

12V/12000A IGBT Electroplating Rectifier for Industrial Nickel Plating

1.Specifications:

Input parameters: Three phase, AC380V \pm 10% ,50HZ

Output parameters: DC 0~12V 0~12KA

Output mode: Common DC output

Cooling method: **Water cooling**

Power supply type: IGBT-based

Application Industry: Surface treatment industry, such as hard chrome, zinc and nickel plating

2.Product Description

In an **12V/12000A IGBT electroplating rectifier for industrial nickel plating**, after the AC input voltage is filtered by a rectifier circuit, high-voltage DC power is obtained. The "variable frequency conversion" stage inverts this high-voltage direct current into approximately 30kHz high-frequency alternating current. This high-frequency AC is then transformed into secondary voltage via a high-frequency transformer and filtered through a high-frequency rectifier circuit to produce the required output voltage. The **IGBT electroplating rectifier for industrial nickel plating** employs a control circuit to sample output voltage and current. These sampled signals undergo closed-loop feedback to generate pulse width modulation (PWM) signals, which regulate the inverter circuit and maintain stable output voltage/current - a critical requirement for precision electroplating applications.

3.Products Applications

Plating rectifiers support surface treatments like **PCB electroplating**, hard chrome coating, and metal plating (Cu, Ni, Zn, Au, Ag).

1)Field application diagram:



PCB electroplating, PCB electroplating

2)Industry application examples:

**Professional Manufacturer of IGBT
and SCR Rectifiers**

Offer you premium rectifiers and optimal solutions

ABS material
surface treatment

CHROME NICKEL COPPER PLASTIC

Automobile industry, ABS material surface treatment, Copper, nickel, chromium

4. Technology Advantages

- › Modular parallel connection
- › Optional N+1 redundant backup
- › Capable of online hot maintenance
- › RS485 digital control function
- › Low-voltage MOS tube rectification
- › High power factor, high efficiency
- › Reasonable structural design
- › Effective sealed isolation
- › No water joint design inside the unit
- › Practical and effective multiple protection system
- › Full soft switch technology
- › High reliability
- › Low noise, high protection level

5. Role of electroplating

Protection Against Corrosion

- Shields metal surfaces from rust and chemical damage (e.g., zinc plating on steel).

Increased Wear Resistance

- Hard coatings (e.g., chromium plating) reduce friction and extend part life.

Improved Appearance

- Adds shiny, decorative finishes (e.g., gold plating on jewelry, chrome on car parts).

Better Electrical Conductivity

- Used in electronics (e.g., copper plating on circuit boards).

Enhanced Solderability

- Improves bonding in electronic components (e.g., tin plating).

Repair of Worn Parts

- Restores dimensions and functionality (e.g., rebuilding engine components).

Special Industrial Uses

- Provides heat resistance (e.g., nickel plating in aerospace).
- Used in medical devices (e.g., biocompatible coatings).

6.Types of electroplating

› Copper Plating

Purpose: Enhances adhesion for subsequent layers and corrosion resistance.

Note: Prone to oxidation (forms non-conductive copper oxide/green patina).

Requires protective coatings.

› Nickel Plating

Purpose: Used as a base layer or decorative finish; improves corrosion/wear resistance. Electroless nickel offers chrome-like durability.

Note: Magnetic properties limit use in electronics (e.g., DIN/N connectors) to avoid signal interference.

› Gold Plating

Purpose: Optimizes conductive contact impedance and signal transmission.

Key: High stability but costly.

› Palladium-Nickel Plating

Purpose: Superior signal transmission and wear resistance vs. gold.

Advantage: Combines palladium's corrosion resistance with nickel's hardness.

› Tin-Lead Plating

Purpose: Improves solderability.

Trend: Phased out due to lead concerns; replaced by bright/matte tin alternatives.

› Silver Plating

Purpose: Best conductivity and signal performance.

