

## Series-connected Silicon-controlled Rectifier Medium Frequency Power Cabinet

Our Product Introduction

### Basic Information

- Place of Origin: China
- Brand Name: Huarui
- Certification: ISO9001
- Minimum Order Quantity: 1 unit
- Price: USD5000-100000 per cabinet
- Packaging Details: Standard size:3.6\*1.4\*1.9, can be designed by the customer's room.
- Delivery Time: 15-30 days
- Supply Ability: 1000 per month



### Product Specification

- Highlight: Medium Frequency Power Cabinet, Silicon-Controlled Medium Frequency Power Cabinet

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## Product Description

The main reasons why series medium-frequency power supply cabinets are more energy-efficient and power-saving than parallel medium-frequency power supply cabinets are as follows

### 1. High power factor

The series medium-frequency power supply cabinet adopts a rectifier full output circuit. The thyristor in the rectifier part is completely on. Generally, during operation, the power factor can always be maintained above 0.92-0.94, and even reach 0.95 or above. This means that it can utilize electrical energy more effectively and reduce reactive power loss.

The power regulation of the parallel medium-frequency power supply cabinet relies on changing the rectifier voltage of the three-phase fully controlled bridge. When the control pulse  $\alpha$  of the rectifier bridge is  $\leq 0^\circ$ , the power factor will decrease accordingly, even reaching as low as 0.3. A low power factor will cause a large amount of reactive current to flow in the circuit, increasing line loss and the burden on the power supply, and wasting electrical energy.

### 2. Reasonable power regulation method:

The series medium-frequency power supply cabinet regulates power by adjusting the inverter frequency. Throughout the entire smelting process, it can maintain a constant power output regardless of the amount of charge in the furnace. This enables the equipment to operate at a high efficiency under various working conditions, avoiding energy waste caused by power fluctuations. Especially when smelting non-magnetic substances such as stainless steel, copper, industrial silicon and aluminum, its superiority is more obvious. The melting speed is fast, the loss of furnace charge elements is less, and the energy-saving effect is better.

The parallel medium-frequency power supply cabinet regulates the output power by adjusting the DC voltage. This power regulation method will cause changes in the rectification conduction Angle under different load conditions, especially at low power output, resulting in a decrease in the power factor and thus a decline in the overall efficiency of the equipment and an increase in energy consumption.

### 3. Small load circuit current

Series resonance is a voltage-type inverter. Its load voltage is Q times the output voltage (Q is the quality factor). During operation, the voltage value of the resonant circuit is relatively high, while the current value is relatively small. According to Joule's Law  $Q=I^2 R t$ , the smaller the current, the less heat is lost in the load circuit

Parallel inverters are current-type inverters. The resonant current is Q times the working current. The working current of the inductor is large, and the large current generates a lot of heat. This heat is carried away by the cooling water, resulting in energy consumption.

### 4. Minimal impact on the power grid

The rectification part of the series medium-frequency power supply cabinet adopts a semi-controllable rectification method.

The DC voltage always operates in a state without adjusting the conduction Angle, which does not generate high-order harmonics, poses no harmonic hazard to the power grid, and does not interfere with the operation of other electronic equipment in the factory, ensuring the stability of the power grid and the normal operation of other equipment. Overall, it has reduced energy waste caused by grid fluctuations and equipment failures.

The parallel medium-frequency power supply cabinet adopts three-phase fully controlled rectification technology. When the equipment is in operation, it will cause harmonic pollution to the power grid, especially the 5th and 7th harmonics may exceed the national standard by 6 to 7 times. This not only affects the normal operation of other equipment in the power grid but also may lead to a decrease in the power factor of the power grid, further increasing the loss of electric energy.

In addition, the series medium-frequency power supply cabinet also has some other advantages, such as no need for large-capacity filter reactors, each induction melting furnace is independently powered by a set of inverters, and there is no need to install high-current furnace switching switches for switching, etc. All these also reduce power consumption to a certain extent.



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