



# Solution For Vacuum Freeze-drying System





## BYK Instrument

Beijing boyikang laboratory instrument company is located in Beijing of China, is one of the professional manufacturer can provide complete freeze-drying solution in the world. The company have several freeze dry technology experts, with the world's leading production technology, can provide the freeze drying equipment from the laboratory research, pilot and industrial production to customer.

### Company development history.

- ◎Founded in 2002.
- ◎Large scale of pilot freeze dryer.
- ◎Complete the design of (SIP+CIP 20m<sup>2</sup>)vacuum freeze dryer in 2004.
- ◎Sold 800 sets and sold to many countries in 2010.
- ◎Complete the design of BIOCOOL series of high-grade laboratory freeze dryers in 2011.
- ◎Large scale of high-grade laboratory research, pilot and industrial product freeze dryers in 2012.
- ◎Complete the design of Laboratory freeze dryer(-165°C).



## Solution For Vacuum Freeze-drying System

### Type of laboratory freeze dryers



### Type of laboratory pilot freeze dryers



### Type of Pilot freeze dryers for production process



### Type of GMP standard pilot freeze dryers.



### Lyophilizer for mass production



## FD-1 Series Freeze Dryer

### Main characteristics:

- ◎ The chamber integral whole models.No splice, high strength, never leakiness.
- ◎ The cold trap have freezing function.
- ◎ The draft tube technique can help shorten drying time.
- ◎ Special sample dry in the cold trap for low temperature .
- ◎ The original package imports backfill valve can backfill N2 or sloth air in order to long -stem storage.
- ◎ Adopts international famous brand compressor, efficiently stable, low noise.

### Choose guide:

FD-1 series have five types:Common type, stopper type, Adapter type, stopper &Adapter type, T drying chamber type.

Load material difference:

- ◎ Common Type:Suit loading bulky material.
- ◎ Stopper Type:Suit loading penicillin bottle .
- ◎ Adapter type:Suit loading hang bottle .
- ◎ Stopper &Adapter type:Suit to loading bulky material, bottled material and hang bottle.
- ◎ T drying chamber type:Suitable for loading ampoule bottle.
- ◎ Suit freeze sample :Water-soluble aqua, muddy liquid or paste-like in shape material, the crystal temperature is higher than-20 ℃ .



### Optional:

- ★ Crystal Temperature Test Instrument      ★ Sample Temperature Monitor
- ★ Six/Eight Layers Drying Chamber      ★ Six/Eight Layers Drying Chambe&Valves
- ★ Build-In Chamber      ★ Manifold Chamber      ★ Ampoule Bottle Sealing Device      ★ Capping Device
- ★ International Brand Vacuum Pump      ★ Oil Mist Filter      ★ Vacuum Pump Defend Return Oil Device
- ★ Vacuum Oil      ★ Backfill Filter      ★ Flask      ★ Serum Bottle

### FD-1 Series Freeze Dryers Technique Parameter

Model	FD-1A-50 FD-1A-80	FD-1B-50 FD-1B-80	FD-1C-50 FD-1C-80	FD-1D-50 FD-1D-80	FD-1E-50 FD-1E-80
Shelf Area	0.12	0.08	0.12	0.08	_____
Cold Trap ( Unload )	-55/-85	-55/-85	-55/-85	-55/-85	-55/-85
LimitingVacuum ( Unload )	<9Pa				
Condensor Capacity	3L/4L				
Compressor	7/8HP 2*2/3HP				
VacuumPump ( China )	2L/S				
Dimension	W350*D600*H345 W540*D550*H900				



## FD-2 Series Freeze Dryer

### Main characteristics:

- ◎The drying chamber adopt special material.High strength, never leakiness.
- ◎The cold trap have freezing function.
- ◎The draft tube technique can help shorten drying time.
- ◎Special sample dry in the cold trap for low temperature .
- ◎The original package imports backfill valve can backfill N2 or sloth air in order to long -stem storage.
- ◎Adpot the PLC&HMI,operate easy.
- ◎Data recording system continuous save data for 90 days.
- ◎Mass memory for safe storage of 500 programmen or user-defined protocols.
- ◎Display Vacuum degree and temperature.
- ◎Adpot safe voltage ensure safty.
- ◎Start-up delay function minimizes damage to compressor.
- ◎Display history curve ,such as vacuum pressure ,cold trap temperature and sample temperature.
- ◎Adopts international famous brand compressor, efficiently stable, low noise.



