



General Catalog for Battery
manufacturing environment



Contact us

Headquarters

3108-3 Aoyagi, Koga-shi, Fukuoka, 811-3134, Japan
TEL +81-92-942-3511
E-mail sales@seibu-giken.co.jp

Tokyo Branch

Nihonbashi East Building 4F, 2-24-14 Higashinohonbashi,
Chuo-ku, Tokyo, 103-0004, Japan
TEL +81-3-3866-3066
E-mail tokyo@seibu-giken.co.jp

Osaka Branch

Shin Osaka Meiko Building 2F, 4-3-12, Miyahara, Yodogawa-ku,
Osaka-shi, Osaka, 532-0003, Japan
TEL +81-6-4807-8611
E-mail osaka@seibu-giken.co.jp

Nagoya Branch

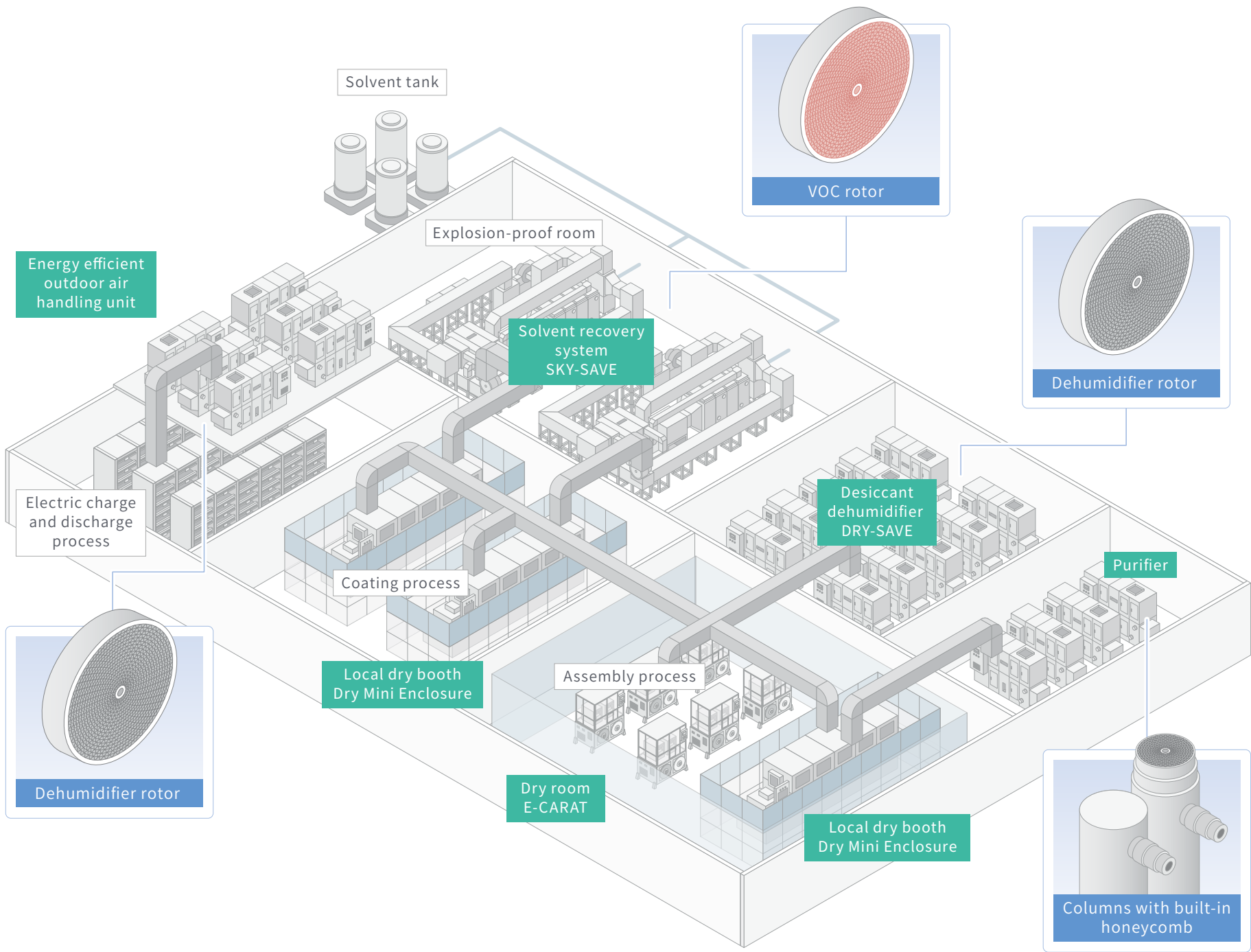
RT Center Stage Building 7F, 1-7-7, Sinsakae, Naka-ku,
Nagoya-shi, Aichi, 460-0007, Japan
TEL : +81-50-3625-7867
E-mail nagoya@seibu-giken.co.jp

