



D'Vine Intervention

Every Drop Counts

OPERATING MANUAL - SWEETSPOTTER

Background on Invention

The Sweetspotter has been designed for the processing of single barrel lots of wine for the removal of VA and 4EP. The system uses cutting edge technology to generate the necessary pressure required to produce permeate for VA removal without the requirement of a high pressure-pumping device. This means that the wine is not abused in any sort of way and is handled very gently. The overall amp draw is 1 amp per 6 gallons of permeate produced, which equates to an energy input of only 110 watts per hour – approximately the same draw as two light bulbs. The higher the energy requirement, the greater the heat transfer to the wine.

Process flow rates from the Sweetspotter depend a great deal on the wine temperature and turbidity. The cleaner the wine, the longer the system is going to deliver a constant flow rate. Should the wine be dirty, then the system will require more frequent cleaning. If lees are pulled into the system, this may irreversibly foul the membranes requiring complete membrane replacement.

What you need before you start

- A clean, 15-30 gallon container.
- Cold running water (preferably dechlorinated).
- 110 Volt (10-15 amp) power supply nearby.
- A handheld pH meter or accurate lab based pH meter
- Wine to be processed in an accessible location.

WHAT NOT TO USE

Please do not use the following to clean or store your system:

- Hot water
- Any oxidizing agents
- Sulfur solutions other than wine



WHAT CAN THE SWEETSPOTTER DO?

- VA Reduction
- 4EP Reduction
- pH Correction
- Smoke taint reduction
- Alcohol reduction trials (renders the wine non-standard if water add backs are used and should only be used in a laboratory setting)

DANGER!

PLEASE ENSURE YOU AND THOSE OPERATING THE SWEETSPOTTER READ AND UNDERSTAND THE FOLLOWING PRIOR TO USE:

- Always wear necessary eye and breathing protection when dealing with chemicals.
- Make sure that the 3-way valves on the inlet and outlet of the machine are not in the “center” position. If left in this position while the system is placed under pressure, the rotameter can fail under pressure or the filter bowl housings will explode.
- Make sure the system is cleaned prior to processing wine.
- **DO NOT SPRAY WATER DIRECTLY ONTO THE PUMPS. THEY ARE NOT WATERPROOF AND WILL FAIL WHEN WATER LOGGED.**



SIMPLE FLOW DIAGRAMS FOR THE AVAILABLE SWEETSPOTTER MACHINES

Note that these are flow diagrams only. Please refer to the layout drawings for the diagrammatic layout of the Sweetspotter.

