



Watch the how to video!



OPERATING MANUAL – SWEETSPOTTER SS4-1-10

Dated: June, 2020

Revision: 8

TECHNICAL SPECIFICATIONS

Model	: SS4-1-10
Permeate flow rate	: 10-15 gallons per hour
Wine flow rate	: 140 gallons per hour
Maximum operating pressure	: 600 psi
Power requirement	: 110V 1 Phase power
Maximum cleaning fluid temp	: 120°F (through cleaning ports only)
Recommended cleaning chemical	: TSP – Non Chlorinated

TECHNICAL SUPPORT

Technical support is only available Monday through Friday 7:30am - 5:00pm. We do not have technical support available on the weekends unless arranged ahead of time.

IMPORTANT TO REMEMBER

- Do not use chlorine in any form!
- Do not use Proxycarb for cleaning purposes.
- Do not close a valve on the inlet to the machine without turning off the feed pump first! This will cause the feed pump to cavitate and can lead to damage.
- Check pre-filter regularly for debris build-up and clean regularly.
- Very cold wine (< 55F) will increase the required operating pressure of the system and or decrease the permeate flow rate to unacceptable levels.
- Do not soak the membranes in a solution greater than a pH of 11.

RESPONSIBILITY

Please note that neither D'Vine Intervention nor VA Filtration will accept responsibility for damage or loss of wine resulting from the operation of the Sweetspotter equipment. We would recommend that you familiarize yourself completely with the operation of the machinery by reading these instructions carefully prior to wine processing and make sure you supervise the machinery at all times.

If you are unsure about the operation of the equipment, please refer to the operating manual or contact one of our staff members and we would be happy to help you. It is critical that the operating manual is read thoroughly before using this equipment. If you do not feel comfortable operating the machine we can supply an operator to set up the system at a rate of \$120.00 per hour plus travel.

WARNINGS

The SS4-1-10 is equipped with a safety pressure relief valve on the permeate side of the system. This relief valve will send permeate back to the feed line to relieve pressure. The valve is located at the outlet of the membrane pressure vessel.

Always ensure all outlet valves from the system are open to avoid triggering the relief valve.

Risk of electrical shock

The SS4-1-10V is equipped with a grounded 110V electrical cable. Please ensure it is connected to a GFI electrical circuit to avoid the risk of electric shock.

SAFETY

Please wear necessary eye and hand protection when operating the Sweetspotter. Please follow all local safety rules for operating pressurized equipment.

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What you need before you start

- Cold pressurized water (preferably dechlorinated).
- 2 x 5 gallon buckets
- 110 Volt 1 phase power supply nearby.
- A handheld pH meter or accurate lab based pH meter
- Wine to be processed in barrel/tank at 55°F or higher.
- TSP and citric acid

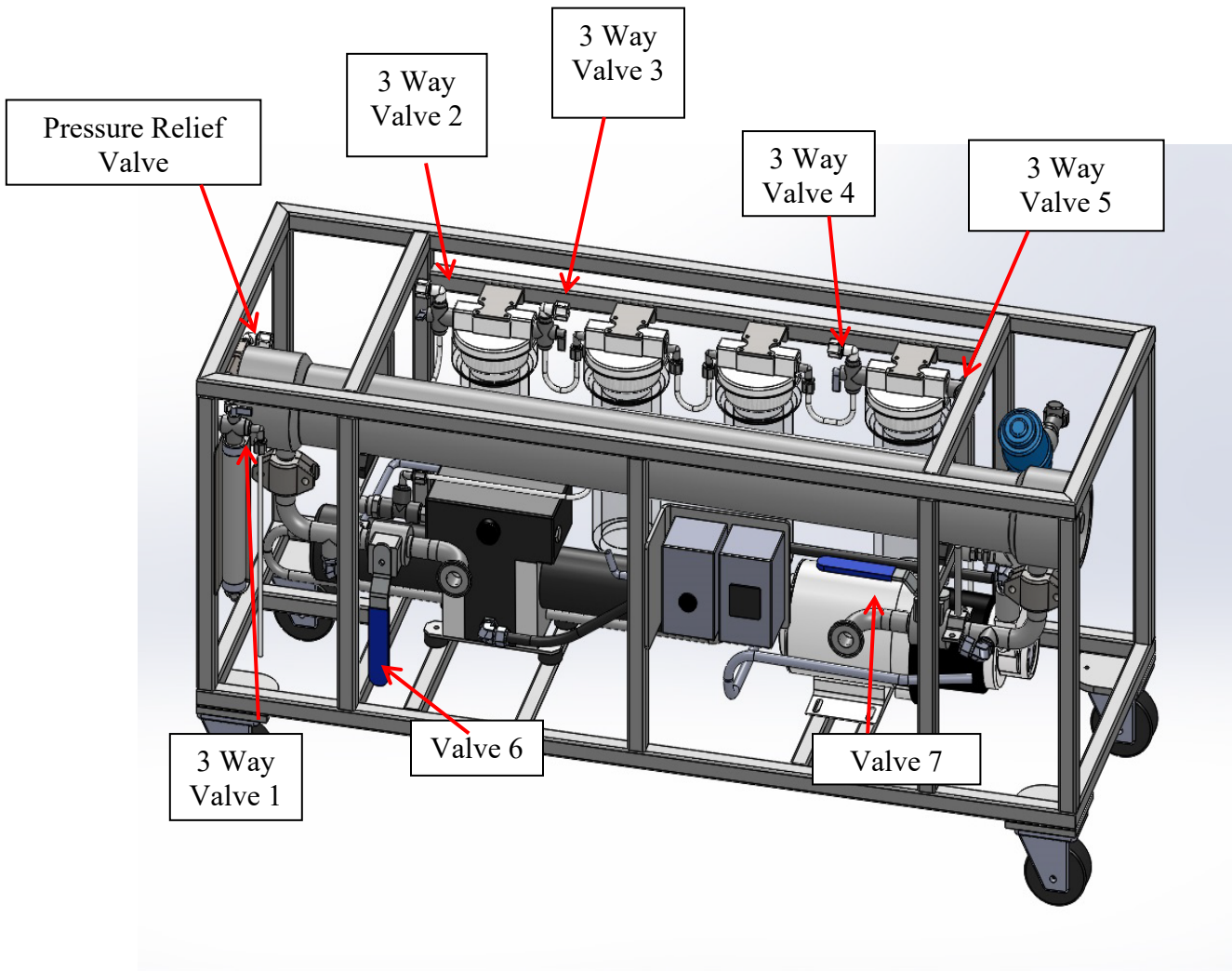
Please note that there are two or four connections to the System depending on your configuration. These are as follows:

