## Typical Applications

Our freeze dryers are suitable for a wide range of applications

- Preserving the product characteristics of the original substances
- Preserving the original form (animal preparations, archaeological objects or owers)
- Conditioning the material (freeze-dried fruit)
- Chemical analyses (trace element analyses of foods, sludge or soil)

## Advantages of Freeze Drying

- **Protein will not be denatured**
  Freeze-drying is carried out at low temperature. Many heat-sensitive substances such as proteins and micro-organisms will not denature or lose biological activity
- **Low temperature non- volatile**
  When drying at low temperature, the loss of some volatile components in the substance is very small, which is suitable for drying chemical products, medicines and foods
- **Keep the original structure**
  Since it is dried in a frozen state, the volume is almost unchanged, and the original structure will be maintained
- **Fast reconstitution with water**
  The dried material is loose and porous, in the form of sponge. After adding water, it dissolves quickly and restores its original properties
- **Powder non-oxidizing**
  Since drying takes place under vacuum with very little oxygen, oxidizable substances are protected
- **No deterioration after dehydration**
  Drying can remove more than 95% - 99% of the water. Samples can be stored immediately after drying







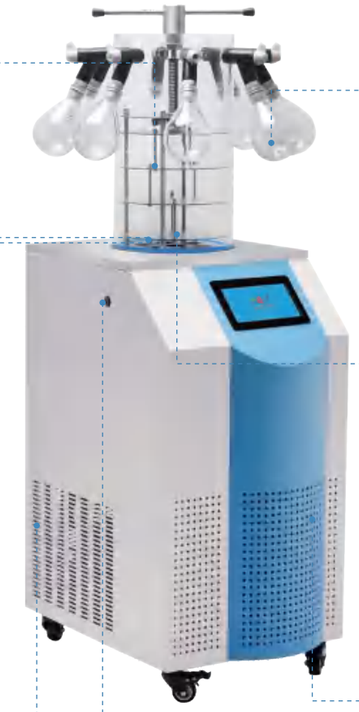

Cap type material rack, suitable for directly sealing penicillin bottles after freeze-drying

Large volume stainless steel cold trap with no inner coil inside, allowing for independent freeze-drying of samples

Design insulation cover with card slot method, reduces cold lost during pre freezing process, saves energy, and prevents condensation



Quality compressor with low cold trap temperature and strong water harvesting ability



Multiple external freezedrying bottles, suitable for simultaneous freeze-drying of multiple samples

All stainless steel countertop, corrosion-resistant, easy to clean, unique bridge breaking design at the top of the cold trap, added insulation layer to avoid condensation and frost on the countertop



Efficient air-cooled condenser, using aerodynamic fan blades, can improve heat dissipation capacity and save more energy

Equipped with USB interface, capable of exporting freeze-dry data, facilitating user information management

## More Configurations



Stainless steel drying drum



20 stainless steel drying rack



24 stainless steel drying rack



Wide mouth freeze-drying bottle

## Laboratory Scale - Console

Economic:

CTFD-12S; CTFD-12T; CTFD-12P; CTFD-12PT

Classic:

CTFD-12S-U; CTFD-12T-U; CTFD-12P-U; CTFD-12PT-U

Premium:

CTFD-12S-UPlus; CTFD-12T-UPlus; CTFD-12P-UPlus; CTFD-12PT-UPlus



CTFD-12S
CTFD-12S-U
CTFD-12S-UPlus



CTFD-12T
CTFD-12T-U
CTFD-12T-UPlus



CTFD-12P
CTFD-12P-U
CTFD-12P-UPlus



CTFD-12PT
CTFD-12PT-U
CTFD-12PT-UPlus

## Product Parameters

| Model | | CTFD-12S<br>CTFD-12S-U<br>CTFD-12S-UPlus | CTFD-12T<br>CTFD-12T-U<br>CTFD-12T-UPlus | CTFD-12P<br>CTFD-12P-U<br>CTFD-12P-UPlus | CTFD-12PT<br>CTFD-12PT-U<br>CTFD-12PT-UPlus |
|---|---|---|---|---|---|
| Basic Information | Type | Standard chamber | Standard chamber | Standard chamber with 8 port manifold | Standard chamber with 8 port manifold |
| | Final Condenser Temp (°C) | -60 or -80 | -60 or -80 | -60 or -80 | -60 or -80 |
| | Vacuum Degree (Pa) | <10 | <10 | <10 | <10 |
| | Condenser Volume (L) | 9.5 | 9.5 | 9.5 | 9.5 |
| | Freeze Drying Area ($m^2$) | 0.12 or 0.18 | 0.09 | 0.12 or 0.18 | 0.09 |
| | Water Condenser Capacity (Kg/24h) | 4 | 4 | 4 | 4 |
| | Qty of Shelf | 4 or 6* | 3 | 4 or 6* | 3 |
| | Material Loading Capacity/Shelf (mL) | 300 | 300 | 300 | 300 |
| | Material Loading Capacity (mL) | 1200 or 1800 | 900 | 1200 or 1800 | 900 |
| | Manifold | / | / | 8 pieces | 8 pieces |
| | USB Interface | Y | Y | Y | Y |
| | Drying Chamber (Standard) | Transparent acrylic | | | |
| | Vacuum Pump | Standard model: 2XZ-2**; Speed: 2L/S | | | |
| | Control System | Microprocessor, touch screen | | | |
| | Ultimate Vacuum (Pa) | Economic: 1 Classic and Premium: 0.6 for -60°C/0.3 for -80°C | | | |
| | Noise (dB) | <66 | | | |
| Electrical Requirement | Electrical Voltage | 220V | | | |
| | Electrical Frequency | 50Hz, 60Hz | | | |
| | Power (Kw) | 0.95 or 1.5 | | | |
| Size Information | Condenser Chamber Dimension (φ*Hmm) | 217*250 | | | |
| | Sample Tray Dimension (φ*Hmm) | 200*20 | | | |
| | Sample Shelf Dimension (φ*Hmm) | 210*365 | 234*518 | 210*365 | 234*518 |
| | Sample Shelf Distance Average (Hmm) | 76 or 50*** | 70 | 76 or 50*** | 70 |
| | Host Size (W*D*Hmm) | 480*610*905 | | | |
| | Vacuum Hood Dimension (upperp/lowerq*Hmm) | 260/240/450 | | | |
| | Exterior Dimension (W*D*Hmm) | 480*610*1355 | 480*610*1415 | 480*610*1355 | 480*610*1415 |
| | Host Net Weight (Kg) | 70 or 83**** | | | |
| Package Information | Host Package (W*D*Hmm) | 730*600*1180 | | | |
| | Vacuum Hood Package (W*D*Hmm) | 410*410*640 | | | |
| | Vacuum Pump Package (W*D*Hmm) | 220*580*370 | | | |
| | Weight (Kg) | 135 or 155**** | | | |

## Model Selection

| Series | Economic | Classic | Premium |
|---|---|---|---|
| **Control System** | | | |
| Controller | 7 inch LCD touch screen | PLC controller | |
| Authority Levels | No | Three-level account password authority management  | |
| **Alarm System** | | | |
| Alarm Method | Text prompt | Buzzer alarm + screen text prompt  | |
| Refrigeration System Monitoring Alarm | No | Yes   | |
| Vacuum Pump Maintenance Alarm | Text prompt | The maintenance time of the vacuum pump can be independently set and modified  | |
| Vacuum Pressure Alarm | No | No | Yes  |
| **Data Tracking** | | | |
| Historical Data | With historical data checking function | Large-capacity storage module can store more than 1000 space freeze-drying curves and alarm records  | |

| Series | Economic | Classic | Premium |
|---|---|---|---|
| **Vacuum System** | | | |
| Vacuum Gauge | Accuracy 1 Pa | Stable and reliable accuracy 0.01Pa  | |
| Minimum Vacuum Pressure | 1 Pa | 0.6 Pa | |
| Vacuum Pump Protection Function | No | Yes | |
| Vacuum Pump Protection Temperature Setting | No | Yes<br>Vacuum pump begins to work automatically when condenser chamber reaches the setting temperature | |
| Vacuum Degree Control | No | No | the required vacuum pressure can be set and modified, so that the vacuum pressure of the freeze dryer can work under the set value  |
| Customized Setting of Freeze-drying Process | No | No | 40 programs can be set  |
| **Structure** | | | |
| Countertop Insulation Structure | Stainless steel countertop, common thermal insulation design | Unique bridge design on the countertop of condenser chamber  | |
| Drain and Inflation Port | Drain and inflation shares one port | Drain and charge port separated, independent drain valve and charge valve  | |
| Nitrogen Filling Valve | Optional | Standard | Standard |
| **Components Testing** | | | |
| Manual Test | No | Manual test function of main functional components, allows autonomous checking of every single component  | |
| **Electric Heating** | | | |
| Shelf Electric Heating Function | Optional (12, 18) | Optional (12, 18) | Standard (12, 18) |
| Defrost Function for Condenser Chamber | Optional | Optional | Optional |