



DESIGNED & ASSEMBLED IN THE USA



# BLUE ALPINE

## Owners Manual



# 1 Thank You

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Thank you for purchasing one of our freeze dryers! We hope you get many years of service and enjoyment from your machine. This manual provides important information about the initial setup, proper use, maintenance, repair, and troubleshooting of your freeze dryer.

Freeze drying is an incredible process that preserves food for 25+ years. The process starts by freezing the food material to approximately -40°F (-40°C). Freezing the food quickly will produce a higher quality end product. Once the food reaches -40°, the vacuum pump is engaged and the pressure within the chamber is reduced to below the triple point of water. This “triple point” refers to the temperature and pressure at which water can exist as a solid, liquid, and vapor. Below this point, ice will sublime into a vapor - that is, the ice will convert directly to water vapor without melting. This sublimation is how freeze drying works and it only occurs at a pressure below 611 Pa (4582 mTorr). As the vacuum pump continuously runs, it reduces the pressure in the chamber. At these low pressures, the ice in the food sublimates, reducing the water content of the food until the food is dry. The water vapor is then deposited on the walls of the chamber to prevent it from entering the vacuum pump. The entire freeze drying process can take 18-36 hours and varies greatly depending on the material and thickness of the food being dried.

To make the freeze drying process quicker, the food is gently heated. **The key to making high quality freeze dried food is precise heating.** If the food is heated too high or too quickly, it will collapse and its texture will degrade. Fruits tend to be the most delicate materials, thus they require gentle heating. Meats, candy, and liquids are more robust and can handle more aggressive heating profiles. As you run batches of different foods in your machine, you will learn the settings that work best for your application. The control software has pre-programmed settings for various foods to assist you in determining the optimal settings. However, keep in mind that freeze drying is sometimes trial-and-error. Not every batch will come out perfect in the beginning.

The freeze dryer is intelligently controlled by a robust algorithm. The system utilizes high precision sensors to accurately regulate the temperature of the food and pressure of the chamber. This combination of precise sensors and intelligent software makes freeze drying simple, even for beginners.

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## 2 Safety Information

To reduce the risk of fire, electric shock, or other injury, follow all instructions and safety guidelines.



### WARNING

- Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction.
- Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- Do not damage the refrigerant circuit.
- Do not use electrical appliances inside the food storage compartments of the appliance, unless they are of the type recommended by the manufacturer.
- Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.

### General Safety

- **Only** use the freeze dryer as described in this manual.
- When not in use, turn the freeze dryer off and disconnect from power by removing the plug from the outlet.
- **Do not** operate the freeze dryer above 90°F.
- Keep the freeze dryer out of reach from children.
- **Always** unplug your freeze dryer from the power outlet before cleaning your freeze dryer.
- **Do not** plug or unplug the heating rack while the unit is turned on.
- **Always** make sure to place the freeze dryer upright on a flat, level surface before operation.
- **Do not** attempt to service the refrigeration system.
- **Do not** place the freeze dryer near sources of heat, such as stovetops, ovens, or radiators.
- **Do not** place the freeze dryer directly on floors, carpets, or rugs.
- Pay attention to warning labels and symbols on the freeze dryer. These labels provide essential safety information.
- **Do not** immerse the freeze dryer, power cord, or plug in water. If the freeze dryer is damaged or not functioning correctly, stop using it and contact **Customer Support** immediately (see page 36).

- If you are using any chemicals in the freeze-drying process, follow proper safety protocols and store chemicals in a secure and well-ventilated area.
- This freeze dryer is not to be used by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Supervise children when they are near the freeze dryer.
- Supervise children to ensure that they do not play with the freeze dryer.

## 3 About Your Freeze Dryer

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### What's included with your order:

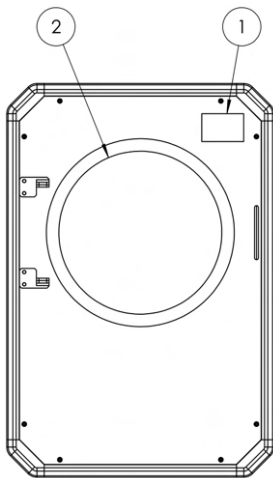
- 1x Freeze dryer
- 1x Power cord
- 1x Impulse sealer
- 1x Premium vacuum pump + oil
- 5x Stainless steel trays
- 5x Silicone mats
- 50x Mylar bags
- 50x Oxygen absorbers
- P100 filter



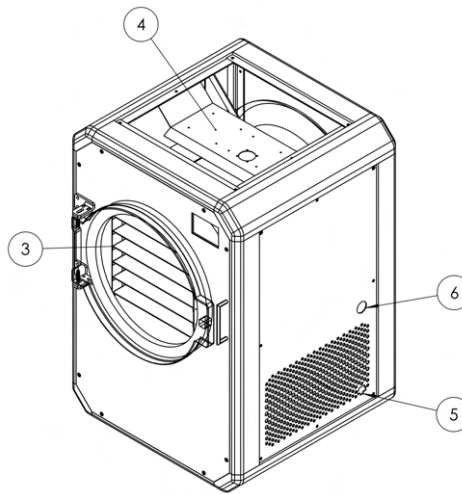
### 3.1 Technical Specs

| Specification        | Medium                       | Large                        |
|----------------------|------------------------------|------------------------------|
| Model                | BA40MFD                      | BA70LFD                      |
| Chassis material     | Aluminum                     | Aluminum                     |
| Refrigerant          | R1270, Propylene             | R1270, Propylene             |
| Charge mass          | 70.0g                        | 150.0g                       |
| Dimensions           | 20"x21"x30"                  | 24"x25.5"x34"                |
| Weight               | 110lbs (50kg)                | 130lbs (59kg)                |
| Max load capacity    | 15lbs (7kg)                  | 25lbs (11kg)                 |
| Tray count           | 5                            | 5                            |
| Tray size            | 9"x13"                       | 13"x18"                      |
| Mat material         | Food Grade Platinum Silicone | Food Grade Platinum Silicone |
| Voltage              | 120V 60Hz                    | 120V 60Hz                    |
| Maximum power draw   | 13A (1560W)                  | 17A (2040W)                  |
| Average power draw   | 9A (1080W)                   | 12A (1440W)                  |
| Heating system power | 540W                         | 555W                         |
| Chamber diameter     | 14in                         | 15.7in                       |
| Door material        | Polycarbonate                | Polycarbonate                |
| Compressor           | 1/3 HP Cubigel               | 1/2 HP Cubigel               |
| Included vacuum pump | 7-8 CFM, 1 HP                | 11-12 CFM, 1 HP              |

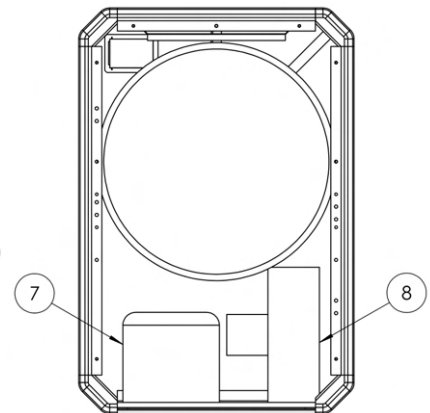
### 3.2 Components



- 1 Control Panel
- 2 Chamber



- 3 Heat Rack
- 4 Electronics Bay
- 5 Vacuum Outlet
- 6 Vacuum Hose



- 7 Compressor
- 8 Condenser



## 4 Initial Setup

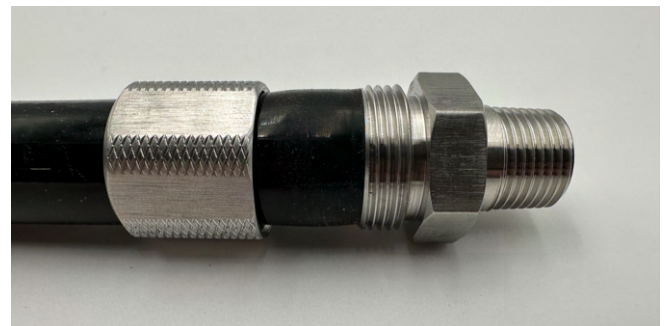
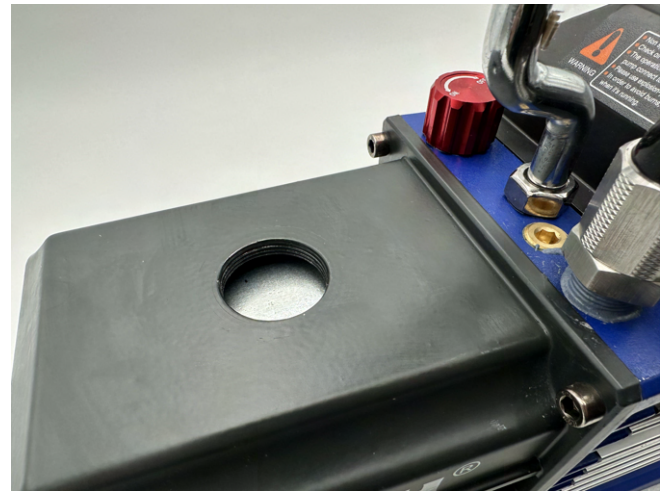
### 4.1 Unpacking

1. Remove the impulse sealer, vacuum pump, and accessory box from the shipping pallet.
2. Cut along the edges of the freeze dryer's cardboard packaging. **Do not cut in the middle of the box**, or you may scratch or damage the freeze dryer.