Note: Conducts even when oxidized but tarnishes over time. Higher cost.

Selection Criteria

Match plating type to application needs: corrosion/wear resistance, conductivity, cost, and environmental regulations.



7.Elements of Electroplating

› Cathode

The object to be plated (e.g., connector terminals or metal surfaces) where metal ions deposit into a solid coating.

› Anode

Soluble Anode: Made of the plating metal. Dissolves during electrolysis to replenish metal ions in the solution.

Insoluble Anode: Used for precious metals (e.g., white gold, iridium oxide). Does not dissolve but supplies electrons for reduction.

› Plating Solution

Contains ions of the target metal. Composition and concentration determine coating thickness, adhesion, and appearance.

› Plating Tank

Materials: Must resist corrosion and temperature fluctuations (e.g.,

polypropylene, titanium alloys).

Role: Stores solution and maintains stable plating conditions.

› Rectifier

Converts AC to DC power to drive electrolysis.

Adjust voltage/current to control deposition speed and coating thickness.

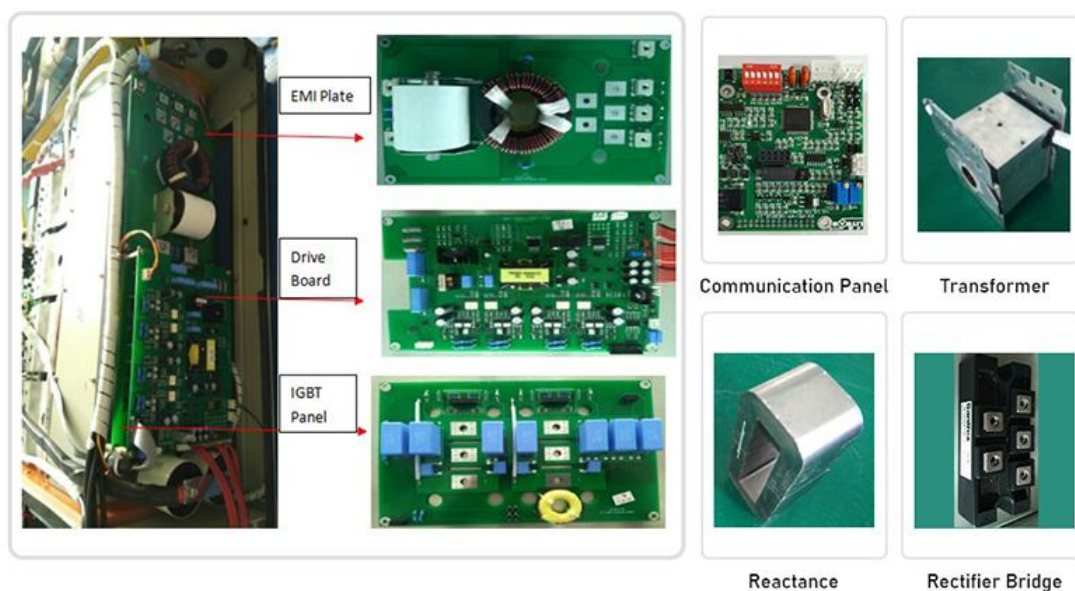
› Auxiliary Equipment

Filters: Remove impurities from the solution.