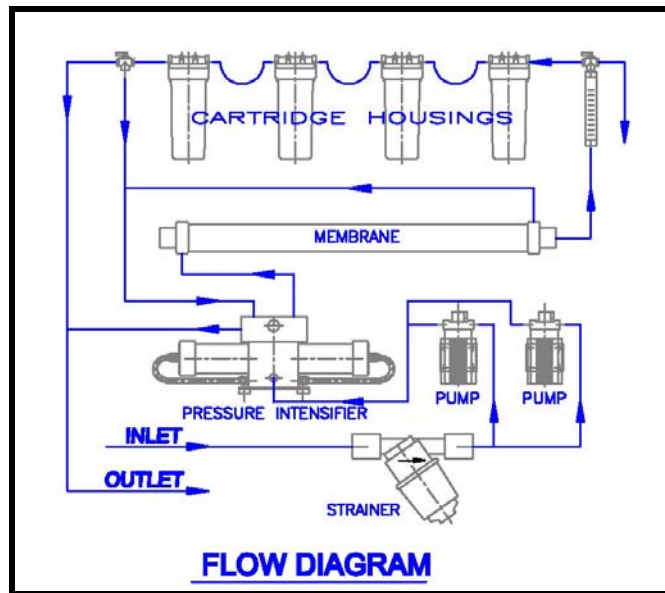


Fig 1 : Flow Diagram of SS4-1-10

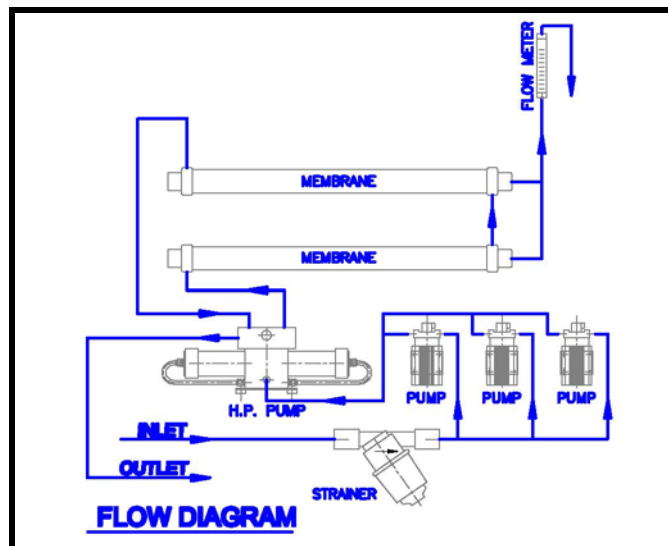


Fig 2 : Flow Diagram of SS4-2-20



Unpacking

The Sweetspotter has been delivered in a crate that is designed for re-use or has been collected from our facility. If it has arrived in a wooden crate, please loosen the top of the crate from the base and lift off the top cover. You will use this crate to return the Sweetspotter after use or to send it in for repair as necessary.

Please remove the Sweetspotter from the wooden base so that the wood does not get wet.

Inspection

Please inspect the system for any damage and contact us immediately should anything be noticed.