SOLUTION

Total Engineering for manufacturing process

Creating the best environment for battery factory

In the manufacturing process of lithium-ion batteries, it is important to control the production environment, including temperature and humidity control and solvent processing. With our long-developed expertise and technology, Seibu Giken offers not only dehumidifiers but also dry rooms and dry booths. For the optimal production environment, we provide green air solutions as an air specialist.



INDEX

Desiccant Dehumidifier	5	Glove Box	11
Solvent Recovery System	7	General Air Conditioning	13
Dry Room	9	Open Lab Rental	14
Local Dry Booth	9		

ABOUT US

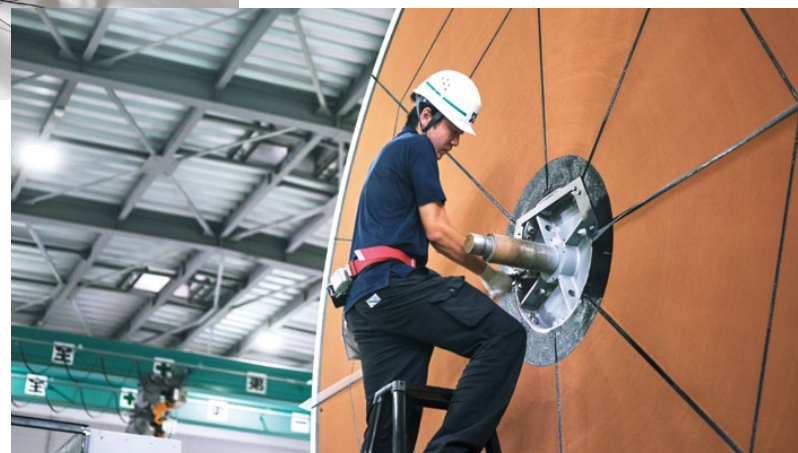
Developed the world's first silica gel rotor

Seibu Giken was originally founded as a laboratory. Research and development were positioned as the main part of business, and we succeeded in developing the world's first silica gel rotor in 1984. Since then, we have been gaining attention for a number of original products. Currently we expanded our network worldwide and grew into a global company with 10 bases in Japan and 8 bases overseas. We collaborate with our group companies and provide high-quality products and services to customers all over the world.



ONE STOP

One-stop service from system design to after-sales service



Hearings and proposals



Design and Development



Manufacturing and Procurement



Construction and Inspection



After-sales service



We propose the construction of high-value-added and appropriate systems from the perspective of current challenges, requests, cost and yield rate improvement.

We do the best space and environment design by utilizing our many years of knowledge and technology. We also develop products to meet the needs of customers.

We manufacture and procure original equipment according to customer needs. We collaborate with channel partners not only in Japan but also overseas to provide the required equipment.

In order to realize environments that meet the required performance, we proceed with construction by taking advantage of the cooperation of centralized management. After construction, we do test run and performance inspection to confirm whether the equipment works.

We respond quickly when trouble occurs. During periodic maintenance, we check whether the equipment is operating normally and maintaining its performance. We contribute to maintaining safe and secure equipment.

Desiccant Dehumidifier

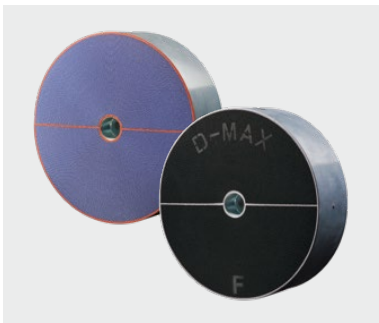
Advanced high efficiency and energy saving
DRY-SAVE



Seibu Giken handles everything from rotor development to manufacturing in-house. As a leading manufacturer of desiccant rotors, which are essential for humidity control, we offer desiccant dehumidifiers that create high-quality dry environments.

