Reverse Osmosis

#100STDRO

- Removes 25% of the water per pass @ 200 GPH
  (@ 45 degree sap temp.)
  - RO to 8 Brix max
  - 5 Micron pre-filter
  - High Pressure Bypass
  - High pressure gauge
  - One valve operation
- Pneumatic tires for easy mobility
- Only 24" wide making it easy to fit through most doors
  - 110 volts / 10 amps

Retail: $1975.00
Owner's Manual & Safety Instructions

**Save this manual** Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance, and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram. Keep this manual and the receipt in a safe and dry place for future reference.

Visit our website at: http://www.nextgenmaple.com
Email our technical support at: Steve@nextgenmaple.com

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-315-432-1326 as soon as possible.

**WARNING**
Read this material before using this product. Failure to do so can result in serious injury. **SAVE THIS MANUAL.**
Congratulations and thank you for the purchase of your new Next Gen Hobby Reverse Osmosis unit. These units have been designed with the hobbyist and small producers in mind. They are easy to operate and maintain with a little understanding of how the unit works. Please read and understand the entire manual.

Reverse osmosis works like a filter. With the sap under pressure against the membrane, it lets the smaller water molecule pass through to the center tube and out of the top center fitting (Blue Hose) as clean water known as Permeate while the larger sugar molecule, too large to pass through the small holes get flushed passed with the remaining water and exits the top of the housing through the outer fitting known as Concentrate (Red Hose). The level of sap pressure that is put on the membrane will determine the level of concentration. Concentrating at to high of a level could plug the membrane causing irreversible damage. We recommend going no higher than twice the incoming brix level. Meaning if your raw sap from the tree is at 2% brix, only concentrate to 4% on the first pass. The second pass will bring the concentrate to 8% brix.

**DO NOT CONCENTRATE HIGHER THAN 8% BRIX.**

Following a few simple guidelines will keep your RO in to working condition for years to come. Further set-up, operation, cleaning, and storage information can be found in the pages ahead.

<table>
<thead>
<tr>
<th>Model</th>
<th>45STDRO</th>
<th>100STDRO</th>
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</thead>
<tbody>
<tr>
<td>Electrical Rating</td>
<td>120V - 60 Hz 10.5 Amps</td>
<td>120V - 60 Hz 10.5 Amps</td>
</tr>
<tr>
<td>Input Diameter</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
<tr>
<td>Concentrate Output Diameter</td>
<td>3/8”</td>
<td>1/2”</td>
</tr>
<tr>
<td>Permeate Output Diameter</td>
<td>3/8”</td>
<td>1/2”</td>
</tr>
<tr>
<td>GPH Capacity</td>
<td>45</td>
<td>100</td>
</tr>
<tr>
<td>Maximum Operating Pressure</td>
<td>190 PSI</td>
<td>190 PSI</td>
</tr>
<tr>
<td>Maximum Concentrate Level</td>
<td>8% Brix</td>
<td>8% Brix</td>
</tr>
<tr>
<td>Membrane Size</td>
<td>2540</td>
<td>4040</td>
</tr>
</tbody>
</table>
Component Break Down

- Membrane
- Stainless Steel Clamp
- Top Cap Assembly
- Hoses & Clamps
- Pre-Filter Wrench
- Pre-Filter
- High Pressure Guage
- Concentration Valve
- Power Switch
- Membrane Housing
- Pre-Filter Housing
- High Pressure Pump
1) Remove plastic bag from top of the stainless steel membrane housing and discard.

2) Remove membrane from box and plastic bag. (Handle with care.)

3) Insert membrane(o-ring end first) into the stainless steel housing. Be sure that the o-ring is in the correct orientation (see picture). The membrane should be seated firmly into the bottom end cap.

4) Place the top plastic end cap assembly onto the membrane and housing. The end cap should seat flush with the flange and the pressure gauge should be facing the front of the unit.

5) Place the two piece stainless steel clamp around the housing flange and the end cap. Tighten each side a little at a time until the clamps touch each other (see picture)or torque to 145 inch pounds.

6) Remove the 5 micron pre-filter cartridge from the wrapper and place inside the blue filter housing making sure that the cartridge slips down over the stand-pipe at the bottom. Screw the filter housing into the top portion of the mounted filter cap, making sure that the cartridge aligns with the upper stand-pipe. Hand tighten only.

   **DO NOT OVER-TIGHTEN.**
   The provided wrench is for loosening the filter housing only.

7) Install the braided hose onto the barbed fitting of the pre-filter housing and secure with the provided hose clamp.

8) Install the two color coded hoses onto the color coded barbed fittings and secure with the provided hose clamps. Note: the red hose is for the concentrate and the blue hose is for the permeate.

Your new RO is now ready for operation.
Important! For your own safety -

before starting to run the RO, please understand the following information:

1. Risk of electrical shock - This unit is supplied with a grounded plug. To reduce the risk of electric shock, connect only to a properly grounded GFI receptacle.

