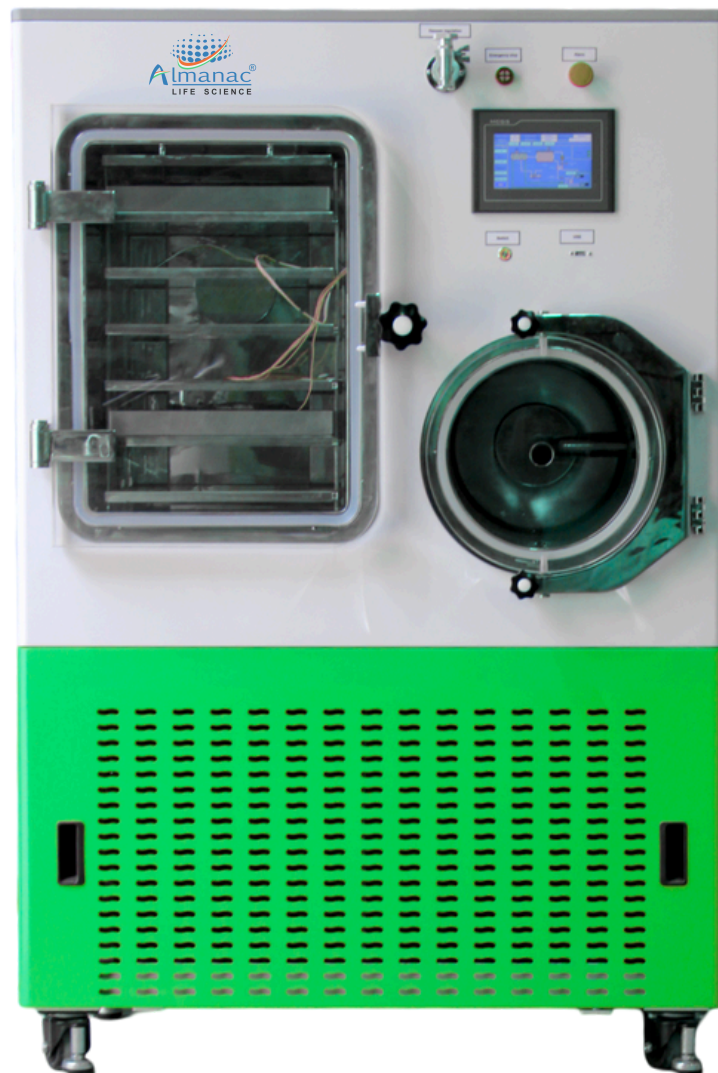


FREEZE DRYER

ALS-INS066



DESCRIPTION

Our advanced freeze dryer employs vacuum freeze drying technology, also known as sublimation drying, which freezes samples in advance and sublimates their moisture in a vacuum state. This process preserves the original state and chemical/biological characteristics of samples, making it ideal for long-term storage. This technology is widely used across medicine, food processing, chemistry, and biological products.

KEY FEATURES

Efficient Freezing & Drying:

- Both freezing and drying processes are performed directly on the shelf, ensuring easy operation and consistent results.
- The separation of the drying chamber and condenser allows for better moisture capture and faster drying times.

Precision Temperature Control:

- Shelf temperature is carefully controlled, making it suitable for pilot and production processes.
- Shelf temperature range from -50°C to +70°C.
- Chamber temperature uniformity within $\leq 1^{\circ}\text{C}$, ensuring uniform drying.

User-Friendly Design:

- Touchscreen operation with PLC control for easy monitoring and operation.
- Display of freeze-drying curves allows precise adjustments during the process.
- Square trays designed for easy use and cleaning.
- Transparent organic glass door on the drying chamber ensures clear visibility of the process.

Advanced Vacuum Control:

- Equipped with a vacuum control valve for setting and maintaining desired vacuum levels.
- **Eutectic Point Test:** Optimize freeze-drying recipes by testing the product's eutectic point.
- **Reliable and Safe Operation:**
 - Check Valve: Prevents oil backflow into the chamber in case of sudden power outages.
 - **Butterfly Valve:** Isolates the drying chamber from the condenser to enhance safety and performance.
 - **Exhaust Filter:** Integrated on the vacuum pump to ensure clean, safe operation.
- **Durable Construction:**
 - Designed to work efficiently in temperatures range of 10°C - 30°C.
 - Built to handle demanding environments with well ventilated, dust-free, and non-corrosive conditions.

ADVANCED CONTROL SYSTEM FEATURES:

Intuitive Touch Screen Interface: Equipped with a large, user-friendly touch screen for simplified and convenient operation.

Flexible Program Segmentation: Each program supports up to 36 configurable segments, allowing precise customization for complex processes.

Precision Temperature Control: Utilizes an advanced fuzzy PID control algorithm for accurate, stable temperature management. Control parameters can be adjusted at any time, enabling flexibility in selecting start and end segments.

