GO fermentor™
A REVOLUTION IN WINEMAKING

Professional winemaking for the serious enthusiast and microvinification researcher. Make wine using real grapes instead of juice for award-winning results. Advanced technology eliminates all the mess and cleaning. Completely self-contained. Does not require a press.

GOFERMENTOR JR MANUAL REV3

Revision 4.1, 01/19/23

www.GOfermentorJR.com

CONTENTS

WHAT IS THE GOFERMENTOR?

The GOfermentor, developed in 2014, is a revolutionary device for winemaking. Traditional winemaking fermentors have changed little in the last 500 years - the only major change being the move from open wood vats to temperature controlled stainless-steel tanks. The GOfermentor brings 21st century technology, developed originally for the manufacture of pharmaceuticals, to modern winemaking. This technology dramatically reduces the capital and operating cost for a winery. No significant installation is necessary – a fermentation system can be set up within minutes in any suitable room. No cleaning is required which dramatically reduces labor requirements. No waste water treatment is needed as the process uses essentially no wash water. And, finally, the GOfermentor provides better control of fermentation parameters, minimal exposure to air, automated punch and built-in press. You can read about it on our website www.GOfermentor JR.com.

GOFERMENTOR JR

The GOfermentor JR is the home version of our revolutionary winemaking technology. The GOfermentor is used for commercial wineries with an operating capacity of up to 1 ton grapes per batch. The GOfermentor JR uses the same technology, but in a compact inexpensive format with a capacity up to 110lb grapes (5 to 7 gallons of wine).

COMPONENTS

The following components are included (see Appendix 2 for details):

1. Electronic controller with power cord.
2. Perforated sampling /pressing tube with pressure relief cap
3. Segmented 2inch TriClamp and gasket
4. Black reusable rubber inflatable bellows (3) with bottom plate
5. Harvest tubing with fitting
6. Inflation/deflation manifold tubing
7. 3x 3/8-inch hose crimps to connect bellows to inflation manifold
8. U-bolt clamp
9. 2-inch hose clamp to close fermentation liner
10. Plastic 30-gallon drum outer container with clear cover plate, reinforcement hoop and locking clamp.

OPTIONAL

GOfermentor hand operated sampler

DISPOSABLES

GOliner JR single-use fermentation liners

YOU WILL NEED TO PROVIDE

Wine Grapes (50 to 110 lbs). Fresh or frozen.
Yeast and additives and some laboratory gear
Wine collection and aging vessels
Inexpensive wine transfer pump (essential for good press yields)

These can be obtained from various online suppliers. Some sources are provided in Appendix 4.

INITIAL EQUIPMENT SETUP

Scan this QR code to see the setup video

SETTING UP

1. All components are shipped packed inside the blue plastic drum. Open the lid clamp and remove the lid and reinforcement hoop. Peel the protective films off both sides so they are clear. Remove all the components inside.

2. **Power up the controller and setup the WiFi connection (Appendix 1).**

3. Place the 3 black reusable rubber bellows in the drum. The bottom of each bellow has a grommet. There is a short length of string that connects this grommet to the circular bottom plate. Verify that each of the three bellows is secured to the bottom plate. Place the bottom plate inside the drum. With the bellows inside, hook the inlet tube on each bellow into the corresponding hole in the drum. Drape the top of each bellow over the edge of the drum. This will make it easier to fill the fermentation liner.

4. Connect the circular plastic pressurization manifold tubing on the outside of the drum to each of the 3 bellow inlet tubes as shown. The small hose crimps are necessary to prevent the fitting from slipping off under pressure. A pliers should be used to compress. The crimps are reusable and can be removed by using pliers to push sideways and separate the teeth.

5. Push **the open** end of the perforated metal tube onto the plastic head securely.

6. Place a new fermentation liner inside the rubber bellows. Drape the open end of the fermentation liner over the lip of the drum. That's it! You are now ready to fill the fermentation liner with grapes.

FILLING THE FERMENTOR LINER

Fill the fermentation liner with grapes. You can use crushed grapes, or whole destemmed grapes. **Do not use whole clusters.** For white wines you can use juice. We do not recommend the use of grape concentrate for red wine– after all – the purpose of the GOfermentor is to make real wine from real grapes, not bogus concentrates.

You can put in 50 to 110 lbs of grapes. You can crush the grapes in the liner by pounding them with a suitable tool such as a 2x4. Or you can go use the punch mechanism as described later.

Now take a sample and measure pH etc. Make any nutrient additions or pH adjustments. You can mix these into the *must* using a stirring paddle. If you are new to winemaking read some of the books in Appendix 3.

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CLOSING THE LINER

Once the grapes and additions are in, twist the open end of the liner to seal it off. Use duct tape to hold it closed and to protect the liner from accidental puncture from the hose clamp. Then, slip on the supplied hose clamp and tighten securely. Put some duct tape over the hose clamp so it cannot puncture the liner.

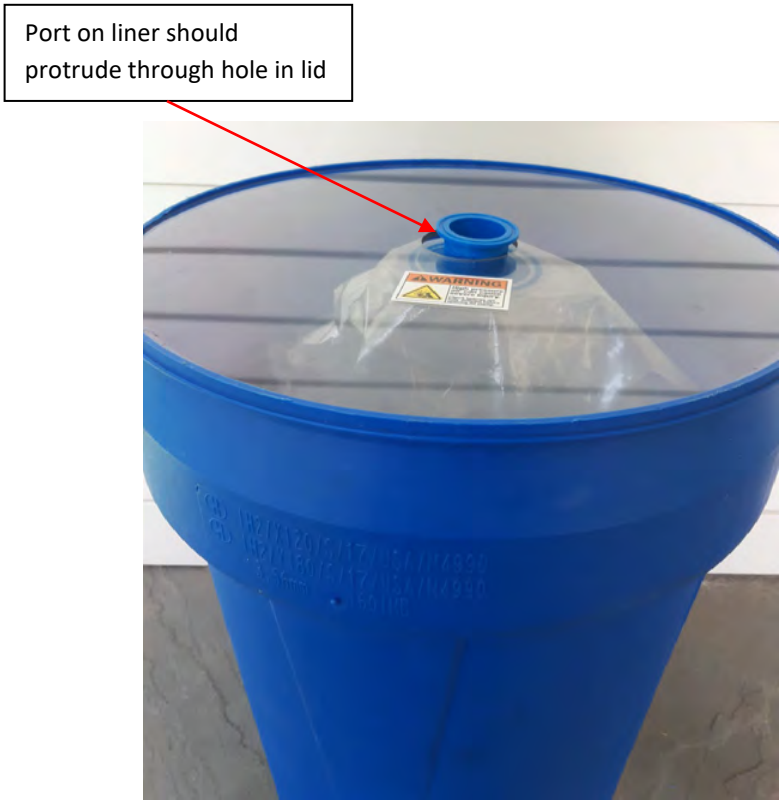
IMPORTANT Use a ratcheting wrench or nut-driver to securely tighten the hose, otherwise you may have leakage.

IMPORTANT Put some duct type tape on top of the hose clamp to make sure it does not chafe and puncture the liner or bellows.

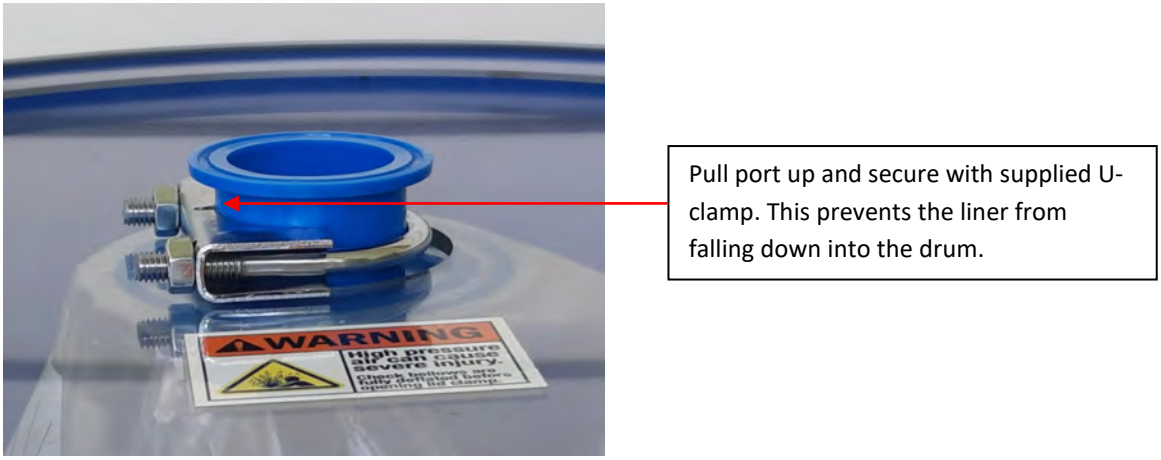
From now on all operations will be done through the 2-inch TriClamp port on the liner.

