CAPNA SYSTEMS
“ATLES”
ETHANOL EXTRACTION SYSTEM

OPERATOR INTERFACE
USER MANUAL
V1.01 - 6.13.19

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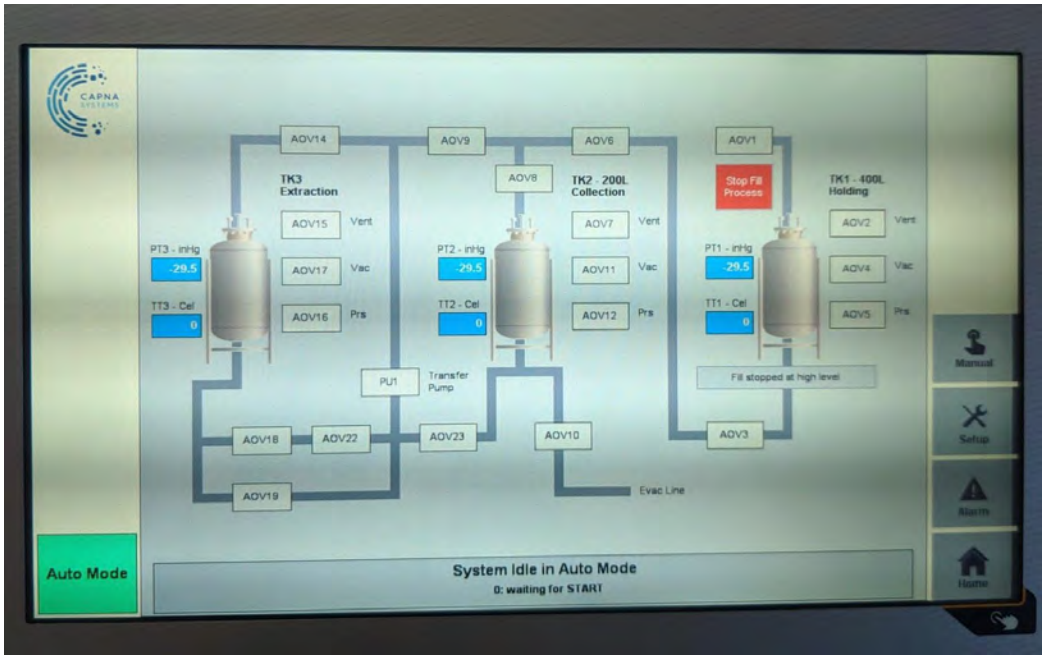


The **Home Screen** is the default screen on boot-up, so this will always be the first screen you see. From this screen you are able to see an overview of the piping and process status.

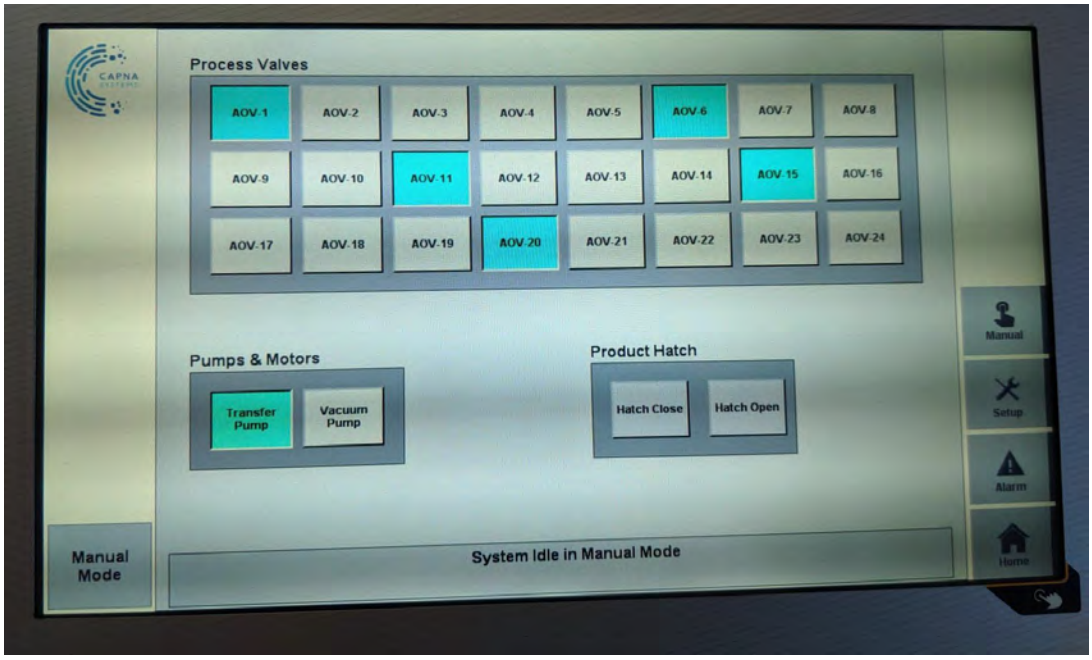
- Valve Status : Off = White, On= Green
- Pump Status : Off = White, On= Green
- Temperature Status : Displayed in real-time in the blue numeric box.
- Pressure Status : Displayed in real-time in the blue numeric box.
- Tank 1 Fill Status : Displayed when the fill process is active, below Tank 1.

