统：集中对配电网的电气负载设备进行监控，实现配电系统最优化，并设有良好的人机界面，数据传输通信接口，可与船舶管理系统连接和数据交互；
Distribution monitoring and management system: centralized monitor the electrical feeders of the power distribution network to realize the the optimization of the distribution system, with a good human-computer interface and data transmission communication interface, be able to connect the ship management system and exchange data;

■ 绝缘监测定位系统：定位绝缘故障负载支路，并设有良好的人机界面，数据传输通信接口，可与船舶管理系统连接和数据交互；
Insulation monitoring and positioning system: locate the fault branch circuit, with a good human-computer interface and data transmission communication interface, be able to connect the ship management system and exchange data;

■ 健康管理系统的核心部件自主研发，完全实现自主可控；
Health management system: realize the health assessment and forecast for the electrical power system, provide the decision support for the equipment maintenance and repair, with a good human-computer interface and data transmission communication interface, be able to connect to the ship management system and exchange data;

■ 自主研发的RF31柜型通过3C认证。
Self-developed RF31 cabinet type pass 3C certification.

产品功能 Product functions

■ 基本功能：实现对发电机组的过载、短路、逆功、差动、频率超标和电压超标等保护功能，对电网绝缘、电站状态进行检测及报警指示功能；
Basic functions: realize the protection for generator overload, short circuit, reverse power, differential motion, frequency out of limits and voltage out of limits, and the monitoring and alarm indication of power grid insulation and power station status;

■ 自动电站管理功能（选配）：自动电站管理系统选用国际优质品牌的元器件作为核心部件，采集电站所需的信息，对电站设备进行高效、安全、可靠的管理，有多种模式可以选择，具有以下功能：

Automatic Power Station Management System (optional): international high-quality brand components are selected as core parts for the automatic power station management system. The system collects the information needed for the power station and realizes efficient, safe and reliable management of power station equipments, with multiple modes to be selected. The system has the functions as following:

Insulation monitoring and positioning system: locate the fault branch circuit, with a good human-computer interface and data transmission communication interface, be able to connect the ship management system and exchange data;

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Automatic Power Station Management System (optional): international high-quality brand components are selected as core parts for the automatic power station management system. The system collects the information needed for the power station and realizes efficient, safe and reliable management of power station equipments, with multiple modes to be selected. The system has the functions as following:

※手动、半自动、自动三种模式

Manual, semi-automatic and automatic modes

※对多台发电机输出功率管理，根据实船工况，通过对发电机的自动起停、并网解列、负荷分配等功能，实现

船舶电力系统的最优控制

Manage the output power from multiple generators, realize the optimization of electric power by automatic start and stop control, deload, load sharing, and other functions according to real-time working condition

※具有前置反馈功能，对于各船型多工况状态，可根据被控设备的运行曲线做出管理

With front feedback function, be able to manage the multiple working conditions of each ship according to the running curves of controlled equipment

※监测推进电机、侧推等大功率设备运行状态，并提供智能化的管理与决策的方案

Monitor propulsion motor, thruster and other high-power equipment state, and supply suggestion for intelligent management and decision-making

※配电网络剩余功率管理功能

Power management of power network surplus power

※电网失电后自恢复功能

Self recover function in the case of power black-out

※良好的人机界面，方便船员操作

With a good human-computer interface, convenient for operators to operate

※支持Modbus, Profibus-DP, TCP/IP 等通信协议

Support Modbus, Profibus-DP, and TCP/IP communication protocols

■ 配电管理功能（选配）：

Distribution management function (optional):

※监测负载电量参数、开关状态

Monitor load power parameters, switch status

※集中控制负载的通断

Centralized control of the load on-off

※良好的人机界面，方便船员操作

With a good human-computer interface, convenient for operators to operate

※支持Modbus, TCP/IP等通信协议

Support Modbus, TCP / IP and other communication protocols

■ 绝缘监测定位系统（选配）：

Insulation monitoring and positioning system (optional):

※在线测量各交流电力网络的接地绝缘电阻，并显示测量结果

Measure the AC power network insulation resistance to the ground on-line, and display the results

※绝缘报警值可设定

The insulation alarm value can be set

※自动定位故障支路

Automatically locate the fault branch

※良好的人机界面，方便船员操作

With a good human-computer interface, convenient for operators to operate

※支持Modbus, TCP/IP等通信协议

Support Modbus, TCP / IP and other communication protocols

■ 健康管理系统（选配）：

Health management system (optional):

※预测断路器的使用寿命

Predicting the service life of circuit breaker

※评估和预测电力系统健康状态

Assessment and prediction for the health status of the electrical power system

※辅助决策功能，提供维修辅助建议

With auxiliary decision-making function, provide maintenance assistance advice

※数据传输接口，方便调阅存储数据

With data transmission interface, making it easy to obtain the stored data

※良好的人机界面，方便船员操作

With a good human-computer interface, convenient for operators to operate

※支持Modbus, TCP/IP等通信协议

Support Modbus, TCP / IP and other communication protocols

▶ 产品组成

Product composition

■ 发电机控制屏

Generator control panel

■ 动力负载屏

Power feeder panel

■ 照明负载屏

Lighting feeder panel

■ 起动屏

Starter panel

■ 同步屏

Synchronous panel (optional)

