

# **FREEZE DRYER**

## **Operation and Service Manual**



**Model : LFD - 300B**

**Labnics Equipment**

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## (Read the user's book carefulness before operate instruments)

### Summarize

Vacuum freeze drying technique, named Lyophilization, is the technique which pre-freezing the watery material, then make moisture sublimation under the invacuo. Lyophilized goods, the biological and chemistry of them unchanged, easy to long-term time average, resume the state of freeze-dry when water them. So freeze-drying technique can be applied to the fields of medicine, foodstuff, chemistry and biological science. Etc.

LFD300B freeze dryer, have four types(all have pre-freezing function) :

- (1) Ordinary: Pre-freezing and drying the material ;
- (2) Top-press: Pre-freezing and drying the material in the bottle, under invacuo manual fasten down the bottle cap, be identical with vacuumize;
- (3) Multi-pipeline ordinary: The material section of the bottle connect rubber valve with freezing-drying cover. In the course of freeze-dried can change different type material drying bottle through switching valve.
- (4) Multi-pipeline top-press: Pre-freezing and drying the material in the bottle, then top press, meanwhile plexiglass tent can hang the dried bottle, increase freeze dried efficiency;

### Major Character And Technique Index

#### 1) Major Character:

- The machine adopt import DOUBLE STAGE VACCUM compressor which made in Germany, complete shut-off compressor refrigerant system, refrigerant quickly, freeze time low, have better ability of the adsorb liquid water content .
- Time, vacuum are all number show, exactly and immediacy.
- Hothouse adopts colorless and transparence plexiglass tent, the sample clarity and immediacy, can observe overall process of freeze dried.
- Link vacuum pump and host is international standard KF automatic coupling, simple and reliability.
- Have pre-freezing function, put stainless steel tray of material on the pre-freezing shelves, then put pre-freezing shelves in cold trap, put on thermal cover about 10h, wait the pre-freezing end ,than go on dryness, pre-freezing function save the low icebox expense for the users.
- Vacuum pump power plug on the host, have no use for other powers, easy to use.
- The machine performance stability, easy to operate, low noise.

#### 2) Technique Index

- Temperature: -55°C(idling).
- Vacuum: <15Pa(idling).
- Capacity:

Ordinary: four material tray,  $\Phi$  200mm can lodge 1200ml material(material thickness 10mm),or arrange 256 bottles of  $\Phi$  22mm.

**Top-press:** material tray diameter  $\Phi$  180mm, 3 layers, can lodge 680ml material, arrange 135 bottles of  $\Phi$  22mm.

Multi-pipeline: material tray have two type: ordinary and top-press, collocate 8 rubber valve, can difference hang 8 of 100ml, 250ml, 500ml or 1000ml freeze-dried bottle.

\* Chiller resorvor having capacity of 2X500ml round bottom flask with slow rotation facilities

\* 12-18 round bottom adaptors and adjustable platform & adaptors for ampules.

#### 3) Material thickness not more than 10mm, freeze time about 24h.

### Use Condition

- Normal work condition :Environment temperature: 10°C~30°C  
Relative humidity: ?70%  
Supply voltage: single-phase 220V $\pm$ 10% 50Hz

Work environment have no conduction dust, explosively & causticity gas, toughness electromagnetic field thump.

- Transportation And Storage Condition: Environment temperature:  $-40^{\circ}\text{C}\sim 50^{\circ}\text{C}$   
Relative humidity:  $<93\%$