2. The electrical connections must be protected from moisture.

3. The electric motor must be kept dry.

4. Do not operate without a pre-filter cartridge in place.

5. THE RO MUST BE PROTECTED FROM FREEZING.

6. Never start the RO with the concentration valve closed. The valve should be completely open when starting the pump.

7. The pump must be protected from running dry for more than two minutes.

8. The operating pressure should never exceed 190 PSI.

9. Do not concentrate to more than double the incoming brix. (e.g. Raw sap in @ 2% / concentrated sap out @ 4%)

10. Do not concentrate above 8% brix.

11. The warnings, precautions, and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.
**Power Supply:**
1. The RO is equipped with a shock-proof plug according to regulations. The unit is design to be connected to a 120V - 60 Hz GFI 15 amp receptacle.
2. Make sure the receptacle is sufficiently secured and in good working condition.
3. The use of an extension cord is not recommended. If an extension cord has to be used, be sure that it is the proper gauge wire.

**Installation Considerations:**
1. This unit should be located on a flat level surface, protected from the elements.
2. Choose a location that is easily accessible as you will need to monitor the unit frequently.
3. This unit cannot freeze. If freezing occurs it can cause irreversible damage and void the warranty.

There are two main methods of concentrating sap. The first method is the Multiple Pass Method and the second is the Recirculation Method. It will be up to the user to decide which method will work best for your operation. These methods will be discussed in the operation portion of the manual. (See next pages)

The Recirculation Method consists of a raw sap tank and a permeate tank. (See diagram below)
The Multiple Pass Method consists of a raw sap tank, concentrate tank, and permeate tank. (See diagram below)
Concentrating Methods

**Multiple Pass Method:** This method allows you to do a single pass and send the sap directly to the evaporator or do multiple passes to achieve the desired brix level. The raw sap travels from the sap tank (via the braided suction hose) to the RO where it is split and is sent to the concentrate tank (via the red hose) and permeate tank (via the blue hose). (Note: The permeate should be kept for cleaning of the RO at the end of the day. 50 to 100 gals will be needed.) At the end of the first pass you will have concentrate and permeate. Your sap tank should be empty. This give you the option to start boiling right away or do a second pass. If a second pass is desired, remove the red line from the concentrate tank and insert it into the raw sap tank. Put the braided suction line into the concentrate tank and continue the RO process. This may be done multiple times to get to the desired brix level.

**Recirculation Method:** This method allows the gradual increase in sugar concentration over a period of time utilizing two tanks. The raw sap travels from the sap tank (via the braided suction hose) to the RO where it is split and sent to the permeate tank (via the blue hose). The concentrate is sent back to the raw sap tank (via the red hose) where it will gradually increase in sugar concentration and reduce in volume. (Note: The permeate should be kept for cleaning of the RO at the end of the day. 50 to 100 gals will be needed.) This process should continue until the desired brix level is achieved at the output of the concentrate hose (red). At that point the concentrate line (red hose) should be transferred to a final concentrate tank or sent to the evaporator. The process will continue until the sap tank is empty.

**Warning:** Do Not Concentrate above 8%
Initial Start-Up Instructions

The RO membrane is shipped dry so the initial start-up only needs to be performed one time. Once the membrane is wet, it must remain wet at all times. The proper start-up is essential to prepare the membrane for operating service. This procedure can be done with clean permeate water or distilled water instead of sap. (Note: Do not use water that is chlorinated.)

Step 1. Make sure you have a clean pre-filter cartridge in the filter housing. It is recommended to use a new filter cartridge every day.

Step 2. Connect the braided suction line to your elevated sap feed tank.

Step 3. Direct the permeate and concentrate hose to the ground or drain.

Step 4. Fill your sap feed tank with water or sap. (You will need about 50 gallons)

Step 5. Make sure the on/off switch is in the off position.

Step 6. Plug unit into the proper receptacle.

Step 7. Make sure the Concentration Valve is fully open. This can be achieved by turning the knob counterclockwise until it stops.

Step 8. Turn the switch on. Pay special attention to the braided suction hose. You should see the hose fill with sap. It will take about 60 seconds to fill the membrane housing. At that point you should see sap/water coming from the permeate and concentrate hoses.

Step 9. Start closing the Concentration Valve slowly (turn clockwise) until the pressure gauge reaches 30 to 50 PSI.

Step 10. Flush the system for 10 minutes, discarding both of the concentrate and permeate.

Step 11. After 10 minutes of flushing at 30 to 60 PSI increase the pressure slowly (No more than 10 PSI per second) until the pressure gauge reads 170 PSI. This is called a soft start. Check for any leak. If a leak is found, tighten fittings.

Step 12. Slowly open the concentration valve (Counterclockwise) until completely open. The pressure gauge should read zero. Turn off power switch.

(NOTE: NEVER START THE PUMP WITH THE CONCENTRTE VALVE CLOSED)

Congratulations, the start-up is complete. Your RO is ready for sap concentration.
Concentration Operating Instructions

Step 1. After choosing which concentration method you will be using. Make sure all of the hoses are connected and secured to the appropriate tanks and your sap feed tank is full of sap.
Note: Be sure to secure the suction feed hose so it does not fall out or get stuck to the side or bottom of the tank resulting in loss of sap flow which could damage the high pressure pump.