### 4.2 Installation

1. Choose a suitable location for your freeze dryer.
  - Find a location that will allow you to plug the freeze dryer directly into a 110V wall outlet. **Never plug the freeze dryer into an extension cord. Never plug the freeze dryer into 220V power.** Doing so will void the warranty. Extension cords will cause the refrigeration compressor to burn up.
  - Make sure the freeze dryer is operated at an ambient temperature between 32°F and 90°F. Operating the freeze dryer above 90°F will shorten the life of the refrigeration compressor and will void the warranty.
  - Ensure that the freeze dryer is plugged into an outlet on a 20 amp breaker. Also ensure that the freeze dryer is the only device on the circuit. Powering other devices on the same circuit as the freeze dryer could cause the breaker to flip and the batch of food to be ruined.
  - When finding a suitable location for the freeze dryer, keep in mind that the machine creates a noticeable amount of noise (~60 dB, or about the same as a clothes dryer). Also keep in mind that the machine creates heat, so the room in which it is operated will become warmer.
  - Only run the freeze dryer on a level surface.
2. Make sure both the vacuum pump and freeze dryer's power switches are set to OFF (the power switch is located on the back of the machine).
3. Make sure the heat tray rack is connected to the electronics. To do this, open the door and remove the black rubber door seal. The heat tray rack may have rotated during shipping — Make sure the heat tray rack is inserted with the orange heat pads face down. The electronic connectors are stored above the heat tray rack.
4. The vacuum pump must be filled with oil and connected to your freeze dryer before operation. The pump will also require regular oil changes over time (see page 26). **All vacuum pumps are consumable items and will be the first component to fail**, but with regular oil changes they will last 4 to 6 years. Before running any batch, ensure that the vacuum pump has the correct amount of oil in it. **Running the vacuum pump without oil will ruin it.**

- Remove the large oil filter located behind the handle, and slowly fill the pump with vacuum oil through the opening until the oil level fills 1/3 to 1/2 of the sight glass. Oil filled above this level may decrease the ability of the pump to pull vacuum. The oil should be no less than the minimum marker. A funnel may help. Replace the oil filter.
- Make sure the red gas ballast valve (located by the pump handle) is completely closed, then open it by one to four full turns. An open ballast valve will significantly increase the life expectancy of your vacuum pump.
- Plug the vacuum pump power cord into the pump outlet on the side of the freeze dryer. Turn the pump switch to the on position. The pump will not turn on at this time. The machine will tell the vacuum pump to turn on and off. The pump will not turn on until the freeze cycle is finished. If you are worried that your pump is not functioning you can test it by plugging it directly into the wall outlet and verify that it is in the on position.
- Unscrew the compression nut from the barbed fitting on the pump. Move it down along the vacuum pump hose a couple of inches. Press the hose end back onto the barbed fitting like the right image, and then screw the compression nut back onto the fitting.



5. Power on the freeze dryer by plugging in the power cord to a 110V wall outlet and turning the switch to ON. The touchscreen should automatically turn on when the machine is switched on.



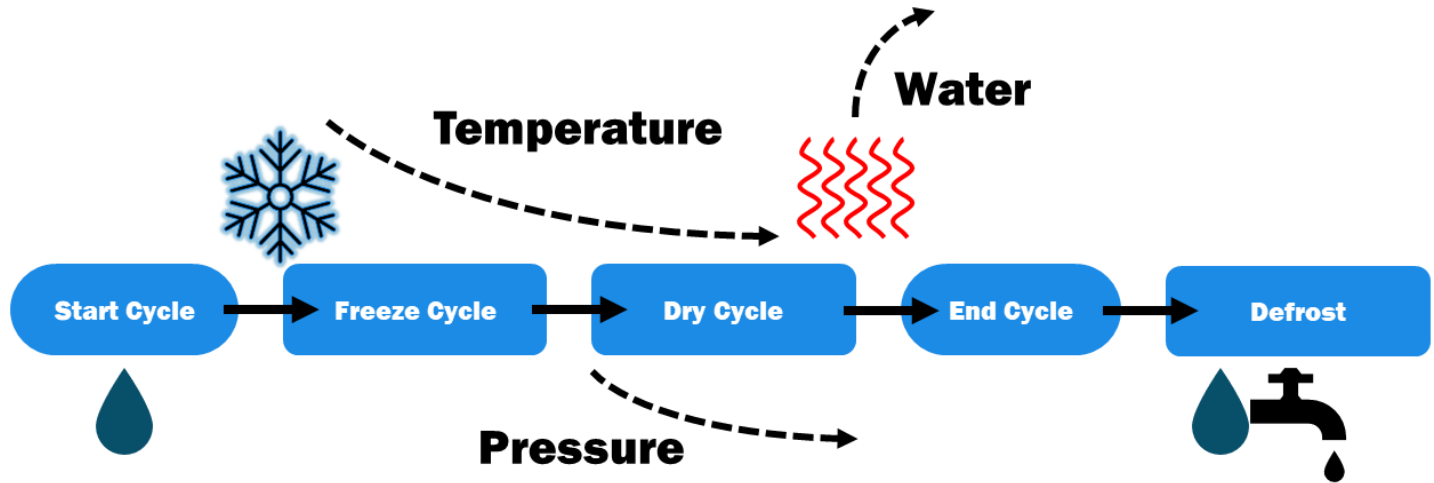
## WARNING

- Never plug the power cord into an extension cord.
- Never plug the power cord into an outlet or power the machine with the side panels removed.

## 5 Running Your First Batch

### 5.1 Overview

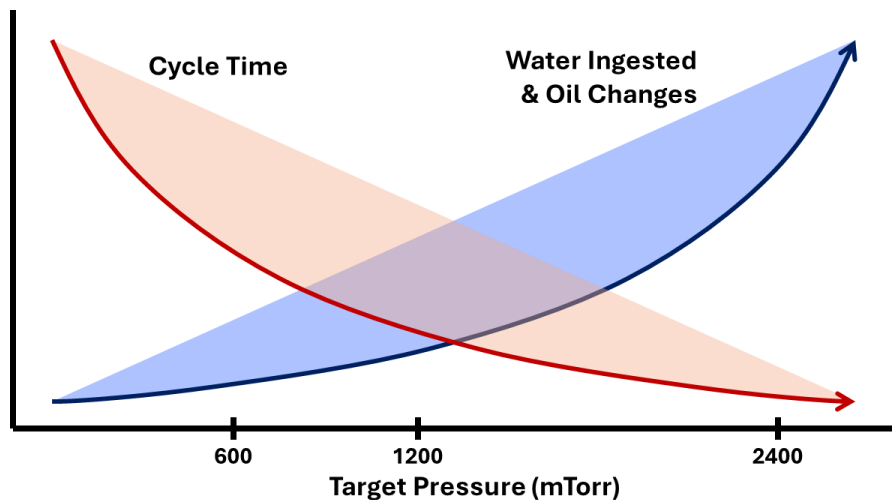
After you have successfully installed and set up your freeze dryer, you're now ready to prepare your first batch of food. Good preparation is essential to successful freeze drying.



The cycle will begin with the **freeze cycle**. During this stage, your freeze dryer will get very cold, completely freezing the water inside your food. Once frozen, your freeze dryer will then begin the **dry cycle**. The pressure will begin to drop extremely fast, then slowly level off to a target pressure. Once the pressure drops low enough, the frozen water will begin to sublimate- transitioning from ice to water vapor. Think evaporation, but from a solid to gas, rather than a liquid to gas.

The heat racks will turn on to help control the sublimation rate. If water sublimates too fast, it may damage the food. The water vapor from the food then sticks, or condenses, onto the cold walls of the chamber and forms ice. All of that ice was water vapor from the air and from the food!