Cartridge configuration

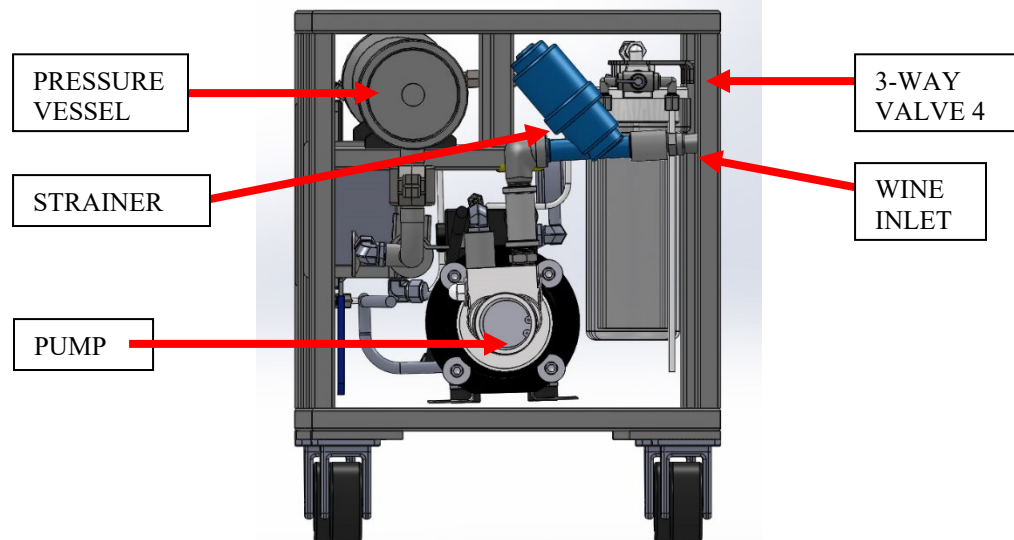
- Wine Inlet – quick disconnect
- Wine Outlet – quick disconnect

Column configuration

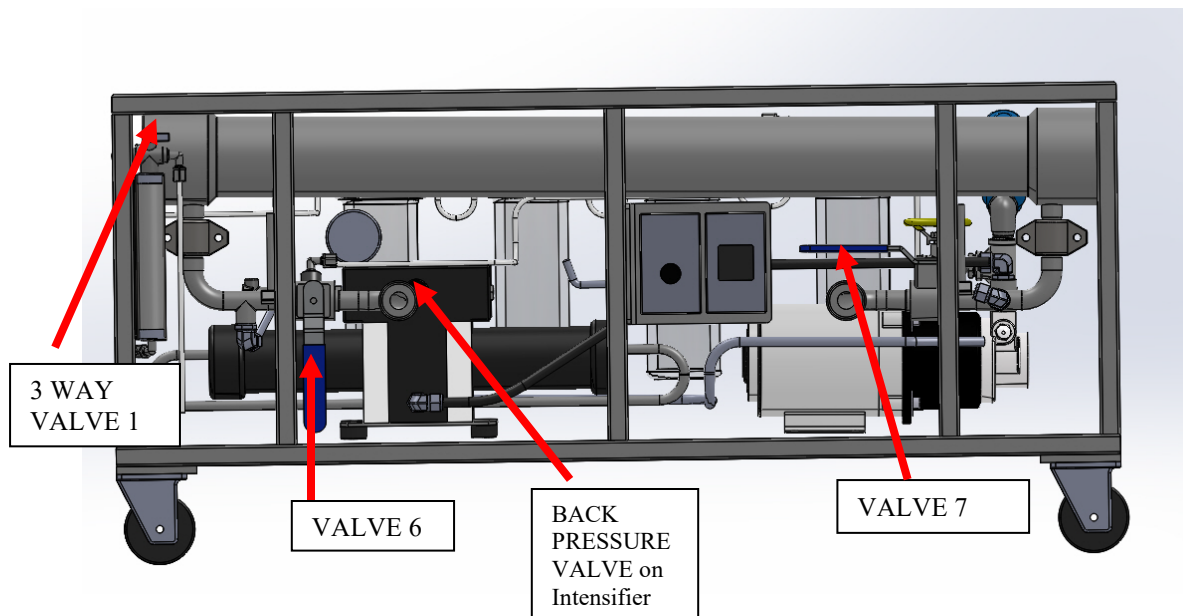
- Wine Inlet – quick disconnect
- Wine Outlet – quick disconnect
- Permeate Outlet (3/8" tubing with 1.5" tri-clamp on the end)
- Permeate Return (3/8" tubing with 1.5" tri-clamp on the end)



RIGHT SIDE VIEW



FRONT VIEW



GETTING STARTED

PLEASE READ INSTRUCTION THOROUGHLY BEFORE USE. WE ARE NOT RESPONSIBLE FOR LOSS OF PRODUCT DUE TO NEGLIGENCE OR FAILURE TO FOLLOW INSTRUCTIONS.

ELECTRICAL

- Connect the power cable to a 110V outlet.
- Do not turn on the pump yet.

HOSE CONNECTIONS (see drawings above for correct fitting location)

N.B. Please check o'rings on the ends of the quick connect hoses. If they are dry, lubricate with water or food grade grease to avoid damage when connecting to the machine. There are additional o'rings zip tied to the machine if needed.

- Insert the fitting end of hose 1 of 2 provided into the Wine Inlet quick disconnect.
- Insert the fitting end of Hose 2 of 2 provided into the Wine Outlet quick disconnect.

Water Rinse- CRITICAL

- The machinery is supplied with a citric acid solution. This needs to be rinsed before processing wine.
- Fill a 5 gallon bucket with cold water.
- Place the end of the *Wine Inlet Hose* into the bucket containing the water.
- Place the end of the *Wine Outlet Hose* and the tubing from valve one into another empty bucket or to drain
- Turn *Valve 1* handle so that it points to the left – to open ended tube.
- Open the *Back Pressure Valve on the Intensifier* – 1 turn to the left.
- Switch on the pump by turning the electrical switch to the right.
- Rinse for 5 minutes continuing to fill the bucket with water as needed
- Close the *Back Pressure Valve* and let run.

Citric acid rinsing

It is good practice to rinse the system with a citric acid solution prior to using it to treat wine. This does not have to take place between lot changes but should take place after each clean and prior to each run after the system has been left with a cleaning solution inside.