The **Global Objects** are seen on this screen and all other screens, they will only be covered in this section.

- Auto/Manual Mode Button : Manual = Gray, Auto = Green

  Note : in Manual, you will be able to manipulate all of the pumps and devices without the provision of the control logic monitoring the process.

- System Banner : this will display the overall status of the system and explain what is currently happening during the automatic process.
- Navigation Buttons : Home, Alarms, Manual, Setup, use these buttons to navigate directly to the desired screen from any other page.

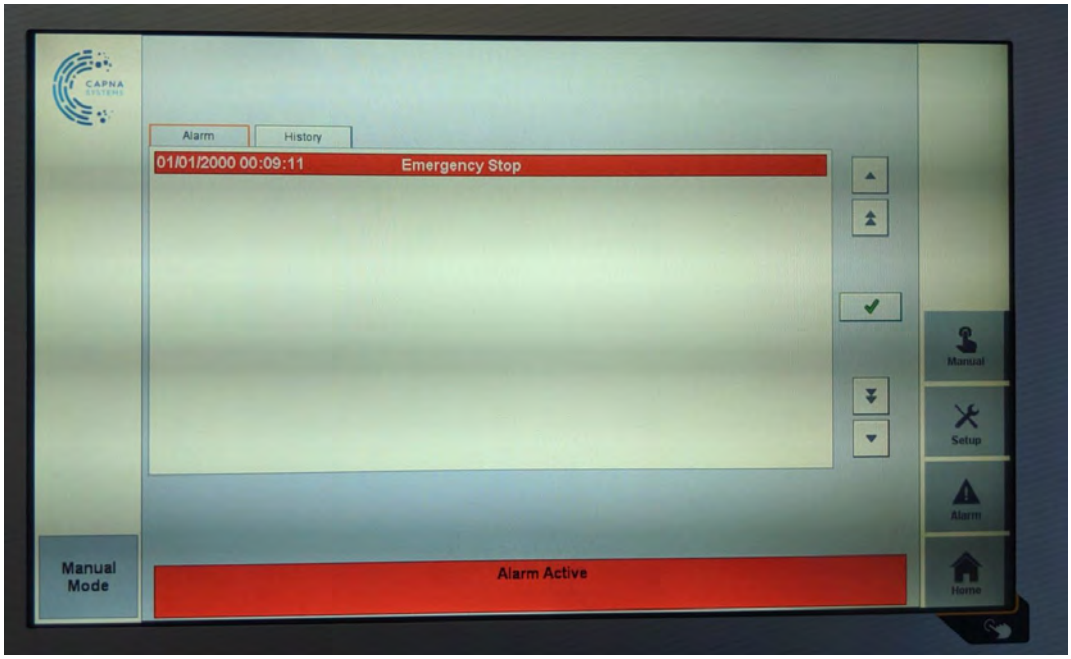


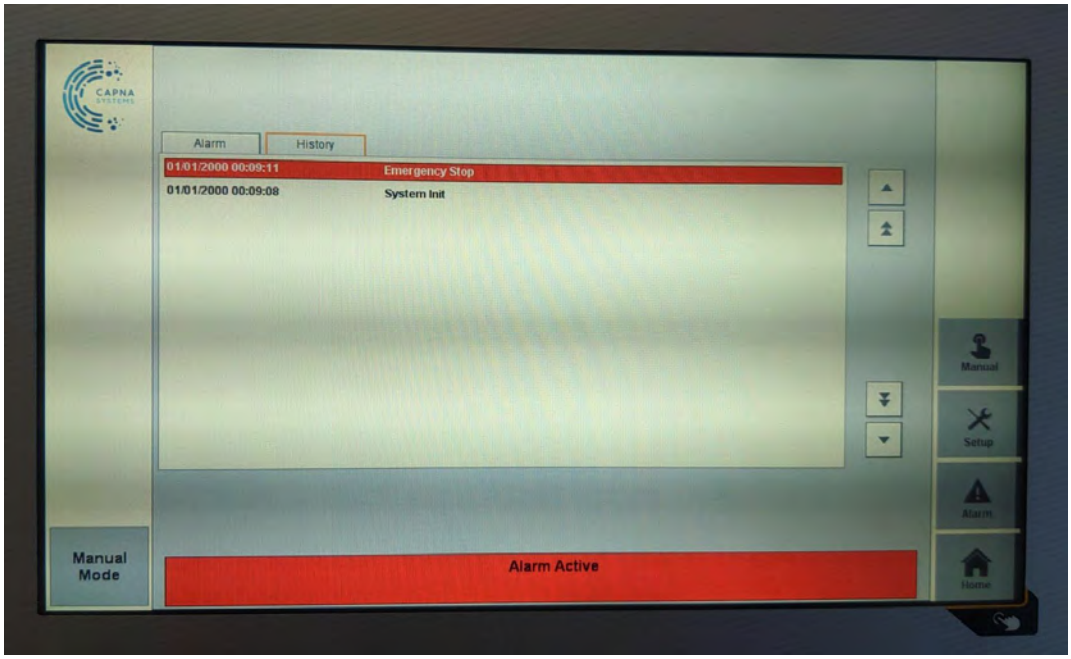
The **Manual Screen** is only available in Manual Mode, so in order to use this screen check that the system is in Manual Mode on the bottom left hand side of the screen. From this screen you can manually manipulate all devices. Press the desired output to toggle it on/off. This is mostly used for troubleshooting or maintenance purposes.

- Output Button : Off = White, On= Green
- When an output is left on and the system is switched from Manual Mode to Auto Mode, all outputs are turned off.
- All alarms such as overpressure, emergency stop, etc. are still being actively monitored in Manual Mode for your safety.

The **Product Hatch** controls are also located in the manual screen. In order to operate the product hatch the safety door must be closed and the system in Manual Mode.

