

## 10V-30V Positive and Negative Pulse Plating Rectifier

### 1.Specifications:

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

Output parameters: Positive: DC 10V 2\*1000A Negative: DC 30V 2\*3000A

Output mode: High speed positive and negative pulse

Cooling method: Water cooling

Power supply type: High-frequency power supply

Application Industry: PCB plating, rare metal plating, precision design, precious metal plating, electrolytic polishing, etc

### 2.Product Description

PCB electroplating power supply mainly includes high-frequency switching power supply, single pulse power supply, high-speed positive and negative pulse power supply, mainly pulse power supply and high-precision DC power supply. The market share of PCB electroplating power supply reaches 75%. Over the years, We have maintained good communication with high-end equipment manufacturers, brand potion manufacturers and end users. Many new technologies have been developed to improve the process quality and efficiency of PCB manufacturing from the aspects of power supply and equipment.

Liyuan PCB power supply has the comprehensive advantages of stable performance (sealing and structure), high efficiency (the highest efficiency can exceed 94%), high control precision, small size, all-new installation mode to reduce costs, improve electroplating uniformity, and optimize electroplating process.

In the PCB manufacturing process, electroless copper plating is an important

step. It is widely used in the following two processes. One is plating onto bare laminate and the other is plating through hole, because under these two circumstances, electroplating cannot or can hardly be carried out. In the process of plating onto bare laminate, electroless copper plating plates a thin layer of copper on the bare substrate to make the substrate conductive for further electroplating. In the process of plating through hole, electroless copper plating is used to make the inner walls of the hole conductive to connect the printed circuits in different layers or the pins of the integrated chips.

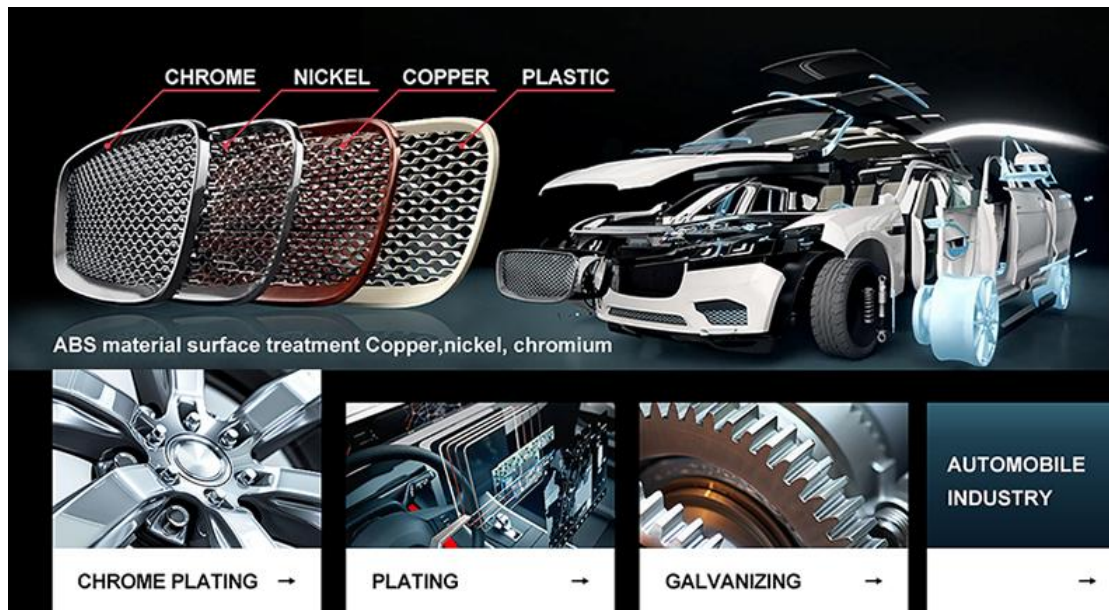
### 3.Product Applications

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

1)Field application diagram:



## 2) Industry application examples:



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

## 4. Technology Advantages

- RS485 digital control function
- High power factor and high efficiency
- Reasonable structural design
- Only the radiator is in the air duct
- Effective sealing and isolation
- High protective properties
- Standard wiring and special wiring
- Practical and effective multiple protection system
- Full soft switching technology
- High reliability

## 5. Role of electroplating

Electroplating enhances functionality and aesthetics: Metal coatings boost wear resistance (hard chromium), conductivity (gold/silver for electronics), and

reflectivity (silver/chromium for mirrors/solar reflectors). It prevents corrosion (zinc-plated bolts, chrome bumpers) while adding decorative finishes (jewelry gold plating, automotive chrome), merging durability with visual appeal.

## **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.



Copper Plating



Metal Plating



Chrome Plating



Gold Plating



Tinned Lead Plating



ABS Plating



Nickel Plating



Silver Plating



Zinc Plating

## 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: Polypropylene and titanium alloys excel in harsh conditions with built-in corrosion and thermal stability, making them top picks for chemical-resistant or extreme-temperature applications.

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.

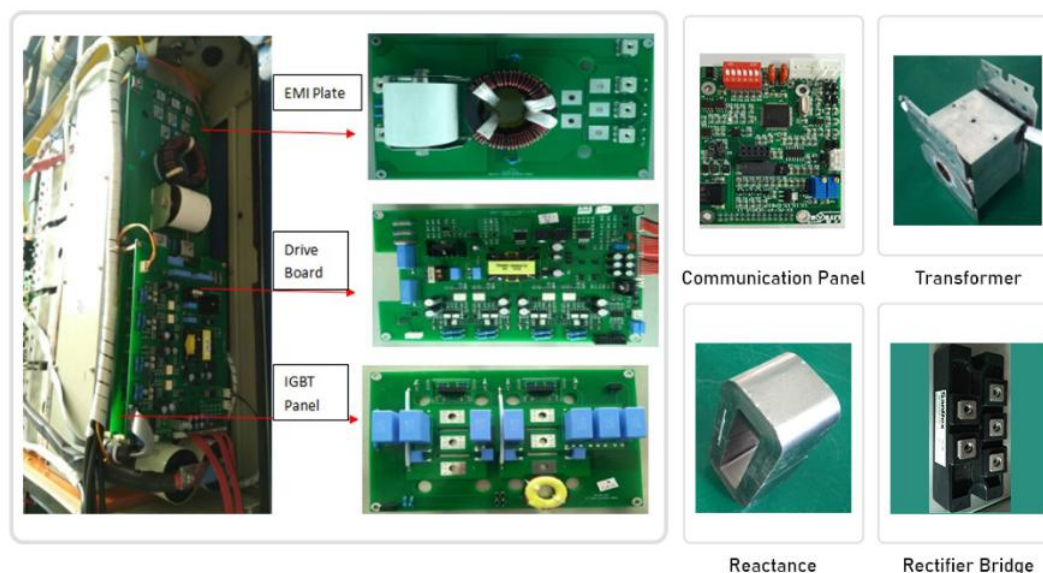
### › Auxiliary Equipment

Filters: Remove impurities from the solution.

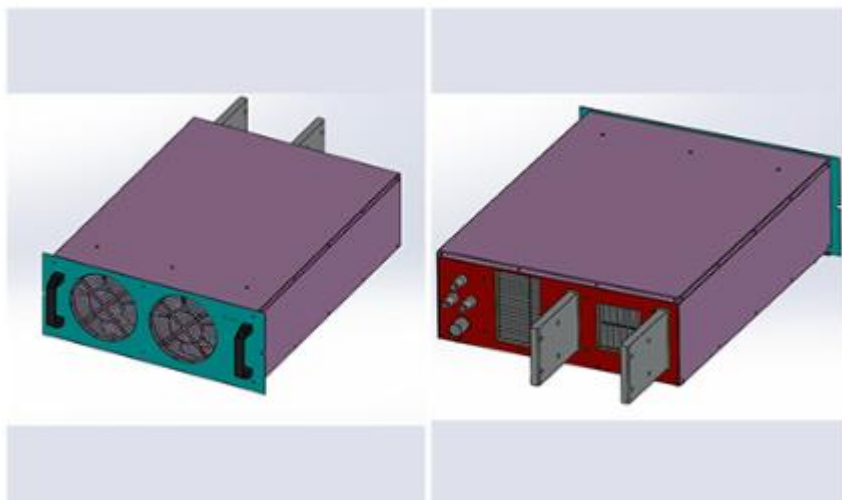
Heaters: Maintain solution temperature.