Features

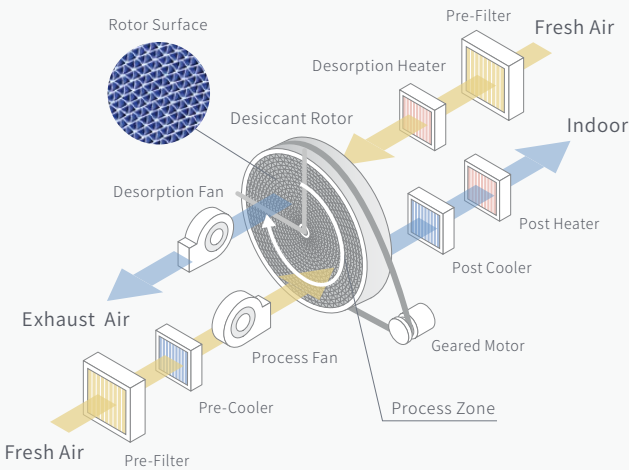
- Energy-saving of a desorption heat source by applying a heat pump system
- Able to supply at -90°C DP
- CO₂ removal possible



Desiccant Rotor

Desiccant Dehumidifier Dry Air Technology

The in-house development desiccant rotor is installed in our dehumidifiers. The dehumidifier absorbs the moisture by going through the air into the desiccant rotor. The absorbed moisture is desorbed from the rotor by passing through the high-temperature air. This process is performed continuously to supply the dry air.



A wide range of selections

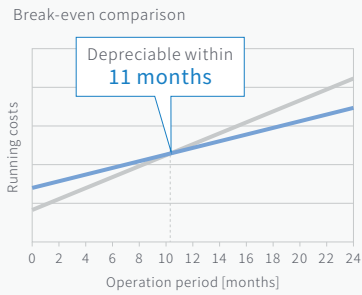
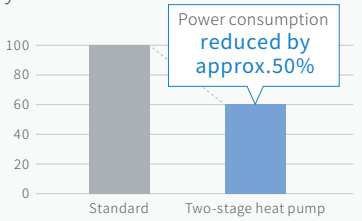
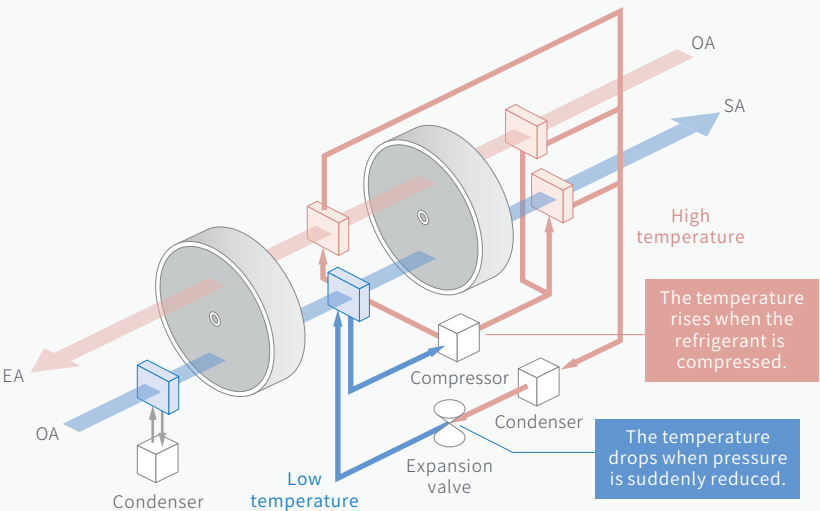
With a wide range of product selections, we create the best dry air environment from energy-saving to high performance of -90°C DP.

