

500A 30V DC/AC Coloring Rectifier

1.Specifications:

Input parameters: Three phase, AC380V \pm 10% ,50~60HZ

Output parameters: AC : 0~30V 0~500A DC : 0~30V 0~500A

Output mode: AC/ DC output

Cooling method: Air cooling

Power supply type: IGBT-based power supply

Application Industry: Oxidation of aluminium profile and DC/AC coloring

2.Product Description

Anodizing, a key surface treatment process, involves electrochemical oxidation to form an oxide film on metals like aluminum, enhancing wear resistance, durability, and aesthetics. The use of advanced equipment such as the Anodizing Rectifier and DC/AC Coloring Rectifier has revolutionized this process, improving precision and efficiency.

During anodizing, an applied current creates a protective oxide layer (Al₂O₃) on aluminum, which can be enhanced through coloring methods like electrolytic or chemical processes. The DC/AC Coloring Rectifier ensures uniform and vibrant coloring, while the Anodizing Rectifier optimizes the oxidation phase, especially in hard anodizing, which requires higher voltages (up to 120V) compared to decorative anodizing (20V-24V).

The Anodizing Rectifier employs high-frequency switching technology, offering benefits like energy savings, shorter processing times, and easier maintenance. The DC/AC Coloring Rectifier complements this by providing precise control over coloring, ensuring consistent, high-quality results. Together, these rectifiers are indispensable in industries requiring efficient and precise aluminum anodizing, delivering both functional and aesthetic

improvements.

3.Product Applications

Anodizing is a vital surface treatment process, widely used in industries like aerospace, automotive, construction, and electronics for enhancing aluminum's durability, corrosion resistance, and aesthetics. This electrochemical process creates a protective oxide layer, offering benefits such as improved abrasion resistance, electrical insulation, and long-lasting finishes. Anodized aluminum retains its color and appearance even under sunlight, making it ideal for both functional and decorative applications.

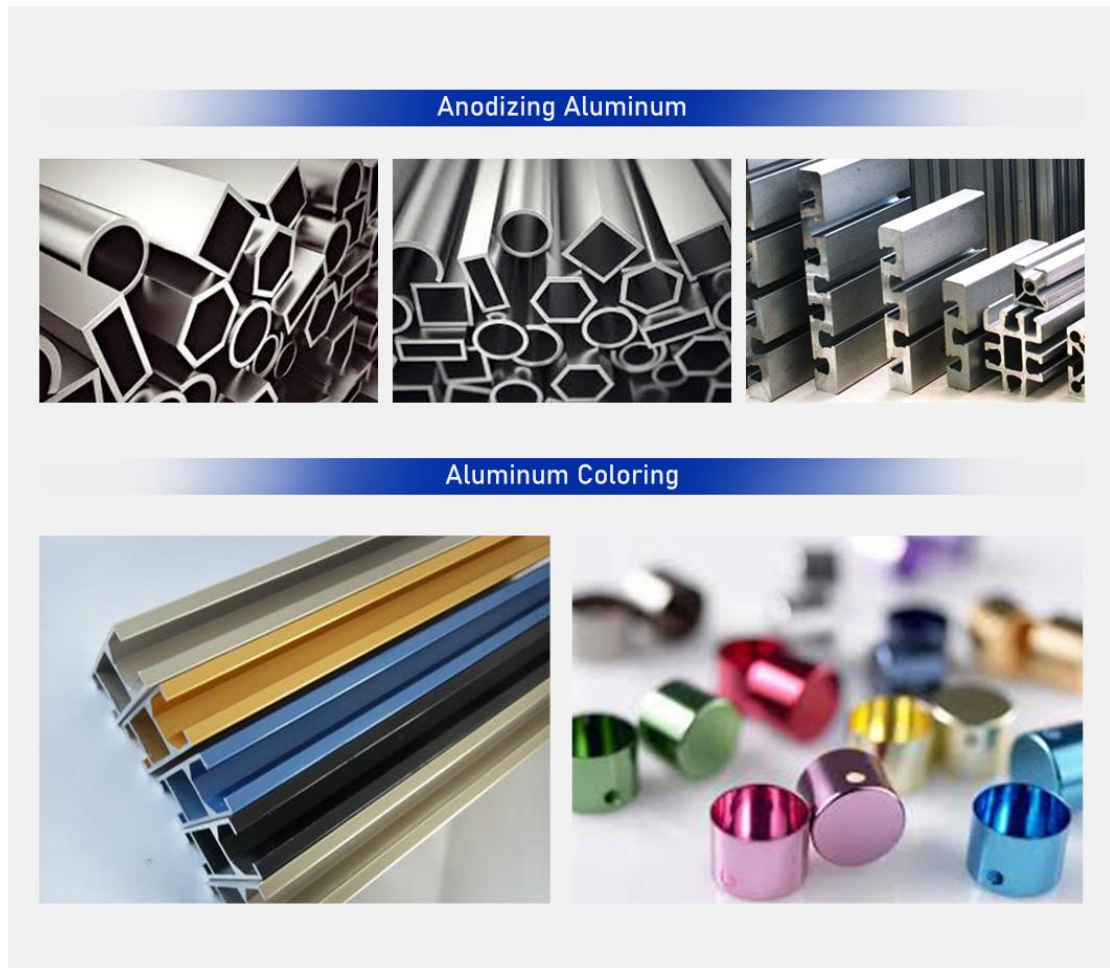
In automotive and architectural sectors, anodizing is used for trim parts, wheels, window frames, and structural components, providing corrosion resistance and surface hardness. The DC/AC Coloring Rectifier ensures precise and uniform coloring, enhancing the aesthetic appeal of anodized products. In electronics, anodized aluminum is used for enclosures and heat sinks, leveraging its non-conductive and heat-dissipating properties.