How low the pressure drops determines the length of the cycle time and the amount of water ingested by the pump. The more water ingested, the more frequent oil changes will need to be. This is a trade-off between longer cycle times and less water ingested, or shorter cycle times and more water ingested.



Every food is prepared differently, so we'll go through an example to give you an overall idea of how to prepare food for the drying process.

## 5.2 Thickness

The thickness of the food is extremely important to the quality of the end product. In general, fruits, vegetables, and meats need to be sliced before they are freeze dried. There is no minimum thickness, but there is a maximum thickness. For example, strawberries and bananas tend to freeze dry best when they are sliced to a thickness between 3/16" and 1/2". As a general rule of thumb, this thickness range (3/16" - 1/2" or 5mm - 13mm) is applicable to all food types.

Thicker slices will tend to leave pockets of water in the middle of the food and will significantly slow down the drying process. Trying to dry very thick pieces of food is not possible in a reasonable amount of time. It's better to limit the thickness to 1/2" or less to keep the drying time within a practical range.

Keep in mind that certain food types contain significantly more water than other foods. Foods with a higher water content will require a longer drying time. For example, drying a batch of candy is significantly faster than drying liquids or fruit.

## 5.3 Orientation

All food needs to be placed as flat as possible on the tray. Avoid stacking food or slices. Avoid overfilling the trays with food.

## 5.4 Loading Food into the Machine

After the food has been sliced and oriented on the silicone mats in the trays, you're now ready to place the trays in the tray rack. Load the food into the tray rack, close the door, and turn the handle. Make sure the vacuum pump is turned on and plugged into the outlet on the side of the machine.

**CAUTION**

- Do not plug or unplug the heating racks while the unit is turned on. Doing so may cause the plugs to arc and damage the unit. Always turn off the machine before plugging or unplugging the heat racks.

## 5.5 Quick Start

Turn the machine on and press the Quick Start button on the home screen. If you pre-froze your food in your own freezer, select the Short Freeze Cycle option. Otherwise, press Start.

Now, ensure that the drain valve is closed. This page is a reminder to always close the valve. If the valve is not fully closed, it will create a leak and cause a vacuum pressure error. Press Start to begin the cycle. You should hear the refrigeration system turn on. The vacuum pump should not turn on yet.

## 5.6 Freeze Cycle

The freeze cycle typically takes 8 hours (factory default setting). You can adjust the freeze time if you need a shorter or longer freeze cycle.

**NOTICE**

- Do not add cold food to a warm chamber. This may lead to a vacuum error.

Do not add cold food to a warm chamber. This will cause ice to melt in the food. This melting can lead to a vacuum error as well as excess water being ingested by the pump.

To prevent this from happening, simply start the cycle for 30 minutes prior to putting food in the chamber. This will ensure that cold food is being placed into a cold chamber.

## 5.7 Dry Cycle

At the end of the dry cycle, you can check the doneness of your food. While the chamber is under vacuum, it is impossible to open the door. Slowly open the drain valve to bring the chamber back to atmospheric pressure. **The trays may be hot immediately following the dry cycle.**

Remove a sample of food from a tray and crack it in half. It should have a crispy snap and a dry texture in the middle. The middle should feel completely dry when you hold the food to your lips. If you do feel moisture, the food needs more dry time. You can restart the drying cycle by going back to the home screen and choosing Quick Start if the cycle has completely ended. Then, skip the freeze cycle and go straight to the dry cycle. Adjust the dry time appropriately based on how moist the food sample was.

The food may be done before the dry cycle completes. If the chamber pressure drops to or below 200 mTorr consistently for 1-2 hours, the food is likely done or close to being done. Pause the cycle and

check the food before ending the cycle.

The heating racks “boil” water off from inside the food, and the resulting water vapor increases the chamber pressure. The freeze dryer applies enough heat to create the desired target pressure. When there is no more water inside the food, the chamber pressure will drop because there is little water to “boil” off and raise the pressure. The pressure sensors are very accurate, but have a lower limit of 200 mTorr and will not show lower pressures.



## CAUTION

- The trays may be hot immediately following the drying cycle.



## NOTICE

- Oil mist from your vacuum pump is normal operation.
- Clean trays and mats soon after a cycle. Residue sugar will allow mold and bacteria to quickly develop if left unchecked.

## 5.8 Defrost

After every batch, it is necessary to remove all of the ice that accumulates on the walls of the chamber. **Before defrosting the ice, remove the batch or the food will rehydrate.** Place the drain hose in a bucket or container (1-5 gallons) and open the drain valve. Close the freeze dryer door. The defrost page uses the tray rack to heat the chamber and expedite the defrosting process. Allow all of the water to drain out of the freeze dryer, and then dry any remaining water in the chamber with a cloth.

- Not every batch will be successful, especially at first. There is a learning curve to freeze drying, so don't get discouraged if it does not work and a batch gets ruined.
- Every food is different. Some foods are significantly easier to freeze dry than others. That said, the machine's default settings should work on almost every type of food.
- Not all foods can be freeze dried. Chocolate, butter, oils, and excessively fatty items are examples of foods which can't be freeze dried.

## 5.9 Storing Your Batch

There are two methods for storing your batch. The first is to use mason jars. While good showpieces, mason jars are heavy and prone to breaking. The second and recommended method is to use 7 mil Mylar bags. These can be easily sourced through the Blue Alpine website, or purchased from third party vendors. Note that not all bags are the same. If purchasing from third party vendors, be sure to use 7 mil bags with at least a 1.2 mil aluminum lining. To store your food:

1. Move your freeze dried food to the Mylar bag or mason jar.



2. Place one oxygen absorber packet in with your food. The O2 absorbers saturate after 30 minutes, so do not leave them out in open air for too long. They can be stored in an airtight container such as a mason jar or resealed in their plastic packaging with the impulse sealer.
3. Evacuate as much air as possible from the Mylar bags. If using a mason jar, shut the jar.
4. Zip the Mylar bag closed. Use the included impulse sealer to heat seal the end of the Mylar bag. We recommend sealing 2-3 rows for added measure to ensure there are no missed leaks.

That's it! Your food is now preserved, and will last for 20-30 years.

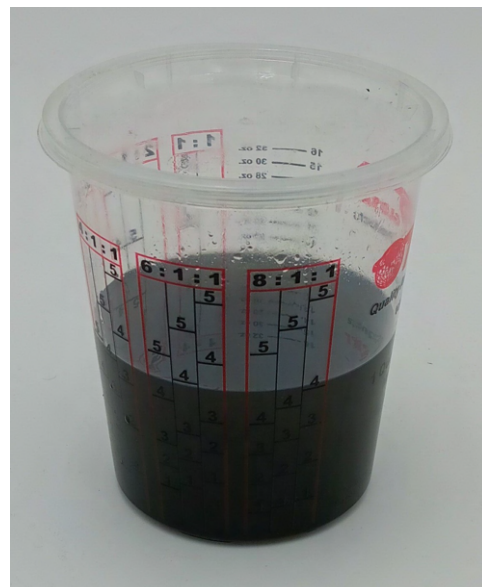
## 5.10 FAQ: Why does my vacuum pump oil look so dark after the first batch?

It can be very alarming to check your machine after running your very first freeze-drying cycle to find that the oil in your pump looks significantly darker. In an average cycle oil discoloration should be minimal, so what is happening on the first run?

This results from a combination of two main sources.

1. Extra particulates from the casting process.
2. Slight imperfections in metal parts within the vacuum pump that when first operated, get shaved off.

Each pump has its own break-in period and it may be a few cycles before there is no longer a noticeable discoloration in the oil after a single cycle. The oil will need to be changed more frequently while the pump is going through this process. Otherwise you can refer to the maintenance section of the manual for oil change frequency.

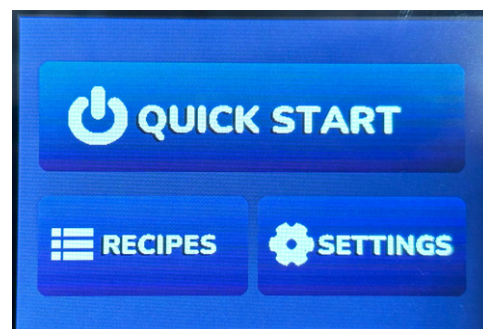


## 6 Controls

This section is intended to help you navigate and optimize your freeze dryer's software efficiently. The software manages the vacuum pump, refrigeration system, and heating shelves.

