

25V 12KA DC/AC Coloring Rectifier

1.Specifications:

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

Output parameters: AC: 0~25V 0~12KA DC : 0~25V 0~12KA

Output mode: AC/ DC output

Cooling method: Water cooling

Power supply type: IGBT-based power supply

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

Anodic oxidation is accomplished by immersing aluminum in an acidic electrolyte and running an electric current through the medium. The cathode is installed inside the anodic oxidation tank. Aluminum acts as an anode, so oxygen ions are released from the electrolyte and combine with the aluminum atoms on the surface of the anodized part. Therefore, anodic oxidation is a highly controlled oxidation problem – an enhancement of natural phenomena. Anodic oxidation is generally used to strengthen the product hardness, corrosion resistance and do surface treatment. One of the materials required to make a set of anodic oxidation equipment in addition to the anode tank, including the anode cathode, refrigerator, etc., rectifier is essential.

Anodic oxidation, electrochemical oxidation of metals or alloys. Aluminum and its alloy in the corresponding electrolyte and specific process conditions, due

to the action of impressed current, aluminum products (anode) on the formation of a layer of oxide film process. Anodizing, unless otherwise specified, usually means anodizing sulfuric acid.

In order to overcome the defects of aluminum alloy surface hardness, wear resistance and so on, expand the scope of application, prolong the service life, surface treatment technology has become an indispensable part of the use of aluminum alloy, and anodic oxidation technology is widely used and successful.

The anodic oxidation of aluminum is an electrolytic oxidation process in which the surface of aluminum and aluminum alloy is usually transformed into an oxide film, which has protective, decorative and other functional properties.

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:

Anodizing Aluminum



Aluminum Coloring



4. Technology Advantages

Dual-channel hot spare scramble-free switchover;

High accuracy of steady flow;

Critical loop redundancy;

High Reliability;

Easy to use and repair;

Soft startup, soft shutdown;

Fault Self-diagnosis;

On/Off loop disturbance-free switch.

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:

Three output poles are designed. Based on the traditional coloring power, the auxiliary action function is added. The power can automatically clean the pole plate to reduce the color differences.

The high-power induction voltage regulator is used for voltage regulation. Single phase or three-phase hybrid single-phase transformer is used to reduce voltage. The servo system is used

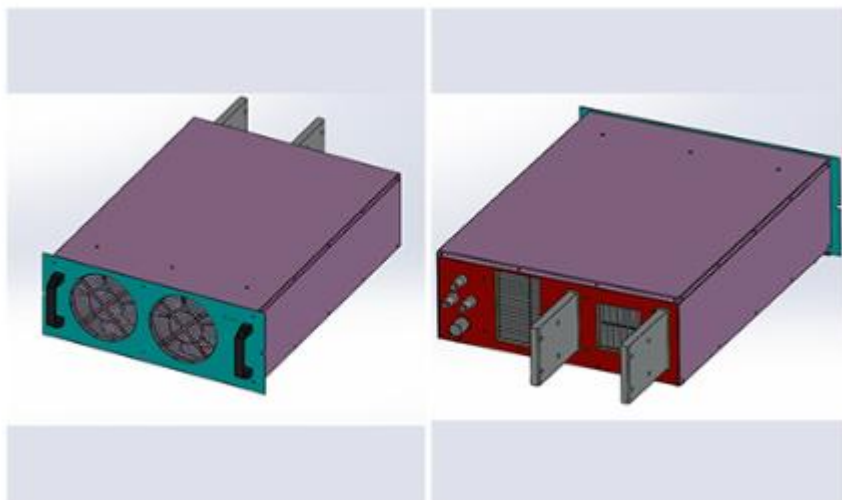
for high-speed precise regulation and control. The silicon controlled is used as the non-touch switch of the main circuit to stably output the linear sine wave form for electrolysis coloring and DC wave form for activation.

Provide perfect protection functions such as phase failure, over- voltage, over-current, over-heat and short circuit.

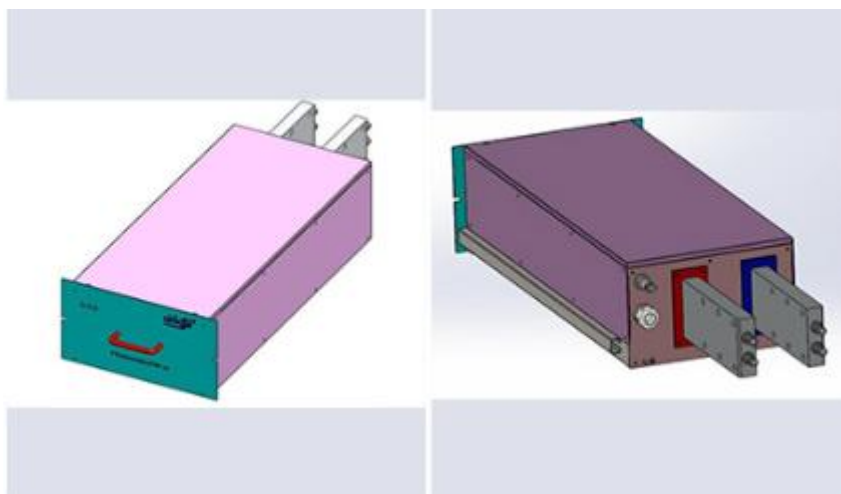
The PLC+ touch screen control is used. The touch screen can be used for state setting, parameter setting, data display and failure display. The immersion color, auxiliary activation, coloring, complementary color and fading processes are precisely controlled to realize multiple coloring modes. The PLC (programmable controller) can realize communication with the upper computer, online control and data collection.

The PROFIBUS, MODBUS, CC-LINK bus network and optic industry Ethernet are designed and connected according to the Customer's requirements. The analog signal control mode can be connected, including 4-20mA, 0-5A and 0-10V.

7.Cooling Type for Anodizing



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



Water Cooling: Built-in water circulation line

8.Components of silicon controlled rectifier



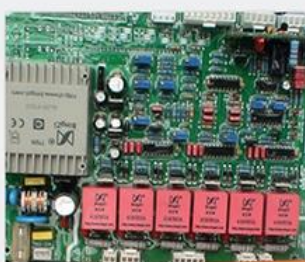
Bolt



Thyristor



Flat ceramic



Main Control Panel



Component Diagram



Component Diagram



Senor



Transformer



Counter Flow Sensor

9. Technical Parameters

Characteristic Types	Parameter Items	Technical Requirements
Power Types	Power types	Silicon Controlled Rectifier
	Model specifications and	AC/DC-12KA/25V
	Cooling mode	Water-cooled
	Switch tube type	SCR Thyristor
Input Characteristics	Rated Input Voltage	Three-phase, AC380V±10% ,50~60HZ
	Rated Input Power	353KW
	Rated Input Current	A phase, C phase AC 928A, B phase 5A
	Input Power Factor	COSΦ≥0.85
Output Characteristics	Output Voltage	DC: 0~25V AC: 0~25V
	Output Current	DC: 0~12000A AC: 0~12000A
	According to accuracy	1A, 0.1V
	Rated Output efficiency	≥85%
Environmental Conditions	Installation site	Indoor installations
	Altitude	≤1500 meters
	Ambient temperature	-20℃~45℃
	Relative humidity	≤90%
Control Mode	Operating mode	PLC, ADDA, Ethernet, RS485 and RS232
External Dimension	Height*Width*Depth	H2300mm×W1500mm×D2300mm
Protection Characteristics	With over voltage, over current, overload, short circuit, overheating and other abnormal self-protection function	

10.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.

11.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.

12.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.



13.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 25V 12KA 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.