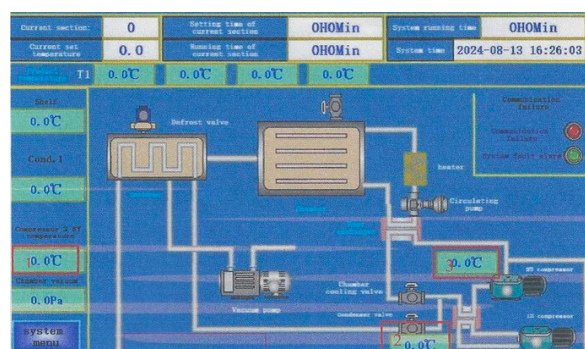
Dual Control Modes: Features both manual and automatic control modes, offering adaptability for various operational needs.

Real-Time Monitoring: Displays real-time curves for shelf temperature, condenser temperature, product temperature, and chamber vacuum, providing comprehensive process oversight.

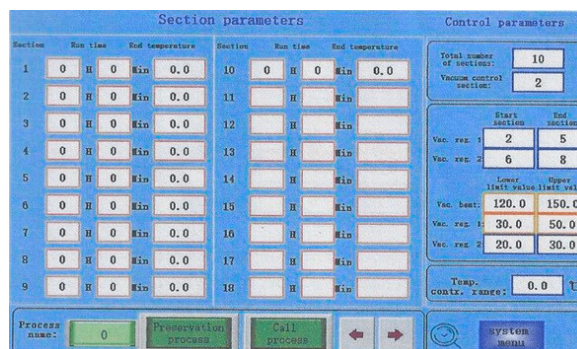
Data Management & Historical Access: Users can view historical curves and access records by date using the date query function. Data can be easily exported via USB for viewing in Excel.

Eutectic Point Detection: Equipped with a specialized eutectic point sensor, allowing users to detect the eutectic point of the product accurately, ensuring optimal processing conditions.

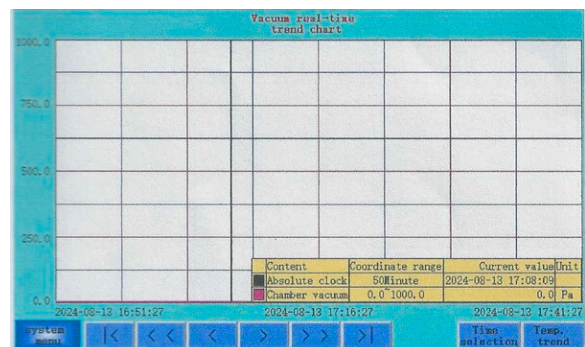
MAIN SCREEN



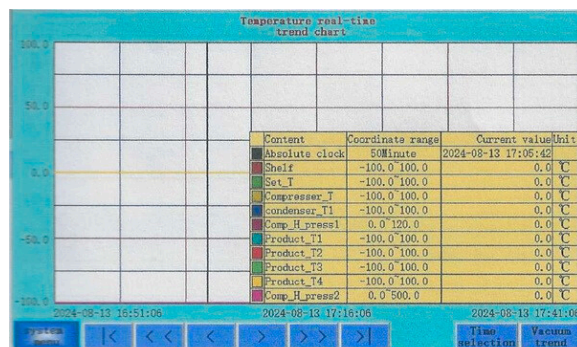
FREEZE DRY PROCESS INTERFACE



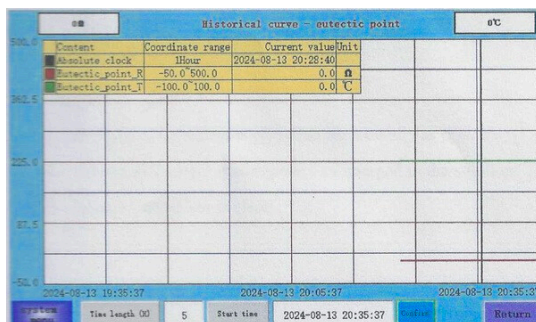
VACUUM REAL TIME CURVE



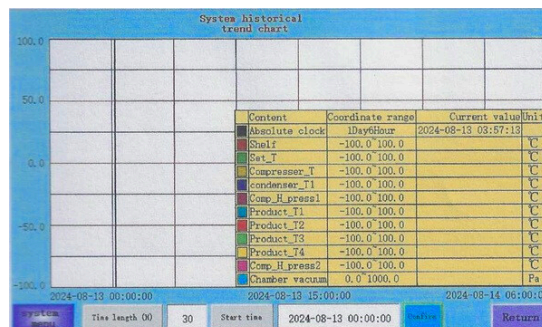
TEMPERATURE REAL TIME CURVE



EUTECTIC POINT TEST



HISTORY CURVE



TECHNICAL SPECIFICATIONS

Freeze Drying Area: 1.0 m²

Shelf Size: 480 mm x 360 mm

Shelf Number: 6 + 1 layers (top shelf for heat radiation)

Shelf Temperature Range: -50°C to +70°C

Minimum Condenser Temperature: -70°C (no-load condition)

Final Vacuum: < 10 Pa

Cooling System: Air-cooled, with electric defrosting

Power Supply Requirements:

Voltage: 380V ± 10%, 50Hz, 3 Phase

Power: 6500 W

Working Environment:

Ambient Temperature: 10°C - 30°C

Relative Humidity: ≤ 70%

No conductive dust, explosive or corrosive gases, and strong electromagnetic interference.

Transport & Storage:

Temperature Range: -40°C to 50°C

Relative Humidity: ≤ 93%

Well-ventilated, no corrosive gases.



VACUUM PUMP