	Standard Model Economical and Energy-saving	Energy saving model Power consumption reduced by approx.50%*	Ultra-low-dew-point environment model
	Standard	Two-stage heat pump	High performance
Supply dew point temperature	-60°C DP	-60°C DP	-90°C DP
Room dew point temperature	-40°C DP	-40°C DP	-70°C DP
Heat source	Electric heater Steam heater	Heat pump	Electric heater Steam heater
The number of rotors	1 unit	2 units	2 units
Add. option : CO ₂ removal function		※Compared to the standard model	Add. option : CO ₂ removal function

Reduce Energy consumption by max 50% ※In the case of Two-stage heat pump

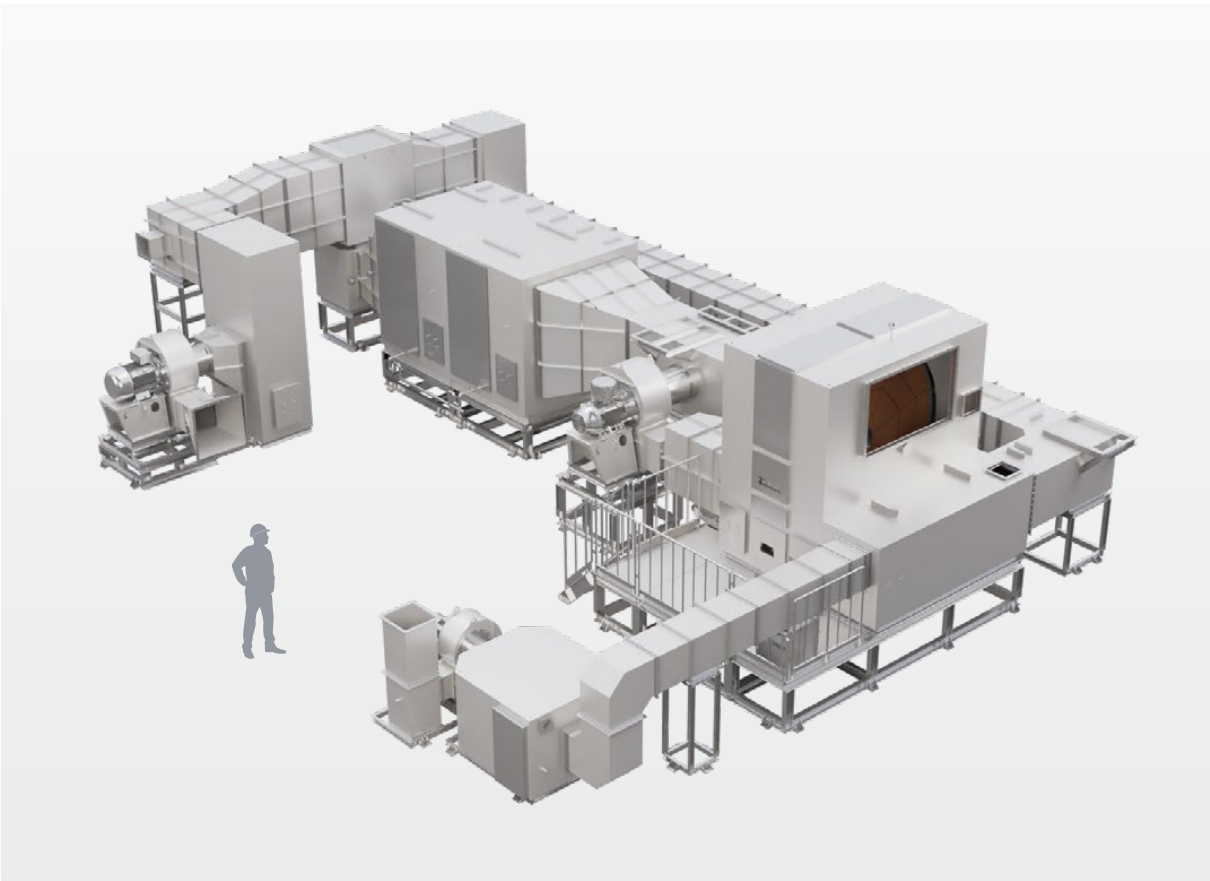
It designs energy-saving systems by taking advantage of both "cool" and "heat" energy from heat pumps. While creating a dry environment with a low dew point of -60°C DP, we have achieved a 50% reduction in energy costs compared to the conventional systems.