This is the home page. The freeze dryer will default to this page every time it is turned on. From here, you can immediately begin a freeze drying cycle by pressing **QUICK START**.

For more precise control over the cycle, the **RECIPES** page will offer different food group presets to choose from. The **SETTINGS** page will be used for editing default settings and running hardware tests.



The **QUICK START** page makes it easy to quickly begin a freeze drying cycle. Pressing **START** will begin a cycle using the default settings.

If the freeze dryer is frozen over from a previous cycle, the **DEFROST** option will immediately begin thawing out the freeze dryer. If your food is already frozen, you can press **SKIP FREEZE CYCLE** to immediately begin the freeze drying cycle.

The **RECIPES** page offers preset freeze drying food groups including candy, greens, meat, fruit, liquid, and delicates. These presets are more optimized for the freeze drying performance of that particular food. Candy, for example, better vacuum dries than it does freeze dry. The candy preset will account for this.

Each preset can also be modified with the **EDIT** button to change the default freeze time, dry time, dry temperature, and pressure.

From the **SETTINGS** page, the default dryer settings can be modified. These settings include the default freeze time, dry time, dry temperature, and pressure for the **QUICK START** setting. Measurement unit preferences, sound settings, and a factory reset are also found in this menu.

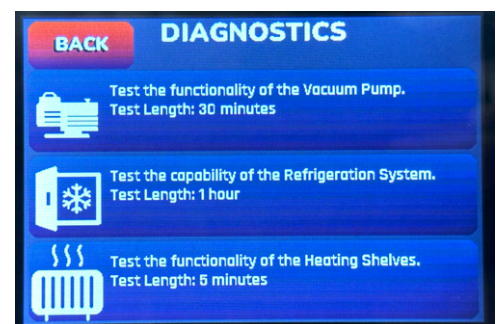
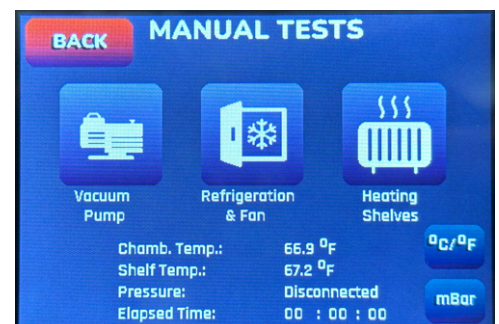
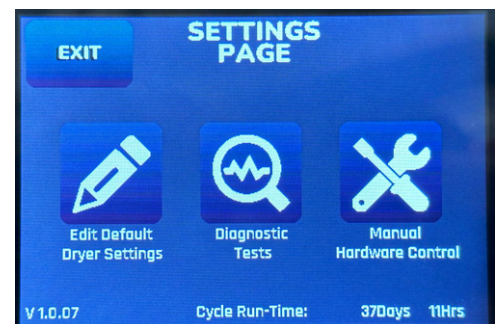
A thorough quality control test can also be run by pressing the blank upper right corner of this page.

The **MANUAL TESTS** page allows for individual components of the freeze dryer to be turned on or off. The vacuum pump, refrigeration and fan, and the heating shelves can all be toggled. Sensor measurements will also be shown.

This page can be helpful in diagnosing your freeze dryer. If any sensors are disconnected, this will be shown where the sensor measurements are displayed.

The **DIAGNOSTICS** page offers three tests to make sure your freeze dryer is functioning properly. The vacuum pump, refrigeration system, and heating shelve tests will measure the performance of each system.

These tests take time to complete. At the end of each test, the freeze dryer will alert you it is done with an audible beeping. If any tests fail, reference the Troubleshooting section on page 30.





## 7 Customize Settings

After running several batches of food in your freeze dryer, you may want to start optimizing the settings to best suit your needs. For example, if you consistently dry the same food material in every batch, you might know the exact freeze time, dry time, or final temperature necessary for your application. Although these parameters can be changed while a cycle is running, it is sometimes helpful to save custom values as the default settings.

From the home screen, select the “CONTROLS” button. Within the controls page, you can select various settings such as:

**Default Freeze Cycle Time:** Increase the freeze time for larger batches and decrease for smaller batches. Default freeze cycle time is 8 hours.

**Dry Cycle Time:** Increase the dry cycle time for batches with more water content.

**Final Shelf Temperature:** This is the highest temperature that food reaches during the drying cycle. In general, the final temperature should be in the range of 100°F to 125°F depending on the hardness of the food. In freeze drying, every food has a melting point - the temperature at which the food begins to degrade, melt back, or shrivel. Below is a table of some of the most common food types and the appropriate final shelf temperature setting:

| Food Material                           | Recommended Shelf Temperature |
|---|-------------------------------|
| Strawberries, Bananas, Apples           | 115°F or 46°C                 |
| Grapes, Pineapple, Blueberries, Oranges | 110°F or 43°C                 |
| Veggies, Squash                         | 120°F or 49°C                 |
| Chicken, Pork                           | 130°F or 54°C                 |
| Raw Eggs                                | 115°F or 46°C                 |
| Steak                                   | 130°F or 54°C                 |
| Potatoes                                | 125°F or 52°C                 |
| Gummy Candy                             | 145°F or 63°C                 |
| Hard Candy                              | 145°F or 63°C                 |
| Yogurt                                  | 115°F or 46°C                 |
| Cottage Cheese                          | 120°F or 49°C                 |

Each shelf on the tray rack will be heated to approximately the same temperature. If you are drying a variety of foods, use the final shelf temperature setting for the food with the lowest recommended temperature.

Generally, the factory settings will work for most applications. Adjusting the settings should only be done if you have sufficient experience with freeze drying. Also, the hardware and software that controls the freeze dryer is inherently intelligent. The system continuously monitors the process while precisely regulating the shelf temperature of the food and the chamber pressure.

## 8 Recipes

The recipes page can help users quickly find settings more optimized to the specific foods they will be drying. The preset temperatures and pressures are a good starting point, but you will need to test each food to optimize your recipe.

For example, pineapple is a relatively delicate food. Fresh pineapple will have a final shelf temperature a few degrees higher than frozen pineapple from the freezer section at the store. Canned pineapple will also be slightly different than the final shelf temperature than the other two. Whatever you are doing, you will need to make small fine tune adjustments to get the final product perfect.

If you are drying a variety of foods, use the final shelf temperature setting for the food with the lowest recommended temperature. If you get the food too hot it will destroy the proteins and cells of the food and cause it to collapse. This will usually result in a soft, flexible product similar to a wet fruit leather. If you see this happen, the food is no longer storable for long term storage and will need to be used quickly or thrown away. If this happens, simply try the samples again but about 10°F colder shelf temperature than what it was before.

The food will take too long to get done if the final shelf temperature is below 100°F. This is a very gentle way to freeze dry (and it can certainly be done this way), but it will take a long time for the food to dry.

### 8.1 Pineapple

**Load Size:**

Medium: 8-16 lbs

Large: 16-20 lbs

**Toughness:** Very delicate**Pressure:** 600-1,200 mTorr**Shelf Temperature:** 105-115°F**Drying Time:** 14-24 hours, or delicate recipe

Freeze dried pineapple is deliciously sweet with tropical flavor locked in. Pineapple is vitamin rich, with plenty of Vitamin C to help boost your immune system. It makes a great snack between meals, on the trail outdoors, or as a unique addition to your yogurt or cereal.

Smaller bits of pineapple work better than larger bits. 3/4" chunks work well.

If the center of the pineapple bits start to look wet and fall in again, the shelves are too hot.



## 8.2 Strawberry

**Load Size:**

Medium: 8-16 lbs

Large: 16-20 lbs

**Toughness:** Delicate**Pressure:** 600-1,200 mTorr**Shelf Temperature:** 105-115°F**Drying Time:** 14-24 hours, or fruit/delicate recipe

Freeze dried strawberries are a popular fruit, and are easy to freeze dry. Ripe strawberries will offer the best flavor.

An optional acidic solution will help keep the strawberries from darkening while freeze drying.

Soak the strawberries in equal parts lemon juice to water for 10-15 minutes and drain.

Slice the strawberries into smaller sections before freeze drying. This cuts back on the time to freeze dry and leaves brittle strawberry “chips”. If the center of the strawberries start to fall in and look wet again, the shelves are too hot.



### 8.3 Banana

**Load Size:**

Medium: 8-10 lbs

Large: 16-20 lbs

**Toughness:** Delicate**Pressure:** 900-1,200 mTorr**Shelf Temperature:** 108-115°F**Drying Time:** 16 hours, or fruit recipe

Freeze dried bananas are inexpensive and easy to make. Freeze drying retains the bananas high concentrations of fiber and potassium. Generally, you do not want overripe bananas. Prefer towards a little on the green side, or the first day they turn yellow, for the best product.