■ 母联开关屏

Bus-tie panel (optional)

▶ 技术指标

Technical index

■ 短时耐受电流 I_{cw} (1s) 150kA，峰值耐受电流 I_{pk} 375kA

Short-time withstand current I_{cw} (1s) can be up to 150kA and peak withstand current I_{pk} can be up to 375kA

■ 主汇流排最大电流可至6300A

The maximum current carrying capacity of the main bus bar can be up to 6300A

■ 产品标准尺寸见下表

The standard sizes optional for each panel are shown in the following table:

■ 防护等级最高IP54

Maximum protection grade IP54

■ 环境温度：-10 ~ 55°C

Surrounding temperature: -10 ~ 55°C

■ 额定电压：≤AC690V，额定频率：50/60Hz

Rated voltage: ≤AC690V, rated frequency: 50/60Hz
DC1000V
Rated voltage: ≤AC690V, rated frequency: 50/60Hz
DC1000V

设备名称 Equipment name	外形尺寸 (mm) Outline dimensions (mm)			备注 Remark
	宽 (A) W	高 (B) H	深 (C) D	
RT8PT 配电柜 Distribution cabinet	500/600/700/800	1800	500/600/800	Fig.1
	600/700/800/1000	2000	600/800/1000/1200	
	600/700/800/1000/1200	2100	600/800/1000/1200	
	600/700/800/1000/1200	2200	600/800/1000/1200	
RF31 配电柜 Distribution cabinet	500/600/700/800	1800	500/600/800	Fig.2
	600/700/800/1000	2000	600/800/1000/1200	
	600/700/800/1000/1200	2100	600/800/1000/1200	
	600/700/800/1000/1200	2200	600/800/1000/1200	

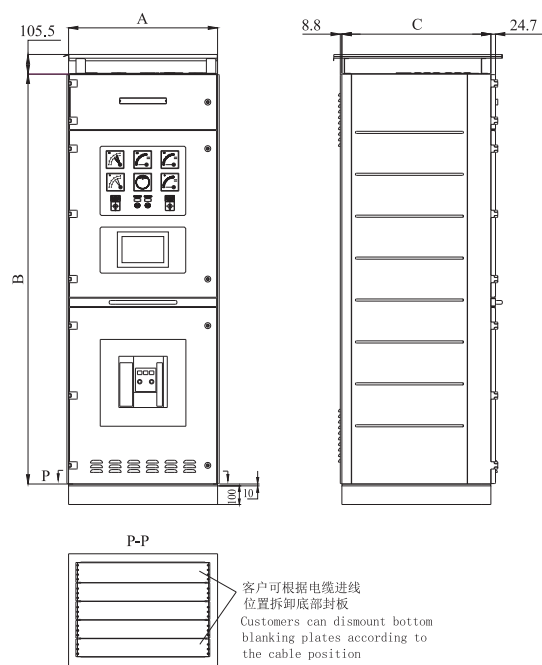


Fig.1

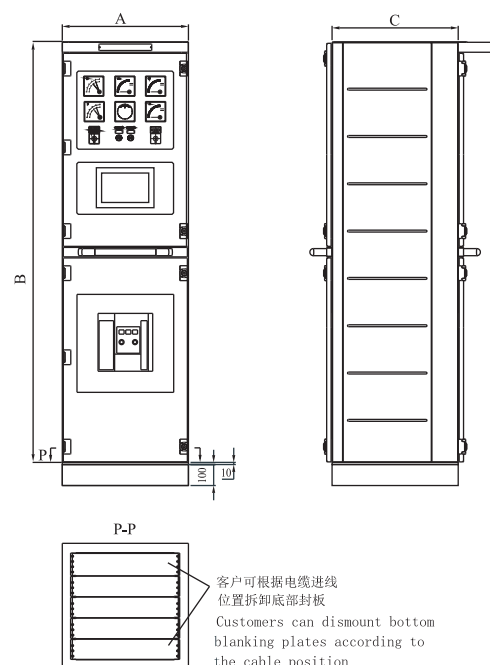


Fig.2

型号命名

Model naming

主配电板 Main switchboard	PGH1	- □	× □	/ □
发电机功率 Generator power				
发电机数量 Number of generators				
配电板屏数 Number of switchboard panels				

选型说明

Selection description

PGH1-800×3/6 发电机功率为800kW，共3台发电机，配电板共6屏

The power of PGH1-800×3/6 generator is 800kW, a total of 3 generators, and the switchboard has 6 panels in total