vacuum lyophilizer freeze dryer with data storage function

Vacuum lyophilizer, also known as freeze dryer, is a kind of equipment that freezes water-containing materials at low temperature and then sublimates and dries them in a vacuum environment.

Vacuum Lyophilizer Freeze Dryer

Vacuum lyophilizer freeze dryer is widely used for products that need to retain the structure, biological activity or pharmacological effect of raw materials, such as biological products, vaccines, protein drugs, microbial preparations, etc.. Characterized by the ability to convert water directly from solid state to gaseous state by sublimation, it avoids the problem of quality degradation due to pyrolysis and denaturation in the traditional drying method.

Features of Vacuum Lyophilizer Freeze Dryer

1. Equipped with 7-inch touch color screen, the interface is intuitive and easy to operate, the system adopts industrial-grade PLC programmable control, anti-electromagnetic interference and waterproof design, to ensure stable operation of the equipment.
2. Support firmware remote upgrade, can continuously enhance the system functions through software updates, to adapt to the changing lyophilization needs.

3. With historical data retrospective function, can store 1000 freeze-drying curves and alarm logs, to meet the requirements of drug production traceability and quality management.
4. Triple account authority system, support operators, technicians and administrators hierarchical control, effective protection of process data security.
5. Built-in imported low-noise compressor system ensures stable freezing performance and quiet operation, suitable for laboratory and clean room environment.
6. Adopting high precision Pirani vacuum gauge, real-time monitoring of chamber vacuum degree, accuracy as high as 0.01Pa.
7. Multiple alarm system: including equipment abnormality, maintenance expiration, vacuum abnormality and other faults, are prompted in the form of sound, graphic, light triple.
8. A wealth of optional accessories, enhance the flexibility of the function: such as oil mist filter, anti-oil return device, automatic defrost module, pre-filtration system, etc., to facilitate the adaptation of different processes.

Core Advantages

1. High retention rate of biological activity: suitable for temperature-sensitive products, after freeze-drying almost does not affect its structure and function.
2. High degree of automation: no need for frequent manual intervention, programmed operation to improve work efficiency and product consistency.

3. Strong adaptability: various cavity forms to meet the needs of different specifications of lyophilized bottles and packaging forms.
4. Data traceability and risk control: multi-layer authority and data recording system, helping GMP production and scientific research supervision.

Basic Principle of Vacuum Freeze-Drying Technology

1. Pre-freezing stage: the material is rapidly frozen to below the glass transition temperature, so that the moisture is converted into solid ice crystals.
2. Primary drying, sublimation stage: under vacuum conditions, the temperature rises so that the ice crystals sublimate directly into water vapor, which is captured and condensed by the cold trap to complete the removal of most of the water.
3. Secondary drying, resolving stage: continue to add temperature to remove the combined water in the material to improve the dryness and stability of the product.

As the whole process is carried out under low temperature and vacuum, it effectively avoids the problems of protein denaturation, reduction of medicinal effect or destruction of active substances.

Application Fields

1. Biopharmaceuticals: such as vaccines, antibodies, recombinant proteins, enzyme preparations, plasma and other stable preservation.
2. Medical diagnosis: lyophilized microspheres, reagent kits, nucleic acid extraction reagents, etc., which are good for room temperature transportation and long-term storage.
3. Food industry: such as freeze-dried fruits, coffee, instant soup, seasoning powder, etc., to maintain flavor and nutrition.
4. Cosmetic field: freeze-drying and preservation of highly active ingredients, such as freeze-dried powder, whitening peptide, repair peptide and so on.
5. Scientific research experiments: preservation and analysis of microbial strains, cell samples, natural extracts and so on.

Chamber Type of Vacuum Lyophilizer Freeze Dryer

1. **Standard type chamber:** no gland mechanism and no manifold interface. It is suitable for conventional tray-type freeze-drying operation, suitable for drying liquid, paste or powder materials. Characterized by simple structure, easy to clean, suitable for basic scientific research or pilot use.
2. **Capping type chamber:** Equipped with automatic capping device under vacuum environment, it can press the rubber stopper in the containers such as vials and then fill nitrogen for sealing. It is suitable for freeze-drying applications such as pharmaceuticals and injections, which have strict requirements for sealing.

3. **Standard chamber with manifold interface:** 8 manifold interfaces are extended on the basis of standard chamber, which can be connected to external lyophilized bottles, such as round-bottomed bottles, vials, etc. to realize freeze-drying in external vials. Flexible, suitable for simultaneous processing of different types or specifications of small batches of samples.
4. **Capping chamber with manifold interface:** both capping and manifold functions, not only for vacuum capping of products in the chamber, but also for external lyophilization bottles to achieve bottle-top freeze-drying. It is a multifunctional design, suitable for research laboratories or users who need to switch between different freeze-drying tasks.

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Model	**FD12S**	**FD12T**	**FD12P**	**FD12PT**
Type	standard chamber	stoppering chamber	standard chamber with 8 port manifold	stoppering chamber with 8 port manifold
No-load condenser temperature	≤-60°C or ≤-80°C			
Condenser size	ϕ270x420mm			
Vacuum degree	less than 1 Pa, at no load			
Freeze drying area	0.18 to 0.27 square meters	0.135 square meters	0.18 to 0.27 square meters	0.135 square meters
Ice condenser capacity	6kg per 24 hours			
Material loading capacity	1800 to 2700ml	1350ml	1800 to 2700ml	1350ml

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Model	**FD12S**	**FD12T**	**FD12P**	**FD12PT**
Shelf	240x20mm			
Shelf quantity	4 to 6	3	4 to 6	3
External dimensions	590x625x940,1390mm	590x625x940,1450mm	590x625x940,1390mm	590x625x940,1450mm
Power supply	220Vac, 50Hz			
Number of vials loaded	360xϕ22mm or 740xϕ16mm or 1320xϕ12mm	270xϕ22mm or 555xϕ16mm or 990xϕ12mm	360xϕ22mm or 740xϕ16mm or 1320xϕ12mm	270xϕ22mm or 555xϕ16mm or 990xϕ12mm