CLOSE THE LID

1. Push the top edges of the rubber bellows towards the interior of the drum.
2. Place the clear lid on the drum. Make sure that the 2 inch top port protrudes through the central hole in the lid:



3. Pull the liner port so that the liner port is flush with the lid, and secure using the U-bolt clamp so that it is held up.



4. Lastly, place reinforcement hoop on top of lid and secure with locking clamp.

During fermentation, and especially during pressing, the system can build up to 2+ psig pressure. IT IS CRITICAL THAT THE LID IS FASTENED SECURELY WITH REINFORCEMENT HOOP AND THE DRUM CLAMP AS SHOWN:

Locking tab rotates downwards and locks

Handle should fold against the drum edge

Clamp should be flush all around the drum edge

MAKE SURE THE CLAMP IS PLACED IN THE CORRECT ORIENTATION AND THE LOCKING TAB MUST LOCK DOWNWARDS (OTHERWISE LID CLAMP IS PLACED UPSIDE DOWN AND WILL NOT LOCK CORRECTLY). MAKE SURE THE LOCKING TAB IS FULLY ENGAGED.

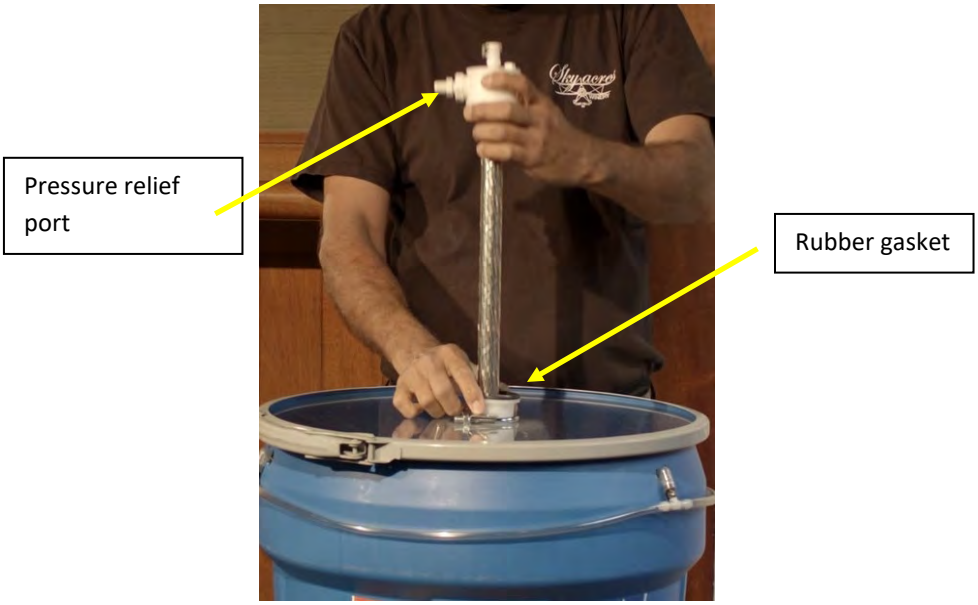
When in the correct position, the reinforcement hoop will overlap the blue drum's circumference.

Reinforcement hoop in position and clamp correctly secured.

FAILURE TO SECURE THE CLAMP WITH REINFORCEMENT HOOP CORRECTLY MAY CAUSE DAMAGE OR INJURY. WE ARE NOT LIABLE FOR ANY DAMAGE OR PERSONAL INJURY CAUSED BY THE FAILURE TO SECURE THE LID CORRECTLY PER THESE INSTRUCTIONS. If you have any questions about how to secure the lid, please contact us for assistance.

ATTACH THE SAMPLING/PRESSING TUBE

1. Put the rubber TriClamp gasket on the 2 inch port.
2. Insert the stainless-steel sampling/pressing tube though the port into the must.
3. Use the supplied stainless-steel TriClamp to secure the tube to the liner port.
4. Verify that the pressure relief valve is firmly screwed in to the side port of the sampling/pressing tube.



CONNECT THE CONTROL UNIT

1. Place the CONTROLLER on top of the drum lid.
2. Plug the end of the pressurization manifold tubing into the connector on the front panel of the controller. You can release this plug later by pushing on the grey release button.
3. Plug the CONTROLLER in to any convenient 110 AC outlet. Press the on/off switch on the front panel to turn it on. The screen should light up and go through an initialization sequence.
4. Read the CONTROLLER OPERATION section for details on how to set up and operate the CONTROLLER.

GOFERMENTOR JR+

The GOfermentor JR+ is an advanced unit with the capability for temperature monitoring and control. The press/sample tube has a temperature probe and coolant circulation coil. It can be used to control fermentation temperature.

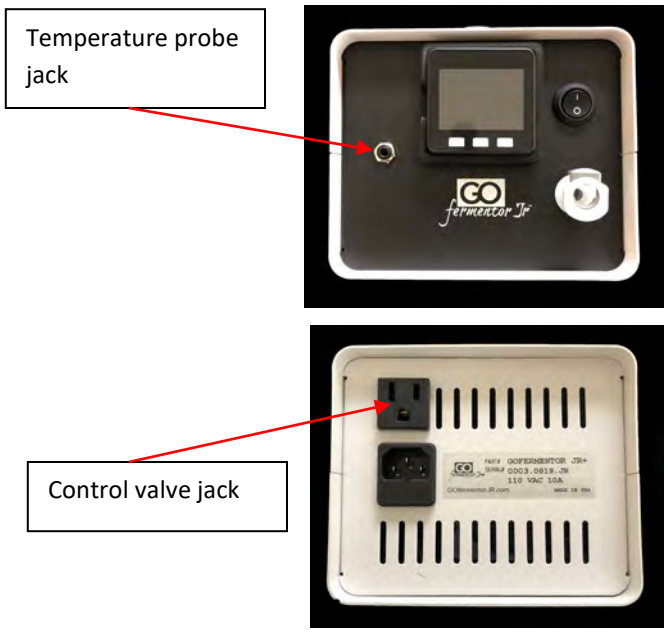
Plug the temperature probe cable on the press/sampling tube into the jack located on the front panel of the GOfermentorJR+. Connect coolant lines to the control valve or pump as shown in the diagram below. Plug the control valve or pump into the jack located on the back panel.

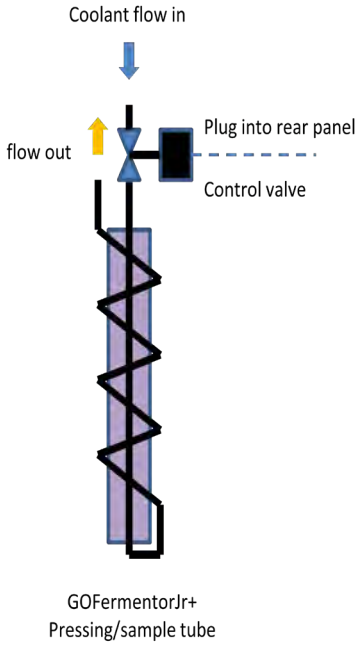
Set up the controller for temperature control. The control valve will open and close or pump will run automatically to introduce coolant into the cooling coil and maintain the desired temperature.

Setup Options:

1. Small submersible pump: pump will run when powered on by JR+ to circulate coolant in a reservoir through cooling lines.

2. Control Valve: Will open and closed when powered on by JR+ to control the flow from a pressurized coolant system.





CLEANING AFTER USE

The GOfermentor JR needs minimal cleaning. After pressing and collecting your finished wine the used fermentation liner containing the waste pomace is simply discarded and a new one used every time. The sampling/pressing tube needs to be rinsed after use. Use a 2mm hex key to remove the perforated tube from the cap as shown below:

Use 2mm hex to disconnect tube

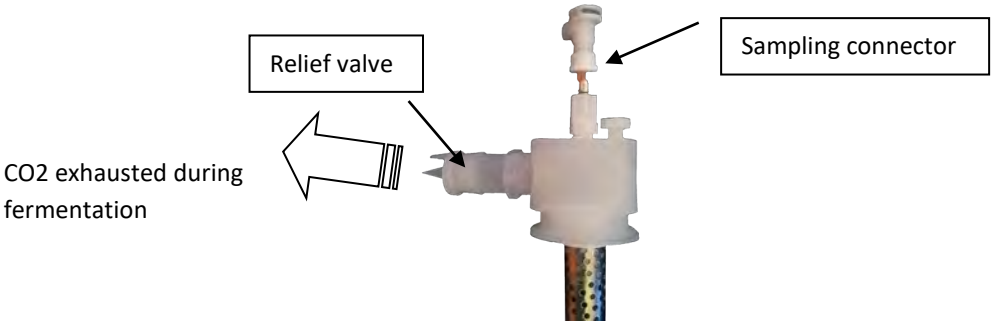
Insert the male adapter into the sampling quick connect fitting to open it facilitate washing. Wash all the components and reassemble the sampling tube.