Cut the bananas into slices no larger than 3/4".

If the banana bits start to bubble up, this is the sugar coming out of the banana. You might need to cool down the cycle a bit.





## 8.4 Grapes

**Load Size:**

Medium: 6-10 lbs

Large: 12-20 lbs

**Toughness:** Very delicate**Pressure:** 600-1,200 mTorr**Shelf Temperature:** 100-112°F**Drying Time:** 20 hours, or delicate recipe

Freeze dried grapes taste similar to raisins, and are very sweet. Grapes need to be freeze dried for longer periods of time. Cut each grape in half before freeze drying. The grape skin makes it difficult for water to escape and dramatically increases the time to freeze dry.

During the process, sugar may bubble out. Laying the grapes face down seems to help prevent larger sugar residue bubbles from being left behind. You might need to cool down the cycle a bit.



## 8.5 Tomatoes

**Load Size:**

Medium: 6-8 lbs

Large: 12-16 lbs

**Toughness:** Delicate**Pressure:** 600-1,200 mTorr**Shelf Temperature:** 110-120°F**Drying Time:** 20-24 hours

Freeze dried tomatoes can be used in tomato paste, as a powder, or as a snack. A little bit of salt is delicious on freeze dried tomatoes.

If the center of the tomatoes start to look wet and fall in again, then the shelves are too hot.

Tomatoes also have a lot of water in them so loads with a lot of tomatoes may take longer.

They are also very delicate once they are dry because the cell structure is so dispersed. If you want nice showpieces, make sure to keep them in a mason jar rather than a Mylar bag.

## 8.6 Puree

**Load Size:**

Medium: 6-8 lbs

Large: 12-16 lbs

**Toughness:** Hardy**Pressure:** 600-1,200 mTorr**Shelf Temperature:** 120-135°F**Drying Time:** 16-20 hours

Many of the delicate foods can be done as a puree. Often this cuts down dry time but keeps the same nutritional value.

Berries, tomatoes, eggs and squashes are great to turn into a puree prior to drying.

## 8.7 Chicken

**Load Size:**

Medium: 8-12 lbs

Large: 16-24 lbs

**Toughness:** Hardy**Pressure:** 600-1,500 mTorr**Shelf Temperature:** 115-130°F**Drying Time:** 16-20 hours, or meat recipe

Chicken is very hardy and is pretty hard to mess up. Just cook the chicken before drying.

The more moist the chicken is before drying the better it will be to rehydrate. Shredded chicken is very easy to dry and rehydrates very well.

For long term storage do not use any oils during cooking and try to cut out as much fat as possible. This will help to preserve the food. Try to get it into small chunks or strips. Shredded chicken is very easy to dry and rehydrates very well.

## 8.8 Pork

**Load Size:**

Medium: 8-12 lbs

Large: 16-24 lbs

**Toughness:** Hardy**Pressure:** 600-1,500 mTorr**Shelf Temperature:** 115-130°F**Drying Time:** 16-20 hours, or meat recipe

Pork is very hardy and is pretty hard to mess up. Just cook the pork before drying.

The more moist the pork is before drying the better it will be to rehydrate.

For long term storage do not use any oils during cooking and try to cut out as much fat as possible. This will help to preserve the food. Try to get it into small chunks or strips. Shredded pork is very easy to dry and rehydrates very well.

## 8.9 Beef

**Load Size:**

Medium: 8-12 lbs

Large: 16-24 lbs

**Toughness:** Hardy**Pressure:** 600-1,500 mTorr**Shelf Temperature:** 115-130°F**Drying Time:** 16-20 hours, or meat recipe

Beef is very hardy and is pretty hard to mess up. Just cook the beef before drying.

The more moist the beef is before drying the better it will be to rehydrate.

For long term storage do not use any oils during cooking and try to cut out as much fat as possible. If you need the seasoning to stick, use something like mustard or apple juice. This will help to preserve the food.

Try to get it into small chunks or strips. Smoked beef is absolutely amazing when it is rehydrated, and is pretty fun to take camping. Fatty cuts like brisket will probably not keep as long as leaner cuts, but should still last at least 10 years.

## 8.10 Eggs

### Load Size:

Medium: 64 small eggs

Large: 128 small eggs

**Toughness:** Hardy

**Pressure:** 600-1,500 mTorr

**Shelf Temperature:** 115-120°F

**Drying Time:** 16-20 hours, or liquid recipe

Eggs are best freeze dried as a puree. Fatty whites in the eggs will develop a strange rubbery texture when freeze dried, so it is recommended that you blend the eggs first. Even a whisk by hand will still leave clumps of whites floating around. The more homogeneous the mixture, the better the eggs will taste.

Scrambled eggs are okay, but raw eggs seem to turn out better in the end. Reconstituted eggs can be cooked like normal after.

Moving eggs around in trays usually results in spilling. Instead, it is usually easier to pour the egg puree into trays already in the freezer. Allow them to freeze, then move the tray to the freeze dryer. Alternatively, the trays can be loaded halfway in the freeze dryer heat rack and then filled with the egg puree.

## 8.11 Gummy Candy

**Load Size:** As many as can fit

**Toughness:** Hardy

**Pressure:** 10,000-13,000 mTorr

**Shelf Temperature:** 140-150°F

**Drying Time:** 4-6 hours

Not all brands of gummies will work. If you are trying to do peach rings, for example, try multiple brands to see what works. Some brands will puff up nicely and others will be flat and hard. Leave ample space between gummies, otherwise they will clump together after freeze drying.

Freeze drying candy will usually take less time than most other types of food. This is because candy works better vacuum drying at higher pressures compared to freeze drying.





## 8.12 Hard Candy

**Load Size:** As many as can fit

**Toughness:** Hardy

**Pressure:** 10,000-13,000 mTorr

**Shelf Temperature:** 140-150°F

**Drying Time:** 4-8 hours

Jolly Ranchers will need to be cut in half. Otherwise, they will blow up and stick to the tray above. Leave ample space between the candies, otherwise they will clump together after freeze drying.

Jolly Ranchers should not need to be preheated. Some other candies like Lemon Heads may need to be preheated in an oven at 300 to 350°F. This will allow the sugar to get soft enough to puff up like it should.

Freeze drying candy will usually take far less time than most other types of food. This is because candy works better vacuum drying at higher pressures compared to freeze drying.

The load size is dependent on how much the candy expands. Some candies will double in size, so leave enough room around each.

## 8.13 Ice cream

**Load Size:**

Medium: 3-5 lbs

Large: 6-10 lbs

**Toughness:** Delicate

**Pressure:** 600-1,500 mTorr

**Shelf Temperature:** 108-125°F

**Drying Time:** 16-20 hours

Ice cream is frozen, but you can't skip the freeze cycle. This is because there will often be a small amount of ice cream that melts on the trays. If you skip the freeze cycle, the vacuum pump may turn on while this tiny amount of ice cream is still liquid. If there is any liquid inside the chamber when the vacuum pump turns on, it will foam up and cause a mess.

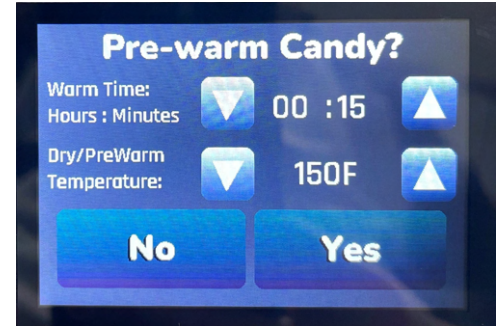


## 9 Advanced Settings

### 9.1 Candy Pre-warm

The Candy Pre-warm feature is intended to help certain candies that might require more heat to puff up and freeze dry. Enabling this option will turn on the heating shelves before vacuum drying the candy.

To access the Candy Pre-warm option, navigate to the candy recipes page. This feature enables you to customize your pre-warm time up to 10 hours and set your desired shelf temperature. Changing these settings will change both the pre-warm temperature and the dry cycle temperature. After the pre-warm is finished, the freeze dryer will proceed to the dry cycle and begin pulling vacuum while the candy is still hot. This process helps to expand and puff out the candy. If you choose not to use the Pre-warm option, your candy recipe will function like the other recipes on the machine.



Using this setting will cause the pump to ingest more water, and may require more frequent oil changes.