Japanese Patent
No. 6059302



Solvent Recovery System

Solvent Recovery System with a dry rotor method
SKY-SAVE



Our Solvent Recovery System recovers organic solvents generated during dry-coating processes. SKY-SAVE is a dry rotor method with VOC concentration rotors. Unlike the conventional wet scrubber systems, our "circulation system" can reuse the process air after solvent removal and contribute to saving energy consumption.

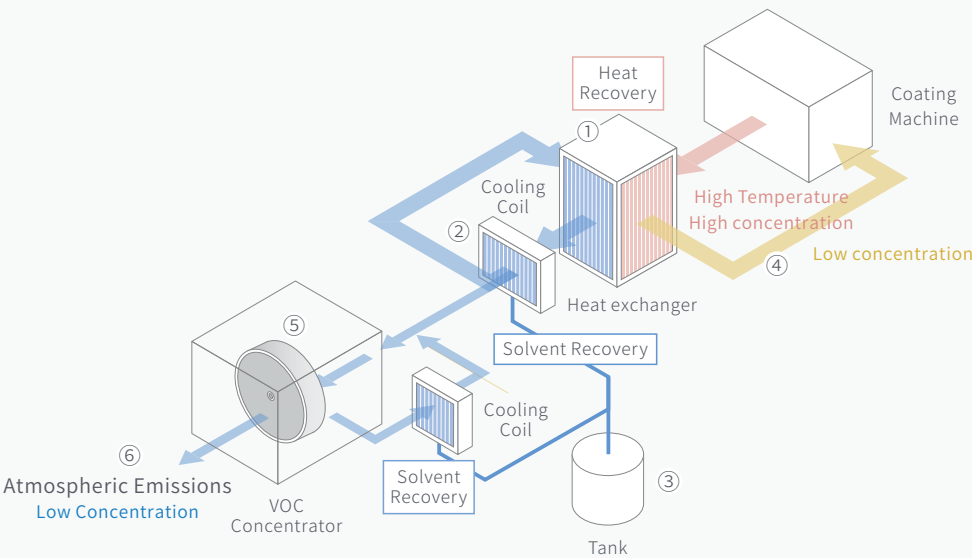
Features

- Process air after solvent removal can be recirculated (reducing the load on outdoor air handling unit)
- Low dew point emissions : compliance with European regulations (1mg/Nm³)
- Solvent recovery possible while keeping a dry environment



VOC Rotor

Cool and condense exhaust air to recover solvents as liquids
Circulation system that can reuse exhaust air



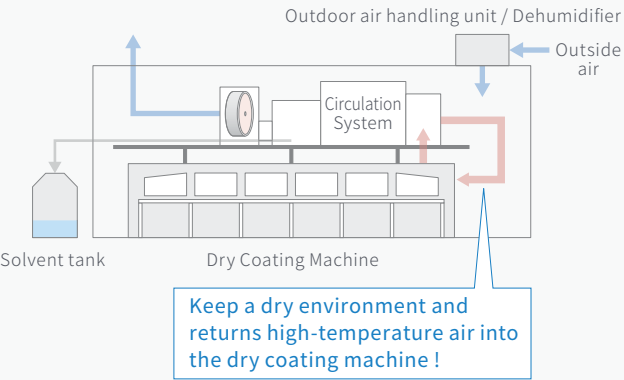
System Flow

1. Recovery of the exhaust air including high concentration solvent from a coating machine by a heat exchanger.
2. The exhaust air passes through cooling coils and the solvent are condensed into the liquid.
3. The liquefied solvent is recovered and then reused.
4. Air after solvent removal is reheated in a heat exchanger and recirculated to the dry coating machine.
5. VOC concentration rotor absorbs the remaining solvent from the air after cooling coil.
6. The rotor purifies the air and then exhausts a part of this purified air into the atmosphere.

Reducing power consumption in the coating process

In conventional scrubber system, it cannot recirculate the air because the air is very humid. Our system can return the high temperature air with keeping a dry environment and contribute to saving energy consumption of the whole coating process.