### Choose guide:

FD-2 series have five types: economical type, common type, stopper type, adapter type, stopper &Adapter type.

Load material difference:

- ◎Economical Type: Suit loading bulky material ( no heating).
- ◎Common Type:Suit loading bulky material.
- ◎Stopper Type:Suit loading penicillin bottle .
- ◎Adapter type:Suit loading hang bottle .
- ◎Stopper &Adapter type:Suit to loading bulky material, bottled material and hang bottle.
- ◎Suit freeze sample :Water-soluble aqua, muddy liquid or paste-like in shape material, the crystal temperature is higher than-40 °C .

### Optional:

- |                                       |   |
|---------------------------------------|---|
| ★ Crystal Temperature Test Instrument | ★ Sample Temperature Monitor            |
| ★ Six/Eight Layers Drying Chamber     | ★ Six/Eight Layers Drying Chambe&Valves |
| ★ Build-In Chamber                    | ★ Manifold Chamber                      |
| ★ Ampoule Bottle Sealing Device       | ★ Capping Device                        |

- ★ International Brand Vacuum Pump
- ★ Vacuum Pump Defend Return Oil Device
- ★ Backfill Filter
- ★ Serum Bottle
- ★ Oil Mist Filter
- ★ Vacuum Oil
- ★ Flask

## FD-2 series freeze dryers technique parameter

Model	FD-2	FD-2A	FD-2B	FD-2C	FD-2D
Shelf Area	0.27	0.18	0.12	0.18	0.12
Cold Trap ( Unload )	-85				
Limiting Vacuum ( Unload )	<9Pa				
Condensor Capacity	6L				
Compressor	2*7/8HP				
Vacuum Pump ( China )	4L/S				
Dimension	W540*D720*H960				



## FD-3/4/5/8 Series Freeze Dryer

### Main characteristics:

- ◎The drying chamber adopt special material.High strength, never leakiness.
- ◎The cold trap have freezing function.
- ◎The draft tube technique can help shorten drying time.
- ◎Special sample dry in the cold trap for low temperature .
- ◎The original package imports backfill valve can backfill N2 or sloth air in order to long -stem storage.
- ◎Adpot the PLC&HMI,operate easy.
- ◎Data recording system continuous save data for 90 days.
- ◎Mass memory for safe storage of 500 programmen or user-defined protocols.
- ◎Display Vacuum degree and temperature.
- ◎Adpot safe voltage ensure safty.
- ◎Start-up delay function minimizes damage to compressor.
- ◎Display history curve ,such as vacuum pressure ,cold trap temperature and sample temperature.
- ◎Adopts international famous brand compressor, efficiently stable, low noise.



### Choose guide:

- ◎FD-3&FD-5 have stopper device.
- ◎FD-4&FD-8 don't have stopper device.
- ◎Suit freeze sample :Water-soluble aqua, muddy liquid or paste-like in shape material, the crystal temperature is higher than-20 °C .

### FD-3/4/5/8 series freeze dryers technique parameter

Model	FD-3	FD-4	FD-5	FD-8
Shelf Area	0.3	0.4	0.5	0.8
Cold Trap (Unload)	-55			
Vacuum (unload)	<13Pa			
Condensor Capacity	10L	10L	15L	15L
Shelf Num.	5	5	7	7
Vacuum Pump ( China )	6L/S	6L/S	8L/S	8L/S
Power	380VAC 50HZ 3KW			



## Lab Series Freeze Dryer(Economical)

### Main characteristics:

◎ Adopt the PLC and HMI

User-friendly interface, easy to understand, do not need instructions can also operate.

◎ Automatic Programmable Control System

From drying to defrosting, user-friendly programmable controls enable you to start runs quickly and the microprocessor controls different ramping and holding segments to meet different temperature protocols.

◎ Heating Drying System

By controlling temperature by forceful circulation of the heat medium of shelf inside, it obtains a further precise distribution of temperatures.

◎ Pre-freeze System

The chamber pre-freezes sample to save money and time, eliminating the need for a separate freezer and product transfer.

◎ Defrosting System

Automatically defrosting system is available for cold tray when defrosting is necessary.