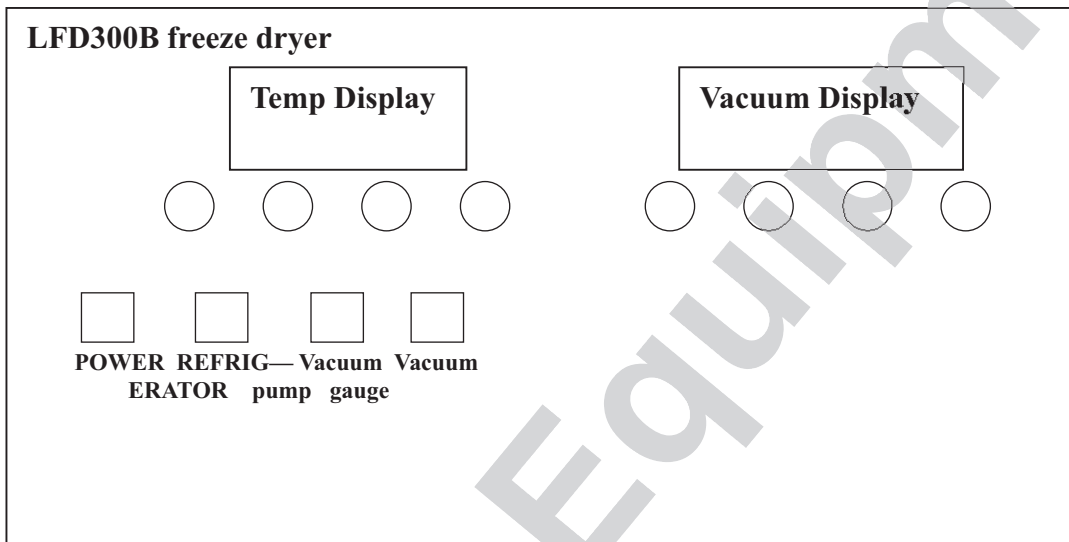
Storage environment may be excellent ventilation, no causticity gas.

- Security categories I categories B type.

### Prepare Before Operate

- 1) Check the link parts of the machine, if it link well, if the place of vacuum pump oil above of the form midline, if oil thickness, if cold trap clean, if seal ring and trough clean, link the power line and vacuum pump power line, open the vacuum pump .
- 2) Put "Power" key 3 seconds, open power, then put "Refrigerator" key, open refrigerator.

### Operating Method



control panel sketch map

### Ordinary Type:

- 1) Put material with need to freeze out in material tray, material thickness under 10mm, put material tray in pre-freezing shelf, put pre-freezing shelf in cold trap, put on thermal cover, start to pre-freezing, pre-freezing about 6-10h.
- 2) Take out the pre-freezing shelf from cold trap rapidly, pack in drying rack, put drying rack on cold trap, hood plexiglass tent, contact "O" type seal ring entirely.
- 3) Screw down vacuum valve clockwise, put "vacuum gauge" key, vacuum display is  $100\sim 110\times 103$ , put "vacuum pump" key, vacuum pump working, vacuum drop, freeze out start.
- 4) After about 24h, see the material dry entirely, open vacuum valve anticlockwise, puff, put "vacuum pump" key, vacuum pump stop working.
- 5) Unbolt plexiglass tent, take out material tray from drying rack, the drying process of ordinary configure is end.

### Top-press Type:

- 1) Put the material in bottles, height less then 10mm, the bottle cap don't fasten down, put the bottle in material tray, then put material tray on pre-freezing shelf, put pre-freezing shelf in cold trap, put on thermal cover, start to pre-freezing, pre-freezing about 6-10h.
- 2) Put the bottles in material tray, put material tray in top-press drying rack, propriety circumrotate top-press drying rack peak, so that the space between layers is largest, put drying rack in cold trap, hood plexiglass tent, contact "O" type seal ring entirely.
- 3) Screw down vacuum valve clockwise, put "vacuum gauge" key, vacuum display is  $100\sim 110\times 103$ , put "vacuum pump" key, vacuum pump working, vacuum drop, freeze out start.

- 4) After about 24h, see the material dry entirely, turn the plexiglass tent handle clockwise, the top-press shelf downward shift, bumping the bottle cap in bottle, corking in vacuum is come true.
- 5) Open vacuum valve anticlockwise, puff, put "vacuum pump" key, vacuum pump stop working, unbolt plexiglass tent, take out the material to storage, the drying process of top-press configure is end.

