OPERATING PRINCIPLE

A filter press serves to remove suspended solids and sugar sand from the syrup after it comes off the evaporator. The syrup filter press works hot, at an approximative temperature of 180°F. Before consumption, to improve maple syrup taste, it is essential to filter the syrup to remove impurities.

Paper filters must be used with filter aid (diatomite) to filter the syrup. A food grade product, diatomaceous earth consists of perforated and striated micro-shell fossils, having a considerable filtering power.

Filtration capacity will vary during the season, but also with the fouling level (filter aid and sugar sand). The press and its filters must be cleaned frequently.
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**DESCRIPTION**

10” filter press of H2O Innovation are composed of light weight plates made of aluminum (3 or 6 set of plates). Syrup inlet and outlet are located on the rear plate which is fixed to the frame of the filter press. When assembling the press, alternate hollow and waffle plates. Hollow plates allow the syrup to enter the press and they hold the filter aid and residue. Waffle plates provide backing for the filter papers and allow filtered syrup to exit the press. On waffle plates, on one of the lower corners, there are some small holes allowing syrup to exit after being filtered. These holes should not be obstructed. The front plate must be installed after an empty frame. The press must be tightened with the two wing nuts located in the front of the press.
**Pneumatic or electric diaphragm feed pump:**
The pump is operated using an on/off switch. The operating pressure will be between 5 and 10 psi when the press is clean. Depending on the filters fouling level, the pressure will increase. If the pressure gauge indicates 40psi and the control valve is closed, the filters are filled with impurities and must be changed. The higher the pressure, the more likely it is that a filter will tear.
PREPARING THE PRESS

IMPORTANT: Before the first use, wash all the filter press plates with soap and rinse thoroughly with warm water.

Installing filters on the press. Align holes on filters with holes on press. A filter needs to be placed between every hollow and waffle plate. 6 Filters for a 3-plate press, 12 for a 6-plate press. Each filter must be wet before use. Only wash filters with lukewarm water.

The press works in parallel, so if a paper is missing the press will not filter.

Note that you can use 2 filters instead of one especially if they tear frequently.
ASSEMBLING THE PLATES

Make the assembly as shown on the picture below. Using the 2 wing nuts, tighten the assembly as much as possible. Metal will expand when the press is hot, retighten the nuts.

It is important that all the mould lines on the top align, if not the press will not work properly. You are now ready for press conditioning.
FILTER AID

Diatomite

The filters need to be conditioned with diatomite to prepare it for operation. To condition the filters, mix diatomite (aid filter) with unfiltered syrup, about 1/3 cup of powder per gallon of unfiltered syrup. Recirculate the unfiltered syrup mixed with diatomite through the filter press. Recirculate for a minute or so. The idea is to catch all the diatomite on the pads to prepare them for filtering. Once all the syrup runs clear and there is no diatomite “sludge” left in your charging pan, you are done conditioning. After 2 minutes of recirculation the syrup should clear up.

If the syrup does not start to run clear within the first 2 minutes of operation, refer to the troubleshooting section of this manual.
FILTERING SYRUP

Keep the syrup and the press hot, about 185°F. Pay great attention to the pressure gauge. With new filters the pressure shall be around 5-10 psi.

Monitor pressure gauge throughout operation. As you approach 40 psi, the press will start filtering syrup much more slowly. When you reach 40 psi, it’s recommended that you change your filters. Minor amounts of syrup leaking out between the aluminum plates is normal. These leaks will be recovered in the drip tray.

IMPORTANT: About every 5 minutes, check the syrup outlet of the filter press. A torn paper can spoil a complete batch.

It’s easy to tell the difference between filtered and unfiltered syrup by looking at the syrup coming out of the press outlet. Diatomite in unfiltered syrup is easy to see, it is cloudy in appearance. If not obvious to you from the press outlet, you can put the syrup in a glass and determine clarity easily that way.
CLEANING THE PRESS

A dirty filter press has lots of syrup left in it. Do not leave syrup in your pump and press to cool overnight.

Start to recirculate hot water/sap/boiling sap through the press to push out the syrup.

