MIKROUNA

SUPER PURIFIED GLOVE BOX

ABOUT US

Mikrouna products strictly implement the German manufacturing standard VDA6.3

Corporate Mission

Contribute to the development of society through technological progress

Manufacturing Standards

German standard, nuclear standard

Core Values

Fairness, Integrity, Technology Innovation, Brand Strategy, Social Responsibility Compliance with the law, team spirit

Company Profile

As a high-tech company integrating R & D, production and service, and a brand created according to German business culture, Mikrouna has always been committed to providing high-end intelligent equipment and services to global customers.
Fairness, justice, technological innovation, brand strategy, social responsibility, law-abiding and teamwork spirit constitute the core values of Mikrouna.
Mikrouna has always been adhering to the mission of technological progress making contributions to social development . It began to research, produce and sell glove box equipment in China since 2004. The products cover inert atmosphere glove box and related intelligent equipment, radiochemical-level sealed chamber intelligent equipment, gas/solvent purification systems, etc. These products are widely used in lithium battery R & D and production, physical and chemical research, powder metallurgy, nuclear technology, biopharmaceuticals, special welding, OLED, material processing, fine chemical and other industries.
Mikrouna's products are sold all over the world. Its headquarters is located in Shanghai and it has three manufacturing bases in Shanghai, Xiaogan Hubei and Tianjin (preparation), and a sales center in the United States. The complete and advanced production equipment provide strong support for product quality and ensure continuous improvement of production capacity.

Striving for excellence, and the boutique strategy is the product strategy of Mikrouna, and also the persistent pursuit of Mikrouna.
Mikrouna fully realizes informatization management, relying on the ERP/PLM system as the core, and developing supporting subsystems according to different business needs, including financial management, supply chain management, production management, quality management and other systems to form an integrated architecture, which efficiently realizes the large-scale standardized mode manufacturing of non-standard equipment, and also ensures that each product strictly implements quality control and realizes a fully closed-loop traceable.
Mikrouna has a professional product R & D team, with more than one hundred engineering and technical personnel, including one researcher (professor-level senior engineer), more than one hundred senior engineers and engineers. Participating in the R & D and manufacturing of relevant equipment in a major national science and technology project, owning more than one hundred patented technologies, and many high-tech achievements transformations; in addition, the company has obtained the high-tech enterprise certificate, ISO9001, CE, UL and other certifications, all of which are the powerful guarantee of Mikrouna's boutique strategy.

patented technologies
100+

R & D centers
4

technical personnel
100+

Established
20+

Product Features

Informationization and systematic management

It has realized informatization and systematization on enterprise management in the whole process from design, procurement, production, finance, sales to after-sales, and the product manufacturing process can be monitored and tracked at any time to ensure stable product quality, on-time delivery and fast service.

Advanced and perfect production equipment

It has high-precision, ull-range and advanced production equipment from domestic and foreign well-known brands. This provides strong support for product quality and promotes the continuous improvement of production capacity.

Full range of products, which can be customized according to requirements

The products can be integrated with organic solvent adsorbers, refrigerators, heating furnaces, micro projection systems, cold trap low-temperature baths, solvent purification systems, dust removal systems, pressurization systems, evaporation platforms, photoresist spinner and vacuum furnaces, etc., and hydrofluoric acid and CO_2 removal devices can be provided for the lithium battery industry.

Large-scale, standardized, modular design and production

Large-scale production realizes the bulk procurement of parts; standardization realizes the universal and interchangeable parts; modularity makes the entire production and assembly process simple and orderly.

Products are manufactured in strict accordance with German standards and nuclear industry standards

The product technology and quality have reached or exceeded the level of international well-known brands, with stable supply to PHILIPS, OSRAM (Germany) CGE, AIXTRON (Germany), Mitsubishi, Sanyo, PLANSEE and other international well-known brands, and rich experience accumulated in international cooperation.

Products can be used in a variety of industries

The products can be used in the R&D and production of lithium batteries, physical and chemical research, powder metallurgy, nuclear technology, special welding, OLED and PLED research, pharmaceutical industry, material processing, solar cells, 3D printing, special lamp R&D and production, fine chemical industry, polymer materials and other industries.

The dew point analyzer adopts the P205 sensor

It is used in corrosive environments such as lithium and organometallics, and can be restored by cleaning and recycling, effectively solving the problem of scrapping due to pollution.

The oxygen analyzer adopts a ZrO2 sensor

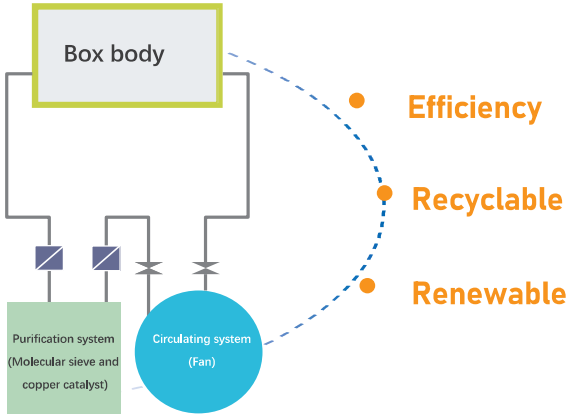
It effectively solves the problem that the fuel cell has a short life and cannot be exposed to the air.

A Inert gas protection/ isolation/vacuum equipment products

Function principle

- Under the control and monitoring of PLC, the working gas in the box is closed and circulates between the box and the purification column (water oxygen adsorbent) through pipes, circulating fans, etc.
- When the working gas circulates through the purification column, the water and oxygen contained in it are absorbed and then returned to the box. With the passage of cycle time, the water and oxygen content in the working gas in the box will gradually reduce, and eventually reach the index of <1ppm.
- The purification column will be adsorbed and saturated after a certain period of cycle, and can be regenerated and reused.

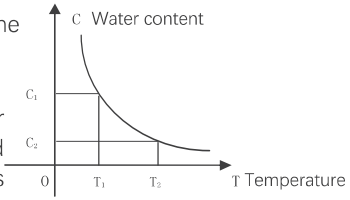
Schematic diagram



Working principle of purification system

Physical process of molecular sieve water absorption

- When the temperature T1 is low, the water saturation of the molecular sieve C1 is high, and it can absorb a lot of water.
- When the temperature T2 is high, the molecular sieve water saturation C2 is low, and the adsorbed water will be released first and evaporate. Regeneration of molecular sieve is achieved by heating and vacuuming.