◎ Vacuum Backfilling System

As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile air and nitrogen gas with back filling system for preventing contamination of the sample. (optional)

◎ Adjust Vacuum System

During the freeze drying, adjust the vacuum can improve the freeze drying efficiency (5–300Pa). (optional)

◎ Automatic drainage system

After the drainage and vacuum system interlocking, avoid forget the breakdown of the drain valve in order to produced the vacuum pump (optional).

◎ Safety Stoppering System

For the purpose of permanent preservation of a sample after freeze dryig, the stopper system, which seals under the vacuum state, consists an option that installs moving guides shelves delicately and that has a function to seal safely and precisely using a rotating sealing device.

◎ Automatic Purge System

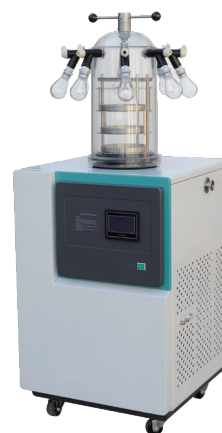
It is equipped with an automated purge system to protect samples by preventing of counter-flow vacuum pump oil. (optional)

◎ Compressor Delayed Protection

Compressor delayed start function to minimize any damage to compressor.

◎ 1.5 km far remote control system

The user can control the device by far remote control system (optional).



## Solution For Vacuum Freeze-drying System

### Choose guide:

FD-1 series have five types: Common type, stopper type, Adapter type, stopper & Adapter type, T drying chamber type.

Load material difference:

- ⊙ Common Type: Suit loading bulky material.
- ⊙ Stopper Type: Suit loading penicillin bottle .
- ⊙ Adapter type: Suit loading hang bottle .
- ⊙ Stopper & Adapter type: Suit to loading bulky material, bottled material and hang bottle.
- ⊙ T drying chamber type: Suitable for loading ampoule bottle.
- ⊙ Suit freeze sample :Water-soluble aqua, muddy liquid or paste-like in shape material, the crystal temperature is higher than  $-20^{\circ}\text{C}$  .

### Optional:

- ★ Crystal Temperature Test Instrument
- ★ Vacuum Backfilling System
- ★ Automatic drainage system
- ★ Six/Eight Layers Drying Chamber
- ★ Build-In Chamber
- ★ Ampoule Bottle Sealing Device
- ★ International Brand Vacuum Pump
- ★ Vacuum Pump Defend Return Oil Device
- ★ Backfill Filter
- ★ Serum Bottle
- ★ Sample Temperature Monitor
- ★ Adjust Vacuum System
- ★ Automatic Purge System
- ★ Six/Eight Layers Drying Chamber & Valves
- ★ Manifold Chamber
- ★ Capping Device
- ★ Oil Mist Filter
- ★ Vacuum Oil
- ★ Flask
- ★ 1.5 km far remote control system.

### Lab-1 series freeze dryers technique parameter(Economical)

Model	Lab-1A-50E Lab-1A-80E	Lab-1B-50E Lab-1B-80E	Lab-1C-50E Lab-1C-80E	Lab-1D-50E Lab-1D-80E	Lab-1E-50E Lab-1E-80E
Shelf Area	0.12	0.08	0.12	0.08	———
Cold Trap (Unload)	$-55/-85$	$-55/-85$	$-55/-85$	$-55/-85$	$-55/-85$
Vacuum (Unload)	<8Pa				
Condensor Capacity	3L/4L				
Compressor	7/8HP 2*2/3HP				
Vacuum Pump	2L/S				
Dimension	W470*D600*H400 W640*D640*H1000				