- Mix up approximately 5 gallons of a 1% citric acid solution in a container or tank (0.5 lb citric in 5 gallons)
- Place the end of the *Wine Inlet hose* into the bucket containing the citric acid solution.
- Place the *Wine Outlet hose* into an empty bucket.
- Turn Valve 1 handle so that it points to the left.
- Open the Back Pressure Valve– 1 turn to the left.
- Switch on the pump by turning the switch to the right.
- Rinse for 5 minutes.
- Close the *Back Pressure Valve* for 2 minutes to ensure complete water rinsing. Open again and let run.

If the system does not suck up the citric acid solution, check that the *Back Pressure Valve is open*.

Water Rinse prior to Wine Processing

Once the Citric acid wash is complete. Follow up with a water rinse again until all the citric acid is gone.

- Fill a 5 gallon bucket with cold water.
- Place the end of the *Wine Inlet hose* into the bucket containing the water.
- Place the *Wine Outlet hose* into an empty bucket.
- Turn Valve 1 handle so that it points to the left.
- Open the *Back Pressure Valve* 1 turn to the left.
- Switch on the pump by turning the switch to the right.
- Rinse for 5 minutes continuing to fill bucket with water as needed
- Close the *Back Pressure Valve* for 2 minutes to ensure complete water rinsing. Open again and let run until water exiting the wine outlet hose and valve one's tubing is free of citric taste.

Proceed to either the cartridge section or the Column section for the correct second stage treatment configuration.

Wine Processing – Cartridges Only

This set-up is only used for trials typically. It is not the normal mode of operation for barrel work. Please ensure that your wine for processing is as clean as possible. The cleaner the wine, the longer the membrane elements will last while processing

Cartridge Arrangement

VA – Resin for acetic acid reduction only.

HpH – High pH resin for acetic acid and ethyl acetate reduction

pHC – pH Correction resin for stabilizing wine pH during VA reduction or for adjusting pH lower. Can also be used in VA reduction to keep pH constant. Also used for cold stabilization of wine.

VA Reduction

Place 1 - pHC cartridge in housing 1 and 1-VA cartridge in each housing 2, 3 and 4.

Combination VA/Ethyl acetate reduction

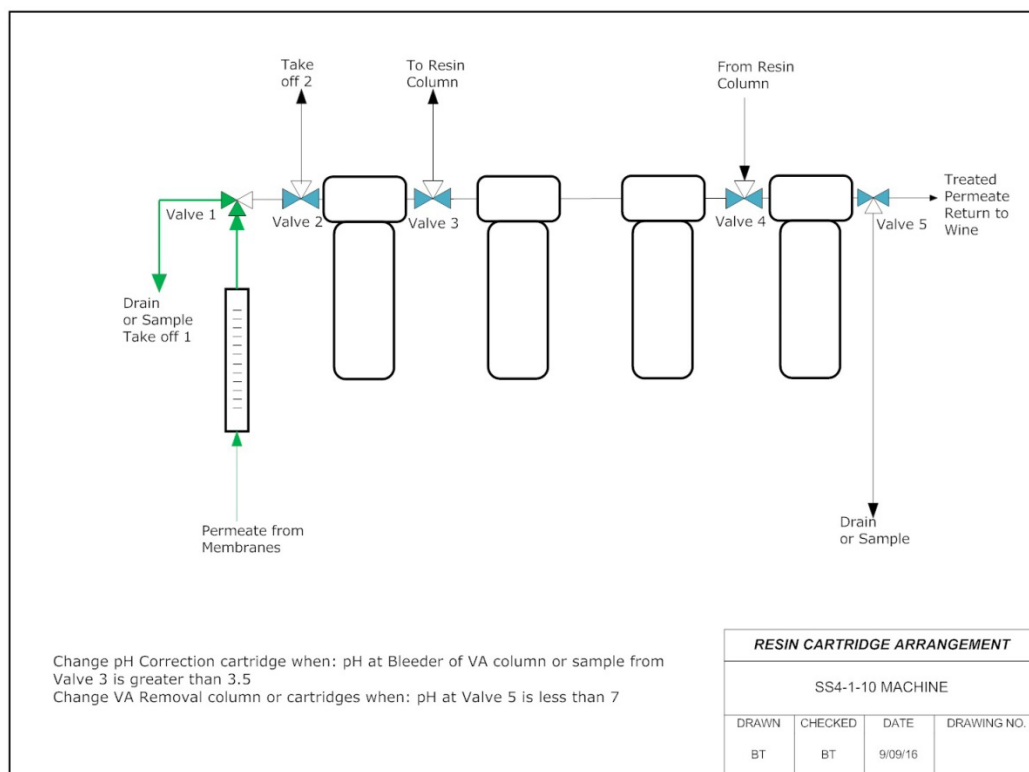
1- HpH cartridge in each housing 1, 2 and 3, and 1 - pHC cartridge in housing 4

pH Correction

1- pHC Cartridges in each housing 1, 2, 3 and 4

Taint Reduction including 4EP, DES, Smoke, Eucalyptol etc

1- Carbon cartridges in each housing 1, 2, 3 and 4



Step 1 - Start-Up

- Place the end of your *Wine Inlet hose* into the barrel **or** connect to the tank to be treated.
- Leave the end of the *Wine Outlet hose* in an empty 5 gallon bucket.
- Insert the necessary cartridge filters into the Cartridge Housings by unscrewing the filter bowl, placing the cartridges into the bowl (arrow side up or the black rubber side up) and screwing the bowl back into place.
- Check that the valves are orientated as follows when standing at the front of the machine:
 - a. VALVE 1 - Handle pointing to the left.
 - b. VALVE 2 - Handle pointing right
 - c. VALVE 3 - Handle pointing to the front of the machine.
 - d. VALVE 4 - Handle pointing to the electrical box or Front of the machine.
 - e. VALVE 5 - Handle pointing toward the back of the machine.
- Switch on the system pump (switch on the front of the machine). Keeping the *Back Pressure Valve* open.
- Watch for wine exiting the *Wine Outlet Hose*.
- Taste the liquid exiting the *Wine Outlet Hose* and as soon as wine is tasted, switch off the pump.
- Place the end of the *Wine Outlet Hose* into the barrel being treated or connect to the tank.
- Switch on the pump again.

Step 2 - Pressurizing the System

- With wine flowing, close the *Back Pressure Valve* (turn to the right) – THUMB TIGHT.
- Watch the pressure increase slowly and watch for flow in the Flow meter(rotameter)
- The system will be pulsing as pressure builds up.
- Liquid should be seen exiting *Valve 1* after about 30 seconds.
- The Flow meter (rotameter) float will be rising and falling as the system stabilizes.
- **Taste the liquid exiting Valve 1 for alcohol.**
- **Switch off the machine and turn Valve 1 to the right. Be sure Valve 2 is pointing to the right as well.**

Step 3 - Treating the Permeate

- **Turn on the machine**
- The Cartridge Housings should now be filling with liquid. If you see any fittings spraying liquid at this time, shut off the machine immediately and check for tightness and restart.

