VACUUM FREEZE DRYER

Freeze-drying is a drying technique that utilizes the principle of sublimation. It involves rapidly freezing the material to be dried at low temperatures and then, under the right vacuum conditions, allowing the frozen water molecules to directly sublime into water vapor and escape. The material remains in a low-temperature (frozen) state throughout the drying process, with ice crystals evenly distributed throughout. The sublimation process does not lead to concentration due to dehydration, thus avoiding side effects such as foaming and oxidation caused by water vapor. The dried material retains a porous, sponge-like structure with virtually unchanged volume and dissolves easily in water to revert to its original state. This process minimizes the denaturation of the material in terms of physicochemical and biological properties to the greatest extent possible.

Application Fields

Control System

One-click operation for speed and simplicity
A 5.4-inch LCD touch screen displays important parameters simultaneously, with numerical values color-coded to correspond to their respective statuses, making it clear at a glance.

Thermal electromagnetic overcurrent short circuit protection
Ensures safer and more stable equipment operation.

Proactive reminders
Equipment maintenance time, vacuum pump oil change time, and ambient temperature monitoring alerts.

Make freeze-drying more scientific
Optional co-crystallization point detection devices and endpoint judgment detection systems can be equipped.

Drying Chamber

Detachable drying chamber

Significantly reduces the probability of damage caused by the overall chamber weight being too heavy.

The upper cover is made of anodized aluminum with corrosion-resistant

High-transparency acrylic drying chamber, which has good thermal radiation conduction and reserved 6/12 external valve interfaces.

316L Stainless T-Frame

24 independent exhaust ports, individually controlled, suitable for multiple users, and improve usage efficiency.

Cold Trap & Condenser Coils

Large opening and passage design

Gases can quickly pass through the condenser coils to be captured. The condenser coils are placed inside the cold trap, increasing the condensation area and effectively preventing external dew formation.

Standard equipment with Teflon anti-corrosion coating

316L stainless steel, fully equipped with Teflon anti-corrosion coating, capable of freeze-drying organic solvents and various corrosive samples.

Sample Shelves

Taking and Placing in Layers, More Convenient

Each shelf can be placed and taken freely without manual work. The height of each shelf can be adjusted freely.

Special Hole Position for Centrifuge Tubes

Conductive to the drying of samples in centrifuge tube containers.

Freeze-Drying Organic Solvent

316L stainless steel stackable sample shelves, capable of freeze-drying organic solvent and various corrosive solvents.

Refrigeration System

Secop compressor;
Copper plate heat exchanger, which increases heat dissipation to the largest area;
Unique refrigeration technology, the temperature of the cold trap can be lowered from ambient temperature to below -80℃ within 2 minutes;
Class A temperature sensor with high temperature accuracy and low error rate;
The multiple detection and alarm system can promptly alert when the refrigeration system pressure is too high or in case of refrigeration failure, and take corresponding measures.

Vacuum System

Pirani Vacuum Sensor

With automatic temperature compensation control unit, Pirani vacuum sensor is capable of precise detection in low-temperature environments.

CKD High Vacuum Electromagnetic Control Valve

Low heat generation, light noise and long-lasting durability.

Stainless Steel Flexible Vacuum Tube

Will never aging and resistant to all types of corrosion.

Fully Automatic Pressure Relief and Drainage

Completely eliminate damage to samples and sensors caused by unstable manual pressure relief airflow.

Conversion Table Vapour Pressure Above Ice

Ice temperature(°C) = pressure (mbar)

°C	mbar	°C	mbar	°C	mbar	°C	mbar
0	6.110	-20	1.030	-40	0.120	-60	0.011
-1	5.620	-21	0.940	-41	0.110	-61	0.009
-2	5.170	-22	0.850	-42	0.100	-62	0.008
-3	4.760	-23	0.770	-43	0.090	-63	0.007
-4	4.370	-24	0.700	-44	0.080	-64	0.006
-5	4.020	-25	0.630	-45	0.070	-65	0.0054
-6	3.690	-26	0.570	-46	0.060	-66	0.0047
-7	3.380	-27	0.520	-47	0.055	-67	0.0041
-8	3.010	-28	0.470	-48	0.050	-68	0.0035
-9	2.840	-29	0.420	-49	0.045	-69	0.003
-10	2.560	-30	0.370	-50	0.040	-70	0.0026
-11	2.380	-31	0.340	-51	0.035	-71	0.0023
-12	2.170	-32	0.310	-52	0.030	-72	0.0019
-13	1.980	-33	0.280	-53	0.025	-73	0.0017
-14	1.810	-34	0.250	-54	0.024	-74	0.0014
-15	1.650	-35	0.220	-55	0.021	-75	0.0012
-16	1.510	-36	0.200	-56	0.018	-76	0.0010
-17	1.370	-37	0.180	-57	0.016	-77	
-18	1.250	-38	0.160	-58	0.014	-78	
-19	1.140	-39	0.140	-59	0.012	-79	

Laboratory Freeze Dryer T Series

Laboratory Freeze Dryer T Series, feature a compact structure that can effectively save laboratory space, offering a small footprint with great capacity.