### **Multi-pipeline Ordinary Type:**

- 1) Put material with need to freeze out in material tray, material thickness under 10mm, put material tray in pre-freezing shelf, put pre-freezing shelf in cold trap, put on thermal cover, start to pre-freezing, pre-freezing about 6-10h.
- 2) Take out the pre-freezing shelf from cold trap rapidly, pack in drying rack, put drying rack on cold trap, hood plexiglass tent, contact "O" type seal ring entirely, multi-pipeline switch valve close up.
- 3) Screw down vacuum valve clockwise, put "vacuum gauge" key, vacuum display is 100~110×103, put "vacuum pump" key, vacuum pump working, vacuum is descend, freeze out start, if hang multi-pipeline freeze dried bottle, first put material in bottles, then put bottles plug aluminum interface of multi-pipeline triple valve, open multi-pipeline valve slowly, until catch up the bottles, wait the vacuum descend under 20Pa, put a bottle again, the rest may be deduced by analogy, until all the bottles hang well.
- 4) After about 24h, see the material dry entirely, multi-pipeline valve close up, support bottles with hand, puff, unbolt the bottles (if have other bottles to freeze, hang the bottle, the process of dryness as has been said before), end up, unbolt the freeze dried bottle, Open vacuum valve anticlockwise, puff, put "vacuum pump" key, vacuum pump stop working.
- 5) Unbolt multi-pipeline plexiglass tent, take out the material from drying rack to storage.

### **Multi-pipeline Top-press Type:**

- 1) Put the material in bottles, height less then 10mm, the bottle cap don't fasten down, put the bottle in material tray, then put material tray on pre-freezing shelf, put pre-freezing shelf in cold trap, put on thermal cover, start to pre-freezing, pre-freezing about 6-10h.
- 2) Put the bottles in material tray, put material tray in top-press drying rack, propriety circumrotate top-press drying rack peak, so that the space between layers is largest, put drying rack in cold trap, hood plexiglass tent, contact "O" type seal ring entirely, multi-pipeline switch valve close up.
- 3) Screw down vacuum valve clockwise, put "vacuum gauge" key, vacuum display is 100~110×103, put "vacuum pump" key, vacuum pump working, vacuum drop, freeze out start, if hang multi-pipeline freeze dried bottle, first put material in bottles, then put bottles plug aluminum interface of multi-pipeline triple valve, open multi-pipeline valve slowly, until catch up the bottles, wait the vacuum descend under 20Pa, put a bottle again, the rest may be deduced by analogy, until all the bottles hang well.
- 4) After about 24h, see the material dry entirely, turn the plexiglass tent handle clockwise, the top-press shelf downward shift, bumping the bottle cap in bottle, corking in vacuum is come true, multi-pipeline valve close up, support bottles with hand, puff, unbolt the bottles (if have other bottles to freeze, hang the bottle, the process of dryness as has been said before), end up, unbolt the freeze dried bottle, Open vacuum valve anticlockwise, puff, put "vacuum pump" key, vacuum pump stop working.
- 5) Unbolt multi-pipeline plexiglass tent, take out the material from drying rack to storage.

### **Close operation**

- 1) After dryness, ice in the cold trap melt the water, open "vacuum valve", discharge the water.
- 2) Clean the cold trap, put thermal cover on cold trap.
- 3) Detach power plug, hood vent hole when vacuum pump doesn't work, prevent dirt from entering into .

### **Notice**

- 1) The nearside, starboard and back of host should distance wall 20 centimeters, assure airiness thermolysis.
- 2) Tow fuse holder are on the host starboard, power key (front) and vacuum pump power (back), notice differentiate when using them.

- 2) The bleeding point of host adopts stainless steel tie-in, vacuum tube link host and vacuum pump, lay on a layer vacuum grease on the tie-in before link, fasten down with the automatic coupling.
- 4) Plexiglass tent and host cold trap flanged shaft rely to "O" type rubber seal ring, should keep cleaning type rubber seal ring, clean it use alcohol before use, lay on a layer vacuum grease, make for airproof.
- 5) When place the plexiglass tent, should place on soft overlay, don't scuffing it.
- 6) Vacuum pump is the most import of the whole machine, should notice maintenance, especial change the vacuum oil, consult the vacuum pump user's book. At the whole running process of the vacuum pump, unscrew valve of the vacuum pump, the function is cleanse a little water or other volatility material, so that prolong the oil life.
- 7) For the sake of reduce vacuum pump noise, reduce shake, can fill up a soft goods under vacuum pump, such as cystose, cardboard and so on.
- 8) Please don't on-off frequently at the operation process, for example, this operation result in refrigerator doesn't work, wait for 3 minutes startup again at least, lest attain refrigerator.
- 9) The process of dryness, if power cut, open vacuum valve quickly, take out material, put them in electric refrigerator to storage; if incoming electric, don't deflate, first open the power, then put "refrigerator" key, wait the temperature descend-40~-50°C put "vacuum gauge" "vacuum pump"key.
- 10) From pre-freezing to dryness end, open refrigerator all the time, don't close.
- 11) There is a seal rubber mat in "vacuum pump", when it fray can change it, lest pledge vacuum.
- 12) Vacuum grease, vacuum pump oil are the standby expendable.