- Bleed the cartridge housings by pressing the red bleeder valve located on top of the housing.
- After the Housings fill the liquid will exit out the back of *Valve 5*.
- Taste the liquid exiting *Valve 5* for alcohol. When alcohol is tasted switch off the machine and rotate the valve 180 degrees so that the handle is facing toward the front of the machine. NEVER leave the valve in the 90° position or straight up – cartridge housings will burst.
- If running Brett removal, the permeate stream exiting *Valve 5* may have a grey tint to it. Please do not worry; this will clear up within 30 seconds to a minute.

Checks to be carried out during operation

If only running VA Reduction (1- pHC and 3- VA Cartridges)

- Measure the pH of the permeate exiting *Valve 5* on a regular basis (every 30 minutes) to gauge when the cartridges require replacing. The pH range should be between 7 and 10.5.
- To get a sample from *Valve 5*, rotate the handle to the back of the machine until liquid flows from the sample tubing.
- When the pH of the permeate exiting *Valve 5* *drops below 7*, open the *back pressure valve* and switch off the machine.
- Remove the 3 VA cartridges from the housings. Empty the residual permeate into the barrel or tank and place a fresh set of cartridges into the housings.
- Start the machine again, taste out at *Valve 5* and resume processing.
- When the next set of VA cartridges require replacing, remove the pHC cartridge from housing number 1 and replace with a fresh cartridge. ONLY REPLACE 1 PHC FOR EVERY 2 SETS OF VA CARTRIDGES USED.
- Start the machine again, taste out at *Valve 5* and resume processing.

Your system is now removing VA and can be left to run for as many hours as is necessary to reduce the VA to your target level.

Ethyl Acetate Reduction (3- HpH and 1 - pHC Cartridge)

- Measure the pH of the **permeate** exiting Valve 4 on a regular basis to gauge when the HpH cartridges require replacing. **To get a sample from Valve 4, unscrew the tubing going into the valve, take a sample and then screw back in ensuring no leaks. Do not turn the valve handle, this will block permeate flow.** The pH should be between 10 and 12.5. This stream might smell like caustic or soap – this is normal.
- When the pH of the permeate exiting Valve 4 *drops below 10*, open the Back Pressure Valve and switch off the machine.
- Remove the cartridges from the housings. Empty the residual permeate into the barrel or tank and place a fresh set of cartridges into the housings.
- Measure the pH of the permeate exiting Valve 5 on a regular basis to gauge when the pHC cartridge requires replacement. The pH should be above 4.
- When the pH of the permeate exiting Valve 5 *increases above 4.0*, open the *Back Pressure Valve* and switch off the machine.
- Remove the pH cartridge from the housing. Empty the residual permeate into the barrel and place a fresh cartridge into the housing.
- Once all the cartridges are replaced, turn the handle of Valve 5 so that the end points to the electrical box. Follow the start-up instructions as above.

If running pH Correction or Cold Stabilization

- Measure the pH of the permeate exiting Valve 4 on a regular basis to gauge when the cartridges require replacing. The pH range should be above 4.
- When the pH of the permeate exiting Valve 4 *increase to above 4.0*, open the Back Pressure Valve and switch off the machine.
- Remove the cartridges from the housings. Empty the residual permeate into the wine being treated and place a fresh set of cartridges into the housings.
- Once all the cartridges are replaced, turn the handle of Valve 4 so that the end points to the electrical box. Follow the start-up instructions as above.

If running for taint removal

- Take a sample of the permeate before the cartridges and place it in a glass. *You collect the sample by turning Valve 1 to the left and collecting the liquid exiting the tube.*
- Take a second sample from Valve 5 *by turning the valve handle towards the back of the machine and collecting the liquid exiting the line.* Pour this liquid into a second glass.
- Compare the aroma before and after on the 2 permeate samples. There should be a distinct difference. If not, replace cartridges.

Wine Processing – Resin Columns or Carbon Columns

Please ensure that your wine for processing is as clean as possible. The cleaner the wine, the longer the membrane elements will last.

Note* - Prior to using any of the columns**

Use caution removing the triclover blanks. There is chemical in the column under a slight pressure.

- The VA Column needs to be rinsed until the water exiting the column has reached a pH of 10.5.
- The HpH column needs to be rinsed for 15 minutes.
- The pHC column needs to be rinsed for 15 minutes.
- The Brett column needs to be rinsed for 15 minutes.

Always make sure the columns are full by opening the bleeder valves on top during rinsing.

Once the rinse has been completed, purge with nitrogen making sure all the liquid is out of the columns before using them on wine.

Column Arrangement

Columns available

HpH – High pH resin for acetic acid and ethyl acetate reduction

VA – VA resin for acetic acid reduction

pHC – pH Correction resin for stabilizing wine pH during VA reduction or for adjusting pH down. Also used for cold stabilization of wine.

Carbon – Taint reduction

Column Configurations

VA Reduction

1 x pHC Column followed by a VA resin column.

Depending on volume of wine or VA concentration, pHC cartridges may be substituted for the pHC column in hosing 1.