Wipe down the bellows and drum, making sure that there is no debris that might puncture the fermentation liner or bellows.

RED WINE FERMENTATION

Prepare the yeast inoculum per manufacturer's instructions. Open the sampling/pressing tube clamp and pull it out a few inches. Using a funnel pour the yeast through the cap on to the surface of the must. DO NOT stir the yeast in. Allowing the yeast to stay on the surface will help to utilize the air entrained during fill. Yeast first utilize air to grow. When the oxygen is depleted the metabolism shifts to anaerobic and converts sugar to ethanol.

Reinsert the sampling/pressing tube and clamp firmly. The tube cap has a spring-loaded relief valve that will vent CO2 out to prevent the fermentation liner from overinflating but will prevent outside air from entering. Make sure it is screwed into the side of the cap as shown below:



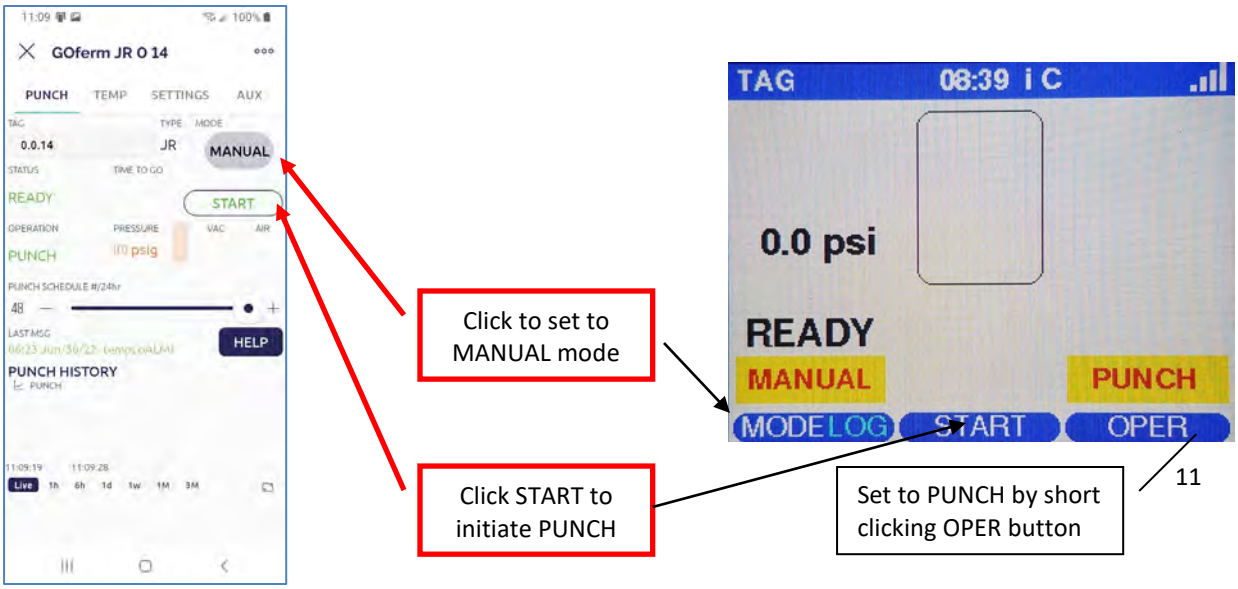
After 24 to 48 hours you will observe the liner starting to inflate. This is due to the CO2 generated by the yeast. We are now in the anaerobic phase and the yeast will produce ethanol and CO2 from the sugar in the grapes. It is also now time to start the punch-down. The punch-down will continue for the next 7 to 10 days.

PUNCHING

The GOfermentor is unique in its ability to perform automatic punch-down. The inflatable chamber is the key to this operation. The punch-down can be performed manually by pressing the START button on the App or controller. Punch can also be done automatically on a preset schedule.

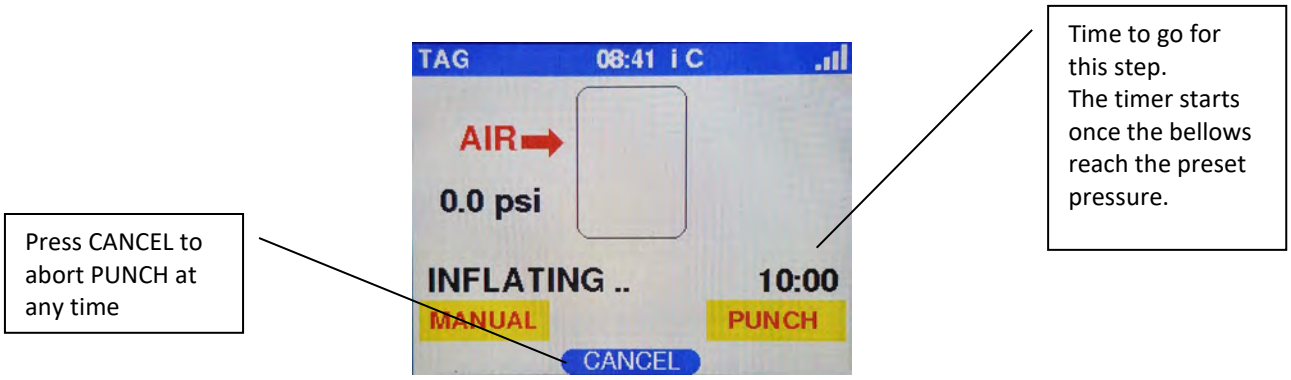
MANUAL PUNCH:

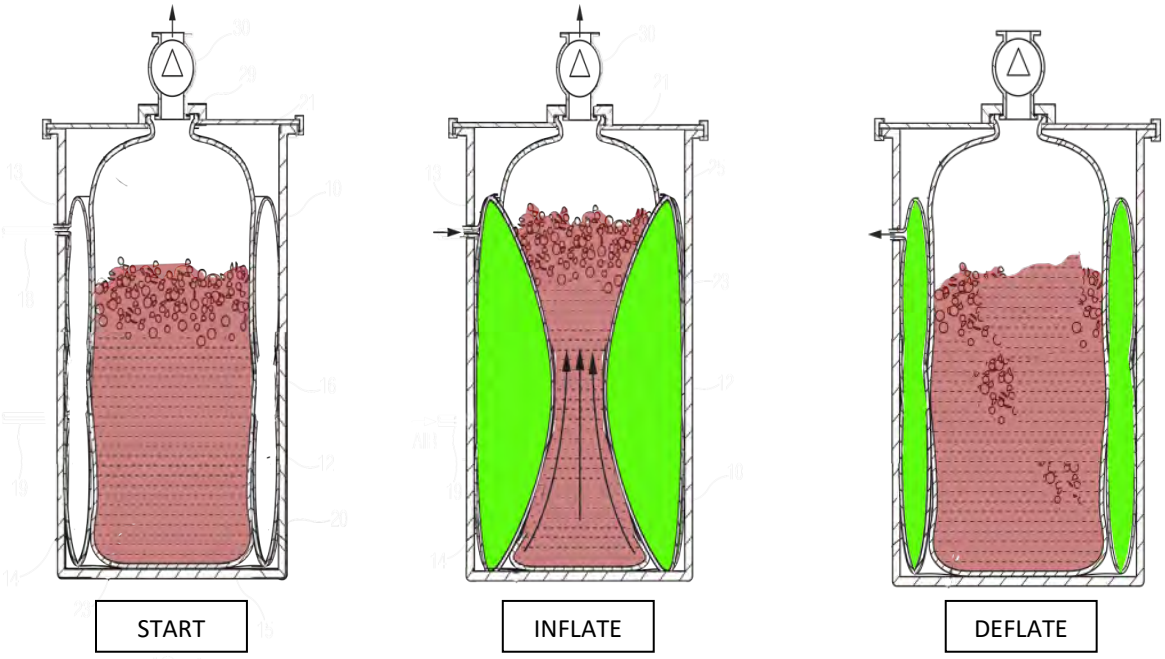
1. Select **PUNCH** operation by short clicking **OPER** button on controller until **PUNCH** is displayed above it.
2. Check mode is set to **MANUAL**.
3. Click **START** on App or controller panel.
4. The **START** button now changes to **CANCEL**. Clicking this button will cancel the punch sequence.



This will initiate the following sequence:

1. Inflate the bellows. This forces the liquid up in the liner. This wets and compresses the crust of skins and seed (the “cap”) and takes about 2 minutes.