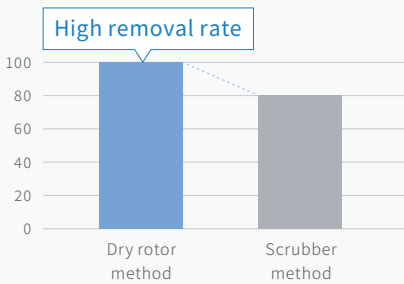
- Reduce heat energy of dry coating machines
- Reduce air conditioning energy consumption to keep coating machine booth dry



Solvents contained in exhaust air 1mg/Nm³ or less

The solvent is removed by a VOC concentration rotor, and the exhaust air becomes low concentration. While scrubber method has a VOC removal rate of approximately 80%, the circulation system can remove up to 99.99% of the solvent in the air.

- Meet the European regulations of solvent emissions



Dry Room

Dry Room made by a dehumidifier manufacturer

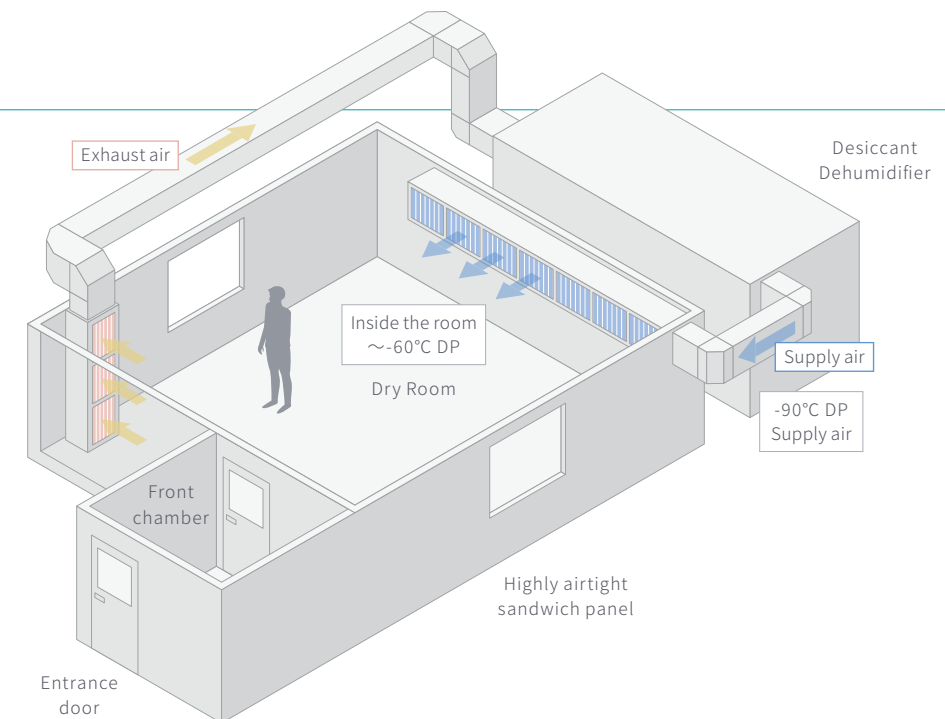
E-CARAT



Our Dry Room solution E-CARAT maximizes the performance of our in-house desiccant dehumidifier. By constructing ourselves, we offer a tailored solution and provide the best dry environment.

Features

- Providing optimal design according to conditions from equipment selection to construction
- The fastest delivery time in the industry by handling everything from design to construction
- Functions of Energy-saving operation and CO₂ concentration control can also be added
- Available at Supplied dew point temperature down to -90°C DP