The syrup comes out quickly, but filter aid can be rinsed for a long time. It is up to you on how much extra work you are willing to put in for some small amounts of sugar. Typically, 2 or 3 gallons of water/sap per plate will clean out most of the sugar caught in the filter aid.

Your filter press is ready to take apart and clean. If the hollow plates are completely chalk full, the amount of diatomite added is appropriate (you also could have used too much but it is not an issue).

If you have used too little filter aid, the chambers won’t be full by the time the press stops filtering. Use more diatomite next time.

At the end of the day (everyone’s syrup filters differently) it will be a process of trial and error to learn how much diatomite works best for your syrup. The values in this manual provide a good benchmark but do not hesitate to add more or less powder if you find you need to.

When the amount of diatomite is optimal, when you are done filtering, there will be just a tiny bit of space left in the hollow plates.
**CHANGING FILTERS**

1. Close the draw-off syrup tank valve. Wait a bit and unplug the hose from the draw-off syrup tank (ideally a quick connect plug). Raise the hose above the pump to allow syrup entering the press. Let it run about 30 seconds so that most of the syrup remaining in the plates will flow into the barrel.
2. Typically, 2 or 3 gallons of water/sap per plate will clean out most of the sugar caught in the filter aid.
3. Disassemble the filter press by slowly unscrewing the 2 wing nuts. Remove the plates and wash in hot water.
4. Syrup that is still in the press will be drained into the drip tray, put it in the syrup filter tank in order for it to be filtered with your next batch.
5. As you assemble, alternate between waffle and hollow plates. All the mould lines on the top must align. Install new filter papers between every aluminum waffle and hollow plates. Align holes on filter papers with holes on press. Tighten the wing nuts.

**NOTE:**
Fully open the regulating valve at the beginning of filtration; then close gradually to obtain the required pressure.

It is best to clean and leave the press ready for use at the end of every day. It is best to use new filter papers at beginning of every day. Lightly used filter papers will work the next morning but will take some time to get going and heat up.

For best performance, and to avoid sugar sand formation, wash the filter press and its lines once a day with hot water. Circulate about 10-15 gallons of water in your system.

Ensure you are using the right amount of filter aid. The average amount of filter aid to be used is about 1/3 cup per gallon of syrup. The amount of filter aid to be used will vary depending on the precoat thickness on filter papers. If less than ¼”, use more filter aid; if more than ½”, use less. Diatomite is an economical food-grade product that does not leave an aftertaste in the syrup. Paper filters are disposable, those made of fabrics are washable (no soap, hot water only). Plates are hot water washable.
DIAPHRAGM FEED PUMP: PNEUMATIC OR ELECTRIC

**IMPORTANT:** THOROUGHLY RINSE YOUR PUMP WITH HOT WATER AFTER USE

WARNING: To protect your pump from freezing, always drain it completely before storing.

The air inlet can not be smaller than the inlet valve, otherwise, air pressure could be insufficient. It is recommended to have a filter at the pump air inlet pipe.

INSTALLATION:
Always connect the liquid outlet hose first, then, connect the pump with the air supply. The press is pressurized during operation. Before any maintenance and before opening your press, ensure it is back to atmospheric pressure.
PNEUMATIC DIAPHRAM PUMP

Use food grade oil (ERACANLA). Always ensure that oil level is in the right range. Do not connect pump on an air supply higher than 115 psi, the operating pressure is 100 psi.

Troubleshooting - PNEUMATIC DIAPHRAGM PUMP

Pump runs but has no suction or improper suction.

1. Pipe squashed or leaking before the pump inlet.
2. No filter before the inlet, solids obstructing pipe.
3. Diaphragm rupture.
4. Pipe squashed after pump outlet.
5. Check valve does not work.
6. Too long pipe or too high outlet pipe that exceeds pump pressure.
7. Insufficient air pressure or insufficient air flow causing improper suction.
8. Intermittent liquid output due to diaphragm rupture or valve obstruction.
9. Maple syrup that solidified inside the pump, too long period of inactivity, the pump must be completely drained and clean before storing.
ELECTRIC DIAPHRAGM PUMP

TROUBLESHOOTING – ELECTRIC DIAPHRAGM PUMP

Check for correct voltage (+/- 10%), check electrical connections, wires, fuses or breaker.