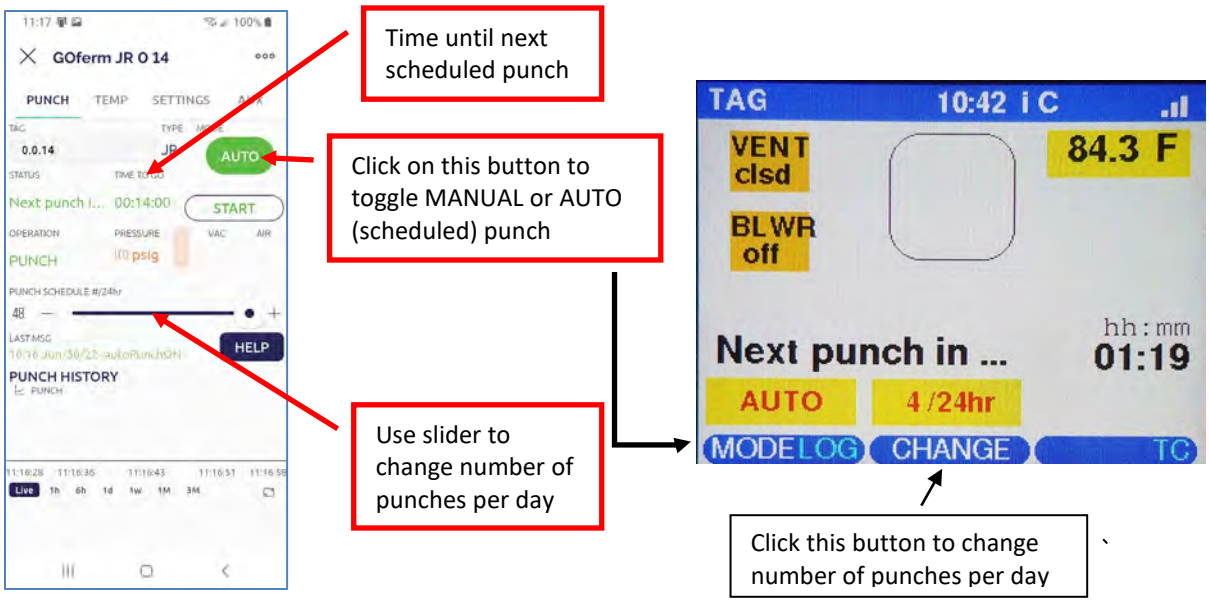


2. Then the bellow automatically deflates. This allows the liquid to return to the lower part of the liner and the” cap” to disperse. This takes 7 minutes and completes the punch cycle.

The whole punch cycle takes about 15 minutes, and progress is shown on the local control panel screen. The operation is entirely automatic and only requires initiation by selecting the PUNCH operation and then pressing the START button. Punch can be cancelled at any time by pressing the CANCEL button. The unit automatically regulates the inflation pressure to prevent over-inflation. The liquid should rise in the liner, but not overflow.

SCHEDULED PUNCH

Punching can also be done automatically on a schedule. Typically, a punch is performed every 3 to 12 hours depending on winemaker preference. This is the preferred mode as the fermentation can be left entirely unattended. The scheduled punch ensures that the punch is performed consistently.



Punches start at midnight and are then spaced at equal intervals over 24 hours. The follows table tells you the time each punch will occur. For example if you select 4 punch per day, they will occur at midnight, 6 am, noon, and 6 pm. Note that if you select say 2 punches and you set this before noon then, the first scheduled punch will happen at noon not midnight. The next at midnight and so on.

PUNCHES ->	1	2	3	4	5	6	7	8
TIME	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
		12:00	8:00	6:00	4:48	4:00	3:25	3:00
			16:00	12:00	9:36	8:00	6:51	6:00
				18:00	14:24	12:00	10:17	9:00
					19:12	16:00	13:43	12:00
						20:00	17:08	15:00
							20:34	18:00
								21:00

The number of punches per day is determined by the winemaker. The default value of 4 per day is correct for most varietals. Very tannic grapes such as Petite Syrah and Cabernet sauvignon can benefit for a more aggressive punch schedule whereas thin-skinned grapes such as Pinot noir should be punched less frequently. Note the in the

GOfermentor is it really a “punch up”, and that the grapes are gently massaged together in a manner very reminiscent of traditional foot stomping.

SAMPLING

Sampling is done by pulling liquid from inside the sampling/press tube. This done by connecting a tube to the top sample quick connect fitting as shown below:

The quick-connect opens automatically when the mating tubing connector is attached. It closes automatically when disconnected. Push the gray button to disconnect.

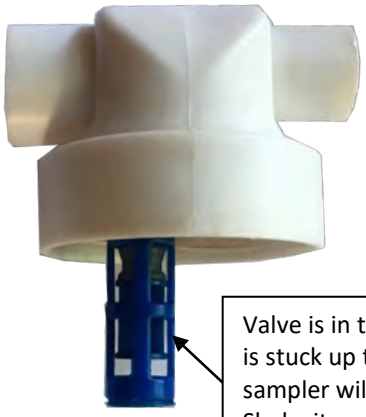
IMPORTANT Connect to the top sampling fitting ONLY when sampling. Leave it disconnected at ALL other times.

You need to pull out the sample. A mating connecter with a barbed end is provided. You can attach a short length of tubing and use a syringe to suck out a sample. For greater ease consider purchasing our GOfermentor hand sampler. This connects to the sample port and enables you to withdraw a sample with just a few hand pumps.

Note the sample is strained as it passes through the sampling/pressing tube as so is delivered free of most seed or skin debris.

HAND SAMPLER OPERATION

The GOfermentor hand sampler makes sampling easy:



Valve is in this cage. If it is stuck up then the sampler will not pump. Shake it so it moves freely up and down and stays in the down position.

If you are unable to pull up a sample, unscrew the sampling quick connector. It is likely to be clogged. Wash any debris out and screw it back on firmly. Then it should be easy to take a sample. Avoid dry-pumping the hand sampler. It will lock up and you have to free up the internal check valve.

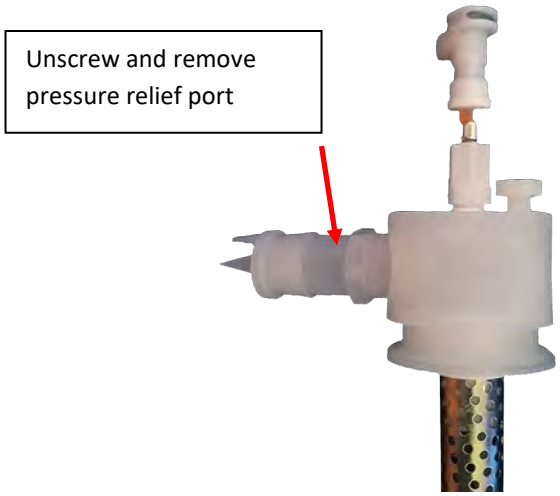
PRESSING OUT THE WINE

One of the remarkable features of the GOfermentor JR is its ability to function as a press at the end of fermentation. The fermented *must* does not need to be transferred out of the fermentor for pressing. No external press is required. The waste skins and seeds are left behind in the fermentation liner and can be easily discarded without any mess, cleaning, or handling.

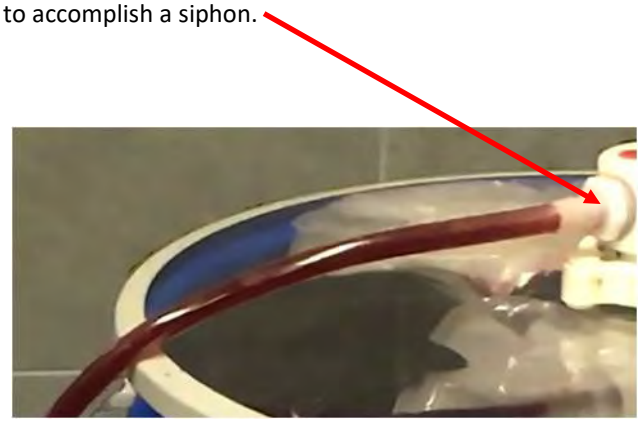
For safety reasons pressing can only be performed using the local controller panel. The App CANNOT initiate the PRESS operation.