Combination Ethyl acetate reduction

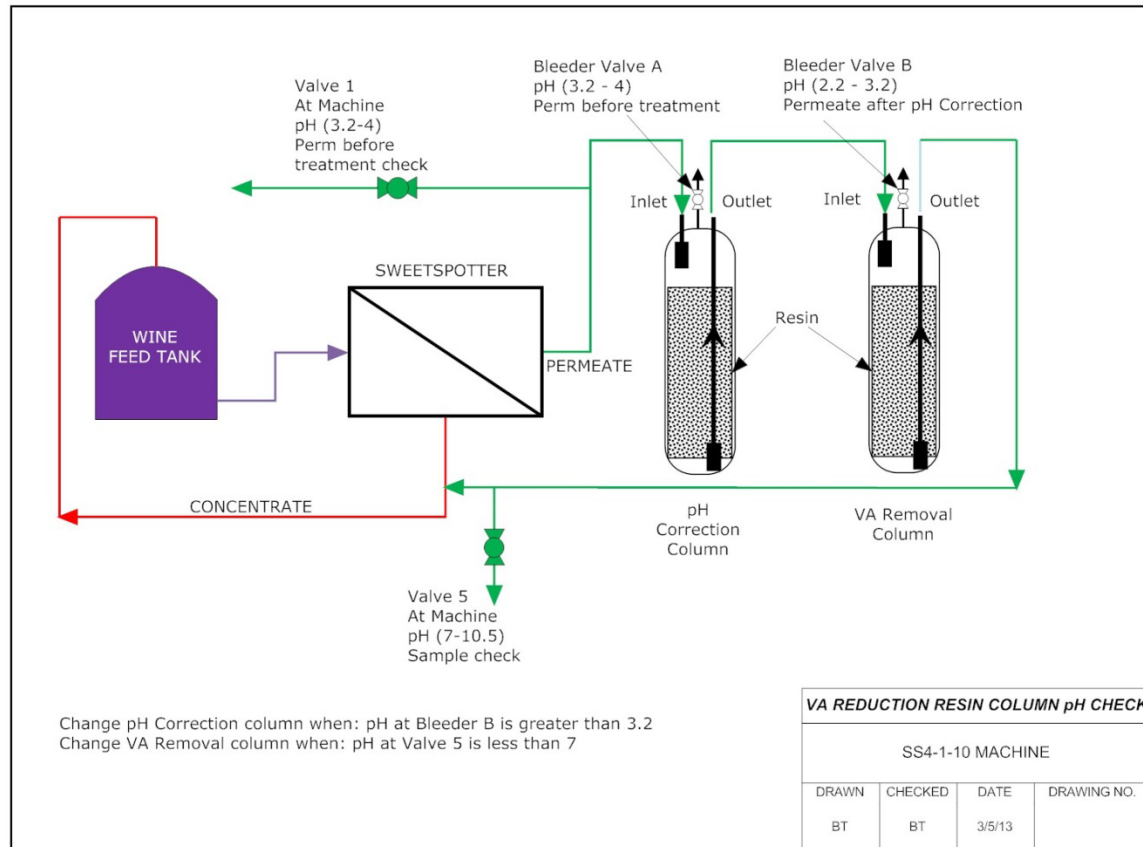
1 x HpH Resin column followed by pHC column

pH Correction

1 x pHC Column

Taint Reduction including 4EP, DES, Smoke, Eucalyptol etc

1 x Carbon column



Step 1 - Start-Up

- Place the end of your *Wine Inlet Hose* into the barrel or connect to the tank to be treated.
- Leave the end of the *Wine Outlet Hose* in an empty 5 gallon bucket.
- Check that the valves are orientated as follows when standing at the front of the machine:
 - a. VALVE 1 – Handle pointing to the left.
 - b. VALVE 2 – Handle pointing to the left
 - c. VALVE 3 – Handle pointing to the front or back of the machine (it will be bypassed when using two columns).
 - d. VALVE 4 – Handle pointing toward the back of the machine.
 - e. VALVE 5 – Handle pointing toward the back of the machine.
- Switch on the system pump (switch on the front of the machine).
- Watch for wine exiting the *Wine Outlet Hose* – 10 seconds or so.
- Taste the liquid exiting the *Wine Outlet Hose* and as soon as wine is tasted, switch off the pump.
- Place the end of the *Wine Outlet Hose* into the barrel being treated or connect to the tank.
- Now connect the resin columns.

Step 2 – Column Connection

If Running VA Reduction

- Connect the 3/8" tube line from *Valve 1* on the machine to the *Inlet* of Column 1 which should be the pHc column. Connect the jumper hose supplied between the *Outlet* of Column 1 (pHc) and *Inlet* of Column 2 (VA Column). Connect the second 3/8" tube line from the *Outlet* of Column 2 (VA Column) to *Valve 4* on the machine.
- Make sure Valve 1 handle points toward the left.
- Make sure Valve 2 handle points to the left
- Make sure Valve 4 handle points toward the back of the machine.
- Make sure Valve 5 handle points toward the back of the machine.
- Check that the bleeder valves on top of the columns are closed.

If Running Ethyl Acetate

- Connect the 3/8" tube line from *Valve 1* on the machine to the *Inlet* of Column 1 which should be the HpH column. Connect the jumper hose supplied between the *Outlet* of Column 1 (HpH) and *Inlet* of Column 2 (pHc). Connect the second 3/8" tube line from the *Outlet* of Column 2 to Valve 4 on the machine.
- Make sure Valve 1 handle points toward the left.
- Make sure Valve 4 handle points toward the back of the machine.
- Make sure Valve 5 handle points toward the back of the machine.
- Check that the bleeder valves on top of the columns are closed.

If Running pH Correction, Cold Stabilization or Taint reduction

- Typically only one column for each process is used. Connect the 3/8" lines to the *Inlet and Outlet* of the correctly selected columns.
- Make sure Valve 1 handle points toward the left.
- Make sure Valve 4 handle points toward the back of the machine.
- Make sure Valve 5 handle points toward the back of the machine.
- Check that the bleeder valves on top of the columns are closed.

Step 3 - Pressurizing the System

- Switch on the system pump.
- With wine flowing, close the *Pressure Relief Valve* (turn to the right) – THUMB TIGHT.
- Watch the pressure increase slowly and watch for flow in the Flow Meter
- The system will be pulsing as pressure builds up.
- Liquid should be seen exiting *Valve 1* after about 30 seconds.
- The Flow Meter/Rotameter float will be rising and falling as the system stabilizes.
- Taste the liquid exiting *Valve 1* for alcohol. Once tasted, turn Valve 1 to the right to allow permeate to flow to the columns.
- Monitor the pressure. If it spikes above 550, please open the back-pressure valve slightly to drop pressure. Keep adjusting until pressure stabilizes at 500 psi.

Step 4 – Filling the Columns

- The Columns should now be filling with liquid. This is a slow process and depending how many columns are in line and the size of the columns, could take up to 20 minutes.
- Be sure to keep the bleeder valves on the columns closed.
- The liquid will flow through the columns, past Valve 4 and into cartridge housing 4.
- The liquid will exit out *Valve 5*.
- While the system is in operation, check for leaking fittings. If anything is seen leaking, open the Back Pressure Valve and switch off the machine. Tighten the fittings and re-start the system. There are additional O'Rings attached to the machine.
- When liquid starts flowing from *Valve 5*, it will contain 100% water. This is the water that was in the bottom of the columns.
- Continue tasting out *Valve 5* until alcohol can be tasted.
- When strong alcohol is tasted exiting Valve 5, open the bleeder valves on top of the resin columns. Gas will be heard escaping. Leave the bleeder valves open until liquid is seen exiting these valves, then close each one only when liquid is seen. Repeat for each column.
- When the final bleeder valve is closed, turn the handle on Valve 4 180° so that it is pointing toward the front of the machine.
- If running Brett removal, the permeate stream exiting Valve 5 may have a grey tint to it. Please do not worry; this will clear up within a few minutes.

