GRF2 type DC switchboard

Product overview

The GRF2 DC switchboard is a power distribution equipment independently developed by our company. It connects devices such as generators, energy storage equipment, frequency converters, daily loads, and propulsion motors through a DC busbar, enabling the transmission and distribution of electrical energy. The AC power generated by the generator is converted into DC power through a rectifier and then connected to the DC busbar. Energy storage devices such as batteries and super capacitors are connected to the DC busbar either through a converter or directly, for storing and releasing electrical energy. The frequency converter converts the electrical energy on the DC busbar into AC or DC power suitable for the propulsion motor and daily loads according to the operational requirements of the ship.

Product features

The product adopts the company's standard ES cabinet type, featuring an aesthetically pleasing appearance and high frame strength;

Unified structure, modular design, easy installation and maintenance, high safety and reliability;

High protection level up to IP54;

The main busbar is made of high-quality electrolytic copper, treated with tin plating, and placed horizontally inside the switchboard;

The power module is designed with a versatile cooling system that supports both air and water cooling;

The product adopts electromagnetic shielding structure design and electromagnetic interference suppression design.

Product composition

Generator rectifier panel
DC conversion panel
Bus tie panel
EMS control panel
Propulsion inverter panel
Domestic inverter panel
Water cooling unit panel (as needed)

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Product functions

Basic functions

The DC switchboard integrates functions such as DC distribution, DC protection, battery connection, frequency conversion drive, and inverter power supply;

The power module is equipped with protection functions such as DC bus undervoltage, output short circuit, overload, and overcurrent protection.

EMS control function

Start/stop management of power supply devices, grid connection/disconnection of power supply devices, load power distribution, and automatic load shedding of non-essential loads;

Power/energy reserve analysis and heavy-load inquiry;

Monitoring of the standby status of the power supply device: Automatic start-up and operation of the power supply device are permitted only after the standby preparation is completed;

Sequential start-up function: When the number of start-up failures of a certain power supply device exceeds the allowable limit for the start-up device, the EMS should be able to issue an alarm and automatically switch to start the next power supply device in sequence;

Implement control over the charging and discharging of the energy storage system;

Power limiting function: When one unit or a group of power supply devices fails and shuts down, the propulsion power can be immediately limited to prevent other on-grid power supply devices from tripping due to overload and causing the entire ship to lose power; after the system dynamic process is restored, the propulsion power limit is lifted, and the propulsion load is adjusted to an appropriate required power value;

Monitoring of faults of the DC integrated power system: When the power supply to the system and equipment on the non-faulty line is interrupted, necessary measures are automatically implemented to restore the power supply to the system and equipment.

Technical indicators

Structural form: metal-clad and air insulation
Busbar voltage: DC 1100V and below
Output harmonic: THDU≤5%
Protection levels: IP23, IP44, IP54
Ambient temperature: 0℃ ~ 45℃