The integration of the DC/AC Coloring Rectifier into the anodizing process ensures efficient and consistent results, making it indispensable for industries requiring high-quality, durable, and visually appealing aluminum products.

1)Field application diagram:



2) Industry application examples:



4. Technology Advantages

A very thin coating: Anodizing creates a fine, uniform oxide layer on aluminum without significantly altering the dimensions of the base material.

Excellent corrosion protection: The anodized surface provides a highly resistant barrier against corrosion, making aluminum ideal for use in harsh environmental conditions.

Good electrical insulator: The anodized layer acts as a dielectric, providing insulation in electronic components and electrical applications.

Fade-resistant in sunlight: The anodized layer is highly resistant to UV degradation, ensuring long-term aesthetic appeal, even with prolonged exposure to sunlight.

Environmentally friendly finish: Anodizing uses non-toxic, water-based electrolytes and does not involve harmful chemicals, making it an environmentally safe process.

Inexpensive: Anodizing is a cost-effective surface treatment option that enhances the performance and longevity of aluminum without adding significant costs.

Extremely durable, hard, abrasion-resistant, and long-lasting: The anodized layer increases aluminum's hardness and wear resistance, extending the lifespan of the product, particularly in demanding environments.

Features of Aluminum Oxide Power Supply: The voltage of common anodizing power supplies typically ranges from 18V to 24V, with currents of 4000A, 6000A, or 12KA. For hard anodizing, which involves creating thicker oxide films, the voltage is generally higher, such as 80V or 100V, with currents like 1500A. This high voltage ensures the formation of a more durable oxide coating, enhancing wear resistance and surface hardness.

5.Role of Anodizing

The role of anodizing in surface treatment includes several key functions that enhance the properties and performance of aluminum and its alloys:

Corrosion Resistance: Anodizing significantly improves the aluminum's resistance to corrosion, making it ideal for use in harsh environments such as marine, aerospace, and automotive applications.

Surface Hardening: The anodized layer is much harder than the underlying aluminum, providing increased wear resistance and durability. This makes anodized aluminum suitable for high-stress applications.

Aesthetic Enhancement: Anodizing allows for a variety of coloring techniques (chemical, electrolytic, or natural coloring) that enhance the visual appeal of aluminum products, commonly used in architectural, consumer goods, and electronics industries.

Electrical Insulation: The anodized layer acts as a dielectric, providing insulation, which is particularly useful in electrical and electronic applications like connectors, capacitors, and housings.

Improved Adhesion: The anodized surface has better adhesion properties for paints, coatings, and adhesives, making it ideal for post-treatment processes in automotive and construction industries.

Environmentally Friendly: Anodizing is a sustainable, eco-friendly process as it does not use harmful chemicals and generates minimal waste compared to other coating methods like plating.

Increased Wear Resistance: Anodized aluminum is highly abrasion-resistant, which makes it suitable for applications that require a durable and long-lasting finish, such as aerospace, military, and heavy-duty machinery.

Thermal Dissipation: Anodized aluminum has better heat dissipation properties, making it ideal for applications like heat sinks and other cooling components in electronic devices.

Overall, anodizing is essential in improving the mechanical, electrical, and aesthetic properties of aluminum, providing a versatile solution for various industrial applications.

6.Types of Anodizing

Anodizing rectifiers provide the necessary electrical current and voltage to create a protective oxide layer on aluminum. The main types include the Aluminum Anodizing Rectifier and the DC/AC Coloring Rectifier, each designed for specific anodizing requirements.

(1)Aluminum Anodizing Rectifier

Function: Delivers direct current (DC) to form a protective oxide layer on aluminum. Voltage typically ranges from 18V-24V for standard anodizing, and up to 80V or higher for hard anodizing.

Features:

Precise Voltage Control: Ensures optimal oxide film formation.

Stable Current: Prevents defects like uneven layers.

Energy Efficient: High-frequency switching technology reduces energy use.