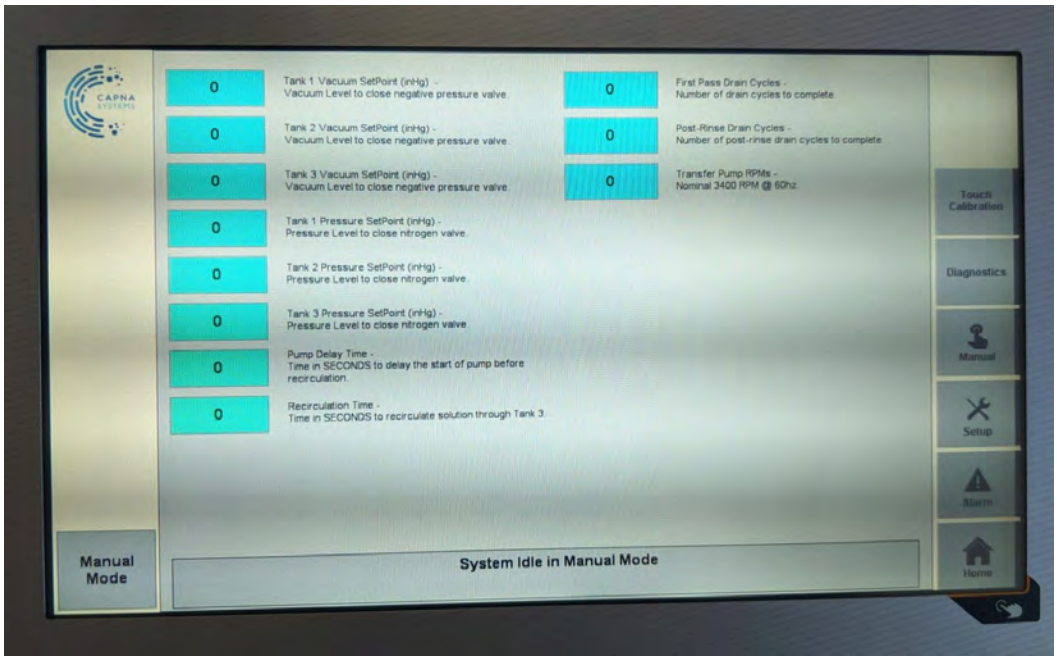
- Press and hold **Hatch Open** button for 3 seconds to initiate the hatch opening process. The hatch lock will release, followed by the hatch door. When the hatch opening process is complete, it is safe to open the door.
- Press and hold the **Hatch Closed** button for 3 seconds to initiate the hatch closing process. The hatch door will close, followed by the hatch lock. When the hatch closing process is complete, it is safe to start the process.





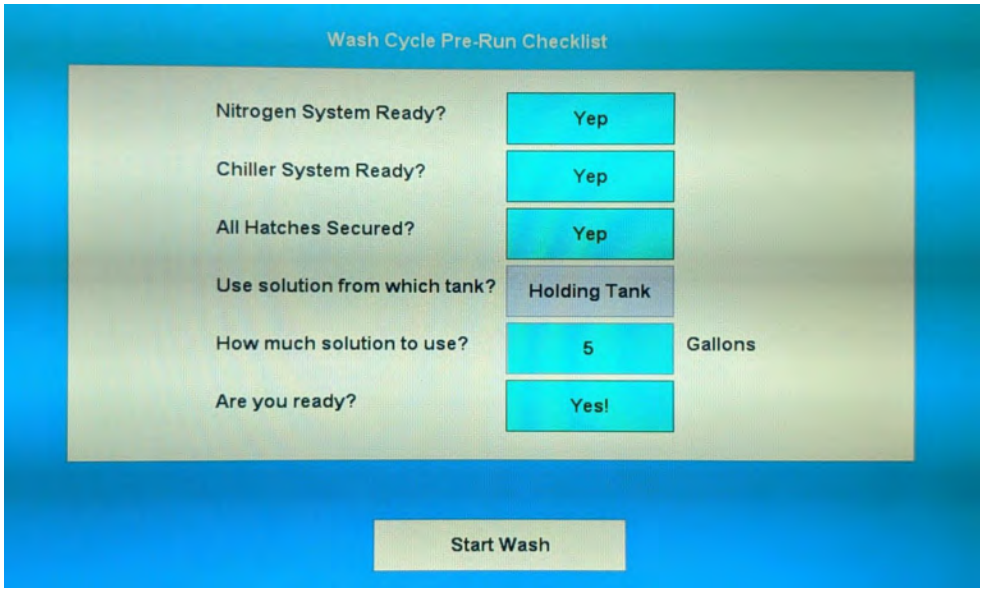
The **Alarm Screen** displays all active and past alarms.If the system stops for an alarm, you can go to this screen to see what the system has stopped for in order to correct the alarm condition.

- Alarm Tab : displays current alarms, these are the alarms that are actively putting the system into a alarm condition.
- History Tab : displays all past alarms, along with the time and date they were triggered. This is good for troubleshooting to determine a nuisance alarm that may be appearing more and more over time.



The **Setup Screen** is for adjusting process parameters used in the automatic cycles. These can be adjusted while running but it is recommended to set these parameters prior to starting an automatic cycle.

