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I. INTRODUCTION

The Mini RO-4 is the smallest concentrator offered by H2O Innovation, it can filter up to 100 gal./hr. Easy to use, the Mini RO-4 is compact and it has low energy consumption. Removes up to 75% water in one pass. Integrated recirculation. Possibility of 2 passes to reach a concentration up to 8°Brix. Do not concentrate above 8°Brix.

II. SPECIFICATIONS
MINI RO 4 FLOW DIAGRAM

Sap inlet

Concentrate outlet 3/4"

Permeate outlet 1/2"
III. MEMBRANE INSTALLATION

Remove the clamps and the black plugs at the end of the membrane vessel. Once the clips are removed, the plugs will come out easily. Insert the membrane in the membrane housing.

Install the U-Cup in the groove at the end of the membrane. The U-Shape of the ring should be facing the outside of the housing. Lubricate the U-Cup and the seal cap with water safe synthetic grease. Then firmly push the membrane into the housing while turning to fit it well.

Reinstall the black plugs and the clamps.
When opening the membrane housing, do not use PVC piping as “handgrips”. Doing so could damage the equipment and create leaks. Remove the lid by pulling on the cap.

It’s important to ensure o-rings are well positioned. To facilitate handling, we highly recommend greasing the o-rings, the permeate outlet and the sap inlet (in the lid). This will allow easier insertion of the lid into the vessel and membrane.
IV. **STARTUP AND INITIAL RINSE**

1. Make sure the pump is not frozen;
2. Install a new 5-micron pre-filter;
3. Open the supply valve from the permeate tank;
4. Close all purge valves and close the concentration control valve;
5. Start the system and hold the switch until you reach over 40 psi. To pressurize, the system must be full of water. You can check the water level while looking at the Ronvik pre-filter, or by opening one of the purge valves.
6. Open gradually the concentration control valve;
7. To properly remove leftover soap or storage solution, run 100 gal. permeate and send to the drain (200 gallons for a organic maple farm);
8. To stop the system, close the supply valve.

NB. The pressure switch is adjusted at 40 psi. When starting the system, open gradually the concentration control valve. The Mini-Ro will run by itself when the pressure reaches 40 psi (you will hear the “click” of the pressure switch). You can release the start switch. Do not allow the pressure to drop below 25-30 psi as the system will shut down itself.

V. **CONCENTRATION**

- Open the supply valve from the sap tank;
- Put the permeate pipe in the permeate tank;
- Put the concentrate pipe in the concentrate tank or in the evaporator to boil directly;
- Completely close the concentration control valve*;
- Start osmosis with the selector, hold the unit until you reach 40 psi and hear the “click” of the pressure switch.

*The ball inside the concentration control valve is pierced, therefore when the valve is completely closed, water flow is at optimum pressure.

VI. **RINSEING (AFTER 4 HOURS OF CONTINUOUS OPERATION)**

- Close the maple water supply valve;
- Open the feed valve from the permeate tank;
- Put the permeate pipe (1/2”) in the drain;
- When your concentrate no longer contains sugar (about 2 minutes), put the concentrate pipe (3/4”) in the drain;
- Start the osmosis and gradually open the concentration control valve without going below 25-30 psi;
- Circulate 50 gal. of permeate.
VII. WASHING (END OF EACH DAY)

- Fill the wash tank with 5 gal. of permeate. The tank must be 1 foot higher than the pump;
- Put permeate, concentrate and feeding pipes in the washing tank;
- Start the osmosis and open gradually the concentration control valve without going under 25-30 psi;
- Add 2 oz. Of Bio-Membrane in the washing tank;
- Let it run 25 minutes or until the temperature reaches 40°C (104°F);
- Stop the unit once it reached 40°C (104°F). The system does not shut down automatically, you must stop it manually or you will damage the system;
- Do a permeate rinse (100 gal.);
- When shutting down the system, be sure to drain it properly using the drain valves. If the system freezes while it is full, you risk damaging it.

VIII. 5 MICRON FILTER MAINTENANCE

Filter frequency of changes

- After washing, if the pressure differential between the inlet and outlet pressure gauge is 30-40 psi, it’s time to change your filter.

Replacement procedure

- Shut down the system and close the feed valve;
- Open the drain valves to bring back the system to atmospheric pressure;
- Unscrew the 5 microns housing (it should be unscrewed by hand);
- Remove the cartridge and replace with a new one;
- Retighten the filter housing by hand, ensure the O-Ring is well positioned.
IX. PRE-FILTER MAINTENANCE

Cleaning procedure, if needed, when you see dirt or when the mesh filter housing becomes opaque.

- Shut down the system and close the supply valve;
- Open the drain valves to bring back the system to atmospheric pressure;
- Unscrew the clear filter housing (it should be unscrewed by hand);
- Remove the filter, sediments and clean the filter housing;
- Retighten the clear filter housing by hand, ensure the O-Ring is well positioned.
X. END-SEASON STORAGE

For the end-season storage, it’s important to take the time to thoroughly wash your system. Do a first rinse, then wash the membrane and redo a permeate rinse. It is highly recommended to wash the membrane a second time and redo a permeate rinse before storing the system. Drain the system well.

Discard the 5 microns filter.

The storage of your membrane is the most delicate part while storing your MINI RO 4. Four recommendations are to be follow according to membrane manufacturers:

- The membrane should never be exposed to freezing. The warranty does not cover a membrane that has been exposed to freezing;
- The membrane must be stored in a storage solution, in a cool place above the freezing point (about 7°C);
- The membrane should always remain moist. The manufacturer recommends full immersion in a basin or box;
- The membrane must be immersed in a solution that will prevent the growth of bacteria (use ½ gallon of storage solution in a sealed storage canister without water).
## XI. SPARE PARTS LIST

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAS3A02B-02</td>
<td>Thermometer 3’’ OD x 2 ½ tige ½ NPT, 25-125F</td>
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<tr>
<td>BVPVC40010FSH</td>
<td>Ball valve SH 1’’ FPT PVC840 White threaded</td>
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<tr>
<td>BVSS316005C</td>
<td>Ball valve SS316 ½’’ FNPT 1000WOG, 2PC</td>
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<td>ERA40711SS</td>
<td>Mini sample valve SS304 F X M ¼</td>
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<td>ERARONPREF</td>
<td>Ronvik complete pre-filter</td>
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<tr>
<td>SCH9013FRG2J35</td>
<td>Pressure switch 30-50psi square D</td>
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<td>G21016T7C00</td>
<td>Potassium permanganate tank</td>
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<tr>
<td>HOSCHA3/4X18</td>
<td>Water heater hose ¾’’ x 18’’</td>
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<tr>
<td>SHERH5808-A-B</td>
<td>Complete stainless filter 20’, ¾’’ inlet and outlet</td>
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<tr>
<td>FLOY63BL300</td>
<td>Pressure gauge 300 PSI 2.5&quot; DIAL 1/4&quot; NPT SS back mount</td>
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<tr>
<td>POM560-5080</td>
<td>Booster pump 8 gpm pompco 1-1/2 hp 4&quot; 115/230V, 1HP</td>
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<tr>
<td>PURSSMH-4040-1234</td>
<td>STAINLESS STEEL PRESSURE VESSELS # 4040 300psi</td>
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<td>SPH-MINI-CONCENTRATOR-D01</td>
<td>Mini-RO-4/8 frame</td>
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<tr>
<td>H2O-704040</td>
<td>H2O membrane H2O 4”</td>
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<tr>
<td>MCM298K22</td>
<td>Water safe synthetic grease</td>
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