

## **(3000A+1000A)/12V Electroplating Rectifier Power Supply**

### **1.Specifications:**

Input parameters: Three-phase AC 380V  $\pm$  10% 60Hz

In line with the national power quality standards

Output parameters: Two independent stand-alone machines.

One TBFB-1000A/12V single machine:

DC 0~12V adjustable, DC 0~1000A adjustable;

One TBFB-3000A/12V single machine

DC 0~12V adjustable, DC 0~3000A adjustable.

Output mode: Common DC output

Cooling method: Air cooling

Power supply type: IGBT-based

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

### **2.Product Description**

In an Electroplating Rectifier Power Supply, 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 Electroplating Rectifier Power Supply 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.



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:** 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.

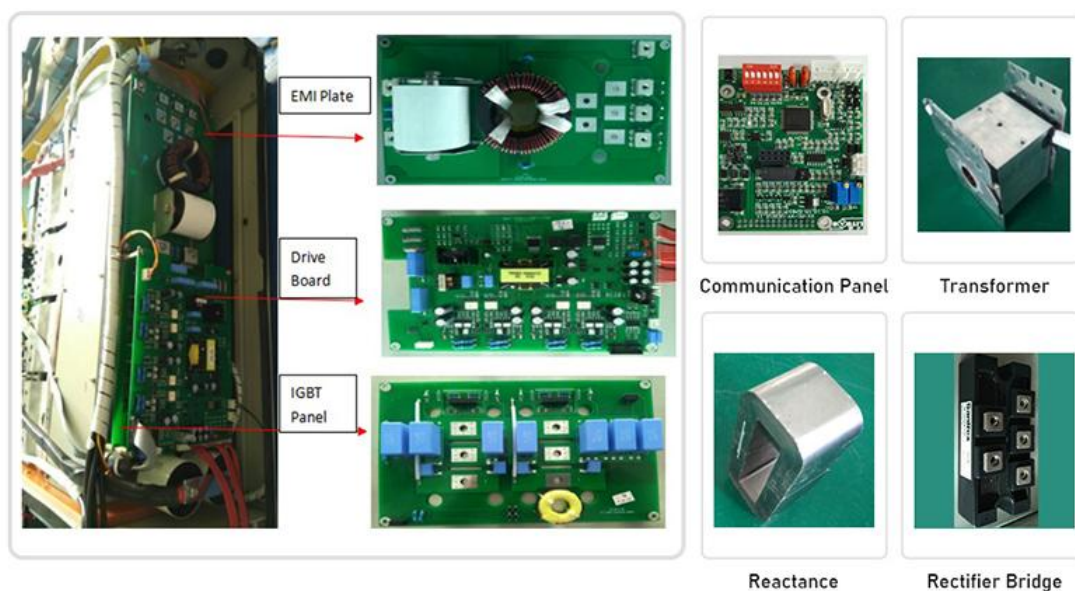
#### › Auxiliary Equipment

Filters: Remove impurities from the solution.

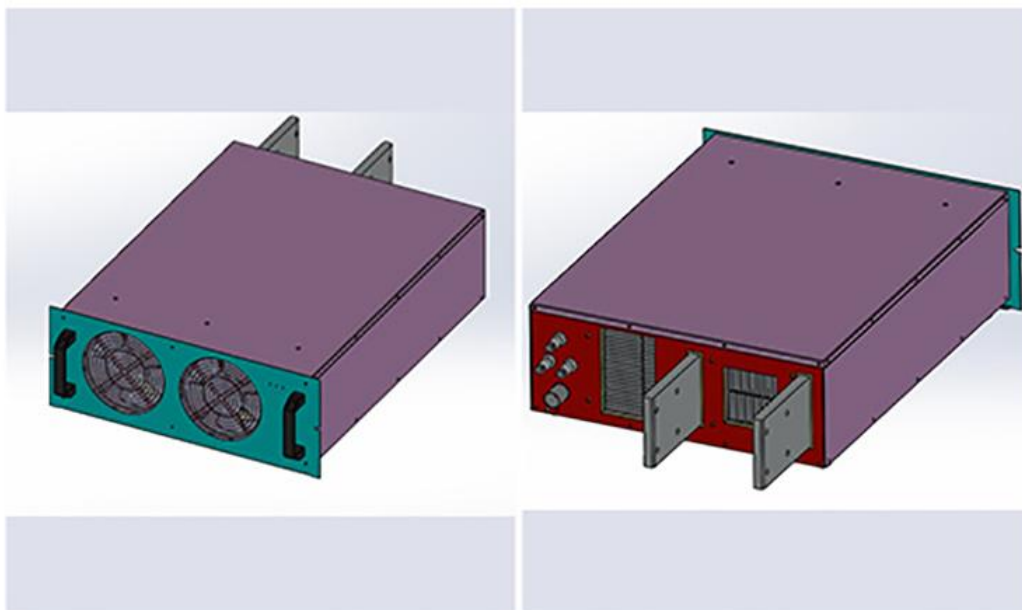
Heaters: Maintain solution temperature.