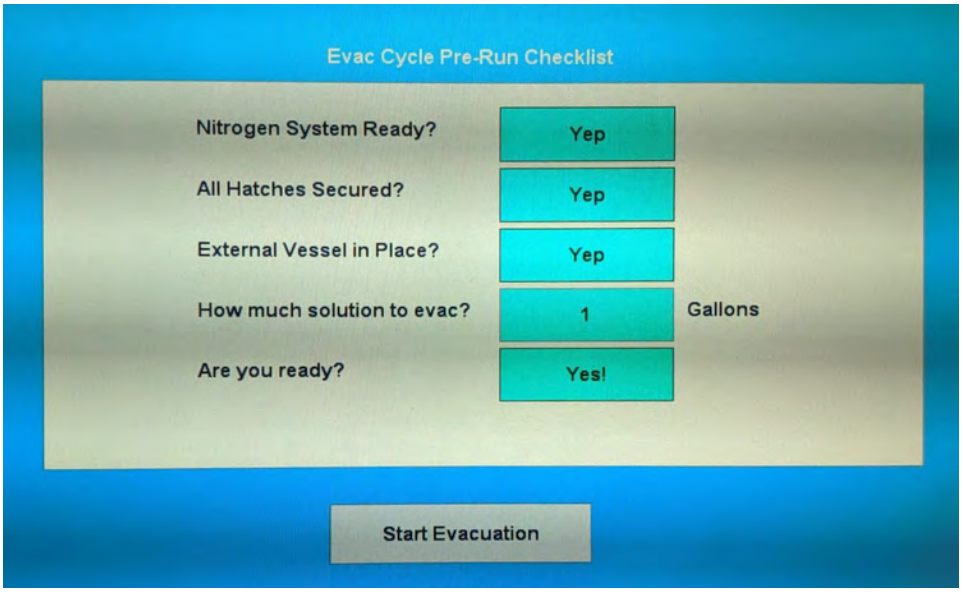
- **Vacuum Setpoint (inHg)** - parameter is for shutting the vacuum valve to each tank. When this setpoint is reached, the inlet valve closes and the system will attempt to maintain this level by modulating the valve as needed.
- **Pressure Setpoint (inHg)** - parameter is for shutting the liquid No2 valve to each tank. When this setpoint is reached, the inlet valve closes and the system will attempt to maintain this level by modulating the valve as needed. Keep in mind the pressure will usually continue to build even after the valve is closed, so choose a setpoint lower than your desired pressure.
- **Pump Delay Time (seconds)** - parameter for delaying the start of the transfer pump prior to the recirculation cycle. This allows the solution in Tank 3 to reach the pump before starting, the goal here is make sure the pump has head pressure.
- **Recirculation Time (seconds)** - parameter for setting the duration of your recirculation cycle.
- **First Pass Drain Cycles** - parameter for setting the number of drain cycles to complete after the recirculation cycle is complete.
- **Post Rinse Drain Cycles** - parameter for setting the number of drain cycles to complete after the rinse cycle is complete.
- **Transfer Pump (RPMs)** - parameter for setting the rotational speed of the transfer pump. The default setting is 3400 RPMs, which is the nominal 60Hz on the pump motor. Only adjust this setting if advised by a Capna Technician.



Once the green start button is depressed, it will pop up a message asking which type of cycle you want to run, Wash or Evacuation. After you choose the cycle type, you will be lead to either the **Wash Cycle Screen** or the **Evacuation Cycle Screen**.

The **Wash Cycle Screen** is for adjusting wash parameters used in the automatic cycle you have just initiated and checking that all external conditions are ready.