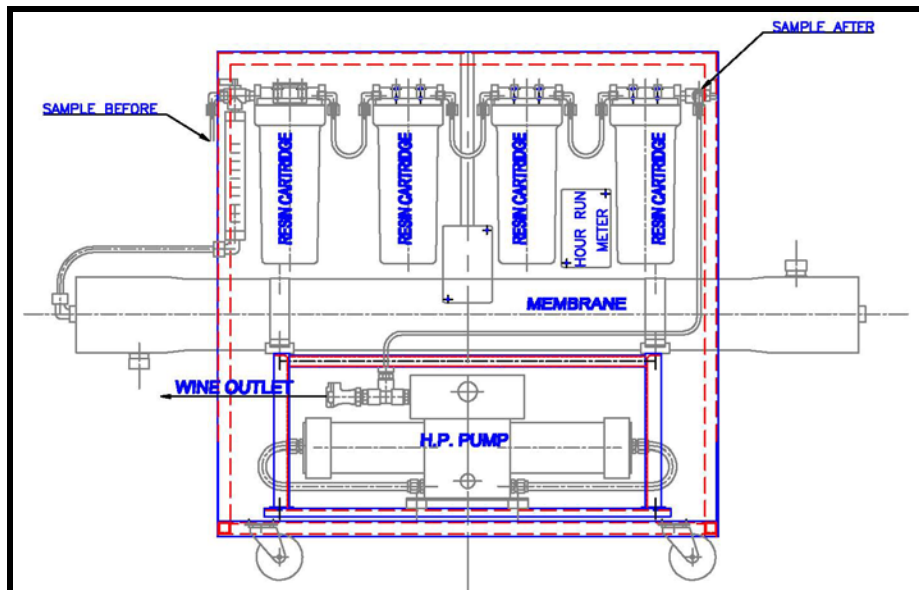


Fig 3 : SS4-1-10 Front Layout

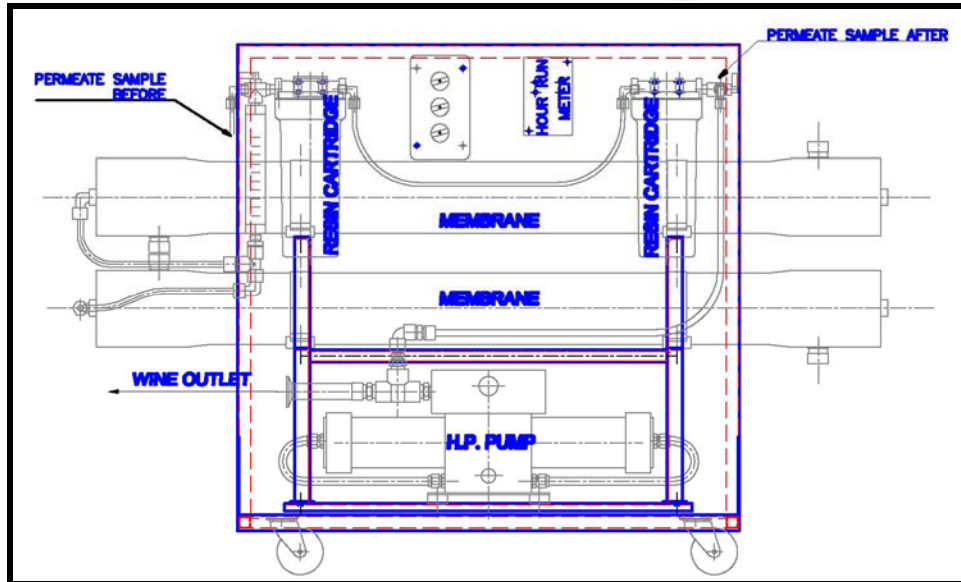


Fig 4 : SS4-2-20 Front Layout

GETTING STARTED – Refer to Fig 2 and Fig 3 for notation.

Rinsing

Your system has been shipped with a preservative chemical and should be flushed out prior to use.

- Fill a 20 gallon container with water
- Connect the plug to a 110 Volt electrical outlet.
- Insert the INLET line (entering the pump) into a container of water. Please make sure you do not run out of feed water. It is a good idea to keep the feed water line running while the system is running.
- Ensure all cartridges have been removed from the blue housings.
- Open the STRAINER located at the inlet to the pumps. This contains a screen that prevents debris from getting into the membranes. Check for any debris and rinse out prior to starting up.
- Place the outlet line near a drain.
- Switch on the pump or pumps by turning the rotary switches to the On position.

The system will now draw water from the water container and pass it through the system. Look for water exiting the wine outlet line.



Citric Acid Rinse

- Water rinse for 5 minutes making sure you do not run out of water.
- Switch off the system.
- Add approximately 10 g/l (38 grams/gallon) of citric acid to the water container ensuring good mixing.
- Once the container is full, switch on the system again and allow the entire contents of the container (minimum 20 gallons) to flush through.
- Switch the system off.
- Refill the container with fresh water and run the system again for 5 minutes.
- You are now ready to run wine.

Wine Processing

Please ensure that your wine for processing is as clean as possible. Although we have included a strainer to prevent lees from reaching the membranes, if a very dirty wine is processed, these lees will ultimately reach the membranes resulting in irreversible membrane fouling. The permeate flow rate will be drastically reduced and a chemical clean and/or soak will not return the membranes to their original operating conditions.

Insert VA/Brett/Smoke Taint removal cartridges into the cartridge housings by unscrewing the blue bowl from the black top. If a column is to be used, please have this ready to be connected. Prior to inserting the cartridges, make sure there are no residual chemicals or any water in the bottom of the bowls. If there is, empty it out and rinse the bowl with clean water. Insert the cartridge into the bowl making sure the cartridge is facing the correct way (see arrow on side of cartridge) and re-attach the bowl to the head.

The system takes 2-4 cartridges, depending on what model you have and it is not necessary to use all four, but it is recommended.

- Place the end of the feed hose into the barrel to be processed taking care not to drop it into the lees, if any, at the bottom of the barrel. Leave the outlet line near the drain for tasting out. If your system is equipped with tri-clamp connections on the inlet and outlet, then your system is designed to process porta tanks of wine.
- Open the round valve (back pressure valve) on the intensifier.
- Switch on the feed pump.
- Taste out the wine on the outlet line.
- As soon as wine is tasted, switch off the pump.
- Drop the outlet line into the barrel or have it returning to the feed tank.