Your system is now in process mode and can be left (supervised) to run for as many hours as is necessary to reduce the VA to your target level. It is important though to check the permeate streams frequently to ensure the system is working efficiently.

Checks to be carried out during column operation

VA Reduction

- There are several places to monitor the permeate pH during treatment. The bleeder valve on top of Column 1 will give you the pH of the permeate exiting the membranes. ***The bleeder valve on top of Column 2 will give you the pH of the permeate exiting Column 1. The liquid exiting Valve 5 will be the pH of the permeate exiting Column 2.***
- Measure the pH of the **permeate** exiting the Bleeder Valve on Column 2 on a regular basis (every 30 minutes). The pH range should be between 2.5 and 3.5.
- *When the pH of the permeate exiting the Bleeder valve on Column 2 rises above 4.0, this means Column 1 is saturated and requires replacing or regeneration. Refer to pH Correction Column Saturated below for detailed instructions on removal of the spent column.*
- Measure the pH of the permeate exiting Valve 5 on the machine also every 30 minutes. It should be between 7 and 10.5.
- *When the pH of the permeate exiting Valve 5 drops below 7, the column is saturated and requires replacing or regeneration. Please refer to VA Resin Column Saturated for detailed instructions on removal of the spent column.*

VA Column Saturated

- Open the Back Pressure Valve on the machine and switch off the machine.
- Wait 2 minutes.
- Disconnect the Hoses/Tubing from the Inlet and Outlet of Column 2 (VA Column).
- Connect a nitrogen line to the Inlet of Column 2 and a line to a clean bucket from the Outlet.
- Set the nitrogen at 20 psi and purge until nitrogen bubbles are seen flowing out the clean line into the bucket.
- Turn off the nitrogen and wait 2 minutes.
- Slowly open the bleeder on top of The Column.
- Replace with a new rinsed and purged VA Column or refer to regeneration instructions for VA Resin Columns.
- Connect the fresh column in the line by referring to the *Column Connection* instructions above and repeat all subsequent steps until you are up and running.

Ethyl Acetate

- There are several places to monitor the permeate pH during treatment. The bleeder valve on top of Column 1 will give you the pH of the permeate exiting the membranes. ***The bleeder valve on top of Column 2 will give you the pH of the permeate exiting Column 1. The liquid exiting Valve 5 will be the pH of the permeate exiting Column 2.***
- Measure the pH of the permeate exiting the Bleeder Valve on Column 2 on a regular basis (every 30 minutes). The pH range should be above 10.
- *When the pH of the permeate exiting the Bleeder valve on Column 2 drops below 10, this means Column 1 is saturated and requires replacing or regeneration.* Refer to *HpH Column Saturated* below for detailed instructions on removal of the spent column.
- Measure the pH of the permeate exiting Valve 5 on the machine also every 30 minutes. It should be between 2 and 4.0.
- *When the pH of the permeate exiting Valve 5 rises above 4.0, the column is saturated and requires replacing or regeneration.* Please refer to *pH Correction Column Saturated* for detailed instructions on removal of the spent column.

HpH Column Saturated

- Open the Back Pressure Valve on the machine and switch off the machine.
- Wait 2 minutes.
- Disconnect the Hoses/Tubing from the Inlet and Outlet of Column 1 (HpH Column).
- Connect a nitrogen line to the Inlet of the HpH Column and a line to a clean bucket from the Outlet.
- Set the nitrogen at 20 psi and purge until nitrogen bubbles are seen flowing out the clean line into the bucket.
- Turn off the nitrogen and wait 2 minutes.
- Slowly open the bleeder on top of The Column.
- Replace with a new rinsed and purged HpH Column or refer to regeneration instructions for HpH Resin Columns.
- Connect the fresh column in the line by referring to the *Column Connection* instructions above and repeat all subsequent steps until you are up and running.

pH Correction or Cold Stabilization only

- Measure the pH of the permeate from either on the Bleeder Valve of Column 2 (if removing VA) **or** Valve 5 (if removing Ethyl Acetate) on a regular basis to gauge when the columns require replacing. The pH range should be between 2 and 4.0.

When the pH of the permeate exiting Valve 5 increase to above 4.0, refer to the *pH Correction Column Saturated* instructions.

pH Correction Column Saturated

- Open the Back Pressure Valve on the machine and switch off the machine.
- Wait 2 minutes.
- Disconnect the Hoses/Tubing from the Inlet and Outlet of the pHc Column.
- Connect a nitrogen line to the Inlet of the pHc Column and a line to a clean bucket from the Outlet.
- Set the nitrogen at 20 psi and purge until nitrogen bubbles are seen flowing out the clean line into the bucket.
- Turn off the nitrogen and wait 2 minutes.
- Slowly open the bleeder on top of The Column.
- Replace with a new rinsed and purged pHc Column
- Connect the fresh column in the line by referring to the *Column Connection* instructions above and repeat all subsequent steps until you are up and running.

If running Taint Removal only

- Take a sample of the permeate at Valve 1 and after the carbon column at Valve 5.
- Place the sample in a glass and compare the before and after aromas. If there is a big difference, the column is working. If they are similar, the column is saturated and requires replacing.

Storing of resin columns at the end of the day or at the end of a run

- Resin columns can be left full of permeate over night for processing the next day.
- If they are not going to be used within the next 48 hours, they should be purged of permeate and rinsed with water. They should be left full of water.
- If not going to be used for a week, they need to be regenerated and left full of the regenerant solution.

SYSTEM CHECKS – All Processes

Once the system is running, please check the following for correct operation:

- Permeate is flowing between 6 and 15 gal/hr or 0.10 - 0.25 gal/min, depending on the membrane in the machine.
- The System is pulsing. If no pulsing is taking place, check troubleshooting.
- The permeate is clear (Depending on the membrane the permeate might have a pink tinge).

We would recommend recording the start-up pressure and flows as a function of time on a log sheet. Re-check every half hour and record the latest values on the log sheet. Please record time (from hour run meter), permeate flow rate, operating pressure, permeate pH exiting column1, permeate pH exiting column 2 and time when columns were replaced or regenerated.

- **PLEASE CHECK THE SYSTEM EVERY 30 MINUTES OR MORE FREQUENTLY AS IS DEEMED NECESSARY.**
- **CHECK pH FREQUENTLY TO ENSURE ADEQUATE REMOVAL OF ACETIC ACID**
- **WHEN RUNNING 4EP REDUCTION, CHECK PERMEATE AROMA EXITING FINAL CARTRIDGE TO TELL IF BRETT CARTRIDGES ARE STILL REMOVING 4EP AND 4EG.**

PRESSURE ABOVE 650 PSI

If at any time the pressure of the system exceeds 650 psi, the membranes are fouled and the system needs cleaning. If the system reaches 650 psi within minutes of starting up after a clean, then the RS of the wine is too high for the temperature. Check with the office if it is appropriate to run at these conditions.