TO PRESS OUT THE WINE:

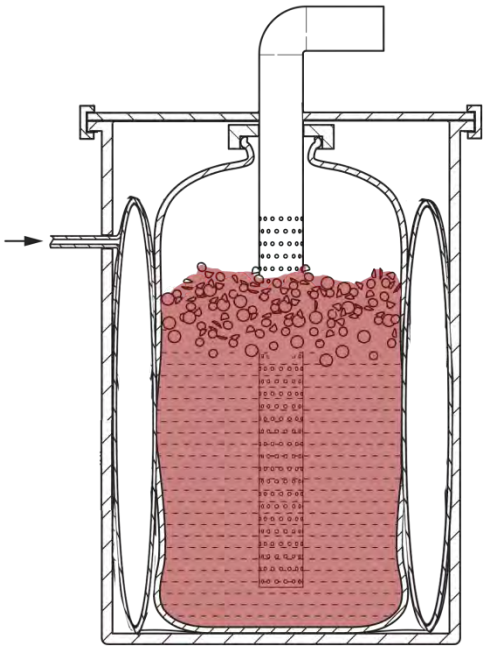
1. Remove the pressure relief by unscrewing it counter-clockwise with a wrench as shown below:

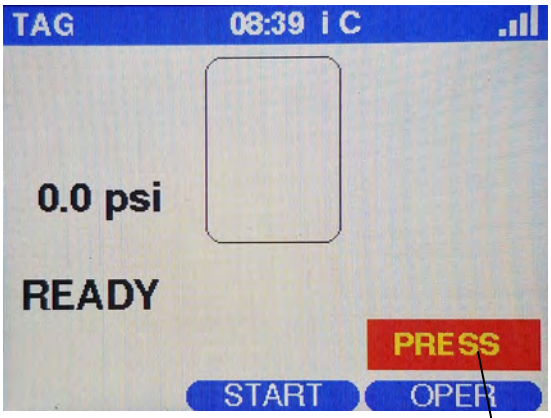


2. Screw in the harvest tubing into this port and insert the other end into a wine collection vessel. Locate this vessel below the harvest port to accomplish a siphon.



3. Use the rightmost button **OPER** to set the operation to **PRESS**.
4. To start press the middle button **– START**

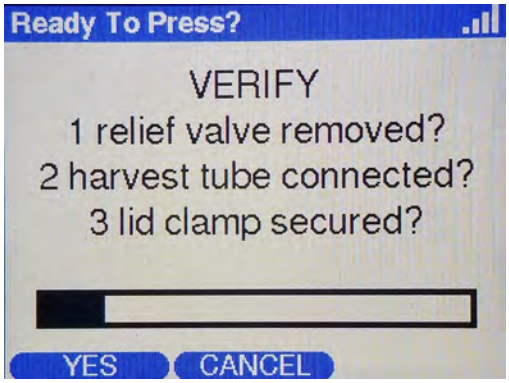




Push button to start pressing

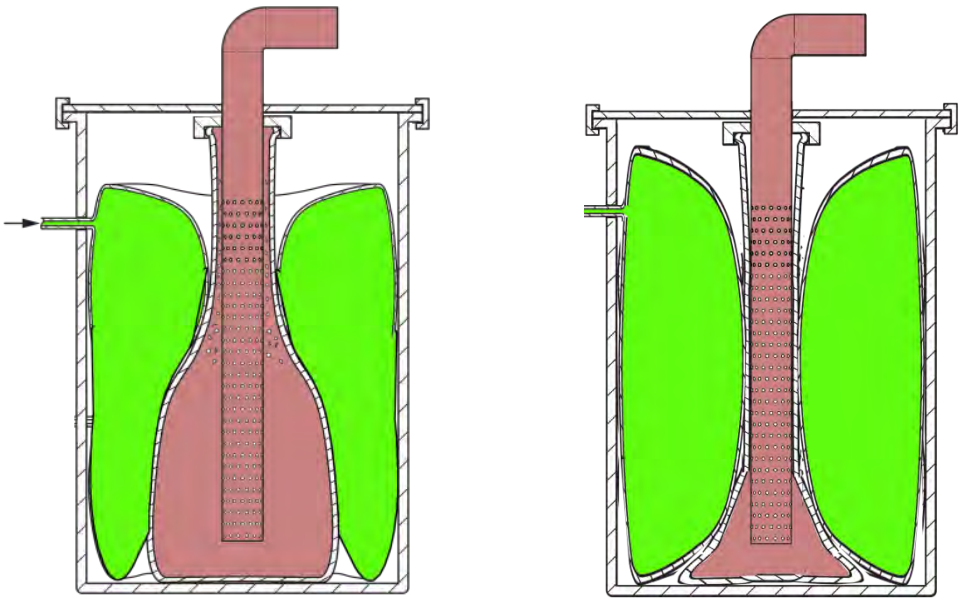
Operation set to PRESS

5. The system will ask to confirm that you want to press. Please CANCEL if you are in the PRESS by accident. Otherwise press YES.



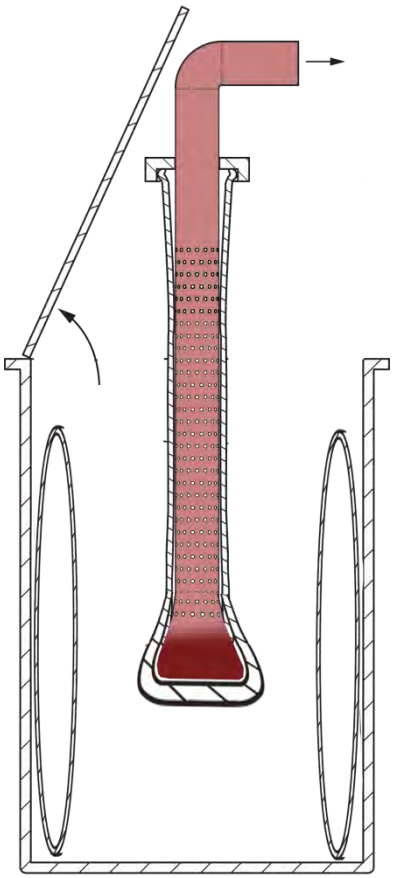
This will initiate the following automatic sequence:

1. Inflate the bellows. This pushes out any CO2 gas out of the headspace. For 3 to 5 minutes nothing will seem to happen. DO NOT PANIC – THIS IS NORMAL. As the pressure builds up, wine is forced through the perforated tube and out into the wine collection vessel. Seeds, stems, and skins are retained inside the fermentation liner. Wine will now rapidly pour into the collection vessel.



2. After 30 minutes or so the pressing is finished and the system will start to deflate.
3. To increase wine yield, perform a second pressing operation after an hour or so. This collects wine that has slowly percolated through the pomace. You can even press a third time.

4. Once wine stops flowing out of the liner, the pressing is done. However, about a gallon of wine may remaining in the sampling/pressing tube. **The extra wine is easily recovered by attaching an inexpensive self-priming wine transfer pump to the press tubing and pumping this residual wine out**.
5. THE LID SHOULD NOT BE OPENED UNTIL YOU HAVE VISUALLY VERIFIED THAT THE BELLOWS ARE DEFLATED AND NOT PUSHING UP AGAINST THE LID. Once they are deflated, the lid can be opened.
6. Remove the pressing/sampling tube and wash it for the next use.
7. Lift out the liner containing the spent pomace. The pomace can be used as compost or simply discarded in the liner. Discard the used fermentation liner.



8. Wipe out the GOfermentor drum and rubber cuff.

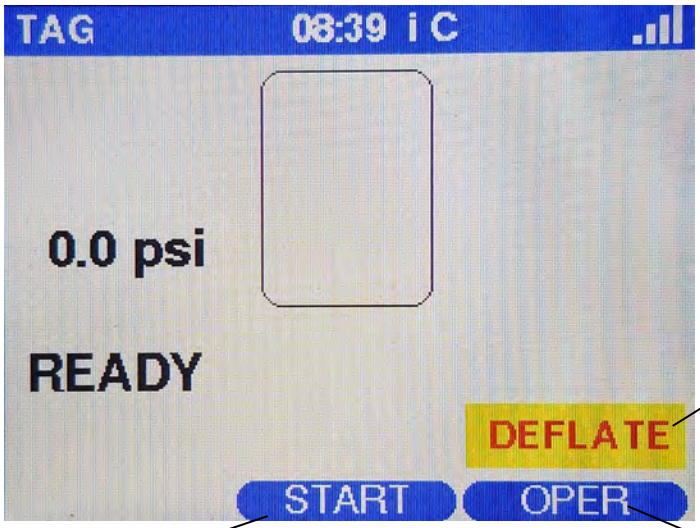
9. Take a sample of the wine you just created. Sit back, take a sip, and congratulate yourself. You just made real wine from real grapes.

10. The GOfermentor is now ready for the next batch using a new fermentation liner. No cleaning is necessary.

DEFLATION

If the punch or pressing operation is interrupted, then it is likely that the rubber bellows may remain inflated. Use the rightmost button to select the DEFLATE operation. Now press the center button and the bellows will start to deflate. The process takes about 20 to 30 minutes.

