

### FD-2L-TP-CIP-SIP(Optional)

#### Stopper Freeze Dryer



- **40L Ice Capacity**
- **2.16m2 Shelf Area**
- **All-include Structure**
- **Versatile&Economic**

FD-2L-TP stopper freeze dryer designed to fit commercial and industrial freeze drying, in pharmaceutical and biological area, the machine designed meet GMP requirements, and provide complete documents package.

The freeze dryer designed consider a lot of factors that will guarantee your success freeze drying result and high dried quality, we also could offer solutions according to your special requirements, with most cost-effective price.

#### Standard Specification:

Shelf Area	<b>2.16m2</b>
Shelf Type	Stoppering
Vials Capacity(φ22)	>4300
Shelves Temp.	-50C to +70C
Shelf Size	900*600mm
Shelves	4+1
Ice Capacity	40kgs
Condenser Temp.	-80C
Condenser Location	Rear side of drying chamber
Defrost	Water soaking
Vacuum Degree	<3Pa
Vacuum Pump Rate	32m3
Power Install	15kwh
Size	2500*1300*2100
Voltage	380V/50-60Hz/3P
Controller	PLC + Touch Screen
Main Material	AISI304 or 316L

#### Technical Features:

##### DRYING HOUSE:

- Design according to GB pressure container directives.
- Rectangular chamber, PUF insulated wall.
- Mirror finished walls, shelves, doors and accessories.
- Hinged door, in front door and side drying house have viewing ports.
- Plates and drying house inner wall mirror finish.

##### SHELVES:

- Stainless steel made, Mirror finish.
- High quality stainless steel knitted plates bellows.
- Sandwich type plates fill silicone oil, all plates have both freezing and heating function: -50C ~ +70C.
- 2.16m2 useable shelf area, 4 plates (size 900\*600mm) with material loading capacity, 1 for extra radiant temperature.

##### STOPPERING DEVICE:

- On top of drying house, hydraulic station installed.
- All plates connect and drive by hydraulic shaft, could flexible move up or down, help vials or bottles capping under vacuum.

##### CONDENSER:

- Condenser house in rear side of drying chamber, Split with drying chamber by Butterfly valve.
- Stainless steel material for both coils and walls, surface mirror finish.
- Condenser floor slope design for water thoroughly discharge.
- Exclusive designed coils route, high performance vapor collection.

##### VACUUM SYSTEM:

- Two stage oil sealed vacuum pump, with vacuum adjust controller.
- Pneumatic isolation valve installed between condenser and pump.

##### CONTROL SYSTEM:

- PLC + Touch screen system, PC connectivity.
- Touch screen panels install both in clean room and mechanical room.
- Automatic and Manual operation selectable.
- System working status diagram display.
- Freeze Drying status & data display.
- Drying data auto storage, could download to U disk.

#### System Performance:

Shelves Lowest Temp.	-50C
Shelves Temp. Range	-50C to +70C
Shelves Cooling Rate	+20C to -40C <60min
Shelves Heating Rate	>1C/min
Shelves Temp. Uniformity	Freezing: ±2C Heating: ±1C
Shelves & Wall Roughness	Ra<0.5
Shelves Flatness	<0.5mm/m
Condenser Lowest Temp.	-45C or -80C
Condenser Cooling Rate	+20C to -40C <30min
Condenser Coil Roughness	Ra<0.5
Vacuum Rate	Atm to 0.1mbar <30min
Vacuum Final	<3Pa
Vacuum Leakage	< 5x10 <sup>-2</sup> mbarL/s

##### COMPRESSOR SYSTEM:

- Reciprocating compressor, oversized for stable performance.
- Water cooled condenser and cooling tower include.
- Brazed plate heat exchanger for shelves cooling to -50C, refrigerant direct expand for condenser cooling to -80C.

##### HEATING SYSTEM:

- Heated silicone oil drive by a centrifuge pump recycle inside shelves.
- Individual electric heater provides heating energy.
- PID control introduced.

**CIP, SIP, PC Suit, Mobile Suit Optional.**

**Customized requirements acceptable.**

*Vikumer® Freeze Dry designed and manufactured freeze drying machine in China. Quality assured freeze dryer with CE marked.*