FLOWRATE AND NECESSARY RUN TIME

Your system is equipped with a Flow Meter /rotameter. Your system permeate flow rate should be 10-15 gal/hr.

Please read the flow rate at the bottom of the mushroom for accuracy. Note that for a 30% reduction in the VA, approximately 40% of the volume of wine as permeate needs to pass through the resin vessels. This is the same for 4EP/4EG reduction. For instance, a 600 gallon tank would require 240 gallons as permeate to be passed through the treatment column in order to achieve a 30% reduction in the VA or 4EP level. This equates to a run time of approximately 24 hours for VA removal and 16 hours for 4EP.

Here are approximate volumes to be processed based on percentage drops of VA and/or 4EP:

20% VA or 4EP Reduction	: Treat 30% of the volume as permeate
30% VA or 4EP Reduction	: Treat 40% of the volume as permeate
40% VA or 4EP Reduction	: Treat 50% of the volume as permeate
50% VA or 4EP Reduction	: Treat 60% of the volume as permeate

IMPORTANT

If you run this system on clean, filtered or well-racked wine, you will have a longer life expectancy from the membranes.

Please check the inlet screen daily to ensure it is clean. It can be pressure washed.

END OF RUN

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

- Open the Pressure Valve on the Intensifier.
- Wait 1 minute.
- Switch off the pump.
- Remove the WINE INLET HOSE from the feed tank/barrel.
- Remove the cartridges from the housings and pour the residual permeate back into the barrel or purge out the columns with nitrogen.
- Rotate Valve 1 handle to the right.
- Fill a 5 gallon bucket with water.
- Place the end of the WINE INLET hose in the bucket of water.
- Leave the WINE OUTLET HOSE in the barrel that you have been processing.
- Switch on the pump.
- Taste out the wine returning to the barrel. Once water is tasted, remove the hose from the barrel and leave to run freely to drain.
- Leave the machine flushing for 1-2 minutes. Keep water flowing to the bucket to avoid running out of water while flushing.

Warm Water Flushing – Using the machine pump

- Warm water can now be used for flushing if required. This will aid in the removal of colloids from the membranes. Please do not exceed 120°F on the water flush.
- Close the PRESSURE VALVE every 5 minutes for 2 minutes to flush through the permeate line too.

CLEANING INSTRUCTIONS FOR SYSTEM

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 – Using Machine Pump

- Warm water can now be used for flushing if required. This will aid in the removal of colloids from the membranes. Please do not exceed 120°F on the water flush.
- Close the Pressure Valve on the Intensifier every 5 minutes for 2 minutes to flush through the permeate line too.
- Rinse system for 5 to 10 minutes to ensure removal of most of the color.

Non Chlorinated TSP Wash 1 (or Caustic potash if available) – Using a winery pump

The ideal cleaning solution is TSP in 120F water.

Please use a winery pump with a variable speed flow rate and connect it using 1" or 1.5" winery hose to Cleaning port 6. Connect another open ended 1" or 1.5" winery hose to Cleaning Port 7.

1. Open Valve 6 and Valve 7. Close the Pressure Valve on the intensifier.
2. Open the STRAINER and remove the cartridge. Rinse debris under running water and return to the housing.
3. Mix up a 1% solution (i.e. 1 kg of TSP in 100 liters (25 gallons) of water) in 25 gallons of 120°F water.
4. Pump this solution through the Membranes using your winery pump to drain. You should have at least 8-10 gpm of flow.
5. When you first run the cleaning solution through the membranes, the solution exiting the membranes will be purple and will turn to orange slowly over time. Once all 25 gallons has been pumped through the system, mix another 1% solution and this time recirculate to the same tank for 10 minutes.

Check the screen in the STRAINER again after your TSP clean. If dirty, rinse out and put back.

WATER WASH 2 – Using Winery Pump

Once the TSP wash has been completed, rinse the system again with warm water.

CITRIC WASH 1 – Using Winery Pump

Mix up a 1% solution (i.e. 1 kg of Citric acid in 100 liters (25 gallons) of water). Pump this solution through the Membranes using your winery pump to drain. When you first run the cleaning solution through the membranes, the solution exiting the membranes should be clear. If it is pink. Repeat the TSP cleaning procedure again after you have rinsed out the citric acid

Please note that citric acid is used as a neutralizing agent as well as to convert tannins that have not been removed from the membrane elements into tannic acid. Soaking the membrane elements in Citric Acid converts the tannin into tannic acid. If you follow this with a warm water rinse, and a TSP wash, these tannins eventually get removed.

END OF CLEAN

Once the citric acid is run clear, add a little KMBS to the citric solution, recirculate through the membranes, switch off the recirc pump and Close valves 6 and 7. You can leave the system in this state for up to a month after which we would recommend cleaning of the system again to prevent mold and or bacteria growth.

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 TSP. To do this carry out the cleaning procedure as above, but stop after the first TSP clean. Check the pH of the solution recirculation through the membranes and make sure it is between 11 and 12. If it is too high, adjust the pH slightly with some citric acid.

LONG TERM STORAGE

Recirculate a KMBS solution (0.2%) through the membrane elements using the cleaning ports only. When complete, close all valves and store machine. Please remove filter bowls and rinse storing externally from the machine. Replace the solution every 2 weeks.

TROUBLESHOOTING

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

Cause

- This may be caused by a blockage in the filter screen located in the STRAINER.
- Another cause could be that the back pressure valve has not been closed.
- If any valves are closed on the cartridge filter loop, the pressure relief valve may be sending permeate flow back to the feed line.

Solution

- Check the Pressure Valve on the intensifier is closed! If it is, proceed to the next step.
- Switch off the pump and close all valves from the wine tank. Remove the Inlet Filter housing by unscrewing to the left. Once loose, the filter cartridge inside can be inspected for debris or blockage. Clean with hot water if necessary.
- 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, then call our service department to schedule a service on the machine.

The System only delivers 3 gal/hr of permeate flow

Cause

- The sugar level in the wine is higher than the recommended 10%.
- The opening of the back-pressure valves lightly to reduce pressure has lowered the permeate flow rate. This is normal.
- The wine is less than 45°F
- You have VP membrane elements loaded in the system
- 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 80 micron screen for signs of lees. Clean it out as necessary. If the wine being processed has a high sugar level or is very cold, adjust the pressure relief valve to allow the feed pump to deliver more pressure to the system.