PUMP WILL NOT START
1. Fuse or breaker
2. Rectifier or motor for open or grounded circuit
3. Look for locked drive assembly

WILL NOT Prime (No discharge/Motor runs)
1. Strainer for debris, Debris in pump inlet/outlet valves
2. Inlet tubing/plumbing for severe suction leak, Inlet/Outlet tubing severely restricted (kinked)
3. Inspect pump housing for cracks

LEAKS FROM PUMP HEAD OR SWITCH:
1. Look for loose screws at switch or pump head (can cause noises)
2. Switch diaphragm ruptured or pinched
3. Look for punctured diaphragm if fluid is present at bottom drain
### TROUBLESHOOTING:

<table>
<thead>
<tr>
<th>SYMPTÔMES</th>
<th>CAUSES</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorly filtered syrup, foggy</td>
<td>Plates are not well</td>
<td>Align all the mould lines on top</td>
</tr>
<tr>
<td>syrup</td>
<td>assembled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Torn filter</td>
<td>Change all filters</td>
</tr>
<tr>
<td></td>
<td>Lack of aid filter</td>
<td>Add filter aid</td>
</tr>
<tr>
<td>Lack of pressure</td>
<td>Open regulating valve</td>
<td>Gradually close the valve to maintain a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pressure of 20 PSI</td>
</tr>
<tr>
<td>Abnormal noises from the</td>
<td>Clogged aspiration line</td>
<td>Suction line can get stuck to a flat surface</td>
</tr>
<tr>
<td>filter press</td>
<td></td>
<td>and filter press may make strange noise</td>
</tr>
</tbody>
</table>

Note: It is best to clean the press and leave ready for use at the end of every day. Lightly used filter papers will work the next morning but will take some time to get going and heat up.

A half-used set of filter papers in the filter press left over night full of syrup will not work in the morning especially if it is cold. Do not leave syrup in your pump and press to cool overnight.
## SPARE PARTS:

<table>
<thead>
<tr>
<th>Product n°</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPH-PRE1210A</td>
<td>U pipe for filter press</td>
</tr>
<tr>
<td>SPH-156110-B01-01</td>
<td>Filter press frame assembly</td>
</tr>
<tr>
<td>ERABLFIL7</td>
<td>Filtration block 10”, 3 plates</td>
</tr>
<tr>
<td>ERABLFIL10</td>
<td>Filtration block 10”, 6 plates</td>
</tr>
<tr>
<td>PR1512A-1</td>
<td>Frame plate 2 ½” for filter press</td>
</tr>
<tr>
<td>PR1512E-1</td>
<td>Frame plate ¾” for filter press</td>
</tr>
<tr>
<td>PR1512D-1</td>
<td>Front frame plate 2 ½”</td>
</tr>
<tr>
<td>PR1512C-1</td>
<td>Rear frame plate 2 ½”</td>
</tr>
<tr>
<td>ERA170PR10BL</td>
<td>Paper filters – white 10” (400/pkg)</td>
</tr>
<tr>
<td>ERA170POLY10</td>
<td>Polyester filter 10” (18/pkg)</td>
</tr>
<tr>
<td>ERA170POU</td>
<td>Filter aid Celite 545</td>
</tr>
<tr>
<td>ERA170POUHY</td>
<td>Filter aid Celite Hyflo</td>
</tr>
<tr>
<td>DYIDS04SAITSSS02-1/2</td>
<td>Pneumatic diaphragm pump ½”</td>
</tr>
<tr>
<td>DYIDS04SAITSSS01</td>
<td>Pneumatic diaphragm pump 1”</td>
</tr>
<tr>
<td>PRO-04-04</td>
<td>Electric diaphragm pump 3 GPM</td>
</tr>
<tr>
<td>PRO-04-05</td>
<td>Electric diaphragm pump 6 GPM</td>
</tr>
</tbody>
</table>
WARNING

Before first use

To remove any traces of packaging debris, manufacturing debris and residual oils:

IT IS IMPORTANT, when first using the press, to wash all frames, plates, stainless steel pipes, fittings and valves with soapy water and then to rinse abundantly with hot water. You can also add the equivalent of one cup of commercial white vinegar per gallon (4L) of soapy solution.