Applications: Used in aerospace, automotive, and construction for corrosion-resistant aluminum products.

(2)DC/AC Coloring Rectifier

Function: Allows for both DC and AC currents to enable precise color effects in anodizing while maintaining the oxide layer's integrity.

Features:

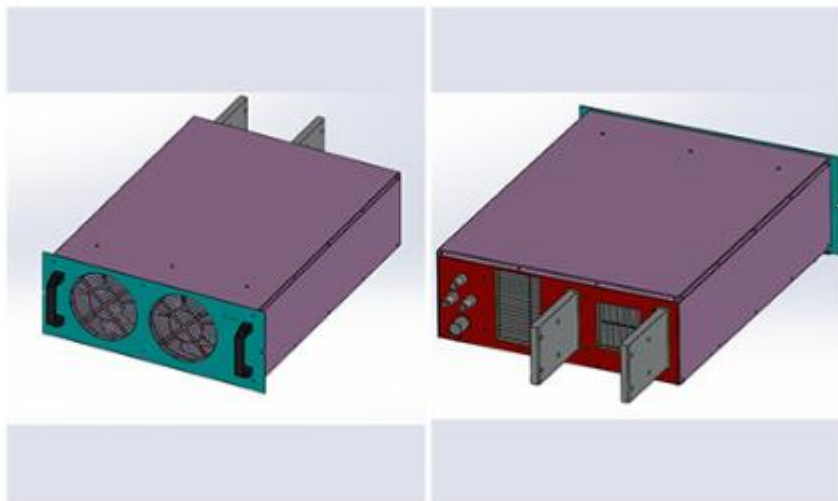
Dual Current Output: Enables fine control over color development.

Energy Efficiency: High-frequency switching reduces energy consumption.

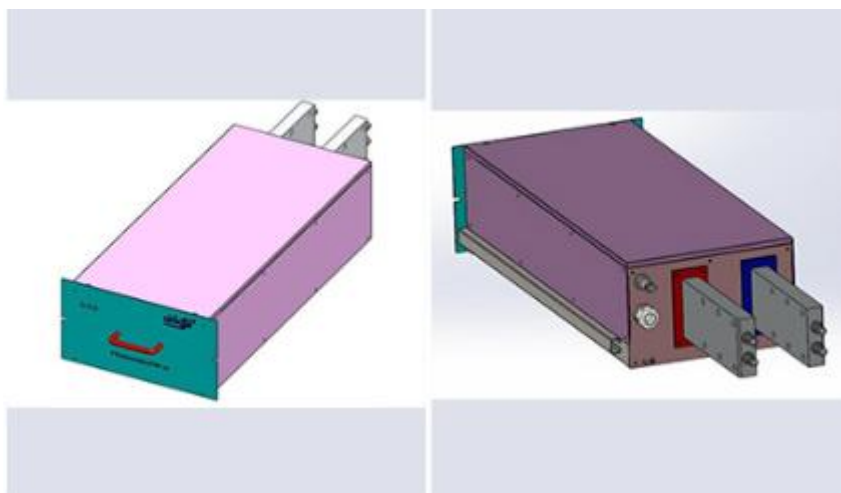
Applications: Ideal for decorative anodized aluminum in consumer goods, architecture, and electronics.

Both rectifiers are essential for anodizing, with the Aluminum Anodizing Rectifier focusing on durability and corrosion resistance, and the DC/AC Coloring Rectifier enabling precise color control for aesthetic applications. These rectifiers ensure efficient, high-quality anodizing results tailored to industry needs.

7.Cooling Type for Anodizing



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



Water Cooling: Built-in water circulation line

8. Technical Parameters

Characteristic Types	Parameter Items	Technical Requirements
Power Types	Power types	High-frequency Power Supply
	Model and specifications	TDFB-800A/150V
	Cooling mode	Air-cooled
	Switch tube type	IGBT
Input Characteristics	Rated Input Voltage	Three-phase, AC380V \pm 10% ,50~60HZ
	Rated Input Power	133KW
	Rated Input Current	AC 203A
	Input Power Factor	COS Φ \geq 0.95
Output Characteristics	Output Voltage	DC 0~150V
	Output Current	DC 0~800A
	According to accuracy	1A, 0.1V
	Rated Output efficiency	\geq 90%
Environmental Conditions	Installation site	Indoor installations
	Altitude	\leq 2000 meters
	Ambient temperature	-20℃~45℃
	Relative humidity	\leq 91%
Control Mode	Operating mode	PLC, ADDA, Ethernet, RS485 and RS232
External Dimension	Height*Width*Depth	H2150mm×W1550mm×D1200mm
Protection Characteristics	With over voltage, over current, overload, short circuit, overheating and other abnormal self-protection function	

9.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.

10.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.

11.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.



12. 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 500A 30V DC/AC Coloring 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, India, 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.