## Lab Series Freeze Dryer

### Main characteristics:

- ◎ Adopt the PLC and HMI  
User-friendly interface, easy to understand, do not need instructions can also operate.
- ◎ Automatic Programmable Control System  
From drying to defrosting, user-friendly programmable controls enable you to start runs quickly and the microprocessor controls different ramping and holding segments to meet different temperature protocols.
- ◎ Heating Drying System  
By controlling temperature by forceful circulation of the heat medium of shelf inside, it obtains a further precise distribution of temperatures.
- ◎ Pre-freeze System  
The chamber pre-freezes sample to save money and time, eliminating the need for a separate freezer and product transfer.
- ◎ Defrosting System  
Automatically defrosting system is available for cold tray when defrosting is necessary.
- ◎ Vacuum Backfilling System  
As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile air and nitrogen gas with back filling system for preventing contamination of the sample.
- ◎ Adjust Vacuum System  
During the freeze drying, adjust the vacuum can improve the freeze drying efficiency (5–300Pa).
- ◎ Automatic drainage system  
After the drainage and vacuum system interlocking, avoid forget the breakdown of the drain valve in order to produce the vacuum pump (optional).
- ◎ Safety Stoppering System  
For the purpose of permanent preservation of a sample after freeze drying, the stopper system, which seals under the vacuum state, consists of an option that installs moving guides shelves delicately and that has a function to seal safely and precisely using a rotating sealing device.
- ◎ Automatic Purge System  
It is equipped with an automated purge system to protect samples by preventing of counter-flow vacuum pump oil.
- ◎ Compressor Delayed Protection  
Compressor delayed start function to minimize any damage to compressor.
- ◎ 1.5 km far remote control system  
The user can control the device by far remote control system (optional).





## Solution For Vacuum Freeze-drying System

### Choose guide:

Lab series have five types: Common type, stopper type, Adapter type, stopper & Adapter type, T drying chamber type.

Load material difference:

- Common Type: Suit loading bulky material.
- Stopper Type: Suit loading penicillin bottle .
- Adapter type: Suit loading hang bottle .
- Stopper & Adapter type: Suit to loading bulky material, bottled material and hang bottle.
- T drying chamber type: Suitable for loading ampoule bottle.
- Suit freeze sample : Water-soluble aqua, muddy liquid or paste-like in shape material, the crystal temperature is higher than  $-20^{\circ}\text{C}$  .

### Optional:

- ★ Crystal Temperature Test Instrument
- ★ Automatic drainage system
- ★ Six/Eight Layers Drying Chamber
- ★ Build-In Chamber
- ★ Ampoule Bottle Sealing Device
- ★ International Brand Vacuum Pump
- ★ Vacuum Pump Defend Return Oil Device
- ★ Backfill Filter
- ★ Serum Bottle
- ★ Sample Temperature Monitor
- ★ 1.5 km far remote control system.
- ★ Six/Eight Layers Drying Chamber & Valves
- ★ Manifold Chamber
- ★ Capping Device
- ★ Oil Mist Filter
- ★ Vacuum Oil
- ★ Flask

### Lab-1 series freeze dryers technique parameter

Model	Lab-1A-50 Lab-1A-80	Lab-1B-50 Lab-1B-80	Lab-1C-50 Lab-1C-80	Lab-1D-50 Lab-1D-80	Lab-1E-50 Lab-1E-80
Shelf Area	0.12	0.08	0.12	0.08	_____
Cold Trap (Unload)	-55/-85	-55/-85	-55/-85	-55/-85	-55/-85
Vacuum (Unload)	<8Pa				
Condensor Capacity	3L/4L				
Compressor	7/8HP 2*2/3HP				
Vacuum Pump	2L/S				
Dimension	W470*D600*H400 W640*D640*H1000				

## Accessories

1.Drying Chamber: FDC 20\*06 FDC20\*08 Explanation: FDC:Freeze Drying Chamber, 20:Tray diameter 20mm, 6:Number of shelf;



2.Drying Chamber&Valves FDC20\*06\*12 FDC20\*08\*12 Explanation: FDC:Freeze Drying Chamber, 20:Tray diameter 20mm, 6:Number of shelf,12:Number of flasks.



3.Stopping Chamber&Valves FDC18\*03\*12-S FDC20\*08\*12 Explanation: FDC:Freeze Drying Chamber, 18:Tray diameter 20mm, 3:Number of shelf,12:Number of flasks, S: Stopping.



4.Build-in Chamber FDC\*2 FDC\*3 FDC\*4Explanation: FDC:Freeze Drying Chamber, 2 : Number of shelf.

5.Manifold Chamber T16 T24 T52 T104



6.Crystal Temperature Test Instrument



10.Capping Device



7.Oil Mist Filter



11.Backfill Filter



8.Ampoule Bottle Sealing Device



12.Temperature Monitor



9.Ampoule Bottle Sealing Machine





## Pilot Series Freeze Dryer

- ◎ Adopt the PLC and HMI

User-friendly interface, easy to understand, do not need instructions can also operate.

- ◎ Automatic Programmable Control System

From drying to defrosting, user-friendly programmable controls enable you to start runs quickly and the microprocessor controls different ramping and holding segments to meet different temperature protocols.