Stirrers: Ensure uniform mixing.

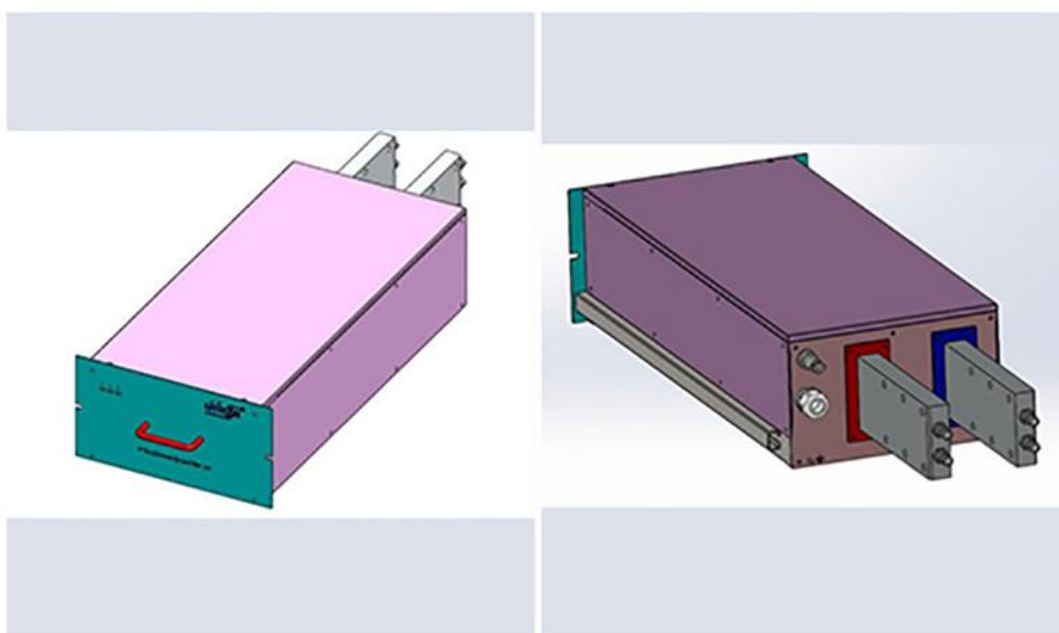
### 8.Component Part for Electroplating



## 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

Attribute type	Parameter items	Technical requirements
Input characteristics	Rated input voltage	Three-phase AC 380V $\pm$ 10% 60Hz In line with the national power quality standards
	Rated input current	AC 84.4A
	Rated input power	55.5KVA
	Rated input power factor	COS $\Phi$ $\geq$ 0.95
Output characteristics	Output voltage current	Two independent stand-alone machines. One TBFB-1000A/12V single machine: DC 0 $\sim$ 12V adjustable, DC 0 $\sim$ 1000A adjustable; One TBFB-3000A/12V single machine DC 0 $\sim$ 12V adjustable, DC 0 $\sim$ 3000A adjustable.
	Steady current precision	$\leq$ 1%
	Steady voltage precision	$\leq$ 1%
	Display accuracy	TBFB-1000A/12V: 1A, 0.01V TBFB-3000A/12V: 1A, 0.01V
	Rated output efficiency	$\geq$ 94%
Insulation characteristics	Insulation resistance	Input-output: $\geq$ 5M $\Omega$
		Input-chassis: $\geq$ 5M $\Omega$
		Output-chassis; $\geq$ 5M $\Omega$
Protection characteristics	It has self-protection function under abnormal conditions such as overvoltage, overcurrent, overload, short circuit and overheat	
Other characteristics	Noise	$\leq$ 75dB
	Operating status	Continuous full load operation of the product
	Load grade	Grade II
	Insulation grade of transformer	Class B
	Weight	300kg

## **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 (3000A+1000A)/12V Electroplating Rectifier Power Supply?

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, Pakistan, 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.