

# 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.

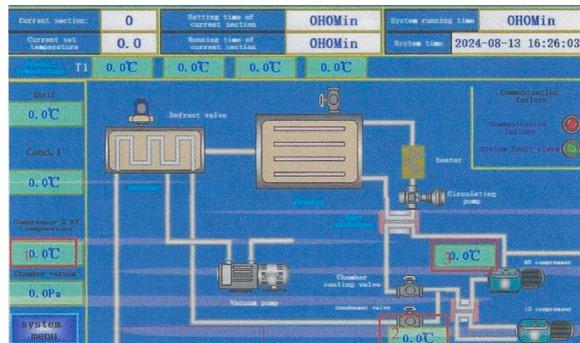
**Dual Control Modes:** Features both manual and automatic control modes, offering adaptability for various operational needs.

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

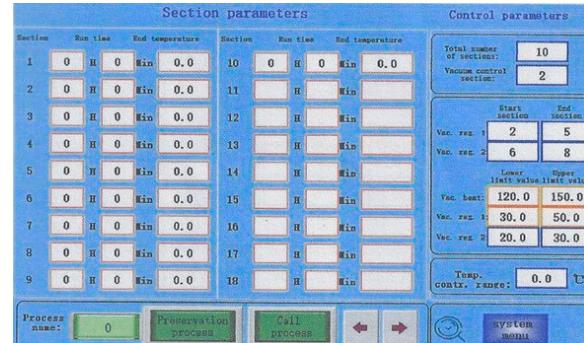
**Data Management & Historical Access:** Users can view historical curves and access records by date using the date query function. Data can be easily exported via USB for viewing in Excel.

**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.

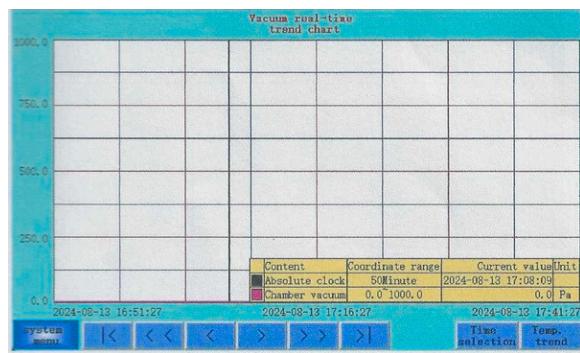
## MAIN SCREEN



## FREEZE DRY PROCESS INTERFACE



## VACUUM REAL TIME CURVE



## TEMPERATURE REAL TIME CURVE

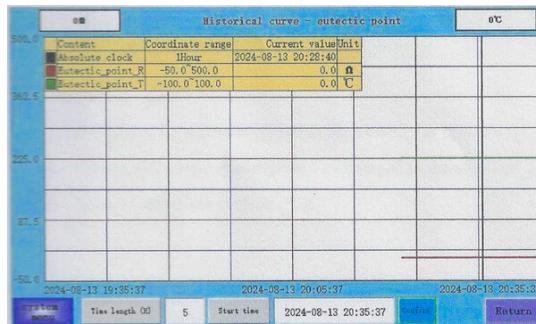


**Registered Office:** 43-B, 3<sup>rd</sup> Floor, Okhla Village Jamia Nagar, New Delhi - 110025, India.

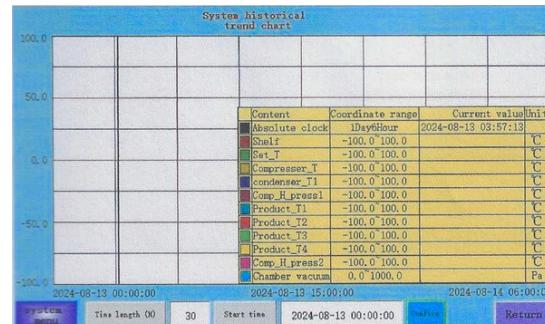
**E-mail :** instruments@almanaclife.com | **Web :** www.almanaclife.com

**Landline No:** 011-43506838 | **WhatsApp No:** +91 9773645708

## EUTECTIC POINT TEST



## HISTORY CURVE



## TECHNICAL SPECIFICATIONS

**Freeze Drying Area:** 1.0 m<sup>2</sup>

**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.



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## VACUUM PUMP