- ◎ Heating Drying System

By controlling temperature by forceful circulation of the heat medium of shelf inside, it obtains a further precise distribution of temperatures.

- ◎ Pre-freeze System

In place pre-freezes sample to save money and time, eliminating the need for a separate freezer and product transfer.

- ◎ Defrosting System

Automatically defrosting system is available for cold tray when defrosting is necessary.

- ◎ Vacuum Backfilling System

As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile air and nitrogen gas with back filling system for preventing contamination of the sample.

- ◎ Adjust Vacuum System

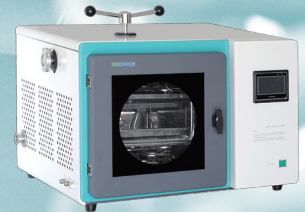
During the freeze drying, adjust the vacuum can improve the freeze drying efficiency (5–300Pa).

- ◎ Automatic drainage system

After the drainage and vacuum system interlocking, avoid forget the breakdown of the drain valve in order to produced the vacuum pump (optional).

- ◎ Safety Stoppering System

For the purpose of permanent preservation of a sample after freeze dryig, the stopper system, which seals under the vacuum state, consists an option that installs moving guides shelves delicately and that has a function to seal safely and precisely using a rotating sealing device.





☉ Automatic Purge System

It is equipped with an automated purge system to protect samples by preventing of counter-flow vacuum pump oil.

☉ Compressor Delayed Protection

Compressor delayed start function to minimize any damage to compressor.

☉ 1.5 km far remote control system.

The user can control the device by far remote control system(optional).

## Pilot Series Freeze Dryer Specification ( Laboratory):

Model	Pilot1–2LD	Pilot2–4LD	Pilot1–2MD	Pilot2–4MD	Pilot2–4L	Pilot2–4M	Pilot2–4H
Shelf Usable Area	0.1	0.2	0.1	0.2	0.2	0.2	0.2
Cold Trap (°C)	–55	–85	–55	–85	–55	–85	–85
Stopper	YES	NO	YES	NO	YES	YES	YES
Vacuum Backfilling System	NO	NO	YES	YES	NO	NO	YES
Adjust Vacuum System	NO	NO	YES	YES	NO	NO	YES
Automatic Purge System	NO	NO	YES	YES	NO	NO	YES
Automatic drainage system	NO	NO	NO	NO	NO	NO	YES
1.5 km far remote control system	NO	NO	NO	NO	NO	NO	NO
Vacuum	<8Pa	<8Pa	<6Pa	<6Pa	<6Pa	<6Pa	<6Pa
Condenser Capacity	3L	4L	3L	4L	4L	4L	4L
Compressor	7/8HP	2*7/8HP	7/8HP	2*7/8HP	1HP	2*1HP	2*1HP
Vacuum	2L/S						
Dimension (mm)	W750*D730*H600	W740*D800*H1330	W750*D730*H600	W740*D800*H1330	W660*D850*H1440	W660*D850*H1440	W660*D850*H1440

## Solution For Vacuum Freeze-drying System

### Pilot Series Freeze Dryer Specification ( Production Process ) :

Model	Pilot3-6H	Pilot5-8H	Pilot3-6T	Pilot5-8T	Pilot10-15T
Shelf Usable Area	0.3	0.5	0.3	0.5	1.0
Through Wall	NO	NO	YES	YES	YES
Cold Trap (°C)	-85				
Stopper	YES				
Vacuum Backfilling System	YES				
Adjust Vacuum System	YES				
Automatic Purge System	YES				
Automatic drainage system	YES				
1.5 km far remote control system	YES				
Vacuum	<8Pa	<8Pa	<6Pa	<6Pa	<6Pa
Condenser Capacity	3L	4L	3L	4L	4L
Compressor	2*1HP	2*1HP	2*1HP	2*1HP	2*2HP
Dimension (mm)	W1400*D760*H1800	W1400*D760*H1800	W760*D900*H1800	W860*D1400*H1800	W860*D2100*H1900

## LYO Series Freeze Dryer

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- ◎ Adopt the PLC and HMI

User-friendly interface, easy to understand, do not need instructions can also operate.

- ◎ Automatic Programmable Control System

From drying to defrosting, user-friendly programmable controls enable you to start runs quickly and the microprocessor controls different ramping and holding segments to meet different temperature protocols.