- Open the backpressure valve.
- Turn the 3-way valve on the first cartridge to the left (i.e. to drain position) if supplied with one.
- Switch on the feed pump again.
- Slowly close the backpressure valve.
- Watch for permeate in the ¼" line to the resin containers. It will exit the line after the 3-way valve (if machine is equipped with one). There might be some pink color initially, but this should clear up within 5 minutes. Turn the 3-way valve to the direction of the blue filter housings.
- Make sure the 3-Way valve is open exiting the final housing and is going to drain. The handle will point in the direction of flow.
- Taste out the permeate from the final resin container as soon as there is flow.
- If running Brett or smoke taint removal, this stream may have a grey tint to it. Please do not worry; this will clear up within 30 seconds to a minute.
- Once ethanol/water is tasted, turn the three way valve 180° to have the permeate returning to the concentrated wine.
- Measure the pH of this **permeate** exiting the final cartridge housing when doing VA reduction. The **pH** should be between **7 and 9** for successful VA reduction.

Your system is now removing VA or Brett and can be left to run for as many hours as is necessary to reduce the VA to your target level. Every hour or so, please open the backpressure valve for a minute and close it again. This will aid in the flushing of the membranes and prolong cycle life.

PLEASE CHECK THE SYSTEM EVERY 30-60 MINUTES OR MORE FREQUENTLY AS IS DEEMED NECESSARY.

CHECK THE pH OF THE PERMEATE EXITING THE FINAL CARTRIDGE FREQUENTLY TO ENSURE ADEQUATE REMOVAL OF ACETIC ACID.



FLOWRATE

Your system is equipped with a rotameter (flow meter). The rate that the system should run is as follows:

| | |
|----------|-------------------|
| SS2-3-10 | : 0.166 – 0.2 gpm |
| SS4-1-10 | : 0.166 – 0.2 gpm |
| SS4-2-20 | : 0.3 – 0.4 gpm |

Please read the flow rate at the top of the float. Note that for a 30% reduction in the VA, approximately 40% of the wine as permeate needs to pass through the resin vessels. This is the same for 4EP/4EG reduction. For instance, a 60 gallon barrel would require 24 gallons as permeate to be passed through the resin.

IMPORTANT

If you run this system on clean filtered or well-racked wine, you will have a longer life expectancy from the membranes. If the feed pump stops and starts while the system is in operation, this is a sign that it may need cleaning. Push through with water and follow the cleaning instructions below.

End of Run

Once finished with the wine, you can either go onto another wine or clean the system with water. As long as the system is not dirty, it can be used to process another barrel or cleaned as necessary.

- Open the backpressure valve.
- Wait 1 minute.
- Switch off the pump.
- Remove the hose from the barrel or container from which you were processing and run out the wine that is sitting in the hose.
- Fill the 20-gallon container with water.
- Drop the hose in the bucket.
- Close the backpressure valve.
- Taste out the wine at the outlet hose.
- Dump to drain once water is detected.
- Leave the system running and now proceed to taste out the permeate
- Once water is detected exiting the resin vessels, turn the 3-Way valve 180° and dump to drain.
- Please note that your resin cartridges might still be sufficient to run another batch of wine.



- Once water has been detected at the end of the resin columns, open the backpressure valve and leave the system to flush for 5 minutes. Remove the resin or brett cartridges from the housings and set them aside. They are re-usable and need not be thrown away. Re-attach the bowls to the black tops.
- Switch off the pump and proceed to the cleaning instructions.

CLEANING INSTRUCTIONS FOR SWEETSPOTTER

Once you have completed the filtration of the wine, please follow the cleaning instructions to ensure that the wine is cleaned out of the system prior to storage.

WATER RINSE 1

Rinse the wine out with water by first leaving the backpressure valve open (black knob located on the backside of the intensifier). Rinse for 2-3 minutes. Now close the backpressure valve and leave running for another 4-5 minutes.