Water content characteristics of molecular sieve

Copper catalyst oxygen absorption and reduction process

Working process	$O2+2Cu=2CuO$
Regeneration process	$CuO+H_2=Cu+H_2O$

Regeneration process: $CuO+H_2\overset{\Delta}{=}Cu+H_2O$

MIKROUNA

Glove Box Composition

Glove box	
Box body	Material: 304 stainless steel, thickness 3mm Exterior surface: 304 stainless steel (color can be customized) Inner surface: oil film drawing surface Internal dimensions: single section of different lengths 1220, 1500, 1800, 2440mm Different depth 750, 1000, 1200mm Height 900mm
Front Window	O-ring vacuum flange seal, tempered glass thickness 8mm
Glove opening	Material is aluminum alloy: O-ring seal
Glove	Butyl rubber: thickness 0.4mm, diameter 7 “or 8”
Filter	Specification: 0.3μm, one gas inlet and one gas outlet
Supporter	Material: Stainless steel, built-in 3 layers, adjustable height
Box lighting	Location: LED light, installed in the lampshade
Interface	Specifications: DN40KF, several standby interfaces, 1 power interface (220V))

Purification unit	
Purification column	Function: gas seal, water removal, oxygen removal Container material: 304 stainless steel Purification material: copper catalyst 5kg, molecular sieve 5kg Purification capacity: oxygen removal 60L, water removal 2kg
Circulating system	Water and oxygen index: <1ppm Working gas: nitrogen, argon, helium Circulation capacity: integrated fan flow 90m²/h (Higher fan flow available: 145m²/h, 180m²/h)
Regeneration	Operation: PLC automatically controls the regeneration process Regenerative gas: working gas mixed with hydrogen gas
Vacuum pump	Specification: 12m³/h, 16m³/h Rotary vane pump: with oil mist filter, air vibration control
Valve	Main valve: DN40KF, electropneumatic angle valve Control valve: solenoid integrated valve

Circular transition bin		Circular small transition bin	Circular big transition bin
Bin body	Size	Diameter 150mm Length 300mm	Diameter 360mm(Optional 400mm) Length 600mm
	Materials	304 stainless steel	304 stainless steel
	Surface treatment	The inner surface is the oil film drawing surface, and the outer surface is spray-paint or mirror surface	
	Tray	Tray	Sliding Tray
Accessory	Bin gate	Dual doors,	Dual doors, with anodized aluminum material,Thickness 10mm, vertical operation, with lift structure
	Pressure meter	Analog display	Analog display
Control	Operation	Manual operation	Automatic control

Standard rectangular transition bin		Standard rectangular small transition bin	Standard rectangular big transition bin
Bin body	Size	Size: 120x150mm	Size: 260x300mm Optional: 360×360mm/450×450mm
	Materials	304 stainless steel	304 stainless steel
	Surface treatment	The inner surface is the oil film drawing surface, and the outer surface is spray-paint or mirror surface	
	Tray	With pallet, no slideway	Sliding Tray
Accessory	Bin gate	Dual doors	Dual doors, with anodized aluminum material,Thickness 10mm, vertical operation,with lift structure
	Pressure meter	Analog display	Analog display
Control	Operation	Operation	Automatic control

* The above specifications are the nominal dimensions of the glove box

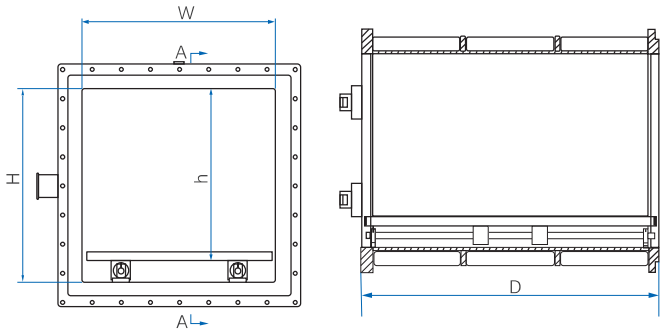
Model Parameters

	Model	Super/Upure	Universal	Advanced
Operation surface Dimensions LxWxH (mm)	Single station (Single side)	1220x750x900		1220x750x900
	Dual stations (Single side)		2440x750x900	2440x750x900
			1800x750x900	1800x750x900
	Dual stations (Dual sides)		1220x1000x900	1220x1000x900
	Three pairs of gloves (single side)		1500x750x900	1500x750x900
	Four pairs of gloves (single side)		1800x750x900	1800x750x900
	Three stations (Single side)		3660x750x900	3660x750x900
	Four stations (Single side)		4880x750x900	4880x750x900
	Four stations (Dual sides)		2440x1000x900	2440x1000x900
	Six stations (Opposite side)		3660x1000x900	3660x1000x900
			3660x1200x900	3660x1200x900
	Eight stations (Opposite side)		4880x1000x900	4880x1000x900
			4880x1200x900	4880x1200x900
	12 stations (Opposite side)		7320x1000x900	7320x1000x900
Control System		Siemens S7	Siemens S7	Siemens S7
Touch screen		Siemens 7" Touch Screen	Siemens 7" Touch Screen	Siemens 7" Touch Screen
Purifier		Single	Single	Double
Blower		90 m^3/h	90 / 145 / 180 m^3/h	90 / 145 / 180 m^3/h
Vacuum pump		12 m^3/h	12 / 16 m^3/h	12 / 16 m^3/h
Moisture		<0.1ppm	<0.1ppm	<0.1ppm
Oxygen		<0.1ppm	<0.1ppm	<0.1ppm
Applications		R&D type For R&D in University and Laboratory	Universal type For both R&D and small-scale production	Production type For large-scale production

* Upure: With internet remote control and automatic antechamber door.
* The above specification dimensions are the nominal dimensions of the glove box case

Standard heating rectangular bin specifications (mm)

Heating rectangular bin	Inner width W	Inner height H	Inner depth D	Remark
360x360x500	360	360	510	The actual effective size depends on the heating method



Standard rectangular bin specifications (mm)

Analyzer		
Dew point analyzer	Measuring range	0 ~ 500ppm
	Sensor	P_2O_5 range
Oxygen analyzer	Measuring range	0 ~ 1000ppm
	Sensor	ZrO_2 range