*Note: The heating profile for the Candy Pre-warm mode is suggested, but may not provide the best results for a specific batch. It is recommended that you test various small loads of candy before attempting large loads to get the best results.*

### 9.2 Maximum Shelf Temperature

This setting will drastically change the amount of time it takes to get the food dry. Generally you want to test a recipe by going lower on the maximum temperature and then testing batches with increasingly higher temperatures. **If the shelf temperature is too hot it will melt the ice in the food and the end product will be less than ideal.** This comes more into play with delicate foods like grapes and pineapple. Hardy foods like meat can often survive a higher temperature.

The shelf temperatures will not always operate at the maximum shelf temperature. These are controlled by an advanced algorithm that efficiently controls the chamber pressure by varying the shelf temperature. As the dry cycle continues and the water content of the food drops, the shelf temperature will approach the maximum shelf temperature.

### 9.3 Pressure Limit

The pressure limit is another great way to shorten or lengthen a cycle. Setting a lower pressure limit will heat the food more gently in the beginning of the cycle. Most of the water in the food is sublimated out in the beginning of the cycle. **Setting a lower pressure limit will increase the dry time, because the shelves will need to heat more slowly to avoid quickly increasing the pressure in the chamber.**

In contrast, setting a higher pressure limit will allow more heat to be put into the food quicker. This results in shorter dry times. The only drawback is that, as more water comes off the food, the pump

has a greater chance of ingesting water vapor. Setting the pressure limit too high will also decrease the quality of the food. Each food will be different, but a general rule of thumb is that anything above the triple point of water (4582 mTorr/ 611 Pascals) is not recommended. Anything above the triple point is more vacuum drying and not freeze drying, although this is preferred for some items like candy.

## 10 Cleaning

This section contains useful information on cleaning your freeze dryer. After each cycle, open the door and allow the inside of the freeze dryer to air dry. Any standing water can allow mold and bacteria to develop. An effective sanitation solution for surfaces exposed to food can be made at home with one tablespoon bleach to one gallon of water at 75°F.



### WARNING

- Disconnect the power cord and ensure the machine has no power before cleaning or servicing.



### CAUTION

- Do not clean a dirty compressor or frozen evaporator with a sharp object.

### 10.1 Cleaning the Tray Rack

Remove the door seal, take out the tray rack, and disconnect the wires. Clean the tray rack with water. Do not place it in a dishwasher or submerge it in water. A bristle brush will help clean the spaces between the trays.

Sanitize the tray surfaces with a second wash of soap and water or the bleach sanitation solution. Rinse the tray rack with water and allow it to air dry.

The rear fan can be cleaned with a bristle brush or canned air. The fan is also resistant to water and can be submerged for deep cleaning.

### 10.2 Cleaning the Chamber

Wipe down the inside of the chamber with a damp cloth, and sanitize the walls. Spray the drain on the bottom of the chamber with sanitizer, and the pass-through (the lower of the holes on the back with protruding wires). **Do not spray the center hole or the electrical connector.** The center hole houses the pressure sensor, and spraying a cleaning solution may damage the pressure sensor. A sterilizing, non-oil wipe can clean the inside of the pressure sensor hole. Do not spray the electrical connector as this could corrode the terminals. Ensure the electrical connectors are free of moisture before reconnecting them.

You may also remove the P100 filter (see Section 11.2) and clean the vacuum hole, but this shouldn't need much cleaning. The filter removes any particles above 3  $\mu\text{m}$  (microns) in size.

### 10.3 Cleaning the Door

The door is made of a polycarbonate glass. Do not use any solvents when cleaning the door, such as rubbing alcohol. Clean both sides first with water, then clean with a sanitization solution.

### 10.4 Cleaning Inside the Freeze Dryer

Once or twice a year, clean out inside the cabinet of the machine. Use compressed air to blow out any dust in the condenser. This keeps the refrigeration system running efficiently by allowing the refrigerant to be effectively condensed and cooled. Wipe down the inside panels and frames with a damp cloth. Use compressed air to clean the electronics and PCB's. Be extremely careful to avoid sharp corners when cleaning.

## 11 Maintenance

This section contains useful information about proper care and maintenance of your machine. Failing to perform proper maintenance on certain components of the machine, such as the vacuum pump, will void the warranty.



### WARNING

- Disconnect the power cord and ensure the machine has no power before cleaning or servicing.

### 11.1 Changing the Vacuum Pump Oil

The vacuum pump tends to take the most abuse in a freeze drying system. Water, dust, and contaminants enter the pump and will eventually cause the pump to fail. However, proper maintenance and consistent and frequent oil changes will keep the pump running for many years. Change the oil in your vacuum pump every 5-10 cycles. Loads with candy can be replaced every 30 cycles.

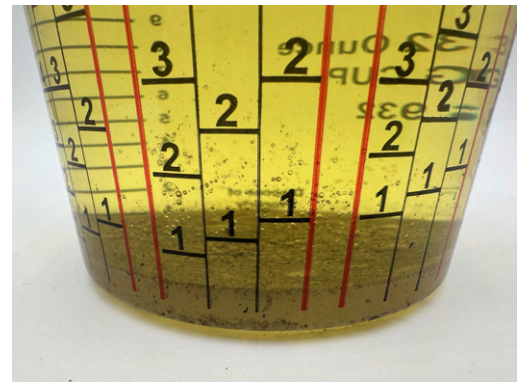
After each batch, check the quality of the oil in the pump through the sightglass. If the oil is milky, mirky, discolored, or there are visible contaminants, change the oil. Never let the vacuum pump sit for extended periods of time (more than 1-2 days) with contaminated oil. Used oil contains water and other contaminants that can corrode the pump. If you will not be using your freeze dryer, replace the oil in the vacuum pump with new oil to prevent corrosion. Robinair vacuum pump oil or JB Industries Black Gold are good options.

Follow the steps below to change the oil in your vacuum pump:

1. Unplug the pump.

2. Have a funnel and storage container placed under the drain valve of the pump to collect the used oil.
3. Use a 5mm Allen wrench to remove the drain plug on the bottom of the pump underneath the sightglass.
4. Drain the oil into a suitable container. Tip the pump forwards to drain all of the oil. Removing the large oil filter at this stage can help the oil flow out the drain plug faster.
5. Replace the drain plug. The vacuum pump must also be level before filling with oil.
6. If not already removed, remove the large oil filter located behind the handle, and slowly fill the pump with vacuum oil through the opening until the oil level reaches the middle of the sight glass. The oil should be no less than the minimum marker. A funnel may help.
7. Replace the oil filter.
8. There are two options to filter the used vacuum pump oil so that it can be reused.

*Note: The oil will often have black particles in it. This is material from the casting of the pump and is normal. The pink P100 filter is intended to prevent food contamination from building up in the oil and will require the oil to be changed less often. It is highly recommended this filter is always used, but is not absolutely necessary.*



**Option 1:** Let the used oil sit in a clear container. Eventually, all the water will settle out and can be removed. The wetter the loads and the longer you go between oil changes the longer it takes for this water to settle out. Once the oil goes to an amber-clear color it is ready to pour back in the machine.

**Option 2:** Brita-style water filter. This will help to clean the oil and is the fastest method. The downside to this is that the filters need to be replaced periodically and it can be a little messier.

Changing the oil is much like a car. The more often you change it the longer the pump will last. All vacuum pumps are consumable items, but with regular oil changes the pump should last about 4 to 6 years.

It is also worth noting that keeping the red gas ballast valve on the top of the pump (open one to four full turns) will significantly increase the life expectancy of your vacuum pump.

## 11.2 Changing the Filter

Changing the P100 filter in the chamber is easy. Simply rotate the filter until it pulls off, and replace the filter with another clean P100 3M™ Particulate Filter 2091. The filter can be changed about every 6 months.



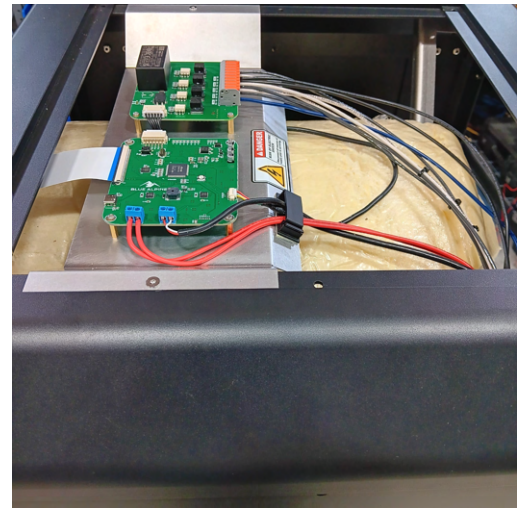
### 11.3 Replacing PCB Components

Ensure that the machine is turned off and unplugged before accessing the machine. Remove the side panels from the machine. The center PCB is the data PCB. The PCB opposite of the screen is the power PCB. Remove the four corner screws from the PCB needing to be replaced. Disconnect the attached wires one by one and install them into the new PCB. Once all the wires are swapped over, install the new PCB by screwing back in the four screws.