Local Dry Booth

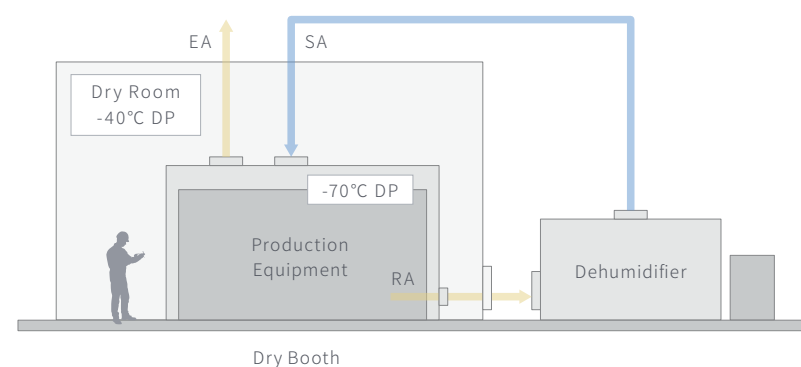
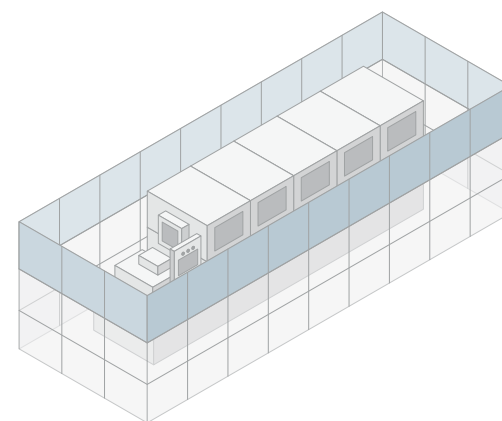
Ultra-low-dew-point dry space

DRY Mini Enclosure

DRY Mini Enclosure is a solution that encloses production equipment. We can realize an ultra-low dewpoint dry space of -70°C DP which is difficult to achieve by the existing Dry room with low cost and low energy consumption.

Features

- Ultra-low dewpoint space of -70°C DP
- Fully customized design for internal equipment
- Equipped with a hydrogen sulfide (H₂S) safety system for Solid-state battery



To prepare the -70°C DP environment in dry room, it is necessary to supply large volume of dry air to offset the moisture from operators. By enclosing the equipment by DRY Mini Enclosure, moisture load and air volume can be significantly reduced.

Prepare the efficient environment by combining a purifier and a dehumidifier

N₂ Mini Enclosure

N₂ Mini Enclosure creates a low-oxygen environment with an oxygen concentration of 1 ppm or less to prevent materials from reacting with moisture or oxygen during manufacturing processes. We can also accommodate large booths requiring on-site construction.

For large scale space

Circulating Nitrogen Purifier

This equipment circulates gas within the booth to create a nitrogen environment with moisture concentration and oxygen concentration 1 ppm or less.

Features

- Processing large volume of air possible
- By operating the moisture removal function independently, it can be flexibly switched to an atmospheric dry environment
- The desiccant dehumidification method enables dehumidification in a shorter time compared to conventional purifiers. This reduces startup time and eliminates unnecessary operating costs



Japanese Patent No. 7080478
Japanese Patent No. 7306683

Glove Box

For research and development requiring special environments

Our glove box makes it possible to conduct research and development in conditions closer to the actual production environment. In addition, it can smoothly transit to E-CARAT or DRY Mini Enclosure during mass production.

Dry Air High Performance Glove Box

Desi-Cube

Without using inert gas, an ultra-low dewpoint environment of -80°C DP is created by our dehumidification rotors.

Features

- Easy to set up with simple touch panel operation
- Can control the dew point temperature and adjust according to test conditions
- Front hatch structure : allowing equipment to be passed into and removed from the box



Specifications

Topic	Specifications
Dew point temperature inside the box	With exhaust air : -60°C DP ~ -10°C DP / Circulation : -80°C DP ~ -10°C DP
Dry bulb temperature inside the box	Dependent on ambient temperature
Power supply	3φ AC200V 50/60Hz
Power Consumption	Up to 5kW
External dimensions	Desiccant dehumidifier : W1,800 x D1,300 x H1,650 (mm)
	Glove box : W2,000 x D700 x H1,980 (mm)
Material	Desiccant dehumidifier : Mild steel stand/ Aluminum frame/ Aluminum panel
	Glove box : Mild steel stand and SUS304 Box
Mass	Desiccant dehumidifier : 400kg
	Glove box : 250kg
Lighting	30W x 2 units
Gloves	Butyl rubber and Neoprene Rubber
Passbox	Floor: Sliding type / Inner door: Sliding type / Effective opening dimensions: W270×H320 (mm)
Outlet inside the box	1φ / AC100 V / 15A / Two outlets / One location
Front hatch	Glass window / Damper flip-up type
Control panel	5.7-inch touch panel
Dew point sensor	For exhaust dew point temperature : Measuring range: 0 °C to -100 °C DP

Desi-Cube

Dry Air Simplified Glove Box

Desi-Cube mini

Desi-Cube mini

This compact device concentrates our dehumidification technology. It is a simple and small glove box that can be used on a table.