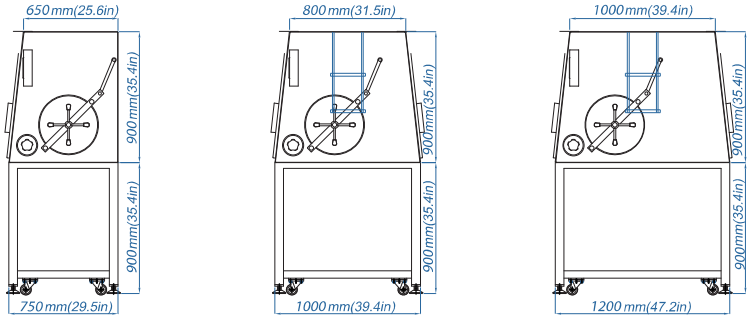

Organic solvent adsorber


Single-column integrated valve assembly

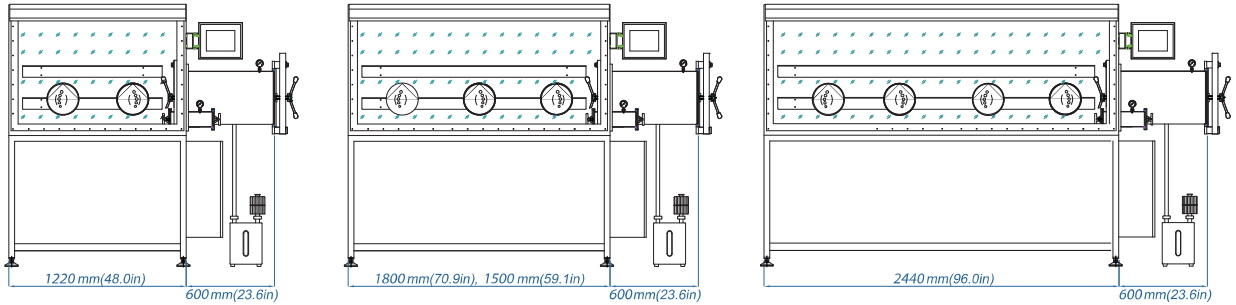

Heating big bin


Pressure meter

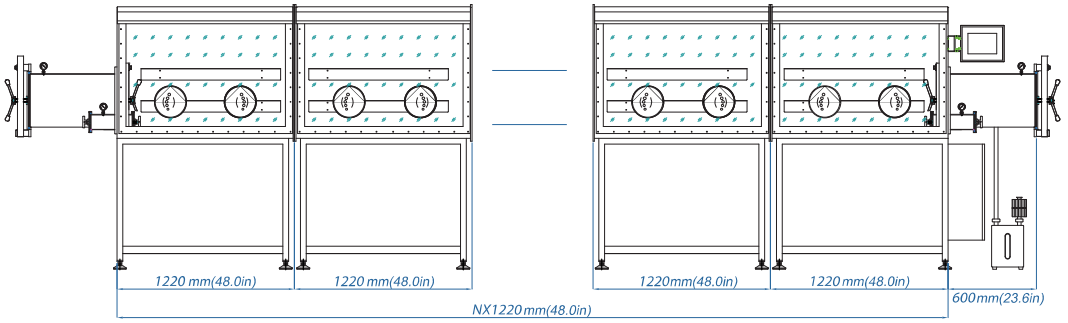
Depth and height size



Length size



Module combination



O-ring vacuum seal flanged-window glove box

Extensible

Optional

Refrigerator

Independent Purification system

Ultra-clean Filtration system

Mirror surface Transition bin

Heating Transition bin

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Integrated temperature control

Cold trap

Microscope

Double-sided window

- Vacuum sealed flange window
- Integral flange window molding
- Easy disassembly and maintenance
- O-ring, "0" leak

O-ring vacuum seal flange window glove box

Super(1220/750/900)

- Flange window "O" seal structure
- Circular big/small transition bin

Super Pro(1220/750/900)

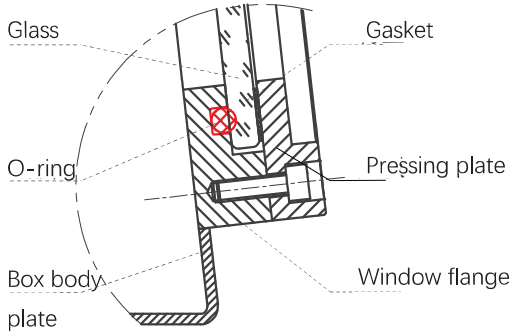
- Flange window "O" seal structure
- Rectangular big/small transition bin
- Manually operated door

Pro(1220/750/900)

- Flange window "O" seal structure
- Rectangular big/small transition bin
- Automatic door

Features and advantages of O-ring flange window:

- The window flange is of rectangular ring cut from a whole piece of thick plate for high strength and resistant to impact, extrusion and deformation, with sealing groove to be slotted.
- The whole flange window and ring sealing groove are formed in one step in the large gantry machining center.
- The flatness of the sealing support surface and the bottom surface of the sealing groove is <0.1 mm/m.
- The flange window and the box adopts continuous welding mode, with non-destructive testing adopted to detect the weld, and there is no leakage in the welding. It adopts the vacuum sealing mode of embedding the integrated "O-shape" sealing ring into the ring-shape groove without seams on the sealing ring, for high sealing reliability, low leakage rate, and box leakage rate of <0.0006vol%/h.
- Suitable for sealing of windows and doors of vacuum equipment.



"O"-ring flange window seal
Structure diagram

Part of the products display

Four ports glove box

Dual stations glove box

Four stations glove box (Dual sides)

Six stations glove box(Dual sides)

Organic chemistry experiment glove box

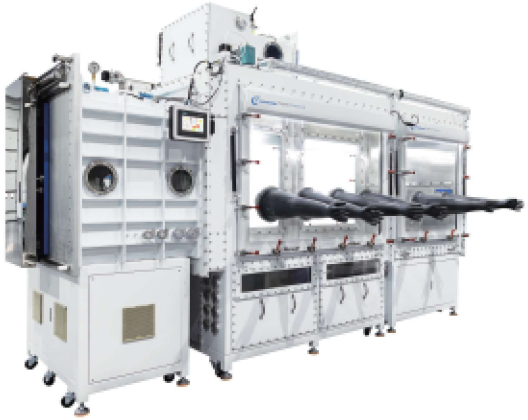
Perovskite R&D glove box

Laser melting&cladding glove box

Double-layer glove box

Nuclear application glove box

Customization glove box



Customization glove box

Customization glove box

Customization glove box

Customization glove box

Customization glove box

Lithium metal solid-state battery intelligent equipment line

Lithium metal battery R&D equipment

Sealed drying box

Advantages of the sealed drying box

1) Industry pain points: The floor of the ordinary drying room is not closed, with poor sealing and large leakage. The dehumidifier must keep running all the time for 24 hours, resulting in high power consumption.