TSP WASH 1

Mix up a 1% TSP solution (i.e. 0.5 kg of TSP in 50 liters (15 gallons) of water). Run this solution through the Sweetspotter using the feed pump by first leaving the backpressure valve open for 2-3 minutes and closing it again for 2-3 minutes. When you first run the TSP solution through the membranes, the solution exiting the membranes will be black and will turn to orange slowly over time. If at the end of the 50 liters (15 gallons) of washing solution the liquid exiting the Sweetspotter is still discolored, mix up another 50 liters and repeat the process.

Check the 100 micron screen located after the pump. If dirty, rinse out and replace.

WATER WASH 2

Once the TSP wash has been completed, rinse the system again with water by alternating between opening the backpressure valve and closing again on a more frequent basis for a total of 10 minutes.



CITRIC WASH 1

Mix up a 1% citric acid solution (i.e. 0.5 kg of citric in 50 liters of water). Run this solution through the Sweetspotter using the feed pump by first leaving the backpressure valve open for 2-3 minutes and closing it again for 2-3 minutes. The solution should be clear exiting the Sweetspotter. If it is pink, the membranes have not been washed sufficiently with caustic soda. Run the entire 50 liters of citric solution through the membranes.

TSP WASH 2

Mix up a 1% TSP solution (i.e. 0.5 kg of TSP in 50 liters (15 gallons) of water). Run this solution through the Sweetspotter using the feed pump by first leaving the backpressure valve open for 2-3 minutes and closing it again for 2-3 minutes. When you first run the TSP solution through the membranes, the solution exiting the membranes will be black and will turn to orange slowly over time. If at the end of the 50 liters (15 gallons) of washing solution the liquid exiting the Sweetspotter is still discolored, mix up another 50 liters and repeat the process.

Leave the system in TSP between runs. This acts as an extended soak on the membranes.

EXTENDED SOAK.

If the system has been used for a long period of time or is not delivering a sufficient volume of permeate, it may be necessary to soak the system over night in a high pH solution (<12). To do this carry out the clean as above, but stop after the first caustic clean. Check the pH of the solution recirculation through the membranes and make sure it is between 12 and 13. If it is too high, adjust the pH slightly with some citric acid.

LONG STORAGE – Greater than 1 month

For long term storage of the membrane elements, we suggest complete membrane removal from the housings and storage in a 0.5% KMBS solution in a PVC sleeve.

For the rest of the machine, rinse out the Sweetspotter system completely using a TSP solution. Rinse with a clean TSP solution every 1-2 weeks to avoid biological growth within the system.



TROUBLESHOOTING

The system does not deliver any permeate after cleaning or during start-up.

Cause

This may be caused by a blockage in the check valves or the pre-filter cartridge due to processing of unfiltered wine.

Solution

Open the cartridge filter housing and clean the screen if dirty.

If this fails to solve the problem, switch off the system and carry out a full chemical clean.

If this still fails to solve the problem, the system will need to be returned to the place of manufacture or rental for servicing.

The pump starts and stops during processing of the wine for VA Reduction

Cause

- The sugar level in the wine is higher than the recommended 3%.
- The wine is less than 40°F
- The system is fouled and requires chemical cleaning.

Solution

Try a chemical clean. If this does not sort out the problem, the system may be fouled. Check the 50 micron screen for signs of lees. Clean it out as necessary.



My VA/Brett/Smoke taint is not dropping accordingly

The reduction of VA/Brett/Smoke taint is dependant on the flow rate of permeate exiting the machine as well as the replacement of acid adsorption cartridges in a timely manner.

As a rule of thumb, treating 40% of the volume of the barrel as permeate will reduce the VA/Brett/Smoke taint by an average of 30%.

An example would be a barrel with a VA of 1.0 g/l. You would need to process 24 gallons of permeate to reach a VA of 0.7 g/l. At 10 gallons per hour permeate flow, this would take 2.4 hours to achieve.

Patience is key to removing taint from wine.

Please contact our offices on 707 552 2616 if any of the above situations occur and can not be resolved by cleaning.