Features

- No special installation work is required. Just connect to a 100V outlet
- One-touch ON/OFF operation
- With dew point temperature control function
- Can be installed on a table



Specifications

Item		Specifications
Dew point temperature inside the box		-40°C DP to 0°C DP
Dry bulb temperature inside the box		Varies (dependent on ambient temperature)
Power supply	Dehumidifier	100V AC 50/60Hz 7A 0.7kVA
	Cooling water circulator (Chiller)	100V AC 50/60Hz 8A 0.8kVA
	Glovebox (Outlet)	100 V AC 15A
Box	Dimensions	W900 x D560 x H570 (mm)
	Weight	35kg
	Outlet	Two grounded outlets with retention feature, 100V AC 15A
	Glove	Natural rubber
Dehumidifier	Dimensions	W400 x D700 x H720 (mm)
	Weight	75kg
	Drainage	Built-in tank (with full water alarm)
Cooling water circulator (Chiller)	Dimensions	W232 x D497 x H490 (mm)
	Weight	29kg
Integrated type (optional)	Dimensions	W1,200 x D800 x H1,365 (mm)
	Weight	210kg

Inert gas replacement glove box

N-CUBE

The purifier and glove box are integrated, making it easy to conduct research and production in an inert gas environment. The purifier removes moisture and oxygen, and the oxygen and moisture concentrations inside the glove box are kept 1 ppm or less.

Features

- Realize an environment of oxygen and moisture concentrations of 1 ppm or less
- Compact design with integrated box and purifier
- Easy operation with touch panel(SmarTrol®)



General Air Conditioning

Providing green air solutions for every environment

Please feel free to contact us regarding the air environments other than dry rooms.
We promise to make suggestions tailored to your needs.

Heatless Desiccant Outdoor Air Handling Unit (OHU)

First the total heat exchanger rotor recovers heat energy, and the dehumidification rotor removes moisture. This method contributes to saving energy consumption in the entire building because it reduces the required energy of air handling unit side. By lowering the humidity in the room, comfort improves even at the same temperature.

Fan Coil Unit (FCU)

First it cools the air taken by an air-cooled refrigeration unit to dehumidify. The re-heating method lowers the relative humidity by raising the temperature. Next, stable low-humid air is supplied by our refrigerator control technology. We have 3 types of fan coil units with different re-heating methods as our lineup.

	Basic model	Energy saving model (PWT type)	Energy saving model (Direct expansion type)
Re-heating Equipment	Electric Heater	Aluminum Plate-Type Sensible Heat Exchanger PWT	Direct Expansion Coil (Heat-pumping method)

Filter Unit

It brings clean air into the room. We can meet various collection needs such as dust, salt removal, insect control, and deodorization.

Open Lab Rental

For pre-introduction study, research and development

Our ultra-low dew point dry room can be tried out. Feel free to use it at your desired dew point temperature for pre-introduction study, research and development, etc.

Item	Specifications
Dew point temperature	Supply air : Minimum -60 °C DP ; Indoor : Minimum -40 °C DP
Indoor temperature	23 ± 3 °C
Maximum occupancy	2 (at -40 °C DP indoors)
Dimensions	Front chamber : W1,800 x L1,800 x H2,500 (mm)
	Main room : W4,500 x L4,500 x H2,500 (mm)

The diagram illustrates the layout of the Dry Room. It features a large main room with dimensions 4,500 mm (width) by 4,500 mm (depth) by 2,500 mm (height). Attached to the bottom of the main room is a front chamber with dimensions 1,800 mm (width) by 1,800 mm (depth) by 2,500 mm (height). A control panel is located on the side of the front chamber. Text inside the main room specifies: Dry Room Temperature: 23° C±2° C, Dew point temperature: -40° C DP, and One to two people entering the room.

Rental Models of Dry Air Glove Box

Dry Air High Performance Glove Box
Desi-Cube



Dry Air Simplified Glove Box
Desi-Cube mini