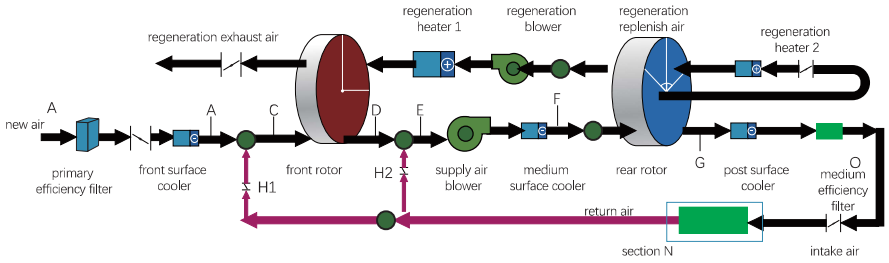
2) The design principle of Mikrouna's sealed drying box: The sealed drying box adopts a fully sealed structure, uses stainless steel instead of color steel plate, and the overall sealing grade reaches the level of the first-class , without gas leakage and moisture penetration.

3) Mikrouna's sealed drying box uses the dehumidifying rotor system to quickly reduce the dew point of the chamber to the required value, closes the pipeline valve between the sealed drying box and the dehumidifier, maintains low dew point operation, and switches to the molecular sieve dehumidification cycle system, so that the power consumption of the dehumidifier unit decreases.

4) The valves at all sections of the dehumidifier of the sealed drying box adopt the control mode of electric sealed valve + electric regulating valve, which is convenient for debugging and reducing the leakage during shutdown.

5) Through the dew point feedback of the sealed drying box, the rotation speed of the rotor and the regenerative heating power can be intelligently changed to achieve energy saving.

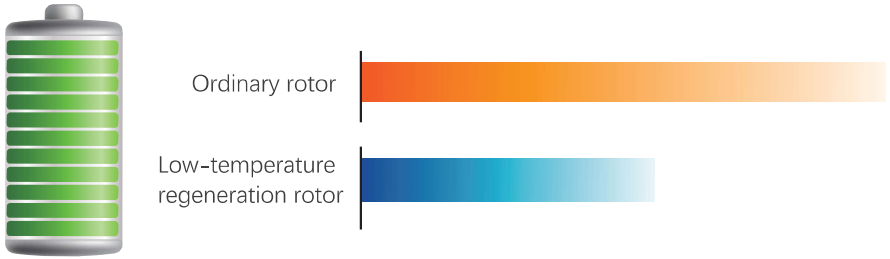
6) Due to the high sealing of the sealed drying box, the operation of the dehumidifier can be completely stopped during the period when no one is working, thereby realizing energy saving.



principle of sealed drying box

Product features

A、Energy conservation and environmental protection



B、Stability design

- All rotor dehumidification units (except for the new air blower unit) adopt the secondary return air design. By adjusting the primary return air volume, the unit can operate stably.
- The electric heating control adopts an isolation circuit (the circuit is designed by our company and the electric control box is made by our company) .
- Adding an energy storage water tank in the chilled water system is beneficial to avoiding the frequent start/stop of the chiller.
- The chiller is designed with a multi-head mode to reduce the risk of low-pressure alarm

Product application

Glove box special for lithium battery experiment

Integrated components of this equipment:

- Regenerable organic solvent trap
- HF(Hydrofluoric Acid) adsorber
- Cooling equipment
- Oven

Specifically used for the research of lithium battery/super capacitor.

Circulation system (Blower) | Purification system (molecular sieve and copper catalyst) | Regenerable organic solvent trap | HF(Hydrofluoric Acid) adsorber

Special glove box for the OLED field

Organic Light-Emitting Diodes, abbreviated as OLED. In OLED, the thin film of organic compounds emits light in response to the electric current and is widely used in lighting applications, household appliances, mobile phones, high-definition televisions and other electronic devices.

functional description

- Provide an ultra-clean box environment
- Provide an effective pollution control plan
- Improve the production efficiency of products

3D Printing series

3D printing glovebox (rapid prototyping glovebox) is designed for manufacturing special components and parts used in aerospace engineering. 3D printing by Powder Feeding Molding and Laying Powder Molding are common congurations in a glovebox. Each molding technique uses a specially designed glovebox based on the requirements.

Features

- Large volume sealing, with high reliability.
- Signal wires and Power wires are highly integrated into the sealing box, avoiding interruptions.
- Automated robotic loading & unloading and transmission.
- Professionally designed antechamber whose surface is sprayed with plastic or mirror surface, the structure is ingenious and the opening is convenient and simple.

Welding series

- Avoid the effect of humidity and impurities in the air while laser welding.
- The glovebox has two rectangular Antechambers, one Heated Antechamber (Maximum 200°C and quick chilling) with water cooling unit and one regular antechamber.
- The outside door of the rectangular antechamber is manually operated and the inside door is automatically operated.
- The glovebox purge is controlled by the ow meter; the glovebox can also be connected with a puri cation system.
- The system has a dust removal unit.

vacuum film coating series

Glove box evaporation film coating all-in-one machine

working principle

This system is integrated by a vacuum film coating system and a glove box system. Thin film evaporation coating can be completed in a high-vacuum evaporation chamber, and the storage, preparation and detection of coated samples can be carried out in the high-purity inert gas atmosphere of the glove box.

Equipment purpose

It is mainly used for experimental research and application such as perovskite solar cells, OLED and PLED, and semiconductor preparation.

