

HARVEST SAVER MANUAL

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Dehydrator
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SET-UP:

- Ensure that the dryer is in a level position for operation. The life span of the fan/blower assembly will be reduced significantly should the dryer be operated in a non-level position for a long period of time.

VENTING:

- Venting the machine outside (similar to a clothes drier) may not be necessary if the dryer is in a very large room with high ceilings. Important: Make sure the dryer is a minimum of 12" inches away from any wall in order to not restrict the exhaust.

Options for venting:

- Install the 'manual exhaust damper' in the 6" inch round exhaust hole on the rear of the dryer. Important: Make sure the exhaust valve in the damper is locked in the 'open' position so the exhaust is never restricted. The end of the exhaust damper marked 'HS' fits into the exhaust hole on the dryer.
- Use 6" inch round single wall galvanized vent piping to vent exhaust away from the dryer. Important: The exhaust pipe should NOT have low spots for water to condensate and collect.
- Vent straight out a wall similar to a clothes drier with standard outside wall exhaust cover.
- Vent up or over to open window to exhaust.
- Vent over to and under running exhaust hood installed in kitchen area for venting, normally found over the grill or cooking area.
- Vent straight up vertically through the ceiling and out through the roof. Install a roof cap to prevent rain from entering exhaust system. Important: Do not overly restrict the exhaust with the roof cap. The vertical run can NOT be more than twenty feet in length without upsizing to an 8" inch pipe with a 1/8 to 1/4 hp exhaust fan mounted on the exhaust end of the piping.

Ganging multiple dryers:

- A maximum of three dryers can be 'ganged' or connected together for the purpose of exhausting air.
- Should you 'gang' three dryers together you must ALWAYS upsize the pipe to 8" – 10" inches and then direct the larger pipe out of the

building. Important: 'Ganging' more than three dryers together will negatively affect the performance of the dryers on the end of the 'ganged' exhaust line.

FRESH AIR SUPPLY:

- In smaller closed rooms/areas you should always provide a supply of fresh air into the room where the dryer is located/operated. Otherwise, the dryer will quickly be starved of air supply as the air is quickly pulled from the room, through the dryer and out the exhaust. Opening a window slightly or a door should be sufficient enough to allow fresh air into the room and into the dryer. Without doing this it may retard the drying/dwell time for the product being dried.

Should you have issues regarding exhaust or supply air other than those stated above please call 1-800-369-4283 Ext 202 for more help.

BASIC OPERATIONS:

- UDC2500 Honeywell Controller – Access the five separate settings or readings on the controller by pressing the 'LOWER DISPLAY' button until you reach the desired setting or readout.
- Select the fan speed to dry at. It is suggested that you ALWAYS use fan speed #4, (high) when drying products unless the product is being blown off the tray. This will be addressed later in the section titled 'TIPS for dehydrating efficiently'.
- With the door closed, turn on the dryer using the on/off switch located on the front center of the control panel.
- The five settings/readouts are as follows:

SET POINT: This is the first display you will see as the dryer is powered up. The display will read 'SP' with a number to the right. This number is the temperature you wish to dry at. Change this temperature by touching the 'arrow up' or 'arrow down' button until the desired temperature set-point is reached. The number above this is the actual temperature within the drying cavity of the dehydrator.

OT: This 'OT' represents the amount of electricity being used by the heater to heat the drying cavity. When the dryer is first started this number will be at 100.0, meaning it is using 100% of the required to raise the temperature in the dryer to the set-point. Once the set-point is reached this figure will drop as much less electricity is required to simply keep the heater at the desired temperature.

2N: True Relative Humidity within the dryer is displayed to the right of the display '2N'. The humidity held inside the dryer is governed by the position of the 'air intake grille' on the lower front of the dryer below the door. We will discuss this at length in the upcoming section titled

'air intake operation'. The humidity will always raise rapidly within the dryer at the start of a load and drop during the process until there is very little humidity available in the dryer as the water at this stage has already been removed from the dryer by means of the exhaust.

'DE': This represents the deviation/difference between what the temperature is in the drying cavity and the set-point temperature, i.e. the set-point is 120 degrees and the actual temperature is 110 degrees. The 'DE' (deviation) will be 10, or ten degrees away from the set-point desired. Once the set-point temperature is achieved the 'DE' or deviation will be zero. This is simply a display showing how far away from the desired 'SP' temperature that the actual temperature is within the drying cavity.