- ◎ Heating Drying System

By controlling temperature by forceful circulation of the heat medium of shelf inside, it obtains a further precise distribution of temperatures.

- ◎ Pre-freeze System

In place pre-freezes sample to save money and time, eliminating the need for a separate freezer and product transfer.

- ◎ Defrosting System

Automatically defrosting system is available for cold tray when defrosting is necessary.

- ◎ Vacuum Backfilling System

As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile air and nitrogen gas with back filling system for preventing contamination of the sample.

- ◎ Adjust Vacuum System

During the freeze drying, adjust the vacuum can improve the freeze drying efficiency (5–300Pa).

- ◎ Automatic drainage system

After the drainage and vacuum system interlocking, avoid forget the breakdown of the drain valve in order to produced the vacuum pump (optional).

- ◎ Safety Stoppering System

For the purpose of permanent preservation of a sample after freeze dryig, the stopper system, which seals under the vacuum state, consists an option that installs moving guides shelves delicately and that has a function to seal safely and precisely using a rotating sealing device.

- ◎ Automatic Purge System

It is equipped with an automated purge system to protect samples by preventing of counter-flow vacuum pump oil.

- ◎ Compressor Delayed Protection

Compressor delayed start function to minimize any damage to compressor.

- ◎ 1.5 km far remote control system

The user can control the device by far remote control system (optional).



## Solution For Vacuum Freeze-drying System

### LYO Series Freeze Dryer Specification ( Economical):

Model	LYO-1E	LYO-1SE	LYO-2E	LYO-2SE	LYO-3E	LYO-3SE	LYO-5E	LYO-5SE
Shelf Usable Area	1	1	2	2	3	3	5	5
Cold Trap (°C)	<-70							
Stopper	NO	YES	NO	YES	NO	YES	NO	YES
Bottle Num. ( ϕ 22)	2100	2100	4200	4200	6300	6300	9450	9450
Liquid (L)	20	20	40	40	60	60	100	100
CIP	NO							
SIP	NO							
Shelf (mm)	100							
Shelf Temperature Range	-55-+80							
Condenser Capacity ( Kg/24H )	20	20	40	40	60	60	100	100
Limiting Vacuum	<5Pa							

## LYO Series Freeze Dryer Specification ( Standard):

Model	LYO-1	LYO-2	LYO-3	LYO-5	LYO-7	LYO-10	LYO-20	LYO-40
Shelf Usable Area	1	2	3	5	7	10	20	40
Cold Trap (°C)	<-70							
Stopper	YES							
Bottle Num. ( ϕ 22)	2100	4200	6300	9450	15750	19950	42900	52500
Liquid (L)	20	40	60	100	150	200	400	800
Cooling Water Qty.	3.2	4.2	4.5	11	16	18	20	50
Cleaning Water(L/min)	100	100	100	100	100	100	150	200
Pure Steam Consumption (Kg/H)	20	40	60	100	150	200	400	600
CIP	YES							
SIP	Optional							
Shelf (mm)	100							
Shelf Temperature Range	-55~+80							
Condenser Capacity ( Kg/24H )	20	40	60	100	150	200	400	800
Limiting Vacuum	<3Pa							



## Product features

### Cabinet:

Cabinet is designed and manufactured according to GB150-2011/PED ASME standards and comply with the CGMP and FDA requirements. The mirror polished inner oven, tilting mode used under oven are more conducive to drainage when CIP and SIP.

Shelf adopts international advanced welding technology manufacturing.

1. The internal welding
2. TIG welding
3. Rail welding technology



### Cold Trap:

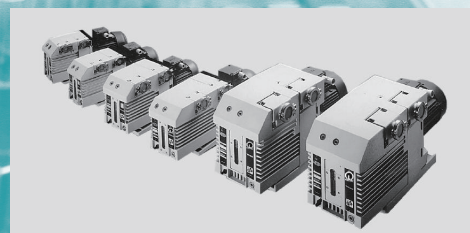
The mirror polished inner cold trap, so the surface is bright and smooth. The channel of water vapor is designed rationally, making the molecules' motion smaller and the water collecting efficiency is higher.

### Refrigeration system:

Adopted first-class refrigeration compressor in the world, the refrigeration system is security and stability.