### **Malfunction And Debug**

- 1) Vacuum fall short of 15pa
  1. Check vacuum valve whether fasten down. At the process of suction, on- off valve repeat, let open air in valve orifice, lest impurity in the valve orifice, so that pledge valve airproof.
  2. Check connection of vacuum pump and host, if coupling fasten down rightly. The stainless steel tie-in of host bleeding point, screw down it anticlockwise use spanner wrench.
  3. Check "O" type seal ring whether clean, and disrepair. When vacuum pump start work, press the plexiglass tent in energize, in favor of seal.
  4. Check vacuum pump oil quality, observe vacuum pump oil whether clean. About work 200h continuum, need change vacuum pump oil.
- 2) Vacuum pump oil seepage: Check ladle body, change new fittings.
- 3) High temperature: Environment temperature too high, maybe heating bad, if refrigerator system have fault, please connect with our technical personnel.
- 4) Host not power:
  - (1) Check power line whether plug in .
  - (2) Check power fuse whether burn out, change new fuse.
- 5) Vacuum pump doesn't work:
  - (1) Check power line
  - (2) Check vacuum pump fuse whether burn out, change new fuse.

### **Guarantee to keep machine in good repair and maintain**

- 1) From the date of sell ,guarantee to keep machine in good repair for one year for free.
- 2) We are responsibility for tenured attendance.

Accessories of machine, please safekeeping, check it unmistakable, send the repair card by return to company marketing department, so that enter company technique service record, provide service for you at the process of use.

## Accessories

Sequence Number	Name	Quantity	Remark
1	Host	1	
2	Material shelf	1	
3	plexiglass tent	1	
4	Φ 200mm material tray	4	
5	Top-press material tray	1	
6	Top-press plexiglass tent	1	
7	Φ 180mm top-press material tray	3	
8	Vacuum pump	1	
9	Power lead	1	
10	Vacuum pressure tubing	1	
11	Pre-freezing shelf	1	
12	Thermal cover	1	
13	"O" type seal ring	1	
14	Multi-pipeline plexiglass tent	1	
15	Multi-pipeline top-press plexiglass tent	1	
16	Multi-pipeline dried bottle 100, 250ml	8	
17	Multi-pipeline valve	8	
18	Multi-pipeline block	8	
19	[User's book]	1	
20	Acceptance certificate	1	
21	Maintain card	1	
22	Vacuum grease	1	
23	Protector tube 5X20 10A	4	

## SERVICE REPORT

Customer's Address : _____ _____	Tel.No.: _____
	Fax No.: _____
	Weekly Off.: _____
Contact Person / Designation : _____	Dept.: _____

Date	Time		System Configuration	Model	Serial No.	Date :	SR. No.	
	From	To					Status : OK <input type="checkbox"/>	Not OK <input type="checkbox"/>
						Installation <input type="checkbox"/>	Warranty <input type="checkbox"/>	
						Demonstration <input type="checkbox"/>		
						Maintenance <input type="checkbox"/>	Contract <input type="checkbox"/>	
						Repairs <input type="checkbox"/>		
						Application <input type="checkbox"/>	Billable <input type="checkbox"/>	
						Calibration <input type="checkbox"/>		
						Validation <input type="checkbox"/>	Courtesy <input type="checkbox"/>	

Nature of Problem : \_\_\_\_\_  
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Observation & Action Taken : \_\_\_\_\_  
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Customer's Remarks : \_\_\_\_\_  
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Parts Replaced : \_\_\_\_\_  
 \_\_\_\_\_

Parts Recommended / Action Required : Yes <input type="checkbox"/>	No <input type="checkbox"/>	Requisition Number :
Service Engineer's Name & Signature	Customer's Name, Signature, Date & Stamp	