'OT': 99 Hour Timer Function. This 'OT' differs from the previous 'OT' setting by having a small 'tick' at the top center of the 'O'. The numbers to the right represent the hours and minutes of the timer. You should see 'OT' with 0.00 to the right. To set the desired time touch the arrow up button until the desired time is reached. With the door closed and the dryer running in the 'on' position press the 'run/hold/' button on the lower right corner of the controller to start the timer. You should see the small 'tick' in the 'O' start moving counter-clockwise indicating that the timer is now counting backwards down to zero minutes in which the dryer will shut off automatically. The timer will continue to count down even if the door is open to the drying cavity. Once a load has finished, has been removed and anew load placed in the dryer, close the door and simply touch the 'run/hold' button again and the dryer will start. If the timer has been started and you wish to reset the timer, you must turn the power off at the panel or unplug the dryer briefly, plug the dryer back in and now you can reset the timer to the desired time. Otherwise, the timer will have to time all the way out to zero minutes. Note: Should you learn that the dwell time of your product is six hours, set the timer for five hours and thirty minutes as the product will continue to dry/dehydrate as the hot dryer slowly cools down. This will prevent over-drying your product by being in the hot dryer too long.

AIR INTAKE OPERATION:

- The air is drawn into the dryer on the front of the unit through the 'air intake grille' located below the door. The air then recirculates within the drying cavity based on the position of the intake grille. If the grille is closed the air is trapped within the drying cavity with little to no exhaust exiting the dryer. Typically the intake should be in the fully 'closed' position for the first 20-30 minutes in order to trap the humidity within the cavity in order to quickly raise the core temperature of the product, thus 'jump-starting' the dehydration phase. Without this procedure it takes considerably longer for the core temperature of the product to raise and begin 'off-gasing', or

dehydrating. It is not recommended to ever open the intake grille completely unless you are at the very end of the drying cycle. Too much air too soon can cause the product to dehydrate too quickly and white spots may develop on the outside of the finished product. This is an indication the air was too dry and the product dehydrated so quickly it brought ingredients that should remain in the product to the surface. It is recommended that the air intake grille never be opened more than half-way for proper dryer operation. Note: ALWAYS leave the exhaust damper open to not restrict the exhaust.

Call the experts at Commercial Dehydrator Systems to discuss your unique products or situation at 1-800-369-4283 Ext 202.

TIPS FOR DEHYDRATING EFFICIENTLY:

- Select the proper tray for the product being dried. Most products will dry most effectively using a perforated tray to allow air to flow to the bottom of a product. For those products that will not work with perforations, i.e. liquids, fruit leathers, seeds and grains, etc. a solid stainless steel tray is an option. For some products a solid Teflon tray liner can be used on the perforated trays in lieu of the less versatile solid trays.
- Most, but not all products will require a tray liner to prevent the product from 'fusing' itself to the hot stainless steel trays while drying. Options can be parchment paper, (rarely used) small or large mesh food-grade plastic liners, small mesh Teflon-coated liners, and solid Teflon tray liners.
- If product is blowing off the tray, a suggested option is to place an appropriate tray liner on top of the product so that the fan speed can remain on high speed, #4. This is very important as turning the fan speed down will always result in longer dwell times.
- Spray-on or wipe-on releasing agents can be used in lieu of tray liners. Note: Product laying directly on the perforated steel trays may result in the pattern of the perforations to be transferred to the side of the product that was making contact with the tray.
- Fan speed – Always leave the fan speed on 'high', #4 as the temperature inside the drying cavity is distributed far more evenly throughout the drying cavity if the fan operates at its maximum speed.
- Select proper temperature. Raw foods are typically dried at 118 degrees or below. Seeds and grains, herbs and spices are typically dried at 110 to 130 degrees. Meats/jerkies/pet treats are typically dried at 155 to 180 degrees maximum. Most products respond very well at 165 degrees. At 185 degrees or above you are blurring the line between dehydrating and cooking, which changes everything.
- Humidity can be your enemy or your friend, depending on how and when you use it. At the start we use humidity to 'condition' your product similar to lotion on your skin in the desert. It prevents the outer skin of the product from drying out and cracking too quickly

which also brings ingredients to the surface that should remain inside. Close the 'air intake grille' at the start for about 20-30 minutes and then open the 'air intake grille' approximately one quarter to halfway and flush out the bulk of the humidity while a small portion remains to again 'condition' the product while drying. The available water in the form of humidity will be less and less as the product eventually dries.