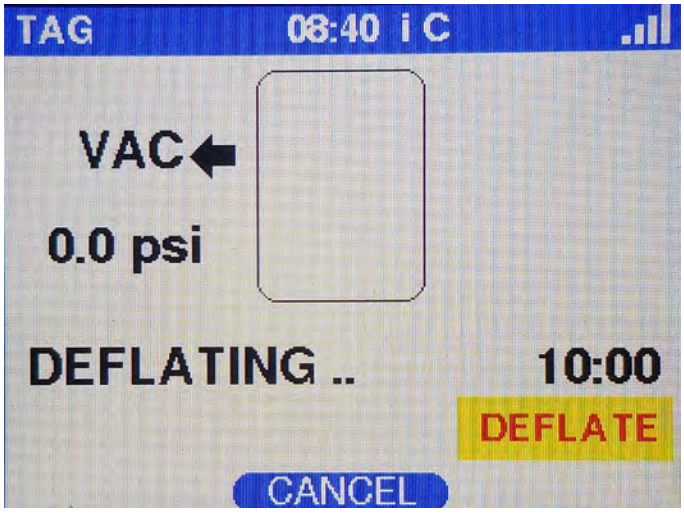
For safety reasons deflation can only be performed using the local controller panel. The App CANNOT initiate the DEFLATE operation.



OPER should be DEFLATE

Push button to select DEFLATE

Press START to begin DEFLATION

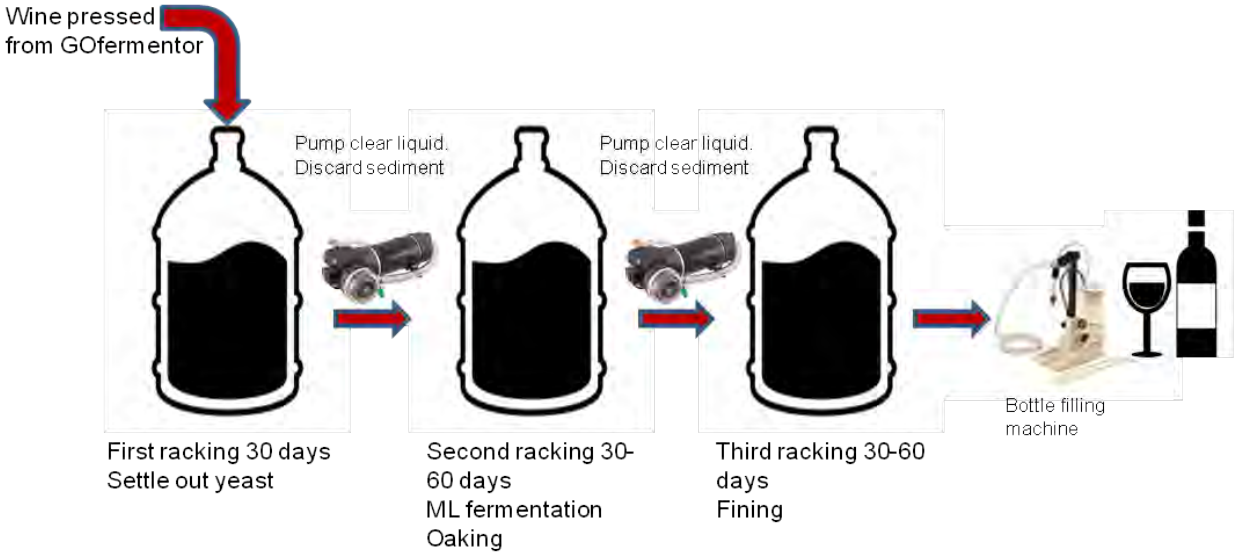


THE CLEAR LID ENABLES YOU TO CHECK IF THE BELLOWS ARE INFLATED. DO NOT ATTEMPT TO OPEN THE LID CLAMP IF THE BELLOWS ARE VISIBLY PRESSURIZED. THIS MAY CAUSE THE LID AND/OR CLAMP TO OPEN IN A VIOLENT MANNER AND MAY CAUSE DAMAGE OR INJURY. ONLY OPEN THE LID CLAMP WHEN THE BELLOWS AND FERMENTATION LINER ARE COMPLETELY DEFLATED.

AGING AND RACKING

The unique punching and pressing mechanism of the GOfermentor produces wine that is soft and fruity. You can even drink it immediately, but it is better to let it settle for a few months. Typically the new wine is kept in a container for 20 to 30 days. This allows the yeast to settle and also for malolactic fermentation to occur. It is critical that air be excluded in the step. This can be done by keeping the container completely full or by storing in a liner with no headspace.

After 20 to 30 days you perform the first racking. This is a transfer of the clear wine to another container leaving the settled yeast behind. The easiest way to perform this is to use an inexpensive wine transfer pump.



While you can use carboys and similar vessels to store the wine during racking and aging it is much easier to use GOfermentor JR aging liners. These are compatible with our SmartBarrel wine storage system and provide a safe environment for the wine with no headspace or oxidation. Look at www.GOfermentor.com/SmartBarrel for more information

WHITE WINE FERMENTATION

The GOfermentor JR can also be used to make white wine from suitable grapes. It turns what is typically a very messy, sticky process into a quick clean operation. With white wine, you need to press the grapes and collect the juice for fermentation leaving behind the skins and seeds. You use the GOfermentor JR for the pressing operation. You can use another GOfermentor JR to collect and ferment the clarified juice or any suitable fermentation vessel such as a carboy with airlock.

PREPARATION

Place the 3 rubber bellows and prepare the fermentation liner inside the rubber bellow as described for red wine.

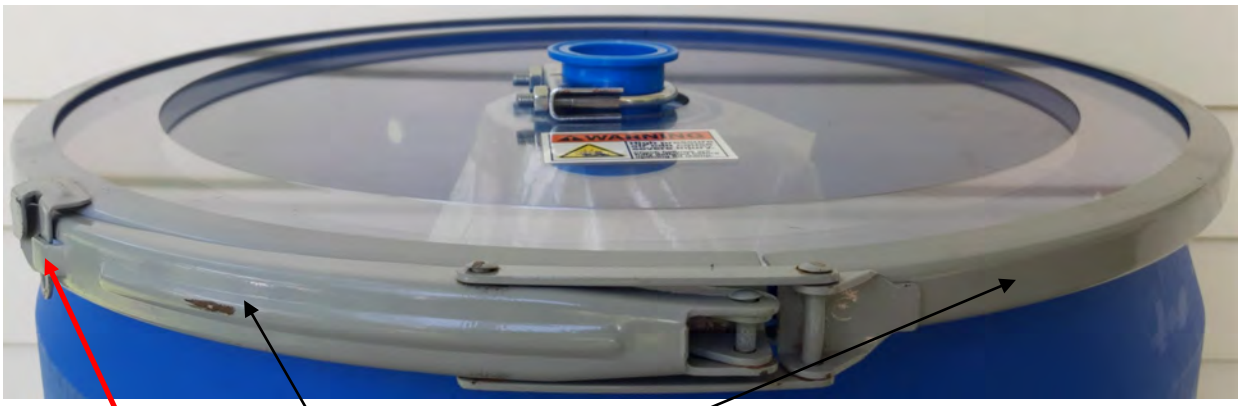
Fill the fermentation liner with grapes and crush manually if desired. Close the open end with a hose clamp as for red wine, but try to vent out as much air as possible.

You can press out the juice right away or you can let it cold-soak for a period of time. This is where the artistry and experience comes in.

PRESSING OUT THE JUICE

Unscrew and remove the pressure relief valve. Screw in the press tube fitting into this port. Connect the press tubing to a vessel suitable for the fermentation of the juice. You can use another GOfermentor JR, carboy, plastic pail, or fermentation liner. Just make sure your fermentor has a suitable airlock to permit fermentation gases to vent, but not allow air in.

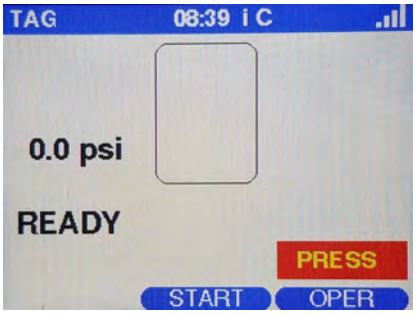
Secure the cover with reinforcement hoop firmly using the clamp. Verify that it is aligned correctly and secure.