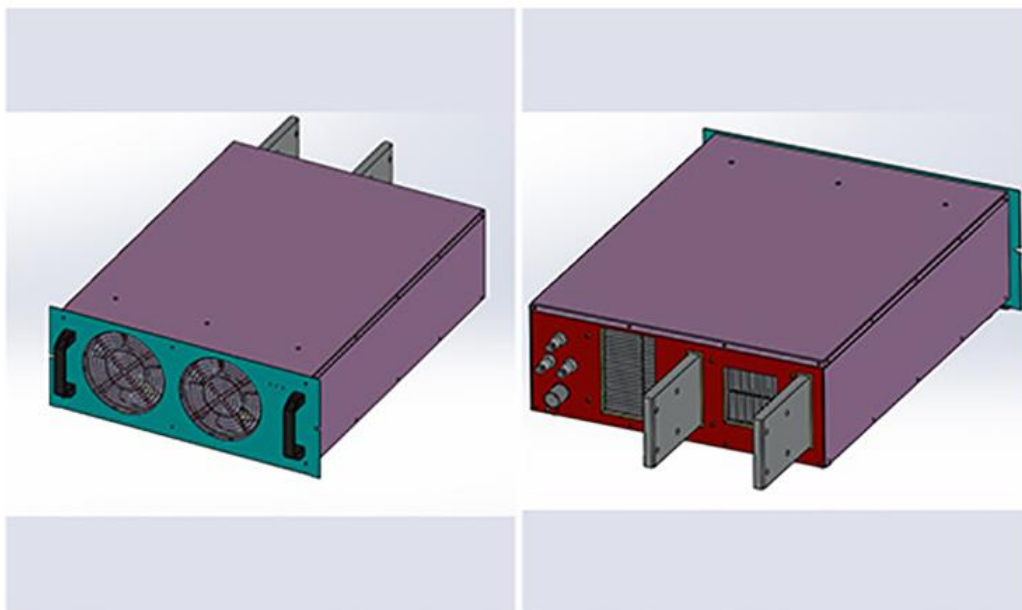
Heaters: Maintain solution temperature.

Stirrers: Ensure uniform mixing.