TESTING THE PRODUCT:

- **Moisture Content:** The 'incoming moisture content' (IMC) is the weight of the water, by percentage, in the fresh product. The remainder of the weight of the product is the solids that make up the product. The 'target moisture content' (TMC) is the amount of water to remain in the product post-dehydration. The amount of water taken out or remaining in the finished product relates directly to the shelf-life of the product. Note: To determine the actual shelf-life of a finished product it is recommended that an accredited laboratory perform the required tests. The more water removed from a product the longer the shelf-life.
- **Water Activity Testing:** Water Activity Testing should be performed to determine the 'safety' of the finished product. If enough water is removed from a product bacteria simply cannot live. If not enough water is removed bacteria can live through the drying process and illness can occur. If the air within the dryer is too hot with little or no humidity the bacteria can encapsulate themselves and live through the drying process. Managing the 'air intake grille' as described in the previous section titled 'AIR INTAKE OPERATION' should ensure that enough humidity is maintained through the drying cycle to effectively kill the bacteria. Note: A printed copy of the safe levels for 'water activity' is available upon request.

PACKAGING THE FINISHED, DRIED PRODUCT:

- Selecting the proper packaging along with desiccant packs for certain products add to and help maintain the shelf-life of the finished, dried product. Sealed bags, resealable bags or vacuum sealed bags/packs are a few of the options available.

PRODUCT UNIFORMITY:

- It's all about the air, how much is used and how it's directed. The key to even and consistent dehydrating is to keep the air speed and temperature at their highest without detrimental effect to the finished product. But, most importantly is the uniform size of the product being dried. Ensure if at all possible that the pieces are cut the same thickness, that the berries are the sized by small/medium/large. This gives the product a chance to dry evenly. Layering some products too

deep prevents the product on the bottom from getting air flow to it and drying properly. Do not overload the trays and block the air flow. Choose the proper tray liner if one is required. Follow the instructions on how to properly operate the 'air intake grille'.

DRIP PAN:

- The lowest solid tray in the dryer is the 'drip pan' which is intended to prevent anything from reaching the fan/blower assembly and the heater located beneath this pan. The 'drip pan' will contain no more than eight liters of juice/fluids/greases before overflow will occur. Not too many products will release this much liquids or grease, but do keep an eye on this during the initial test drying.

MAINTENANCE:

- Unplug the dryer from the electric source. For older models remove all trays and lower drip pan from the drying cavity. Use warm, soapy water or the cleaner of your choice to thoroughly wipe down as much of the drying cavity as possible. Check behind hinged wall on the left side of the lower compartment for loose debris blown off the trays while drying. Wipe down the blades of the fan/blower assembly should buildup be present. Clean lower cavity of all loose debris if present. Replace lower drip pan, replace all trays, close the door and turn the dryer on at its maximum speed and temperature of 200 degrees for a minimum of 15-20 minutes to complete the sterilization process. Thoroughly wipe down exterior using warm soapy water and/or stainless steel cleaner. Note: Harvest Savers from 2014 and forward have removable side tray racks (racks that hold the trays in place) for easier, more thorough cleaning of the drying cavity.
- Open dryer door and periodically inspect the door switch mounted on the lower ledge when the door is open (similar to a refrigerator door switch). Clean and inspect as necessary to prevent gumming and sticking. Normally the dryer will shut off automatically when the dryer door is in the 'open' position. If the dryer continues to run once the door is opened, maintenance on the door switch may be required to free the gummed-up door switch. A lite food-grade lubricant spray s

SPARE PARTS KIT:

- A box of spare parts is included with the purchase of each 'Harvest Saver' tray dryer. A female 220 volt receptacle will be found here to prevent having to purchase the same to fit the 'Harvest Saver'. Other spare parts will be found in the

spare parts kit, i.e. fuses, switches, solid state relay, contactor, capacitor, heating element and more including a small multimeter. The Operators Manual in CD form will also be found in the spare parts kit. Please locate the CD and place in a safe location for future use and reference.