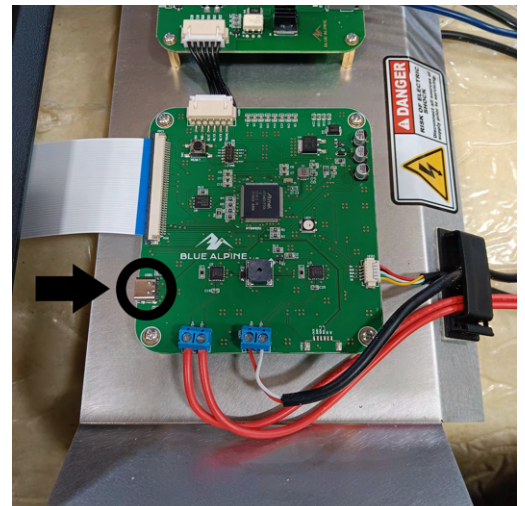
### 11.4 Updating Firmware

The latest firmware updates can be found on the Blue Alpine website. Navigate to the Downloads page and download the latest firmware for your model of freeze dryer.

1. Switch off and unplug your freeze dryer.
2. Open up the top panel of the freeze dryer using the screwdriver.

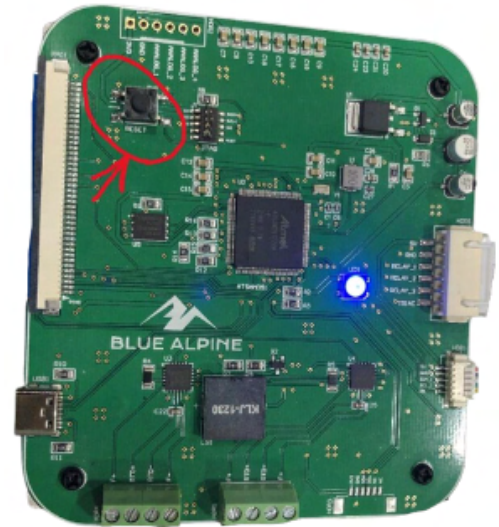


3. Find the USB-C port on the Blue Alpine (green board shown in the picture) and plug in the USB-C connector.
4. Plug in the other end of the USB-C connector to your computer.



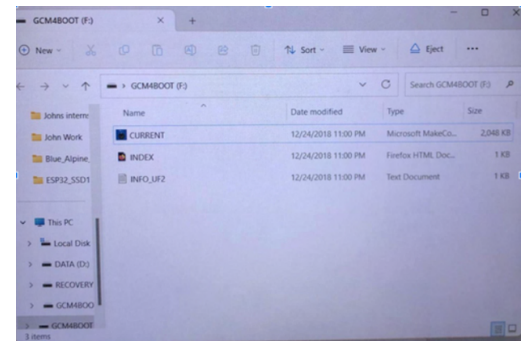
- Press the reset button twice\* to activate download mode. The GCM4BOOT drive window should pop up on your computer and will act like a USB drive; if not, check the connected USB devices on your computer and see if this drive is found.

*\*The LED on the board lights green when in bootloader mode. If a red light is present, try pressing the reset button two more times. If the problem persists, contact support at (208)-607-1722.*



- Drag and drop the new software (UF2 file) to the GCM4BOOT drive.
- The new software will instantly upload and run on the board after this step.

**Note:** *The screen backlight will not work until the machine is powered back on.*

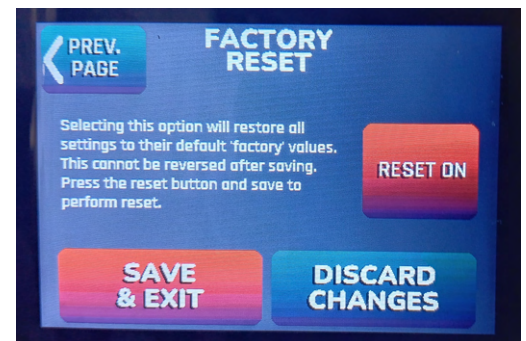


- Unplug the USB-C Cable from the machine, and place the metal panel back onto the machine.

*\*As of patch 14, multiple default values have changed. The machine is designed to not alter its default memory even with updates unless the user explicitly factory resets the machine. We recommend factory resetting the machine after the update. Please note that this will erase your personally saved settings.*

## 11.5 Performing a Factory Reset

- From the Home Screen, press the settings button.
- Press the button entitled “Edit Default Dryer Settings”
- Press and hold the next page button until the factory reset page.
- Press the button called “RESET OFF” and ensure that it reads “RESET ON”
- Press the “SAVE & EXIT” button



## 12 Troubleshooting



### WARNING

- Disconnect the power cord and ensure the machine has no power before cleaning or servicing.

### 12.1 Freeze Dryer won't Turn On

Check that the circuit breaker is not tripped. If so, check that the freeze dryer is not damaged in any way and reset the circuit breaker. Check that the power cord is plugged in, and that the mechanical power switch on the back of the unit is set to ON. If the machine is receiving power, a LED will glow on the power PCB board. Remove the top panel to check whether this is on. If not, contact **Customer Support** on page 36.

### 12.2 Chamber Pressure not Achieving Vacuum

Run the diagnostic test for the vacuum pump from the settings menu. This test will determine what vacuum pressure the unit can reach. If the test fails, there are a few possible fixes.

Check that door is sealing properly. The door seal should create a solid ring around the door seal about 1/8" thick and 1/2" thick during vacuum. Check that door screws are loose enough that the door can move forward and back, but not so loose that the vacuum pump cannot pull the door closed from vacuum. If the door is open a little bit when pulling vacuum, press the door closed against the freeze dryer and the vacuum pump will suck the door in. Also make sure that the door handle is completely closed.

Check that no residual water is inside the chamber. When attempting to pull vacuum, this water will evaporate and prevent the pressure from dropping.

Cold food added to a warm chamber will cause ice to melt in the food. This melting can lead to a vacuum error as well as excess water being ingested by the pump. To prevent this from happening, simply start the cycle for 30 minutes prior to putting food in the chamber. This will ensure that cold food is being placed into a cold chamber.

Check that the drain valve is closed. If air is escaping through any gaps between the hose and drain valve, then remove the drain valve from the hose, cut the hose back by about 1/2", and reinsert the hose. The drain valve itself might have a leak — drain valves can be replaced relatively inexpensively. Quality drain valves can be purchased through McMaster Carr. Sometimes a small puncture in the hose will also cause a leak. These hoses can be replaced with a HPS 1/2" high temperature reinforced silicone heater hose.

Check that the vacuum pump oil is clean. Water and other contaminants will discolor the oil, and will cause the pump to not operate as efficiently as possible. Too much oil will also cause the pump to not draw vacuum as efficiently.



### 12.3 Door Not Sealing

Ensure the door is completely closed. The door seal should create a solid ring around the door seal about 1/8" thick and 1/2" thick during vacuum. Check that door screws are loose enough that the door can move forward and back, but not so loose that the vacuum pump cannot pull the door closed from vacuum.

If the door is open a little bit when pulling vacuum, press the door closed against the freeze dryer and the vacuum pump will suck the door in. Also make sure that the door handle is completely closed.

### 12.4 Heat Tray Rack won't Connect/Heat up

Run the diagnostic test for the heat rack from the settings menu. This test will determine what temperature the heat rack can reach. If the test fails and states that the heat rack is disconnected, check that the electrical connections between the heat rack and machine are secure.

The pins inside each Deutsch connector should be pulled out — if any are pushed in, carefully pull the pins out with needle nose pliers until locked in place. If the heat rack still does not reach temperature, contact Blue Alpine support on page 36.

### 12.5 Chamber Temperature not Cooling

Run the diagnostic test for the refrigeration from the settings menu. This test will last 60 minutes and determine what temperature the refrigeration can reach. Check that the evaporator is clear of any dust or debris, and that there is sufficient airflow around the machine. It may also help to reduce the temperature of the room.

Check that there are no punctures or porosity in the refrigeration circuit inside the freeze dryer. If the test fails and the unit appears otherwise visibly undamaged, your compressor may be defective. Contact Blue Alpine support on page 36.