### Vacuum System :

Vacuum pipe with automatic orbital welding, welding firm and beautiful. The detection was performed by mass spectrometry detector, ensure the vacuum system to achieve high vacuum requirements.



### Plate heat exchanger:

Adopted first-class plate heat exchanger in the world, the refrigeration system is security and stability.

### Technical advantage:

- Automatic Programmable Control System:  
Programmable freeze-dried whole process, from the



lyophilized to defrost and drainage control by program.

- Heated Drying system:

By controlling temperature of shelf ,making further precise distribution of temperatures. At the same time improve the freeze drying speed.

- Pre-freeze system:

The freeze dryer has pre-freeze function ,eliminating the need for a separate freezer and product transfer.

- Defrosting system:

Automatically defrosting system is available for cold tray when defrosting is necessary.

- Vacuum Backfilling System:

As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile air and nitrogen gas with back filling system for preventing contamination of the sample.

- Stoppering System:

For the purpose of permanent preservation of a sample after freeze dryig, the stopper system, which seals under a vacuum state, consists an option that installs moving guides shelves delicately and that has a function to seal safely and precisely using a rotating sealing device.

- Vacuum adjustment system

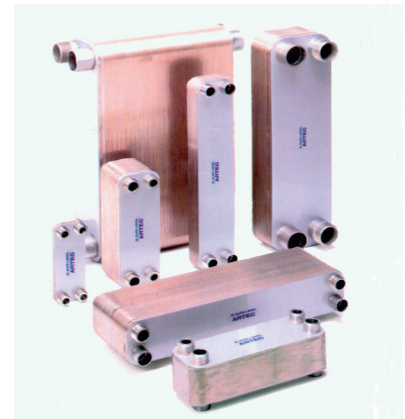
In the freeze drying process, through adjusting the vacuum to accelerate the drying rate.

- Freeze dried terminal test

When drying nearly, carry on lyophilized terminal test to ensure the moisture content reach standard.

- Remote control system

Control the equipments of the long range by PC.



## VO Series Vacuum Oven

The VO series is designed for the University and research institutes. Other fields of vacuum drying or corresponding experiments can be used.

### Product features:

- ◎The heating system:  
Adopt four heating, fast heating speed, uniform temperature. The temperature sensor installation location to ensure the scientific, capable of measuring the geometric center of temperature.
- ◎The over temperature safety device:  
Double protection of temperature, the user can according to need to adjust the over temperature protection value, to ensure the system security and stability.
- ◎Liner:  
Use (5mm) SUS304 stainless steel plate, ensure the smooth. Special polishing process to ensure the smoothness of the inner liner.
- ◎Sealing door: adopts the double-layer tempered glass, ensure the strength.
- ◎Seal: use high temperature resistant silicone seal, ensure good sealing.
- ◎Use high-quality control system, sensor, vacuum gauge and vacuum seal.
- ◎The box is made of high quality insulation materials, reduce the loss of heat.
- ◎The use of high-quality vacuum pipeline valve, ensure that the system can protect the pressure for more than 48 hours.
- ◎Use fuzzy +PID control with advanced technology, ensure the precision of temperature control.
- ◎Configuration over temperature protector, protector of leakage of electricity, to ensure the security of system.



### VO Series Vacuum Oven(Economic)

Model	VO-30E	VO-60E	VO-90E
Heating	Four heating		
Temperature Range	10-210℃		
Limiting Vacuum	133Pa		
Display precision	0.1℃		
Control precision	± 1℃		
Heating-up time	90Min		
Heating power	1.3KW	1.8KW	2.2KW
Temperature control method	Puzzel+PID		
Sensor	ALevel PT100 ( ABB )		
Vacuum Meter	Mechanical type vacuum gauge		
Liner ( mm ) W*D*H	320*320*330	400*390*410	450*460*460
Shelf	Two		
effective volume	30L	60L	90L
Dimension (mm) W*D*H	510*460*760	620*540*910	620*630*950
Power	AC220V 50/60HZ		
Weight	80Kg	120Kg	150Kg



## YC-1 YC-1A YC-2 YC-2A

### Chromatography Refrigerator

- ◎YC series chromatography refrigerator is special purpose for chromatography experiments and also use to other experiments in the low temperature environment.
- ◎YC-1 is single door,inner top is 1.7 meter.
- ◎YC-2 is double door,inner size is bigger than YC-1.
- ◎YC-1A and YC-2A have tray.