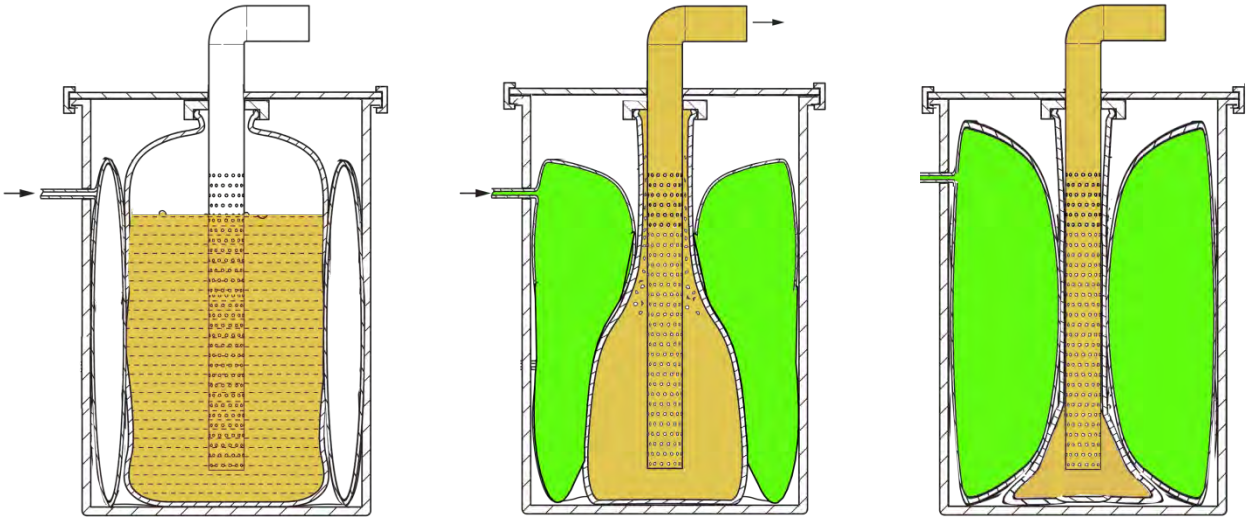
WARNING – THE SYSTEM WILL PRESSURIZE TO 2 PSIG DURING THE PRESS OPERATION. MAKE SURE THAT THE LID AND REINFORCEMENT HOOP ARE ON CORRECTLY AND THE LOCKING CLAMP IS CORRECTLY ORIENTED AS SHOWN BELOW. ENSURE THAT THE LOCKING TAB IS ENGAGED. FAILURE TO SECURE THE LID WITH REINFORCEMENT HOOP CORRECTLY CAN RESULT IN DAMAGE AND POSSIBLE INJURY.

The key to getting a good yield of juice for the grapes is patience. While the bellows do a good job of squeezing the grapes, the pulpy nature of the *must* restricts the flow of the juice. It is essential to wait for the squeezed juice to percolate out. This takes time. To further improve yields, it is also recommended to connect an inexpensive wine pump between the GOfermentor JR and the collection vessel. **DO NOT attempt to press whole grapes – the yield will be very poor.**

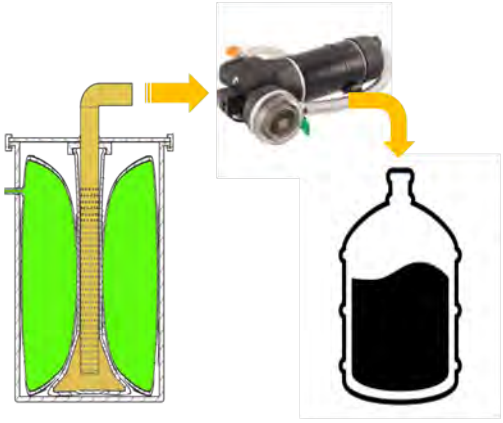
Use the rightmost button **PROCESS** to set the operation to **PRESS.**



Press the middle button to **START** the pressing sequence. The sequence is identical to that used for red wine and is described earlier in detail. You should see the juice being forced out into your collection vessel.



When no more juice is flowing start the wine transfer pump until no juice is being pumped. The PRESS operation will end automatically, and the bellows will deflate. Wait about 30 to 60 minutes and then repeat the PRESS operation. Again, use the pump to assist in collecting the juice. You can even try the PRESS a third time. You can expect a yield of 5 to 7 gallons/110 lb grapes.



After the bellows deflate, you can pump out any residual juice. Once the operation is complete open the cover. Remove and discard the liner containing the spent grapes.

THE CLEAR LID ENABLES YOU TO CHECK IF THE BELLOWS ARE INFLATED. DO NOT ATTEMPT TO OPEN THE LID CLAMP IF THE BELLOWS ARE VISIBLY PRESSURIZED. THIS MAY CAUSE THE LID AND/OR CLAMP TO OPEN IN A VIOLENT MANNER AND MAY CAUSE DAMAGE OR INJURY. ONLY OPEN THE LID CLAMP WHEN THE BELLOWS AND FERMENTATION LINER ARE COMPLETELY DEFLATED.

FERMENTATION

Add additives and yeast to the juice collected in your fermentation vessel and you are on your way to an excellent white wine.

Using the GOfermentor JR allows the winemaker to use fresh grapes and avoid frozen juices and concentrates usually loaded with preservatives. Pressing white grapes in the GOfermentor JR minimizes oxidation of the juice and results in fresher fruitier wine with superior aroma. Sulfite use can be minimized or even eliminated.

APPENDIX 1 OPERATING THE CONTROLS

The GOfermentor JR is an IOT (internet-of-things) device. It is best to operate it via the smartphone App available from the Android Play store or Apple App Store. To work with the app the GOfermentor must be connected to the internet using WiFi. If there is no internet access available the GOfermentor can be operated solely from the device display panel, however remote functionality will not be available. Refer to Appendix A4 for instructions on how to permanently disable WiFi (not recommended).

A1.1 USING SMARTPHONE CONTROL APP

FIRST TIME USER REGISTRATION

1. You will receive an email from Blynk robot@blynk.cloud on the email address you provided to us at the time of your GOfermentor order. Click on the link in this email to setup a Blynk account. You can provide a password of your choice. Close the sign up window when you are done.

   What is a Blynk account?
   An account is an email+password combination
   Each GOfermentor is assigned to an account. This gives it secure ownership. Only this account can view or control this GOfermentor. The account holder can extend invites so other users can share access.

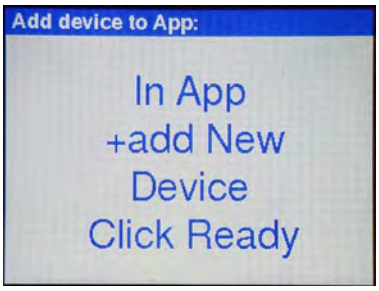
2. Download the Blynk IoT app (**not Blynk legacy**) to your mobile device from either Android play store or Apple App store.

LOGGING IN

1. Open the Blynk app and login using your email address and password. You will see tile display showing you all the devices you can access.

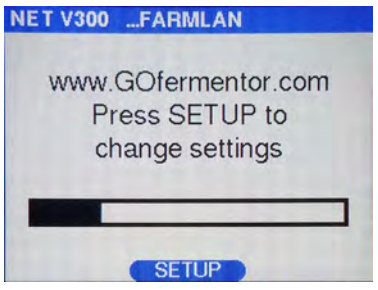
ADDING DEVICES

Power up the GOfermentor JR unit you want add and control to you Blynk app. After the startup screen you should see the following screen on the GOfermentor display:



If it gets stuck in this startup screen:

Cycle power OFF/ON. Hit the SETUP button within 30 seconds and select option Reset WIFI. Unit will restart and show the +add New Device screen.



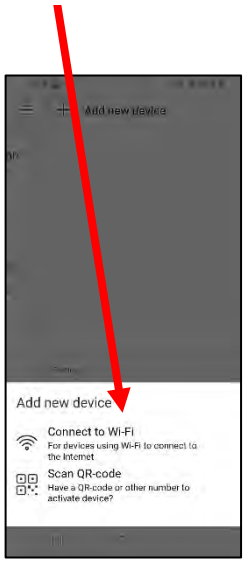
Open the Blynk app and login using your email address and password you selected on sign up. You will see a tile display showing you all the devices you can access.

If you do not have any devices yet, then click to add the first device.

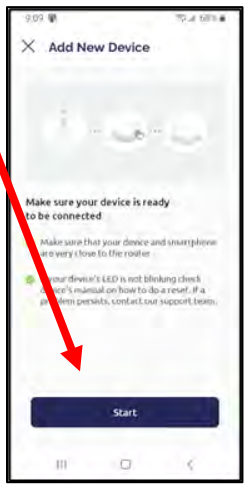
To add additional new devices, first click the 3 lines in the top right corner

Next click “Add new Device”.

Select Connect to WiFi



Verify that the JR lcd display still shows **In App, +Add New Device**. Now click “Start” on the app. screen. Click “Continue” on next screen.



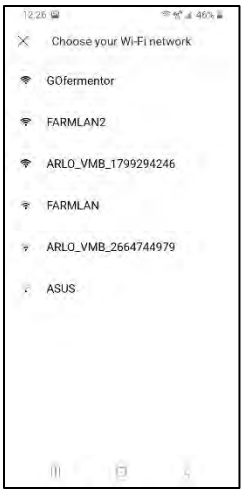
The App will search for compatible devices, when displayed, click on the name of found device. Device names will be similar to “Blynk-GOFERMENTORxxxx”

It will display “Connection Successful” once connected.

Next choose your Wi-Fi network from the list. **These MUST be 2.4 gHz networks. GOfermentor does not connect to 5 gHz**.

Now type in your WiFi network password (**not Blynk password**), remember this is case sensitive. Click the option to remember these settings if you plan on using it for other devices.