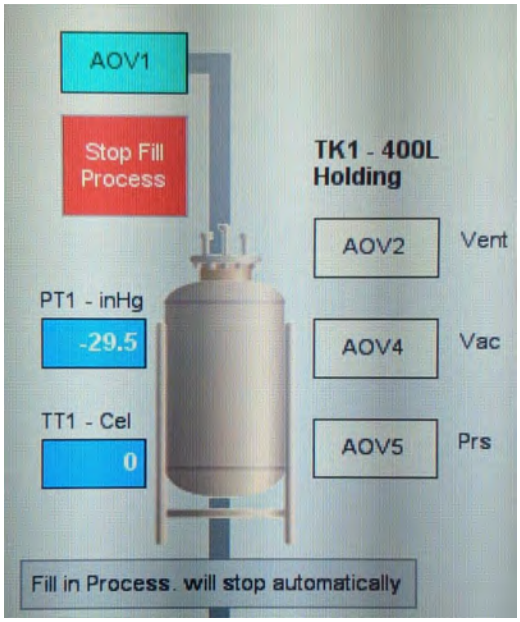
- **Nitrogen System Ready** - confirm that the nitrogen tank is filled and open, also check the connections from the tank to the inlet on the ATLES system.
- **Chiller System Ready** - confirm that the chiller system is powered on and is actively cooling to the desired temperature, also check the connections from the chiller to the inlet on the ATLES system.
- **All Hatches Secured** - confirm that the viewports and hatches on all three tanks are closed and locked.
- **Use Solution from Which Tank** - toggle to change from the Holding Tank (tank 1) to the Collection Tank (tank 2). You are selecting which solution you would like to use for the wash cycle.
- **How much Solution to Use** - select how much solution you would like to use from the tank selected in the previous parameter. This will automatically adjust the timers for transfer so there will be minimal setup required for using the amount of solution you need.
- **Are You Ready** - confirm that you are ready to start the process, you have verified all the above parameters.
- **Start Wash** - when all the parameters are set and all the checks are made, the Start Wash button will appear. This button will immediately start the wash cycle and return you back to the **Home Screen**.

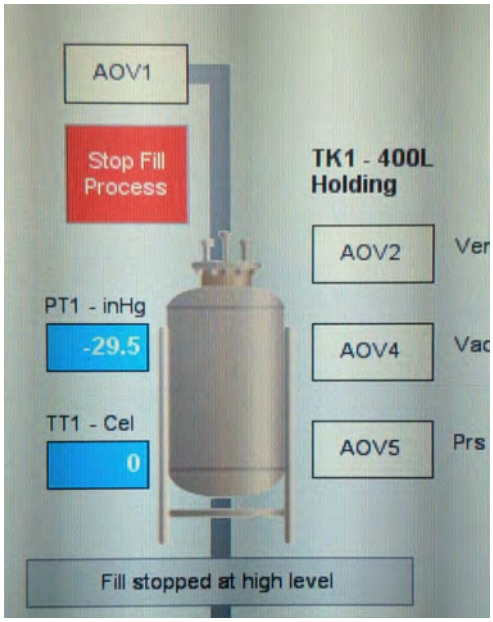


Once the green start button is depressed, it will pop up a message asking which type of cycle you want to run, Wash or Evacuation. After you choose the cycle type, you will be lead to either the **Wash Cycle Screen** or the **Evacuation Cycle Screen**.

The **Evac Cycle Screen** is for adjusting wash parameters used in the automatic cycle you have just initiated and checking that all external conditions are ready.

- **Nitrogen System Ready** - confirm that the nitrogen tank is filled and open, also check the connections from the tank to the inlet on the ATLES system.
- **All Hatches Secured** - confirm that the viewports and hatches on all three tanks are closed and locked.
- **All Hatches Secured** - confirm that there is an external vessel in place to accept the evacuated solution from the system. Also confirm that the vessel has is large enough to handle the volume to be evacuated.
- **How much Solution to Evac**- select how much solution you would like to evacuate from the Collection Tank (tank 2). This will automatically adjust the timers for transfer so there will be minimal setup required. If you are unsure, use a higher number than you think is in the vessel to ensure complete evacuation.
- **Are You Ready** - confirm that you are ready to start the process, you have verified all the above parameters.
- **Start Evacuation**- when all the parameters are set and all the checks are made, the Start Evacuation button will appear. This button will immediately start the evacuation cycle and return you back to the **Home Screen**.





To fill the Holding Tank (tank 1), the system needs to be in automatic mode. The fill process can be done while the system is idle or running an automatic cycle.

Once in auto, there is green **Start Fill Process** button next to holding tank on the Home Screen. Press this button to initiate the fill process and a banner will be displayed below the tank indicating the status of the process.

