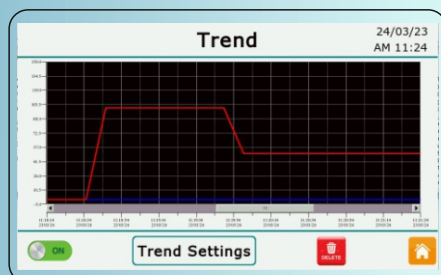
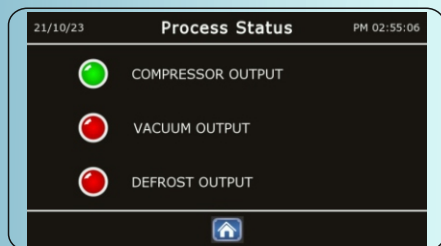
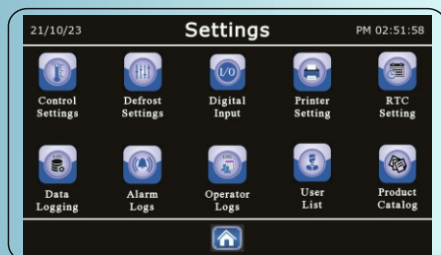
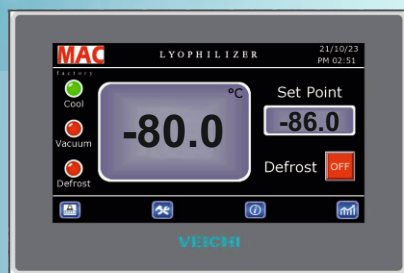


MAC

LYOPHILIZER (FREEZE DRYER) MSW-137(PRO)

PLC Controller



WHAT IS FREEZE DRYING?

- Freeze Drying is the process of removing the moisture from a biological product while maintaining the integrity of the biological products, chemical structure and activities. Freeze Drying technology is used in particular for removal of moisture from the products usually of biological origin without causing any noticeable change in the original characteristics. Freeze Drying is also the preferred process in the field of Pharmacy, Chemistry and in conservation of Food.

ADVANTAGE OF FREEZE DRYING

- Heat sensitive biological materials may be freeze-dried without affecting their potency. The dried materials may be stored for years at room temperature without loss of their original characteristics.
- The freeze-dried material may be transported and shipped in small containers, and no provision is necessary for refrigeration enroute.
- Bacterial growth and enzyme action do not take place in freeze-dried products and proteins do not coagulate.
- Oxidation of many materials such as hemoglobin and vaccines is completely prevented when drying and sealing is done under high vacuum.

Images for reference purpose only, may change according to model & size

HOW FREEZE DRYER WORKS:

- All "MAC" units are provided with following basic requirements:-
- A Drying Chamber or Manifold on/in which the containers with pre-frozen samples are connected/placed.
- A high Vacuum double stage pumping system with gas ballast with ultimate vacuum of less than 50 microns in the system and 10 microns on pump head to facilitate the vapour flow to the condenser for speedy drying.
- A low temp. condenser to trap the moisture vapour and allow the non-condensable vapours to go to the pump for release to the atmosphere.

CONSTRUCTION & SALIENT FEATURES

- Bench Top type freeze dryer.
- Outer chamber made of CRC sheet duly powder coated and inner chamber is made of stainless steel (non-magnetic).
- Housed in a super structure steel frame it is mounted on swivel casters.
- Complete with Perspex see through lid.
- High grade PUF INSULATED between outer and inner chamber for minimal thermal losses.
- Condenser Trap : All non-magnetic stainless steel fabricated, argon welded, dished-bottom for complete effluent removal.
- Refrigeration coils made of copper bonded to outside of condenser heavily insulated.
- Low noise compressor, good efficiency, long service life.
- CFC Free refrigeration
- Complies with international standards of green environment.
- Big opening condenser has pre-freeze function.
- Condenser (COLD TRAP) and top panel are all stainless steel (SS-304 grade).
- Secure and intuitive transparent drying room.
- Small volume, easy and convenient operation.
- Microprocessor Based Digital Temperature Indicator-cum-Controller with LED display OR TFT Touch Screen Display Controller interface.
- Program can be altered during running process.

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 (e.g. animal preparations, archaeological objects or flowers).
- Conditioning the material (e.g. freeze-dried fruit).
- Chemical analyses (e.g. trace element analyses of foods, sludge or soil).

Advantages of Freeze Drying

Protein is not denatured.

- Freeze-drying is carried out at low temperature, for many heat-sensitive substances such as proteins and microorganisms 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 some chemical products, medicines and foods.

Keep the original structure.

- Since it is dried in a frozen state, the volume is almost unchanged, the original structure is 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, so some oxidizable substances are protected.

No deterioration after dehydration.

- Drying can remove more than 95-99% of the water, so after drying, the samples can be stored for a long time without deterioration.

TECHNICAL SPECIFICATIONS & ORDERING INFORMATION

MODEL (LED DISPLAY)	#FD-408	#FD-508	#FD-808
MODEL (TFT TOUCH SCREEN DISPLAY)	#FD-408(PROPLUS)	#FD-508(PROPLUS)	#FD-808(PROPLUS)
No Load Condenser Temperature	-40°C	-50°C	-80°C
Freezing Capacity	3-5 Ltrs./24hrs.		
Material Tray Dimensions	Vial 90 x 3 = 270		
Vacuum Degree	< 10 Pa		
Drying Chamber (SS-304)	Stainless Steel 230mm (dia) x 285mm (D)		
Cold Trap Dimensions (SS-304)	230mm (dia) x 230mm (D)		
Vacuum Probe	Electric Vacuum Transducer		
Vacuum Indicator	Digital Vacuum Indicator		
Vacuum Seals	Made of silicon rubber		
Ultra Ultimate Vacuum (Pump Head)	1 x 10 ⁻² torr		
Vacuum Pump	Direct drive motor rotary vane type vacuum pump of double stage with Air ballast having ultimate vacuum of 1x10 ⁻² torr on pump head		
Manifold/No of Ports	One manifold with 8 ports		
Ability to hold flasks	1000ml, 500ml, 250ml, 100ml		
Ambient Conditions	Ambient temperature ≤25°C		
Voltage	220V, 50Hz		

OPTIONS

- 3 Stage Shelf Stainless Steel Drying Rack
- 2 Stage Table Cart with lockable casters
- Silicon Drum attachment for 2ml ampoule
- Vacuum Pump Oil / Fluid (Silicon Based High per performance) #VPO-30(SB)



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