The Feed pump is running, but is not pumping

Cause

- Air lock on the inlet line to the feed pump.
- Closed inlet valve
- Blocked strainer on the feed

Solution

- Check the pre-filter for blockage
- Make sure all inlet valves are open
- Bleed out the air on the inlet hose to the system as much as possible. If the pump is still not pumping the please call for advice.

Please contact our offices on 707 552- 2616 x 102 if any of the above situations occur and can not be resolved by cleaning.

Regenerating the VA or HPH Resin column

Your system has been supplied with a regenerable resin column for purposes of VA Reduction.

You will require the following for correct operation of this column:

- 1 x Water line with tri-clamp fitting
- 1 x Nitrogen gas line to tri-clamp
- 1 x bottle of nitrogen
- A 6% Potassium hydroxide (CAUSTIC POTASH) solution
- Floor drain
- Handheld pH Meter
- Chemical pump in box + 2 hoses (supplied with the column)

Safety

Please make sure you protect your eyes and lungs when mixing up any chemical solution. Safety goggles and a gas mask rated for caustic fumes are necessary.

Connection Type

The resin column has the following connections

- Inlet and outlet 1.5" tri-clamp
- A bleed valve is located on the top of the resin column (in the column head).

Chemical pre-mix (please use necessary protection)

Mix up the water & caustic solution as follows:

8" diameter resin column : 12 gallons water with 6 pounds caustic potash

14" diameter resin column : 25 gallons water with 12.5 pounds caustic potash

Your resin column diameter is written on the lower part of the column in the form of 844 or 1447 etc. The first 2 numbers are the vessel diameter size in inches.

Prior to Use (of after prolonged storage)

1. Connect a water line to the fitting on the "INLET" line
2. Connect a drain line to the fitting on the "OUTLET" line
3. Make sure the bleeder valve is closed
4. Open the water line to the column
5. After a minute, water should be seen flowing from the OUTLET water line

6. Open the bleeder valve (air will be heard escaping) until water escapes through the valve.
7. Smell the water for “off” odors, if any strange odors are detected, regenerate the system.

Regeneration

Regeneration is made up of 3 stages: *Rinsing with water, pumping in the caustic potash solution and rinsing again with water for 20 minutes (HPH resin) or to a final pH of 10.5 (VA resin).* This is carried out as follows:

1. Connect the water line to the INLET tri-clamp connection on the column
2. Open the water line to the column
3. After a minute, water should be seen flowing from the outlet line
4. Open the bleeder valve (air will be heard escaping) until water escapes through the top of valve. Close the valve.
5. Rinse for 10 minutes
6. Position your 6% caustic potash solution near the column
7. Using the pump provided, pump the pre-mixed caustic solution through the resin column.
8. Once the caustic potash solution is empty, switch the pump off. Do not pump air into the column.
9. Add 5 gallons water to the empty caustic potash solution bucket. Switch on the regen pump and pump the water through the column for approximately 2 minutes. *This process is done mainly to flush out the pump.*
10. Disconnect the pump hose from the Column Inlet. Connect your water line to the column inlet and rinse down **for 30 minutes (HPH resin only).**
11. **For VA resin, rinse until the rinse water pH exiting the resin column is less than 10.5**
12. Purge the water out of the column with nitrogen or argon.
13. Now you are ready to start reprocessing your wine.

TROUBLESHOOTING REGENERATION OF VA RESIN

My resin column only lasted 2 hours before it was spent.

- An incomplete regeneration or incorrect caustic potash concentration was used.

Purge the column and carry out a regeneration as per the instructions above.

Regenerating the pH Correction Resin column

Your system has been supplied with a regenerable resin column for purposes of pH correction.

You will require the following for correct operation of this column:

- 1 x Water line with tri-clamp fitting
- 1 x Nitrogen gas line to tri-clamp
- 1 x bottle of nitrogen
- A 5% HCl (Hydrochloric acid/Muriatic acid) solution
- Floor drain
- Handheld pH Meter
- Chemical pump in box + 2 hoses (supplied with the column)

Safety

Please make sure you protect your eyes and lungs when mixing up any chemical solution. Safety goggles and a gas mask rated for caustic fumes are necessary.

Connection Type

The resin column has the following connections

- Inlet and outlet 1.5" tri-clamp
- A bleed valve is located on the top of the resin column (in the column head).

Chemical pre-mix (please use necessary protection)

Mix up the water & acid solution (assuming 31% HCl strength) as follows:

- 8" diameter resin column : 6 gallons water with 1 gallon acid
- 12" diameter resin column : 20 gallons water with 4 gallons acid
- 14" diameter resin column : 25 gallons water with 5 gallons acid

Your resin column diameter is written on the lower part of the column in the form of 844 or 1447 etc. The first 2 numbers are the vessel diameter size in inches.

Prior to Use (of after prolonged storage)

- i. Connect a water line to the fitting on the “INLET” line
- ii. Connect a drain line to the fitting on the “OUTLET” line
- iii. Make sure the bleeder valve is closed
- iv. Open the water line to the column
- v. After a minute, water should be seen flowing from the OUTLET water line
- vi. Open the bleeder valve (air will be heard escaping) until water escapes through the valve.
- vii. Smell the water for “off” odors, if any strange odors are detected, regenerate the system.

Regeneration

Regeneration is made up of 3 stages: *Rinsing with water, pumping in the acid solution and rinsing again with water for 20 minutes.* This is carried out as follows:

- i. Connect the water line to the INLET tri-clamp connection on the column
- ii. Open the water line to the column
- iii. After a minute, water should be seen flowing from the outlet line
- iv. Open the bleeder valve (air will be heard escaping) until water escapes through the top of valve. Close the valve.
- v. Rinse for 10 minutes
- vi. Position your 5% acid solution near the column
- vii. Using the pump provided, pump the pre-mixed solution through the resin column.
- viii. Once the solution is empty, switch the pump off. Do not pump air into the column.
- ix. Add 5 gallons water to the empty solution bucket. Switch on the regen pump and pump the water through the column for approximately 2 minutes. *This process is done mainly to flush out the pump.*
- x. Disconnect the pump hose from the Column **Inlet**. Connect your water line to the column **inlet** and rinse down **for 20 minutes.**
- xi. Purge the water out of the column with nitrogen or argon.
- xii. Now you are ready to start reprocessing your wine.

TROUBLESHOOTING REGENERATION OF pH CORRECTION RESIN

My resin column only lasted 2 hours before it was spent.

- An incomplete regeneration or incorrect acid concentration was used. Purge the column and carry out a regeneration as per the instructions above.