### 12.6 Mist Coming out of Vacuum Pump

**This is normal operation.** The "smoke" that comes from your vacuum pump is oil mist, and is a trait of every oil-based vacuum pump. During operation, if the freeze dryer unit is not completely sealed (door shut and drain valve closed), oil mist may also leave from these openings.

### 12.7 Excessive Water in the Pump

**Defrost and drain your freeze dryer after every cycle.** This is very important. Otherwise, the ice may become too thick and prevent the water vapor from being captured on the walls of the chamber. This could send excess water through the pump. This is not always the case for candy loads, but for regular food loads is a must.

Make sure to run the vacuum pump with the gas ballast valve open about one to four full turns. This will help cycle water vapor through the oil.

Make sure the pump is on the correct side of the machine. If it happens to get installed on the drain side the pump could ingest liquid water after the defrost cycle.

Check that there is no liquid water in the vacuum chamber during the cycle. This can boil off and the refrigeration will not keep up. If too much water vapor is created all at once, excess water vapor may be sent through the pump.

Make sure that the chamber and tray rack are cold if you are skipping the freeze cycle. Otherwise there may be some melting going on that can cause liquid water in the chamber.

Keep loads to about 8 pounds of food for a medium freeze dryer or about 16 pounds for a large freeze dryer when wet food is being dried. Larger quantities of wet food could cause excess water vapor and therefore excess water in the oil.

## 12.8 Excessive Noise

Noise is to be expected during operation. About 60 dB (about the same as a clothes dryer) is typical. If the unit is excessively loud, check that there are no loose parts inside the machine. Check that the evaporator fan blades are in good condition.

# 13 Return Policy

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## Money Back Guarantee

Customers may cancel their orders, prior to shipment, for a refund less a 3% fee to cover the credit card charges incurred by Blue Alpine.

Once the freeze dryer(s) ships, if it is within 30 days of ship date, customers may return their freeze dryers for a refund less shipping costs and less a restocking fee of 15%.

# 14 Warranty Information

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## 14.1 One-Year Warranty

**Full One-Year Warranty only includes the U.S. continental 48 states**

**Warranty Period:** For one year from original ship date.

**Included: Brushless vacuum pump**

**Blue Alpine will be responsible for:** Repair or, at our option, replace any part of this freeze dryer and/or vacuum pump which proves to be defective in workmanship or material.

**Consumer will be responsible for:** Costs of service calls. Consumer may also be responsible for replacement parts caused by consumer misuse and neglect of product. See Normal Responsibilities of the Consumer below.

## 14.2 Limited 3-year warranty

**Warranty Period:** For the second and third year from the original ship date.

**Blue Alpine will be responsible for:** Repair or, at our option, replace any part of the sealed refrigeration system (compressor, condenser, evaporator, tubing) which fails because of defective workmanship or material.

**Consumer will be responsible for:** Diagnostic charges for determining defects, and any costs for transportation and delivery of the appliance required because of service.

### Limited Warranty (Alaska, Hawaii, Canada and Puerto Rico)

All provisions of this limited warranty are the same as listed above except that service will be provided by the customer or a qualified local service provider that is approved by Blue Alpine. The consumer will be responsible for the cost of transportation of the product to the repair shop or the travel cost of the technician to the consumer's location. In the event a consumer is required to ship the product directly to Blue Alpine for repair, the consumer is eligible for a shipping credit in an amount determined by Blue Alpine at the time of shipping.

### Normal Responsibilities of the Consumer:

This warranty applies only to freeze dryers used in clean environments and when operated in accordance with Blue Alpine instructions. The consumer is responsible for the following items:

1. Proper use of the appliance in accordance with the instructions provided with the product.
2. Proper installation in accordance with the instructions provided with the appliance and in accordance with all local electrical codes.
3. Proper connection to a grounded power supply of sufficient voltage, replacement of blown fuses, repair of loose connections or defects in house wiring.
4. The appliance must be operated in a clean open area that has plenty of airflow and is not above 90°F (32°C) or below 35°F (2°C).
5. Damages to the appliance during or after installation. Do not lift the unit by holding onto the door.
6. Properly maintaining and operating the freeze dryer and vacuum pump.
7. Ensuring freeze-dried food, or other freeze-dried material, are completely dry prior to packaging.
8. Ensuring proper, durable containers are used. Containers, once sealed, must not allow water or air to penetrate them.
9. Ensuring sufficient/proper, fresh oxygen absorbers are included in the sealed container with the freeze dried material. They must not have expired or been exposed to the air prematurely.

*Blue Alpine accepts no responsibility for the quality of freeze-dried food or freeze-dried materials; nor does it accept responsibility for the packaging of the food or other freeze-dried material.*

### Exclusions:

1. Any modifications or add-on after-market accessories will void the warranty in its entirety.

2. Consequential or incidental damages such as, but not limited to, property damage and incidental expenses resulting from any breach of this written or any implied warranty.
3. Service calls which do not involve malfunction or defects in workmanship or material.
4. Damages caused by services performed by persons other than authorized by Blue Alpine.
5. Parts other than Blue Alpine repair parts or parts obtained from suppliers other than Blue Alpine personnel.
6. External causes such as abuse, misuse, inadequate power supply, or acts of God.
7. Products with original serial numbers that have been removed or altered and cannot be readily determined.
8. Using an extension cord instead of direct line connection to available power supply.
9. Claims for personal injuries, incidental or consequential damages, or economic loss (profit or revenue), however caused.
10. If you are not the original owner of the freeze dryer, the warranty no longer applies.

**Service:**

Since it is the responsibility of the consumer to establish the warranty period by verifying the original purchase date, keep your delivery slip or purchase receipt or some other appropriate payment record. This written warranty gives you specific legal rights. You may have other rights that vary from state to state. Service under this warranty must be obtained by contacting Blue Alpine directly:

## 15 Legal Disclosures

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Blue Alpine offers substantial support for our freeze dryers. Customers can contact our dedicated customer service team for assistance with maintenance, repairs, and technical inquiries for the service period of up to 8 years from the date of purchase. Even after the end-of-life period, Blue Alpine remains committed to providing general support and assistance to our customers. If you have any questions or require further information, please don't hesitate to contact our customer service team.

Blue Alpine does not assume responsibility for any damaged food or financial losses using our freeze dryers. Blue Alpine will provide maintenance and repair parts covered by the warranty during the warranty period.

## 16 Disposal

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If you wish to discard this product, please contact your local authorities for the correct method of disposal and for proper treatment, recovery and recycling. It is important to comply with local regulations and guidelines for the proper handling and disposal of your freeze dryer.

Here are some local authorities and resources you can contact for guidance on disposal:

**Municipal or City Government Offices:** Contact your local municipal or city government offices, particularly departments responsible for waste management, environmental protection, or sanitation. They can provide information on local regulations regarding electronic waste disposal and may offer guidance on disposal options or designated drop-off locations.

**Waste Management Authorities:** In many areas, there are specific waste management authorities or agencies tasked with overseeing waste disposal and recycling programs. These authorities can provide guidance on proper disposal methods for electronic equipment and may offer services for electronic waste collection or recycling.

**Environmental Protection Agencies:** State or regional environmental protection agencies often provide resources and information on electronic waste disposal and recycling initiatives. They may have guidelines or programs in place to promote responsible disposal practices and prevent environmental harm.

**Recycling Centers or Facilities:** Contact local recycling centers or facilities that accept electronic waste for recycling. They can provide information on accepted items, drop-off locations, and procedures for recycling electronic equipment such as freeze dryers.

**Online Resources:** Websites or online databases maintained by government agencies or environmental organizations may provide information on electronic waste disposal options and resources available in your area. These resources can help you locate designated drop-off locations, recycling events, or collection programs for electronic equipment.

# 17 Customer Support

If you have any questions or concerns about your product, please contact us.

**Email:** [contact@bluealpinefreezedryers.com](mailto:contact@bluealpinefreezedryers.com)

**Phone:** 208-607-1722

**Address:** 80 East Industrial Park Rd Saint Anthony, ID, 83445

## Support Hours

Mon-Fri, 8:30am-5:00pm MST

\*Please have your order invoice and order ID ready before contacting Customer Support.

## Other Information

Warnings are added throughout the owners manual for your safety and convenience. Reference these warnings when setting up and operating your freeze dryer.



### WARNING

- Incorrect operation could result in bodily injury or death.



### CAUTION

- Incorrect operation could result in bodily injury or equipment damage or failure.



### NOTICE

- Helpful suggestions and information to operate the machine most efficiently.