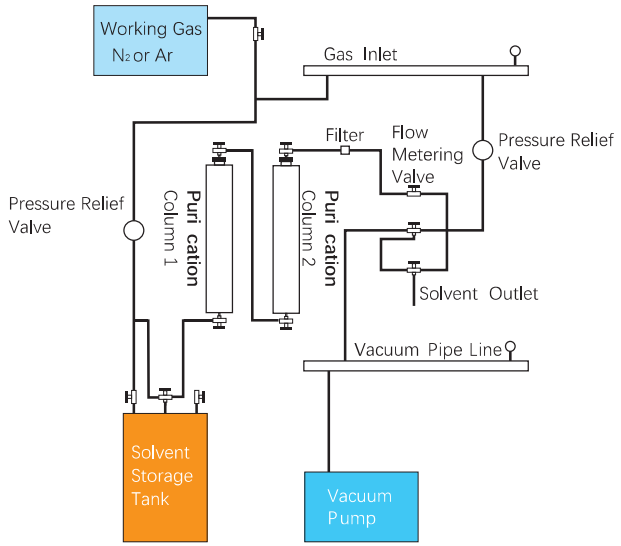
Product features

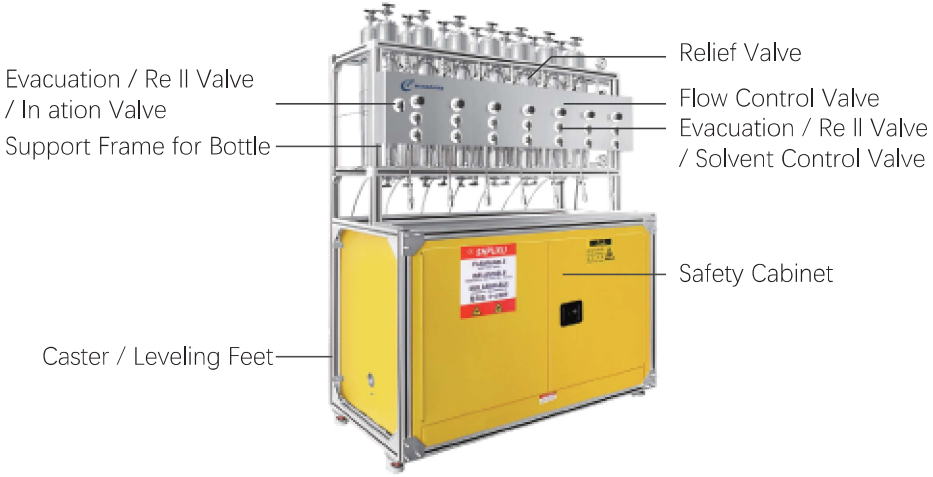
The combination of evaporation film coating machine and glove box realizes the fully enclosed production of processes such as evaporation coating, packaging, and testing, so that the entire thin film growth and device preparation process is highly integrated in a complete controllable environmental atmosphere system, eliminating the influence of unstable factors in the atmospheric environment during the preparation process of large-area organic circuits, and ensuring the preparation of high-performance and large-area organic optoelectronic devices and circuits.

Solvent purification syatem

Applicable for solvent drying and puri cation by removing water,oxygen etc.
Low purity grade industrial solvents can be puri ed into high purituy grade.

MIKROUNA provides materials replacement and regeneration services for puri cation columns.





Treatable Solvent

Aromatic and Lipid	Pentane, n-Hexane, Cyclohexane, n- Heptane, Toluene, Benzene
Ethers	Diethyl Ether, THF, Dimethyl Ether
Chlorinated Solvent	Dichloromethane, Chloroform, Chlorobenzene
Amine Solvent	Triethylamine, Pyridine, N-di(isopropyl)ethylamine
Alcohol	Methanol, Ethanol
Other General Solvent	Acetonitrile(MeCH), DMF, Dimethyl Sulfoxide, Acetone

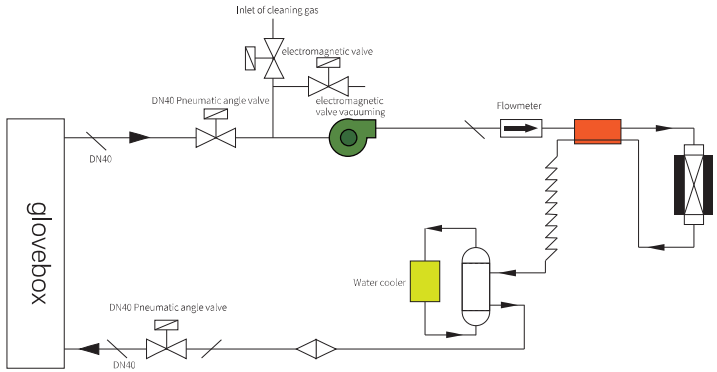
Nitrogen removal unit

Working principle

The nitrogen removal device is used to remove the nitrogen in the argon glove box. The argon gas in the glove box passes through the valve and enters the high-temperature nitrogen removal column through the compressor. In the nitrogen removal column, the impurity nitrogen reacts with the adsorption material and is removed. The temperature of the nitrogen removal column is controlled by PLC.

Components of the nitrogen removal tower

Internal structure of the nitrogen removal tower



Schematic diagram of the nitrogen removal unit system

Equipment purpose	Absorb nitrogen in argon
Adsorption materia	Zirconium-vanadium-iron adsorbent, 5 kg, in flake form
Working pressure	Slightly positive pressure
Working temperature of the nitrogen removal tower	300-500℃

Pipeline	φ12 stainless steel rigid pipe
Working power supply	220V/50Hz
Nitrogen analyzer	0-100ppm

B Gas protection/ protection products

Gloveboxes for nuclear research are mainly concerned with the handling of radioactive substances, and such gloveboxes are based on the principle of ensuring that operators are protected from the threat of radioactivity. Glove boxes used in the nuclear waste, reprocessing, nuclear energy and nuclear research fields are subject to strict regulations and MIKROUNA adheres to a number of international safety standards in the design of glove boxes for nuclear applications, such as environmental protection and quality control.

Nuclear-grade sealed chamber - hot cell

The German laser welding system is welding the hot cell

Double-cover transfer: Used for leak-free transfer of radioactive materials or nuclear waste in nuclear sealed chambers or hot cells

Air valve for maintenance

Equipment purpose

The air lock is used as a transitional lock chamber for personnel to safely enter the hot cell for maintenance operations during maintenance operations, which can realize the safe overhaul of personnel and prevent the spread of contaminated areas.