- **Fill Process will stop automatically** - the fill process is active, the tank will build vacuum, then open the inlet valve to start filling.
- **Fill stopped by another process** - the fill process is paused, the holding tank was needed during a step in the automatic process and is not available to run the fill process. When the automatic process no longer needs the holding tank the fill process will resume.
- **Fill stopped at high level** - the fill process is stopped, the ultrasonic level sensor has detected that the tank is full and will stop the fill process.

The fill process can be stopped at any time by the operator, either by pressing the **Stop Fill Process** button on the Home Screen or by pressing the red stop pushbutton.

Auto Mode, Wash Cycle Operation

1. Place biomass material into the top hatch of extraction tank (tank 3), note the amount of biomass as this will determine the amount of solution that is used.
2. Close the top hatch on the extraction tank (tank 3), be sure to center the hatch and always check the integrity of the o-ring.
3. Close the safety door.
4. Reset the system and wait for all alarm conditions to clear, the green stacklight will be solid green and the green push button will blink.
5. Press the green push button, this will bring up the selections referenced on page 6, once all the parameters are set, press the Start Wash button on the screen.
6. The process is 100% automated from this point on. The system will stop when the cycle is completed and ask that you press the red push button to confirm the cycle is done.
7. Press the Emergency-Stop prior to entering the lower hatch area of the extraction tank (tank 3).
8. Place bag cart under the extraction tank (tank 3).
9. At rear of machine, unlock and release latch 3 and latch 4.
10. At front of machine, unlock and release latch 1 and latch 2.
11. The hatch is now free to open under its own weight. The air spring on the hatch will allow the hatch to open gently and drop the biomass bag onto the cart below.
12. With the cart clear, press the air assist hand switch located on the left side of the hatch area. This will assist the closing of the hatch. If at anytime there is a need to stop this process simply release the hand switch and the hatch will revert to open.
13. Once the hatch is snugly against the sealing ring, engage and lock latch 2. Release the air assist switch, engage and lock latch 1.
14. At rear of machine, engage and lock latch 3 and latch 4.
15. Reset the system and wait for all alarm conditions to clear, the green stacklight will be solid green.
16. Once the cart has been cleared it can be placed back under the extraction tank (tank 3) and the process can now be repeated.

Auto Mode, Evacuation Cycle Operation

1. Place external vessel near the evacuation outlet and connect all necessary sanitary fittings to insure point to point transfer of the solution is leak-free.

2. Press the green push button, this will bring up the selections referenced on page 7, once all the parameters are set, press the **Start Evacuation** button on the screen.

3. The process is 100% automated from this point on. The amount of solution requested for evacuation will now be transferred from the collection tank (tank 2) to the customer provided external vessel. The system will stop when the cycle is completed and ask that you press the red push button to confirm the cycle is done.

   NOTE : If at any point during the process you need to stop the evacuation to swap out the external vessel, simply press the red pushbutton to stop the cycle. To restart the cycle repeat steps starting with #2.

Cycle Stop and General Stop

For all non-emergency stops during automatic and manual operations, press the red pushbutton.

In Automatic Mode, a cycle stop will occur. The system will complete any active transfers of solution then come to a controlled stop and will return to idle. You will be able to pick up where you left off from a Cycle Stop simply by selecting Recovery instead of Wash or Evac on the cycle select screen.

In Manual Mode, a General Stop will occur. All outputs will deactivate and the system will return to idle.

Emergency Stop and Door Sensor

For all emergency situations, press the red emergency-stop button located on the control panel. Use this ONLY in emergency situations where the operator and/or system are in danger.

In Automatic Mode or Manual Mode, an emergency-stop will deactivate all outputs and release the potential air in the valves via a dump valve located prior to the valve-bank. This will remove all potential energy from the system. You will not be be able to automatically recover from an emergency stop, all current processes are stopped and the system will not have a memory of where the stop occurred.

It is advised to manually move the solution back to a good starting point that you are comfortable with and restart the automatic cycle.

Alarm Recovery

If the system stops for an alarm condition, the operator must reset the alarm by pressing white push button. This will accomplish two things; resetting the alarm in the software and resetting the safety relay hardware if it was tripped by an emergency stop or door sensor.

The status of the safety relay is indicated by the white push button light. If the light is active, the relay status is OK. If the light is inactive, the relay status is TRIPPED.