Stirrers: Ensure uniform mixing.

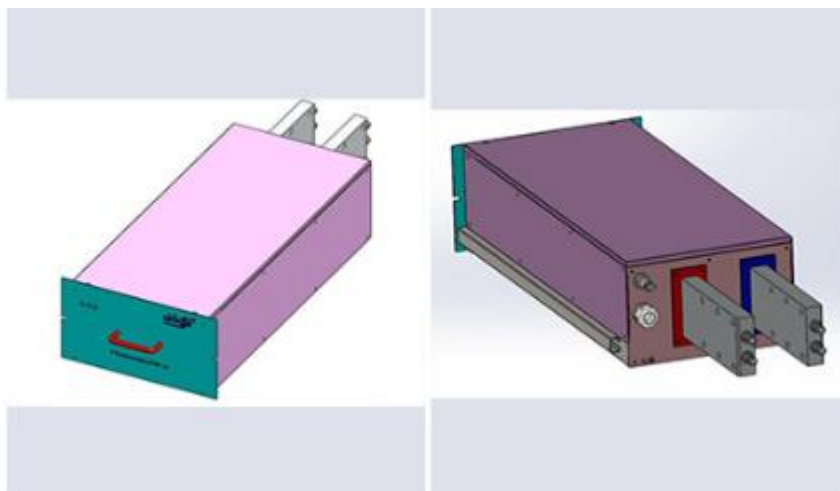
## 8.Component Part for Electroplating



## 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 and specifications	HPNPS-2*Z1000AF3000A/6V
	Cooling mode	Water-cooled
	Switch tube type	IGBT
Input Characteristics	Rated Input Voltage	Three-phase, AC380V $\pm$ 10% ,50HZ
	Rated Input Power	26KVA
	Rated Input Current	AC 39.5A
	Input Power Factor	COS $\Phi$ $\geq$ 0.90
Output Characteristics	Output Voltage	DC +10V/-30V
	Output Current	DC 2*+1000A/2*-3000A
	Stabilized Current Precision	$\leq$ 1% (Rated Current)
	Stabilized Voltage Precision	$\leq$ 1%
	According to accuracy	1A, 0.1V
	Rated Output efficiency	$\geq$ 90%
Environmental Conditions	Installation site	Indoor installations
	Altitude	$\leq$ 2000 meters
	Ambient temperature	-20 $^{\circ}$ C $\sim$ 40 $^{\circ}$ C
	Relative humidity	$\leq$ 90%
Control Mode	Operating mode	PLC, ADDA, Ethernet, RS485 and RS232
Weight	Net weight	About 400KG
Dimension	Height*Width*Depth	H860mm $\times$ W700mm $\times$ D930mm
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.

Are you looking for 10V-30V Positive and Negative Pulse Plating Rectifier? Liyuan Haina Group is one of the professional manufacturers and suppliers in this field. With over 27 years of focus on R&D, design, production, sales, and technical services for industrial rectifiers, we have already exported our products to the United States, Canada, Britain, Italy, Spain, South Africa, Russia, the UAE, Japan, South Korea, Malaysia, and other parts of the world. Equipped with a productive factory, we warmly welcome you to purchase our high-quality, Made-in-China products at competitive prices or try our customized service.