

LYO-068

Professional R&D Freeze Dryer





A Wise Choice

For Your Research Center

Laboratory research is the first step of new drugs development, lab data acquisition procedures and accuracy are very vital part, therefore, an advanced lyophilization equipment that meet FDA is needed, which could help pharmaceutical manufacturers success transfer research achievement to clinical trials and commercial production in future from R&D department.

The LYO freeze dryers are special designed to fit rigorous research center, **HELP CUSTOMER BUILD QUALITY CONTROL SYSTEM UNDER CGMP FROM THE START PHASE, EXTEND TO PRODUCTION PROCESS.**



Multi Applications

Bulk or Stoppering

The AISI316L finished shelves, trays, chamber and condenser, enable the LYO freeze dryers could easily handle different products include corrosive items, by using stoppering device, also could freeze drying items in various type vials.

Backside of freeze drying chamber, **RESERVE 1 INLET PORT FOR MANIFOLD CONNECTION**, flask holder could set in left or right side; validation port also reserved.

Reserved Inlet Port (Manifold connector)



Backside of drying chamber



AISI316L Drying Chamber

Considered Design

The LYO freeze dryers are designed self-contained body, compact size with casters for move, deliver to customer ready for operation, after plug in and connect compressed air device, all sides panels could open for maintenance.

Reliable Systems

All parts installed in LYO freeze drying system have been carefully select from world famous brand, right model select, highest quality, entire system assembled go through years' lasting to verify its reliability and stability. Temperature probes, vacuum pressure gauges, parts that have variable and will influence the drying result have go through strict validation and test, the sensors installed in LYO freeze dryer, its accuracy is warranted. Ensure you a precision data and procedure.



Heavy Duty Chambers

Drying chamber, shelves, trays and condenser are made from AISI316 material, superior craftsmanship ensure its flatness, roughness is same as production units. Drying chamber have rounded corners easy cleaning, both drying chamber and condenser have transparent door, lock by EXCLUSIVE compression lock method, door rubber seal is special made, >100000 open/close no leakage according to our lab test.

Condenser and drying chamber isolate by butterfly valve, that could test pressure change, judge drying finish or loading material without defrosting, condenser defrosting by hot gas.



Condenser and Chamber Door Lock

Precise and Uniform Temperature Control

Fluid recycle system used for shelves cooling or heating, all shelves are sandwich structure, inside have channels for fluid recycle, heating by individual electric heater, cooling indirect through plate heat exchanger, shelves temperature balance system allow the tolerance $< \pm 1\text{C}$ during sublimation.

Fluid temperature probe installed, real time display the fluid set temperature and real temperature, vacuum sensor in the drying chamber monitoring vacuum degree change and assist electric heater working, support/avoid overheating during sublimation.



Fluid recycle and electric heater

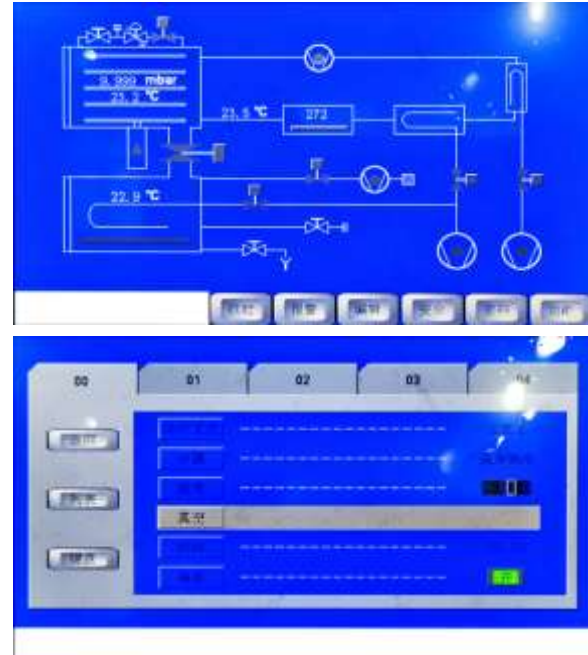
Advanced Control system

PLC + Touch Screen

One prominent feature of LYO freeze dryers is its high advanced control system, the system adopt PLC and user friendly Touch Screen controller, its same function as industrial units, which include:

- ◆ Log in and authority management.
- ◆ Parts/valves working status.
- ◆ Freeze drying recipes management.
- ◆ Drying curve display.
- ◆ Drying data export by batches.
- ◆ Automatic or semi-automatic working select.
- ◆ Alarm information.
- ◆ Data download.

Optional, PC suit provide more convenient freeze drying operation and data storage.



Excellent System Performance

Designed to meet user requirement, LYO freeze dryer delivered with excellent system performance:

Shelves cooling from +20C to -40C within 60min.

Shelves lowest temperature -55C (accuracy 2C).

Shelves heating from -40C to +20C within 60min.

Shelves Max temperature +80C (accuracy 1C).

Ice condenser cooling from +20C to -40C within 30min.

Ice condenser lowest temperature -80C.

Ice condenser defrosting time within 60min.

Vacuum pump from atmosphere to 0.1mbar within 30min.

System final vacuum 0.01mbar, leakage $\leq 5 \times 10^{-2}$ mbarL/s.

Data Sheet:

Model	LYO-068
Shelf area	0.68m ²
Ice capacity	16kgs/24hr
Size	H1980*W1510*D986mm
Weight	900kgs
Power install	6.328kwh
Power consumption	3.24kwh
Drying House	
Shelves	4+1
Material trays	4
Shelves size	420*480*20mm
Shelves spacing	100mm
Shelves temp.	-55C to +80C
Vials capacity	Dia.22mm *1500pcs
Ice condenser	
Isolation	Butterfly valve DN100
Condenser temp.	< -80C
Defrosting	Hot gas
Vacuum System	
Vacuum degree	<1Pa
Vacuum pump rate	16m ³ /hr
Vacuum gauge	INFICON
Leakage	5x10 ⁻² mbarL/s
Refrigeration System	
Compressor	Cascade, R404a+R508b
Expansion valve	EMERSON
Solenoid valve	Danfoss
Control System	
Control type	PLC + Touch screen
Main parts brand	SIEMENS