① Sealed door

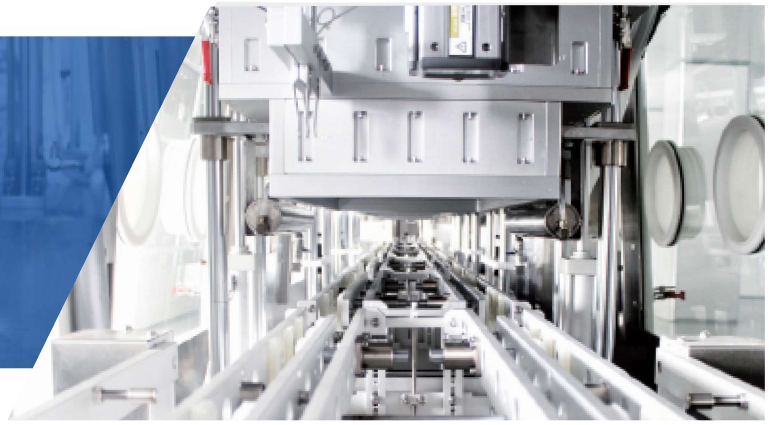
② Various interfaces

③ Internal view of the interface

④ Observation window

- The inner door of the double-cover seal of the air lock serves as the sealing interface of the hot cell and must ensure sealing with a sealing grade of 2 to prevent the contaminated atmosphere in the hot cell from overflowing.
- The air intake and exhaust system of the air lock must ensure that the airflow direction always flows from the outside to the inside: the maintenance hall → the temperature zone of the air lock → the hot zone of the air lock → the hot cell.
- The movement of the air lock should be stable, and there should be no excessive gaps and swings in the front, back, left, and right. It should be able to be reliably positioned and locked at any position, and it should be able to ensure the stability of the air lock during the process of the maintenance personnel entering and leaving the hot cell, and there must be no overturning phenomenon.

C Automation Products



Total solution design and manufacturing of automation production line, applied to consumer electronics, flexible display, automotive, intelligent home appliances, robotics, energy saving and environmental protection and other industrial fields.

Lithium automatic production line

The production line can realize fully automatic scanning - liquid injection - weighing - replenishment - sealing in the super purified glove box, realizing efficient and completely unmanned automatic production, greatly saving labor cost, greatly improving production capacity and product quality and yield rate, maximizing benefits for customers, this production line is a revolution in lithium/super capacitor production.

Lithium metal solid-state battery intelligent equipment line

· Integrating functions such as lithium metal sheet making, stacking, welding, packaging, insulation detection, and vacuum filling
·The transition bin has vacuum baking function
·The content of water and oxygen < 1 PPM

Lithium metal solid-state battery research equipment

This production line is composed of a four-section glove box system (front round heating bin, rear square transition bin), lithium strip cutting machine, lithium negative electrode sheet making machine (including pasting and pressing tabs, special tooling for turnover), positive electrode sheet punching and cutting, semi-automatic stacking machine, ultrasonic welding machine, top sealing machine, side sealing machine, vacuum filling machine, vacuum pre-sealing machine, etc., to realize the functions of different dehumidification systems.

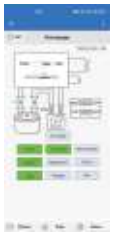
Sodium-ion battery automated production line

This production line can independently complete operations such as quantitative powder injection - tunnel furnace type segmented continuous high-temperature heating - quantitative liquid injection - automatic sealing and welding - automatic sodium injection with negative electrode heating - automatic vacuum welding of annular sealing end cover. Finally, it is sent out through the discharge chamber by the transmission line. The entire production process realizes automated transmission and production, and it is a relatively complete and advanced sodium-ion battery automated production line.

D IoT Industrial Smart Products

Networking and online centralized management of industrial equipment has become a trend in today's world. Under the trend of German Industry 4.0, Michelona launches industrial intelligence products, which can be applied to a variety of industrial equipment to achieve networked monitoring, centralized management and online diagnosis of equipment in different areas, creating a convenient, hassle-free, intelligent and reliable equipment management experience.

Centralized equipment management



Monitoring main interface

Simultaneous online management

Smart Alert

Alarm message interface

Push method

01 SMS Push

02 WeChat Push

03 Email Push

Online repair report

Follow the public

IoT Glovebox functionality

- Mobile and tablet management is safe and secure
- Online after-sales service
- Abnormal equipment, automatic warning
- Online debugging and upgrading of equipment
- Equipment history status enquiry
- Remote diagnosis of faults

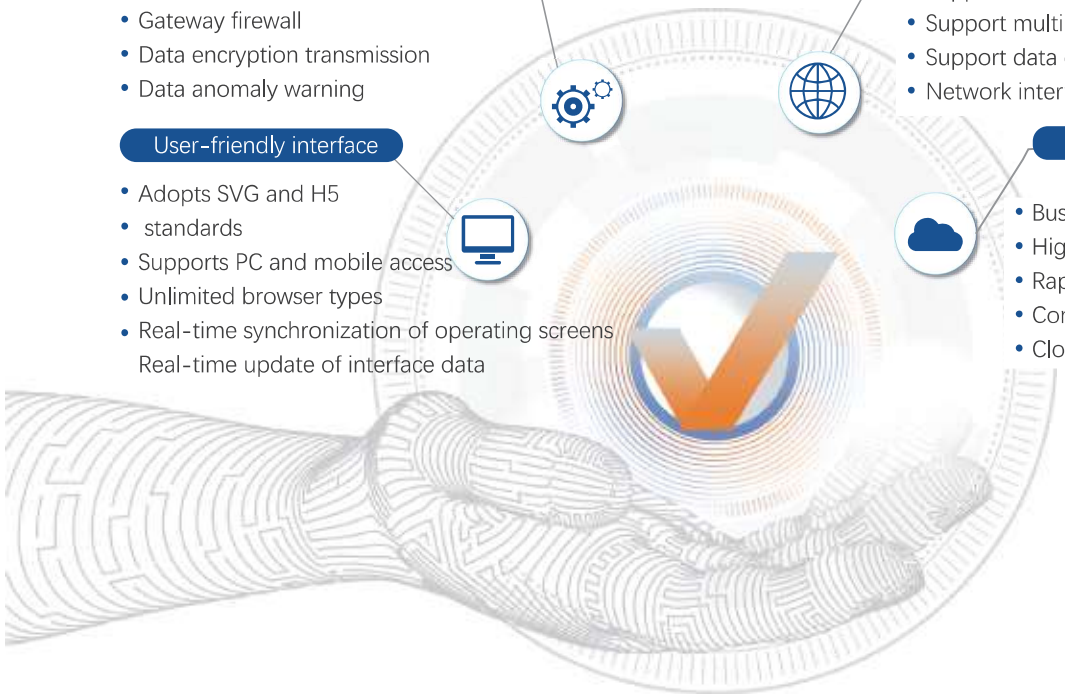
Industrial intelligence product features