### Main Characteristics:

- ◎Adpot the international brand compressor.
- ◎Inner top is 1.7 meter,suite for operate.
- ◎Adpot the sus304 stainless steel for inner.
- ◎Two chromatography poles and two tray.
- ◎Lighting ,antiseptis light and power socket.
- ◎RS485 is optional.
- ◎Safety protect fuction.
- ◎Aralam function.



### YC Series Chromatography Refrigerator

Model	YC-1	YC-1A	YC-2	YC-2A
Temperature Range	2-8℃			
Display precision	± 0.1℃			
Control precision	± 0.5℃			
effective volume(L)	800	800	1200	1200
Tray size(mm)	650*345	650*345	605*525	605*525
Dimension ( mm) W*D*H	760*880*1960		1320*760*1960	

## HX-1050 HX-2050 Constant Temperature Circulator

HX series of constant temperature circulator, also known as low temperature water bath, have built-in refrigeration and heating, used to be precision constant temperature source.

Used to constant temperature experiments in the bath, or connected with other devices by tube. Use as the constant temperature source, such as rotary evaporator, electrophoresis, viscometer, medical coldcap, cooling blanket; or to other equipment used in circulating cooling water, such as electron microscopy, sub pump, ion pump, diffusion pump, microwave therapy machine etc.

### Main Characteristics:

Adopt international brand compressor.

Temperature is even.

Used to provide constant temperature source.

Special pump, stable quality.

Batch adopt the stainless steel, clearing and anti-corrosion ;

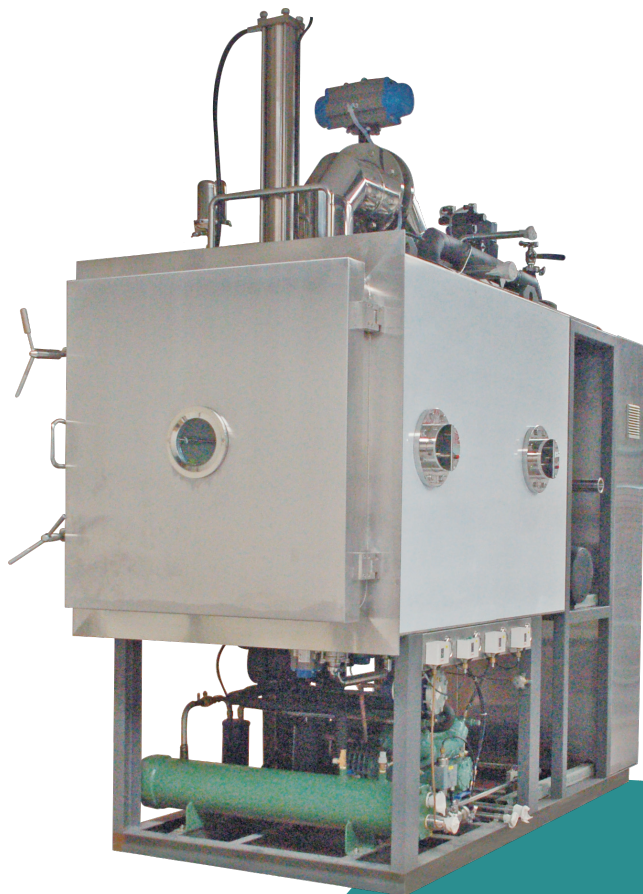


## HX-1050 HX-2050 Constant Temperature Circulator

Model	HX-1050	HX-2050
Temperature Range(°C)	-10~50	-15~50
Refrigerator power(W)	200	1000
effective volume(L)	4	20
rate of flow(L/Min)	10	20
Lift(m)	2.5	3.0
Control precision(°C)	±0.1°C	±0.2°C
Dimension ( mm) W*D*H	200*350*480	360*570*620



**BIOCOOL**



**Beijing Boyikang Laboratory Instrument Co.,Ltd  
International Department:**

Karaltay Scientific Instruments Co., Ltd.  
Room 1015, BRIMET, No.18 Xueqing Road,  
Haidian District, Beijing, P.R. China 100083  
Tel: 0086-10-62023948 62016954  
Email: [sales@karaltay.com](mailto:sales@karaltay.com) [karaltay@hotmail.com](mailto:karaltay@hotmail.com)