Step 2. Make sure there is a new pre-filter cartridge in the filter housing. The pre-filter cartridge should be replaced daily or if it starts to get plugged. A plugged pre-filter will restrict flow to the high pressure pump possible causing damage.

Step 3. Turn power switch on. Pay special attention to the braided suction hose. You should see the hose fill with sap and you should also see fluid coming from the concentrate hose.

Step 4. Slowly close the concentration valve at a rate of 10 PSI per second until you reach the desired pressure (Around 175 PSI). At this point the flow rate of the concentrate hose should be about double the flow rate of the permeate hose. You are now concentrating. You should be removing about 25% to 35% of the water. Continue this process until the desired sugar content is reached not going above 8%.

Note: After concentrating 200 to 300 gallons, a quick rise should be preformed to knock off some of the sugar that has accumulated on the membrane. This can be done simple by lowering the pressure to 40 to 50 PSI for five minutes and then resume concentrating at 175 PSI.

Step 5. When the sap feed tank is near empty or you are at the desired sugar content, turn the power switch out. It is important to monitor the unit as it is running. These smaller units do not have automatic shut-off's. You will need to make sure that the high pressure pump does not run dry.
When the flow rate starts to slow, it means that the membrane is starting to plug. It's time to do a rinse cycle. This should be done every 2 to 3 hours of operation, or at the end of each day. Rinsing and washing your membrane is critical in keeping it healthy.

**Rinse Cycle:**
Step 1. Put a new filter cartridge in the pre-filter housing. This filter cartridge can be re-used for each rinse and wash cycle.

Step 2. Connect the suction line to the permeate tank.

Step 3. Place the concentrate hose (red) and the permeate hose (blue) to the ground or drain.

Step 4. Turn the power switch on. (Be sure that the concentration valve is open)

Step 5. Slowly close the concentration valve until 40 to 50 PSI is reached.

Step 6. Run for several minutes or until the concentrate is sugar-free.

Step 7. Turn the power switch off.

Step 8. Fill a clean 5 gallon pail with 30 to 60 degree permeate.

Step 9. Place the braided suction hose, concentrate hose, & permeate hose into the pail.

Step 10. Turn the power switch on and adjust the pressure to 40/50 PSI. Let the RO run for 20 to 30 minutes recalculating the warm water. This will help loosen the embedded sugars.

Step 11. Turn the power switch off.

Step 12. Connect the braided suction hose back to the permeate tank and place the concentrate hose (red) and the permeate hose (blue) on the ground or into a drain.

Step 13. Turn the power switch on and flush the membrane at 40 to 50 PSI with 50 gallons of permeate. Be sure not to run the pump dry.

Your RO is ready to concentrating again.

**Be sure to store in a warm environment. Do not let the RO freeze.**

**Soap Wash Cycle:**
The Wash Cycle is the same as the Rinse Cycle but with the addition of soap. Follow the Rinse Cycle steps 1 thru 7. At step 8, add the soap to the 5 gallon pail of warm permeate (Use the recommended amount of soap that the soap container calls for.) Follow the remaining steps 9 thru 13. Your RO is ready for concentrating. The wash cycle should be preformed after two or three daily run cycles.
After concentrating for the final time, a wash cycle needs to be preformed. After the wash cycle is completed the membrane needs to be flushed and stored with preservative. There are two options available.

**Option One:**
Step 1. Fill a 5 gallon pail with permeate.

Step 2. Add recommended amount of preservative (see package instructions).

Step 3. Please braided suction hose, concentrate hose (red), and permeate hose (blue) into the 5 gallon pail.

Step 4. Turn power switch on.

Step 5. Adjust pressure to 40/50 PSI and let the RO run for 5 minutes.

Step 6. Turn the power switch off.

Step 7. Remove the pre-filter cartridge and discard.

Step 8. Close the concentration valve.

Step 9. Plug all hose ends with a pipe plug or equivalent.

Step 10. Store the unit where it will not freeze.

**Option Two:**
Note: Storage cylinder Needed (sold separately)

Step 1. Remove the top cap from the stainless steel membrane housing.

Step 2. Remove the membrane and place in the storage cylinder.

Step 2. Fill cylinder with preservative, tighten cap and store above 32 degrees Fahrenheit. (Be sure the membrane is completely submerged in solution.)

Step 3. Remove the pre-filter cartridge and discard.

Step 4. Drain all hoses.

Step 5. Use a wet-vac to vacuum out the remaining fluid from the stainless steel housing and pump.

Step 6. Reinstall the top cap.
Next Generation Maple Products makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 1 year from the date of purchase. This warranty does not apply to the following.

- Misuse, or use for anything other than the concentration of sap.
- Improper installation
- Normal wear and tear
- Lack of proper maintenance
- Negligence or accidents, repairs or alterations outside our facilities.
- Freezing of the unit.
- Running the pump dry.
- Running chlorinated water through the membrane.

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