



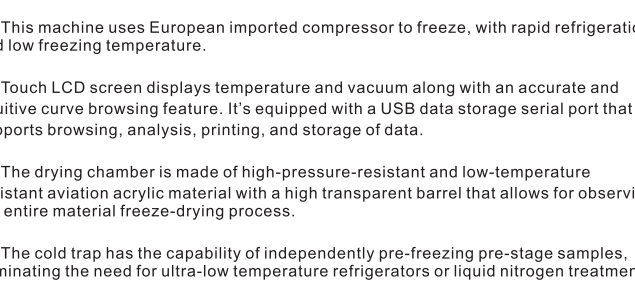

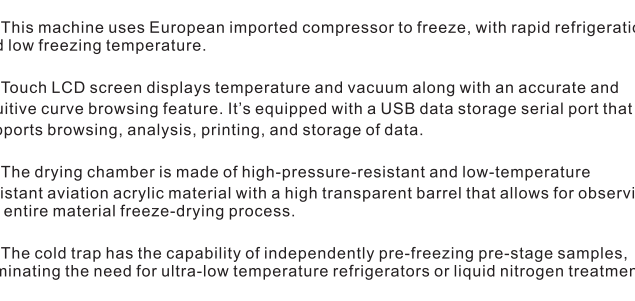


<div>  <b>StonyLab®</b> </div> <div>  </div> <div> <b>FREEZE DRYER</b>  OPERATION MANUAL </div> <div>  www.stonylab.com </div> <div>  support@stonylab.com </div>	<div> <b>Contents</b> </div> <div> 1. Installation.....01  1.1 Unpack .....01  1.2 Safety Requirements.....01  1.3 Installation Location.....03  1.4 Normal Operating Conditions.....03  1.5 Instrument Composition.....04  2. Product Description.....06  2.1 Introduction.....06  2.1.1 Features.....06  2.1.2 Technical Index.....07  3. Operation Instruction.....08  3.1 Instrument Installation and Freeze Drying Preparation.....08  3.2 Freeze Drying Operation.....10  3.2.1 Standard Drying Type.....10  3.2.2 Gland Drying Type.....10  3.2.3 Multi-manifold Drying Type.....11  3.2.4 Multi-manifold Gland Drying Type.....12  3.3 Shutdown Operation.....13  4. Precautions and Maintenance.....14  5. Common Troubleshooting.....15  6. Warranty .....16 </div>	<div> <b>1. Installation</b> </div> <div> <b>1.1 Unpack</b>  Open the packing box, check the instrument and accessories for damage, ensure that each item listed on the packing list is in place and can be used normally. See packing list for details. </div> <div> <b>1.2 Safety Requirements</b>  <ul style="list-style-type: none"> <li>It is strictly forbidden to fall, bump or vibrate the product to severe vibration during transportation and lifting.</li> <li>Please operate the equipment strictly in accordance with the ambient temperature and use conditions specified in the manual.</li> <li>Regular maintenance is necessary to ensure the equipment's longevity, as prolonged overworking conditions can significantly reduce its service life.</li> <li>Please ensure that the power is disconnected before performing any electrical maintenance.</li> </ul> </div> <div> <b>1.3 Installation Location</b>  It is recommended to install the equipment in a clean and well-ventilated area, and to avoid exposure to strong electromagnetic radiation, direct sunlight, rain, and other such elements. Sufficient space should be allotted on the left side of the instrument to accommodate the vacuum pump. </div> <div> <b>1.4 Normal Operating Conditions</b>  <ul style="list-style-type: none"> <li>Ambient temperature: (10 ~ 30) °C;</li> <li>Relative humidity: less than 80%;</li> <li>Power supply: AC voltage (220 ± 22) V, frequency (50 ± 0.5) Hz;</li> <li>Attention: 110V voltage machine equipped with AC transformer;</li> <li>With no vibration impact around to interfere its performance;</li> <li>Non-corrosive gases in ambient air;</li> <li>No electromagnetic field interference to affect performance except the geomagnetic field.</li> </ul> </div> <div> <b>1.5 Instrument Composition</b>  The freeze dryer consists of 2 parts: the main engine of the instrument and the vacuum pump. Please see below for details. </div> <div>  </div> <div> 1. Power Switch      2. Main Power Socket      3. Vacuum Pump Socket  4. Vacuum Pump Connection      5. Drain &amp; Vent Valve      6. USB Interface </div> <div> <b>1.6 Overview</b>  Sublimation drying, commonly known as vacuum freeze-drying technology, is a process that involves freezing water samples beforehand and then evaporating the moisture in a vacuum state. This method preserves the original biological, chemical, and physical properties of the samples, making it easy to store them for extended periods. Upon rehydration, the samples can be restored to their original state before freeze-drying while maintaining their original biochemical characteristics. As a result, freeze-drying technology has found extensive applications in various fields such as pharmaceuticals, food, chemicals, and biological products. </div>	<div>  <b>Warning</b> </div> <div> <ul style="list-style-type: none"> <li>It is strictly forbidden to fall, bump or vibrate the product to severe vibration during transportation and lifting.</li> <li>Please operate the equipment strictly in accordance with the ambient temperature and use conditions specified in the manual.</li> <li>Regular maintenance is necessary to ensure the equipment's longevity, as prolonged overworking conditions can significantly reduce its service life.</li> <li>Please ensure that the power is disconnected before performing any electrical maintenance.