Safety and reliability

- EmacScript international specification
- Anti-virus sandbox
- Gateway firewall
- Data encryption transmission
- Data anomaly warning

User-friendly interface

- Adopts SVG and H5
- standards
- Supports PC and mobile access
- Unlimited browser types
- Real-time synchronization of operating screens
  Real-time update of interface data



Private network communication

- Supports wired and wireless networking
- Supports wide area and local area networks
- Support multiple device access
- Support data disconnection and retransmission
- Network interruption alarm

Smart Industrial Cloud

- Business Intelligence Management
- High-speed data interaction
- Rapid Content Distribution
- Communication Protocol Analysis
- Cloud Shield Security

Real-time glovebox status analysis and early warning function

Real-time recording of equipment operating status, with searchable historical status;

User-defined settings to record or monitor certain states of the equipment;

User-defined setting of status thresholds corresponding to device alerts;

The system calculates and analyses in real time the changes in the various states of the equipment during operation;

The system provides alerts based on thresholds and changes in the various states of the equipment;

The system statistically analyses the status of the equipment during its operating cycle and generates reports.

E High-end intelligent equipment products

A+C·Lithium battery automatic production line

The production line can realize automatic code scanning, injection, weighing, fluid supplementation and sealing in the super-purified glove box, realizing efficient and completely unmanned automated production, greatly saving labor costs, greatly improving production capacity, product quality and yield, and maximizing benefits for clients. The production line is a revolution in the production of lithium batteries/supercapacitors.

Function description

The battery raw material package enters the glove box from the feed bin;

The battery raw material package is automatically scanned and weighed, and then automatically placed in the material conveying device;

The conveying device automatically sends the package to the injection cylinder for injection;

After injection, the battery enters the standing cylinders 1, 2 and 3 respectively for standing.

After standing, the battery enters the sealing cylinder for vacuuming and sealing;

The sealed battery will be automatically weighed again, and the unqualified product will enter the recycling bin on the left side for treatment;

Qualified batteries will be automatically sent to the discharge bin.

B+C·Nuclear power automatic production line

- In the field of nuclear research, there are strict regulations on the use of glove boxes in the field of nuclear waste, after-treatment, nuclear energy and nuclear research, mainly involving the treatment of extremely toxic and radioactive substances. The glove box is designed to ensure that the operator is protected from radioactive hazards;
- Mikrouna designs glove boxes for nuclear applications in strict compliance with a range of international safety standards, including environmental protection and quality control.

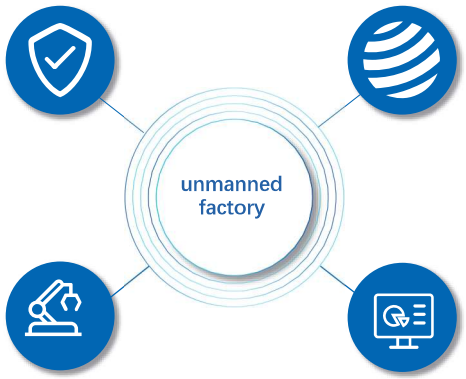
A+C+D•unmanned factory

Protective isolated device

Filter out water, oxygen, organic gases and other substances in the air to provide an ultra-pure use environment.

Data visualization

Real-time data such as the operation status of each equipment in the factory, the processing and forming status of each product, the network status, and the plant situation are presented to a unified control platform through visualization technology to achieve visual integrated control.



Automation

Through the automatic production of equipment, save labor costs, improve production capacity, improve product pass rate, ensure product quality, and avoid losses caused by manual errors.

Internet of Things

Different types of industrial equipment in different regions are interconnected through the Internet of Things technology to achieve online integrated control and centralized management of industrial equipment clusters.

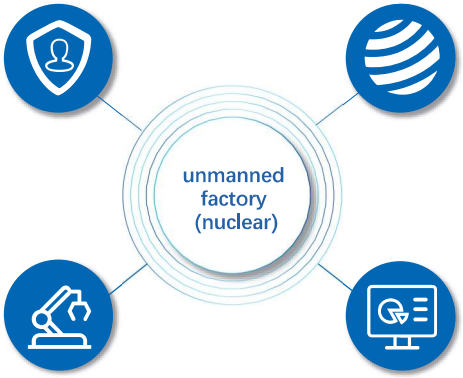
B+C+D•unmanned factory (nuclear)

Protective isolated device

Protect users from radioactive or highly toxic substances.

Automation

Through the automatic production of equipment, save labor costs, improve production capacity, improve product pass rate, ensure product quality, and avoid losses caused by manual errors.



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Nuclear-used accessories

Double-cover sealed transfer device

In the application of sealed chambers in industries such as medicine, chemical industry, and nuclear power, it is often necessary to transfer toxic or radioactive materials in and out of the sealed chambers. During the transfer process, it is not allowed for pollutants to leak and cause environmental pollution.
The double-cover transfer device is easy and simple to operate, operates smoothly, and the transfer is reliable without jamming. When items are transferred, there is no slightest leakage in the sealed state, achieving safe and reliable transfer.

φ190 double-cover sealed transfer device

Φ270 double-cover sealed transfer device

Model	Inner diameter of the transfer bucket (mm)	Length of the transfer bucket (mm)	Material of the transfer bucket	Material of the α door	Material of the β door
MKD-105	Φ105	400 (the length can be customized)	PE (optional stainless steel material)	PE (optional stainless steel material)	PE (optional stainless steel material)
MKD-190	Φ190				
MKD-270	Φ270				

Performance indicators of the double-cover sealed transfer device:

Sealing performance indicator: Level 2 (according to EJ/T 1096-1999 Classification and Inspection Method of Sealing Chamber Sealing Performance)

Number of switching operations: More than 3000 times (verified)

Anti-pollution function: Ensure that the environment exposed outside the α door and the β door is not polluted.

Nuclear-used filters

50 intake air filters

50 exhaust air filters

·solve the defect that pollutants will pollute the environment

·achieve the purpose of the experiment and the purpose of protecting the environment

Material transfer device

·Transporting in a closed container

·It does not pollute the closed container and the surrounding environment.

·It can continuously and quickly transfer materials in and out.