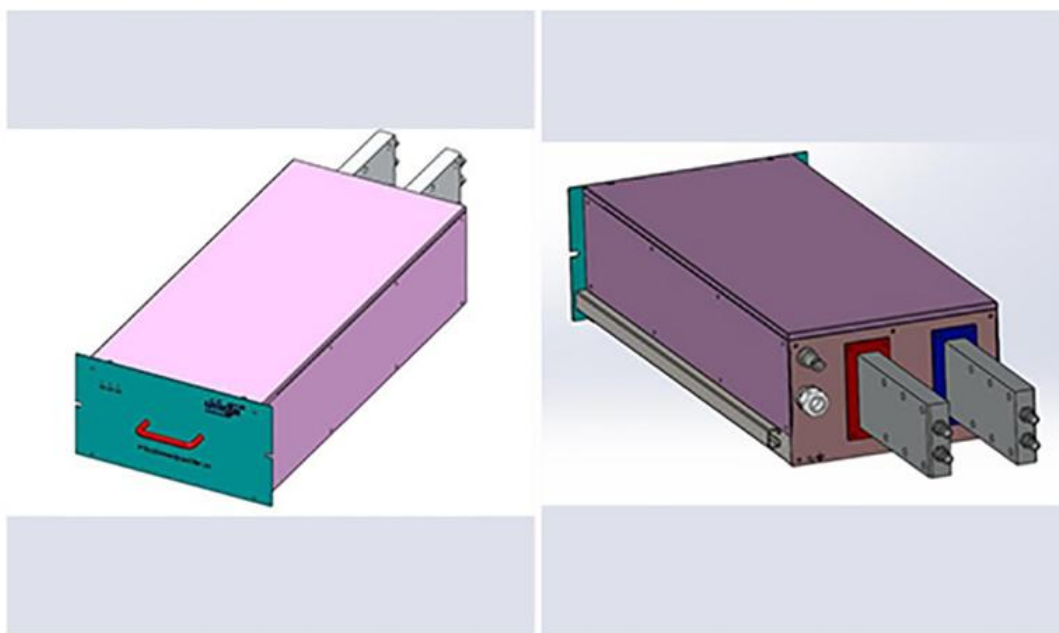
8.Component Part for Electroplating



9.Cooling Type for Electroplating



Air Cooling:Heat dissipation fan + air duct + comb heat sink



Water Cooling: Built-in water circulation line

10. Technical Parameters

Characteristic Types	Parameter Items	Technical Requirements
Power Types	Power types	High-frequency Power Supply
	Model specifications and	TBSB-12KA/12V
	Cooling mode	Water-cooled
	Switch tube type	IGBT
Input Characteristics	Rated Input Voltage	Three-phase, AC380V \pm 10% ,50HZ
	Rated Input Power	161 KVA
	Rated Input Current	AC 245A
	Input Power Factor	COS Φ \geq 0.95
Output Characteristics	Output Voltage	DC 0~12V
	Output Current	DC 0~12KA
	Stabilized Current Precision	\leq 1% (Rated Current)
	According to accuracy	10A, 0.01V
	Rated Output efficiency	\geq 94%
Environmental Conditions	Installation site	Indoor installations
	Altitude	\leq 2000 meters
	Ambient temperature	-20 $^{\circ}$ C~40 $^{\circ}$ C
	Relative humidity	\leq 90%
Control Mode	Operating mode	PLC, ADDA, Ethernet, RS485 and RS232
Weight	Net weight	About 350KG
External Dimension	Height*Width*Depth	H1470mm*W700mm*D1200mm
Protection Characteristics	With over voltage, over current, overload, short circuit, overheating and other abnormal self-protection function	

11.Solution

Liyuan will keep up with the world's latest technology closely, and uphold the concept of providing customers with high-quality power supplies and professional integrated services.

With advanced design and rich experience in rectifier manufacturing, we will provide the best power solutions as well as the most stable and efficient power supply for users both at home and abroad.

12.Technical Capability

LIYUAN rectifier is the most competitive brand in China

Company relies on strong technology research and development cooperation basis, created a number of advanced technology, in recent 3 years amounted to more than 30 to apply for a patent, which has nearly 10 patents of invention. Equipped with the national electric power transformation and control engineering technology research center (branch), and has set up a loan enterprise academician workstation.

Strict implementation of ISO quality management system, and through the CE safety certification, has been implementing ERP management for many years, to achieve the network, systematic computer control, the formation of a standard, efficient modern management system.

13.Qualification certification

Liyuan adhere to innovation and the continuous improvement of power conversion efficiency and product quality.

The increasing R&D investment every year, and cooperation with China's well-known universities, we has established the research center of national electric power conversion and control engineering technology.

Especially the related core patents of high-power synchronous rectifier power supply, stay ahead of the whole industry in China.

The ISO 9001 quality management system has been fully implemented in Liyuan, including quality inspection of components in warehouse, production process inspection, and final product inspection.

We adopt advanced scientific quality management system and the most stringent testing methods in the whole process to ensure the stability and reliability of products.



14. Service

Packing

- 1) Small size rectifier packing in carton box separately.
- 2) Large size rectifier will be packed in wooden case.
- 3) We guarantee that all the packing is intact when it reaches its destination.

Shipping

- 1) 30-45 Days after payment.
- 2) Transport: DHL, FEDEX, UPS, Air shipping, Boat shipping
- 3) You may choose our shipping partner or your own partner.

Maintenance

We are pleasant to share our theory and experience on equipment maintenance with users.

We are pleasant to interact with users to collect their tips and know-hows on equipment maintenance.

The module "Maintenance" here is intended to help users solve various problems they possibly encounter during equipment maintenance...

If you need other power **electroplating rectifiers**, we can custom design them according to customer requirements. Please contact us.

Seeking **12V/12000A IGBT electroplating rectifier for industrial nickel plating**? Liyuan Haina Group, a professional manufacturer with 27+ years specializing in industrial rectifiers, supplies global clients including the United States, Canada, Britain, Italy, Spain, South Africa, Russia, the UAE, Japan, South Korea, Malaysia, etc. Our advanced factory delivers cost-effective Made-in-China solutions, with competitive prices and customizable options. Contact us for sales inquiries.