</li> </ul> </div> <div> <b>1.3 Installation Location</b>  It is recommended to install the equipment in a clean and well-ventilated area, and to avoid exposure to strong electromagnetic radiation, direct sunlight, rain, and other such elements. 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(2) Touch LCD screen displays temperature and vacuum along with an accurate and intuitive curve browsing feature. It's equipped with a USB data storage serial port that supports browsing, analysis, printing, and storage of data.  (3) The drying chamber is made of high-pressure-resistant and low-temperature resistant aviation acrylic material with a high transparent barrel that allows for observing the entire material freeze-drying process.  (4) The cold trap has the capability of independently pre-freezing pre-stage samples, eliminating the need for ultra-low temperature refrigerators or liquid nitrogen treatment.  (5) KF quick coupling to connect vacuum pump and main engine, simple and reliable.  (6) Equipped with USB communication interface for easy data download.  (7) Equipped with heating system, defrosting by electric heating.  (8) Equipped with child lock and alarm function to prevent misoperation.  (9) It can realize remote control from mobile phone and computer terminals, easier to view and manipulate (optional).  (10) Choose configuration of -80 °C, with better cooling effect (optional). </div> <div> <b>2.1.2 Technical Index</b>  <ul style="list-style-type: none"> <li>Standard cold trap temperature (no load): standard ≤ -60 °C, optional ≤ -80 °C (ambient temperature ≤ 30 °C)</li> <li>Watercapture: 4KG</li> <li>Standard vacuum (no load): ≤ 5 Pa</li> <li>Ultimate vacuum: 2 Pa</li> <li>Material drying capacity: <ul style="list-style-type: none"> <li>Standard type: 4 material trays with disc diameter of φ200mm</li> <li>Gland type: 3 material trays with disc diameter of φ180mm, and can be used in Cillin bottles</li> <li>Multi-manifold type: 4 material trays with disc diameter of φ200mm</li> <li>Multi-manifold gland type: 3 material trays with disc diameter of φ180mm, can be used in Cillin bottles and connect 8 drying bottles</li> </ul> </li> <li>Main engine dimension: 600 mm×560 mm×390 mm (+430 mm vacuum cover)</li> <li>Power requirements: AC220V/25A/50HZ</li> <li>Applicable environment: ambient temperature ≤ 30 °C</li> </ul> </div> <div> <b>3. Operation Instruction</b> </div> <div> <b>3.1 Instrument Installation and Freeze Drying Preparation</b>  (1) Retrieve the pre-frozen material tray from the cold trap and promptly place it onto the drying rack. Position the drying rack above the cold trap and then shield the multi-manifold with the plexiglass cover.  (2) Once the temperature of the cold trap reaches -40 °C, activate the "vacuum" button to initiate the vacuum pump's operation. The vacuum pressure will then decrease rapidly until it drops below 10 Pa.  (3) Retrieve the drying bottle from the low-temperature refrigerator and ensure that the cover has a standard multi-manifold rubber valve. Insert the rubber valve port into the bottle's center, and then turn the valve wing vertically downwards to connect the inside of the bottle with the cover's interior (If using a jar, be sure to match it with the appropriate adapter before proceeding). Once everything is properly set up, the freeze-drying process can begin. If you need to replace or remove the drying bottle during the process, turn the valve flap upwards to isolate the inside of the bottle from the cover and atmosphere, allowing for the safe removal of the drying bottle.  (4) Once all the materials in the drying bottle and trays within the cover have been completely dried, the initial step is to remove the drying bottle and rotate the screw of the cover holder within the cover by turning the handle on the top of the plexiglass cover. This will cause the original plate to move downwards and press the bottle cap into the bottle, thereby creating a vacuum seal.  (2) Upon the cold trap's temperature reaching -40 °C, activate the "vacuum" button, prompting the vacuum pump to start operating, resulting in a swift drop in the vacuum value. The freeze-drying process will begin once the pressure falls below 10 Pa.  (3) If the material has undergone complete freeze-drying after 24 hours, rotate the handle situated on top of the plexiglass cover, causing the gland pole to shift and the original plate to descend, ultimately sealing the cap onto the bottle.  (4) Press the "vacuum" button to halt the vacuum pump. Remove the plexiglass cover and retrieve the material bottle. Click the defrost option to expel the water. </div> <div> <b>3.2 Freeze Drying Operation</b> </div> <div> <b>3.2.1 Standard Drying Type</b>  (1) Remove the pre-frozen material tray from the cold trap and promptly mount it onto the drying rack. Position the drying rack above the cold trap and cover it with the plexiglass cover, ensuring that the bottom of the cover makes complete contact with the sealing O-ring.  (2) Once the temperature of the cold trap reaches -40 °C, activate the "vacuum" button to initiate the vacuum pump's operation. The vacuum pressure will then decrease rapidly until it drops below 10 Pa.  (3) Retrieve the drying bottle from the low-temperature refrigerator and ensure that the cover has a standard multi-manifold rubber valve. Insert the rubber valve port into the bottle's center, and then turn the valve wing vertically downwards to connect the inside of the bottle with the cover's interior (If using a jar, be sure to match it with the appropriate adapter before proceeding).  (4) Once all the materials in the drying bottle have been completely dried, the initial step is to remove the drying bottle and rotate the screw of the cover holder within the cover by turning the handle on the top of the plexiglass cover. This will cause the original plate to move downwards and press the bottle cap into the bottle, thereby creating a vacuum seal.  (2) Upon the cold trap's temperature reaching -40 °C, activate the "vacuum" button, prompting the vacuum pump to start operating, resulting in a swift drop in the vacuum value. The freeze-drying process will begin once the pressure falls below 10 Pa.  (3) If the material has undergone complete freeze-drying after 24 hours, rotate the handle situated on top of the plexiglass cover, causing the gland pole to shift and the original plate to descend, ultimately sealing the cap onto the bottle.  (4) Press the "vacuum" button to halt the vacuum pump. Remove the plexiglass cover and retrieve the material bottle. Click the defrost option to expel the water. </div> <div> <b>3.2.2 Gland Drying Type</b>  (1) Put the pre-frozen Cillin bottles (in the tray) into the gland drying rack. Proceed to position the gland drying rack above the cold trap, cover it with a plexiglass cover, and ensure complete contact of the lower end of the cover with the O-shape seal.  (2) Upon the cold trap's temperature reaching -40 °C, activate the "vacuum" button, prompting the vacuum pump to start operating, resulting in a swift drop in the vacuum value. The freeze-drying process will begin once the pressure falls below 10 Pa.  (3) If the material has undergone complete freeze-drying after 24 hours, rotate the handle situated on top of the plexiglass cover, causing the gland pole to shift and the original plate to descend, ultimately sealing the cap onto the bottle.  (4) Press the "vacuum" button to halt the vacuum pump. Remove the plexiglass cover and retrieve the material bottle. Click the defrost option to expel the water. </div> <div> <b>3.2.3 Multi-manifold Drying Type</b>  (1) Retrieve the pre-frozen material tray from the cold trap and promptly place it onto the drying rack. Position the drying rack above the cold trap and then shield the multi-manifold with the plexiglass cover.  (2) Once the temperature of the cold trap reaches -40 °C, activate the "vacuum" button to initiate the vacuum pump's operation. The vacuum pressure will then decrease rapidly until it drops below 10 Pa.  (3) Retrieve the drying bottle from the low-temperature refrigerator and ensure that the cover has a standard multi-manifold rubber valve. Insert the rubber valve port into the bottle's center, and then turn the valve wing vertically downwards to connect the inside of the bottle with the cover's interior (If using a jar, be sure to match it with the appropriate adapter before proceeding).  (4) Once all the materials in the drying bottle and trays within the cover have been completely dried, the initial step is to take out the drying bottle and inflate the cover, followed by the removal of the plexiglass cover of the multi-manifold. Finally, extract the materials from the cover for packaging. </div> <div> <b>3.3 Shutdown Operation</b>  (1) Power off the entire control system by switching off the "main power" switch.  (2) Unplug both the main power and the vacuum pump.  (4) Please cover the exhaust hole to prevent dust from entering when the vacuum pump stops working. </div> <div> <b>4. Precautions and Maintenance</b>  (1) Place the vacuum pump on the ground, keeping a certain height difference with the freeze dryer. When there is a sudden power outage, it can help prevent oil return. In the event of a power outage, immediately unscrew the inflation valve, the freeze dryer will inflate, then take out the sample as soon as possible, and store it properly.  (2) Working temperature ≤ 32 °C; Humidity ≤ 80%.  (3) Inflate the freeze dryer before turn off the power, then turn off the vacuum pump to prevent vacuum oil flow into the freeze dryer and contaminate the materials.  (4) The sealing between the plexiglass cover and freeze dryer is very important, so always make sure the sealing O-ring in good condition.  (5) Use electrical grounding socket. Make sure the cleanliness of sealing ring, and could not use organic solvents to clean. The connection parts of the plexiglass cover and the O-ring should be protected from biting, scratching and damage.  (6) The vacuum pump oil should be regularly changed after 300 hours of continuous work in accordance with the operation instructions. Ensure with proper maintenance.  (7) Do not frequently power on/off the freezer dryer. If the refrigerator stops due to frequent power on/off, wait at least three minutes before restarting the refrigerator.  (8) If the air pressure does not change within 5 minutes while the vacuum pump is running, check whether the exhaust valve is closed and that the connection between the vacuum pump and the freeze dryer is correct. </div> <div> <b>5. Common Troubleshooting</b>  <b>A. Failure to achieve a vacuum below 15 Pa:</b>  (1) Check the connection between the vacuum pump and the freeze dryer, and whether the clamp is properly clamped.  (2) Check whether the bottom surface of the plexiglass cover is clean and whether it is damaged.  (3) Check whether the sealing O-ring is clean and placed correctly.  (4) Check whether the gap between the black rubber strip between the cold trap and the gray disc is too large.  (5) Check whether the vacuum pump is working properly and check whether the pump oil is clean.  (6) Check whether the air release valve is closed or there are foreign objects.  <b>B. Vacuum pump oil leakage:</b>  (1) Check the pump and replace the defective accessories.  (2) Regardless of whether the vacuum pump is in use, the operator must maintain it regularly, such as, run the pump about 2 hours with no-load and open the flush valve to flush the line. Check there is no oil leakage, and no abnormal noise while working.  <b>C. Machine failed to power on:</b>  (1) Check whether the fuse under the main power cord socket is burned out.  <b>D. High temperature of the cold trap:</b>  (1) The ambient temperature is too high and the heat dissipation is poor. If there is malfunction of the refrigeration system, please contact our company's technicians. </div> <div> <b>6. Warranty</b>  There is a 1-year comprehensive warranty, within the warranty period, the manufacturer provides free accessories (except for disclaimer). The user replaces the accessories according to the manufacturer's instructions.  Manufacturer's disclaimer:  (1) Products that have surpassed the warranty period.  (2) Damage caused by human error or external factors that are beyond control (such as natural disasters).  (3) For accessories and consumables, please refer to the usage instructions of consumables and the warranty period.  (4) Failure or defect resulting from improper operation that does not follow the instructions specified in the manual.  (5) Products that have been modified, disassembled, or repaired without our company's consent.  (6) Faults or defects caused by abnormal working environment (strong electromagnetic, radioactive environment, high temperature, high humidity, flammable gas environment, corrosive gas environment, dust, etc.).  (7) Failure caused by using the product under improper usage conditions.  NOTE: Appropriate accessories are required for instruments of different specifications, for more information on accessories please contact customer service. </div>
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