Model No	MBFD-T 7003	MBFD-T 7006	MBFD-T 9006
Ice condenser capacity	3kg	6kg	6kg
Ice condenser temperature	-70℃	-70℃	-90℃
Cold trap volume	5L	10L	10L
Freeze dried chamber	Bell shape (standard configuration)/Multi manifold type/T-shaped frame type		
Sample shelf	Φ200mm,Single layer area 0.03m² with 3-5 layers available	• Φ260mm,Single layer area 0.055m². 3-10 layers/optional • Electric heating/manual capping/optional	
Vacuum pump	Extreme vacuum 5*10^{-3}mbar with a pumping capacity of 8m³/h optional pump of various types		
Oil mist filter	Standard configuration		
Vacuum pump connection pipe	Single forming stainless steel flexible pipe DN16 ISO-KF		
Anti-corrosive treatment	Cold trap, condensing coil/all equipped with PTFE anti-corrosion treatment as standard. Freeze-drying organic solvents.		
External valve	6pieces/optional	12pieces/24pieces	
Eutectic point detection system	Support/Optional		
Data output analysis	Support/Optional		
Power	0.6kw	1.1kw	1.5kw
Size	420*545*455mm	510*570*500mm	
Net Weight	50kg	55kg	65kg
Voltage	220V, 50/60Hz		

Laboratory Freeze Dryer **F** Series

Laboratory Freeze Dryer F Series, with high water vapour capture capacity, offer efficient freeze drying.

Model No	MBFD-F 7009	MBFD-F 9009	MBFD-F 7012	MBFD-F 9012
Ice condenser capacity	9kg		12kg	
Ice condenser temperature	-70℃	-90℃	-70℃	-90℃
Cold trap volume	15L		20L	
Freeze dried chamber	Bell shape (standard configuration)/Multi manifold type/T-shaped frame type			
Sample shelf	• Φ260mm,Single layer area 0.055m². 3-10 layers/optional • Electric heating/manual capping/optional			
Vacuum pump	Extreme vacuum $5*10^{-3}$mbar with a pumping capacity of $8m^3/h$ optional pump of various types			
Oil mist filter	Standard configuration			
Vacuum pump connection pipe	Single forming stainless steel flexible pipe DN16 ISO-KF			
Anti-corrosive treatment	Cold trap, condensing coil/all equipped with PTFE anti-corrosion treatment as standard. Freeze-drying organic solvents.			
External valve	12pieces/24pieces			
Eutectic point detection system	Support/Optional			
Data output analysis	Support/Optional			
Power	0.9kw	1.5kw	1kw	1.6kw
Size	525*570*1080mm			
Net Weight	80kg	85kg	82kg	87kg
Voltage	220V, 50/60Hz			

Laboratory Freeze Dryer **H** Series

Laboratory square chamber front opening model, integrated freeze dryer, with a large drying area and easy operation.

Model No	MBFD-H 7006	MBFD-H 9006	MBFD-H 9009
Ice condenser capacity	6kg	6kg	9kg
Ice condenser temperature	-70℃	-90℃	-90℃
Cold trap volume	12L	15L	
Freeze dried chamber	Square cavity/front door opening/door opening angle up to 180 degrees		
Sample shelf	• Stainless steel template partition • Electric heating/optional		
Vacuum pump	Extreme vacuum $5*10^{-3}$mbar with a pumping capacity of $8m^3/h$ optional pump of various types		
Oil mist filter	Standard configuration		
Vacuum pump connection pipe	Single forming stainless steel flexible pipe DN16 ISO-KF		
Anti-corrosive treatment	Cold trap, condensing coil/all equipped with PTFE anti-corrosion treatment as standard. Freeze-drying organic solvents.		
External valve	8pieces		
Eutectic point detection system	Support/Optional		
Data output analysis	Support/Optional		
Power	0.95kw	1.65kw	
Size	700*580*1600mm		
Voltage	220V, 50/60Hz		