Replace gloves quickly and safely

·Gloves can be replaced quickly and safely

·During the glove replacement process, the contaminated gloves are not exposed to the atmosphere, or the gas in the container does not leak to the atmosphere.

Separate gas purification system

- Operation: Easy access to the glovebox
- Control: Manual or PLC controlled
- Power: 110V/50Hz or 220V/50Hz
- Working Gas: Nitrogen, Argon or Helium
- Regeneration gas: Working gas mixed with Hydrogen (5%-10%)

Type	MK100	MK200	MK300	MK400	MK500	MK600
Puri er	Single	Double	Single	Double	Single	Double
Main Pipe	DN40	DN40	DN50	DN50	DN63	DN63
Circulation Capacity	90m^3/h	90m^3/h	145m^3/h	145m^3/h	180m^3/h	180m^3/h
Copper Catalyst	5Kg	2×5Kg	9Kg	2×9Kg	12Kg	2×12Kg
Molecular Sieve	5Kg	2×5Kg	9Kg	2×9Kg	12Kg	2×12Kg

Dust Filter

Gas/Fluid Feedthrough

Power Cord Feedthrough

Aviation connector

connector/port

Gloves

hydrofluoric acid adsorber

Internal Solvent Trap

air conditioner

Oxygen Analyzer

·Measuring range: 0 ~1000ppm
·ZrO2 Sensor: Solid state sensor, long life, to be exposed in the air without consumption

Moisture Analyzer

· Measuring range: 0~500ppm
· P2O5 Sensor: Corrosion resistant, the sensor can be renewed by acid-cleaning while contaminated by HF or other corrosive atmosphere

electrochemical oxygen analyze

·Measurement accuracy: <1%
·resolution: 0.01ppm
·Range automatic or manual adjustment

Michell Moisture Analyzer

Accuracy: ±2 °C dp dew point

Angle Valve

· Applicable to various small rotary vane vacuum pumps
· Bellows seal
· With pilot valve

Oil Mist Filter

· Prevent oil mist
· Applicable to various small rotary vane vacuum pumps

Vacuum Pump

· Built-in automatic oil return check valve
· Pump body adopts new material and new technology
· Low vibration and noise

Positive pressure explosion-proof instrument power distribution cabinet.

·Solve the heat dissipation problem of some devices with large power consumption and large heat generation in the explosion-proof cabinet.
·Solve the operation problem of some complex operation analysis instruments and human-machine interfaces such as touch screens on the explosion-proof box.

Cold Well

· Fabricated through the floor of the Glovebox
· Stainless steel well
· Diameter: 150mm; depth 200mm (customized sizes on request)
· Dewar filed with liquidnitrogen for low temperature work

Microscope Unit

· Type: TV Microscope, 1/3"CCD color
· Magni cation: Max. 300 times, continuously adjustable
· Monitor: PHILIPS 17", with exible support
· Up and Down lighting source: LED ring
· Platform: Movable, easo to align the objective and center the lens

De-Electrostatic Unit

· Effectively remove localized static charges
· Effective ionization range: 12"
· Pulse rate and ionic balance controls allow for effective calibration and adjustment of the counter SPI to give optimum ion balance and output.

chiller

· Refrigeration capacity: ⩾1kw,
· Temperature control range: 5 ~ 25℃,
· Temperature stability: ±2K

Refrigerator

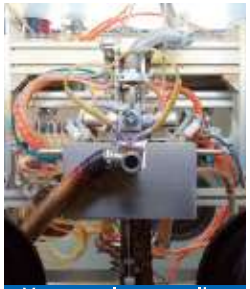
· Interior dimensions
(20L) L×W×H=250×200×400mm
(30L) L×W×H=300×220×450mm
· Lowest temperature: -30 ℃ (-35 to -40°C available)
. Can store heat-sensitive materials

Rectangular Vacuum Chamber

· The vacuum degree can reach below 10 Pa
· Both doors can be operated manually or automatically

Vacuum Furnace

· Vertical or horizontal, maximum
· temperature 1200℃
· Ultimate vacuum 1×10-4Pa
· Furnace cavity size can be customized,
· program control temperature rise and vacuum,
· cooling system failure protection



Vacuum plasma sealing machine

· For the sealing of vacuum glassware, the container can be vacuumed, or the required gas can be injected, and then sealed in the glove box

De-Dusting Unit

· With 2 ters, switchable Stainless
· steel shell Filter accuracy: 0.3μm
· High performance circulation unit
· Main pipe Stainless steel DN40 (KF40)

Large heating chambe

· Can control that both the water and oxygen contents are <1 ppm
· The heating temperature of the transition chamber can be controlled and can reach 250°C
. Cooling accessories are installed at the flange

Air conditioner for electrical control box

·It has a temperature adjustment function: Users can set the working temperature in the electrical control box as needed by themselves.
· It has a dehumidification function, which can ensure the ideal temperature and humidity in the electrical control box

Production equipment

Belgian LVD-HD multi-axis electro-hydraulic servo CNC bending machine

5x15-meter gantry machining center

FANUC welding machine

German original five-axis high-precision turning-milling compound machining center

Medium-speed wire-cutting EDM machine

Mazak turning-milling center

CNC bending machine

Japanese original high-precision horizontal machining center

American HAAS machining center

HOMAG high-precision machining center

Japanese Makino horizontal 4-axis machining center

Laser cutting machine

Testing equipment

Non-destructive lead room

Helium mass spectrometer leak detector

Full-spectrum direct reading spectrometer

Brinell bench hardness tester

Coordinate measuring instrument Global plus 10.15.8
(including TP200 probe and HP-S-X1S probe)

Projector

Coordinate measuring instrument GLOBAL S (including scanning probe)

Karl Fischer moisture titrator

List of some partners

Service Network

Hubei Manufacturing Center

Shanghai Manufacturing Center

Mikrouna (Dongguan) Industrial Intelligence Technology Ltd
Fengyuan Lithium Battery Equipment Research Institute

3major manufacturing factories

Mikrouna's headquarter is in Shanghai, and it has three major manufacturing bases in Shanghai, Xiaogan Hubei, and Tianjin (preparation), and service centers in Beijing, Guangzhou, Shenzhen, Dongguan, Xi'an, Zhengzhou, Wuhan, Nanjing, Fuzhou, Hangzhou, Ningbo, Changsha, Hefei, Chengdu, Kunming, Changchun, Tianjin, Jinan, Qingdao and Dalian.

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