In a moment, the app and device will pair and configure the Wi-Fi credentials.



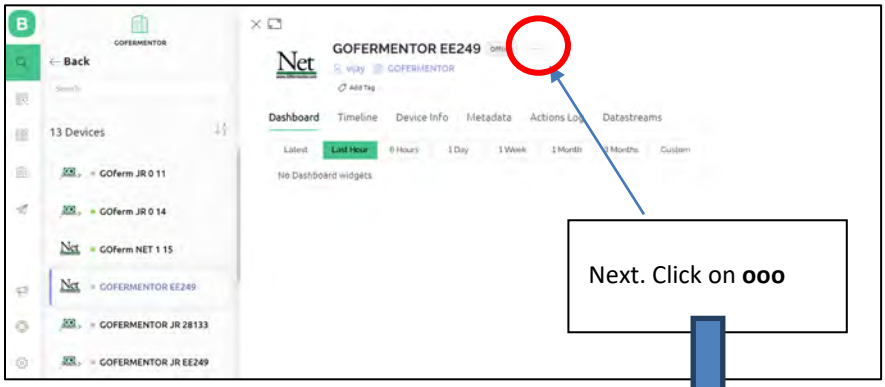
C indicates device is online

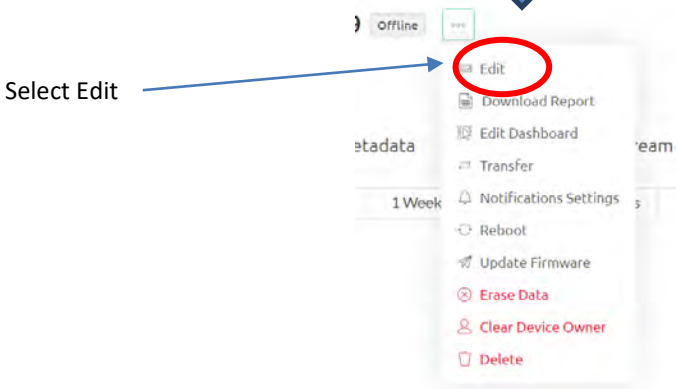
If successfully connected the following screen will be shown in the app and also the devices display will show the home screen.

CHANGING THE DEVICE NAME

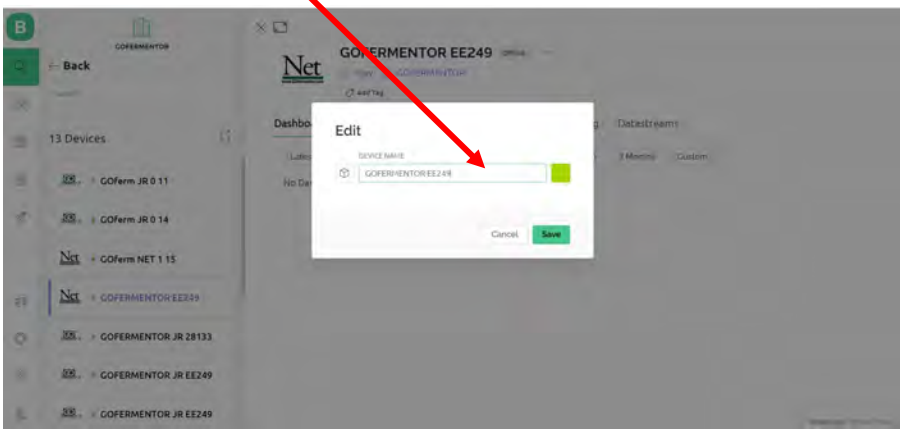
When you add a new device to your mobile app it will be given a default device name. You can change this name to something that is more meaningful and easier to remember.

Login into your Blynk console by clicking on **blynk.cloud** in any web browser and enter your username and password (same as the mobile app). Next click on **my Devices** and select the one you wish to rename. For example click on GOFERMENTOR EE249 to change it's name. You will see the info page for this device.





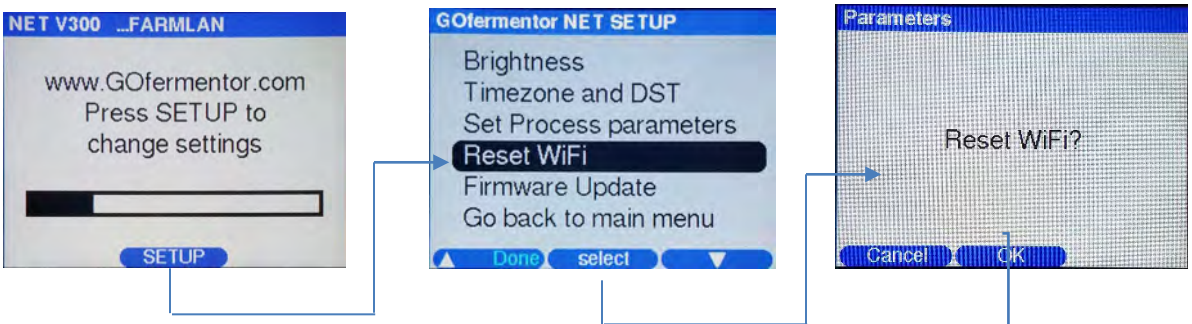
Enter new name and
click SAVE



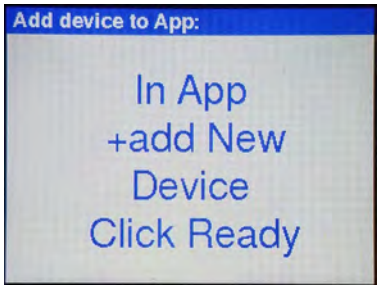
CHANGING THE WIFI SSID (LAN)

If you move the GOfermentor to a new location that is out of range of the original LAN (SSID) you assigned it the first time, you can easily change the WiFi SSID:

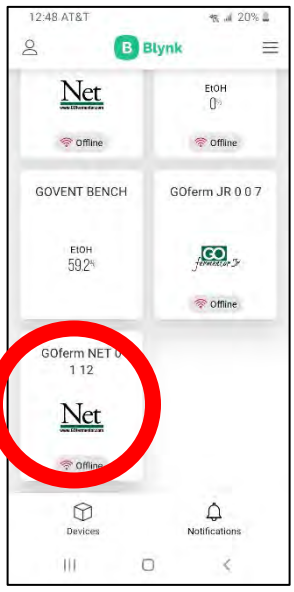
Cycle power on the GOfermentor and click the center button within 30 seconds. This will force the controller

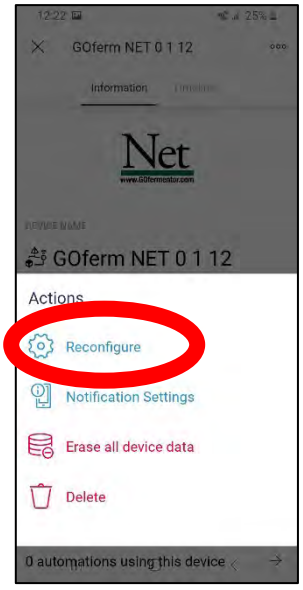


enter the SETUP menu, from here select “Reset WiFi”, confirm OK and wait for the reboot.



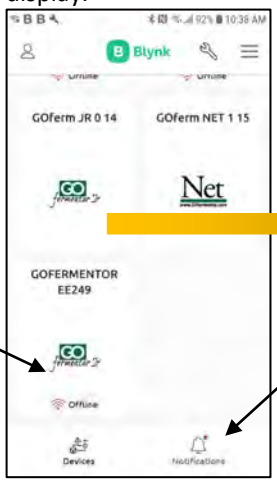
Now open the app, select the device you are wanting to change. Then tap the three dots in the upper right corner. On the next screen, tap the three dots in the upper right corner again. Finally tap on the “Reconfigure” option to reinitiate the pairing process. Confirm your selection when asked.





DEVICE INFORMATION AND TIMELINE

The Blynk app shows all the devices you are allowed to view on a tiled display. Click to bring up a particular GOfermentor display.



Shows if device is currently offline

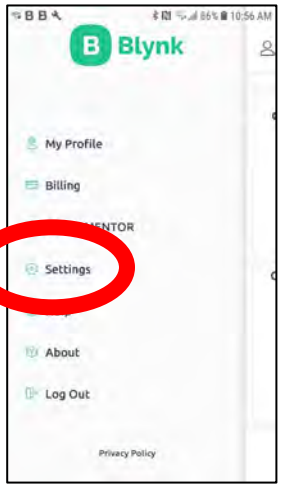
Click to show ALL device notifications

Next click on **ooo** symbol

First tab shows you **Information** about the device. Clicking on **Timeline** will show you all the timestamped alarms and events.

APP SETTINGS

1. Click on  icon (left top).
2. Click on Settings. The settings pertain to how notifications are handled. You turn notifications ON and OFF and also control how you wish to be notified.



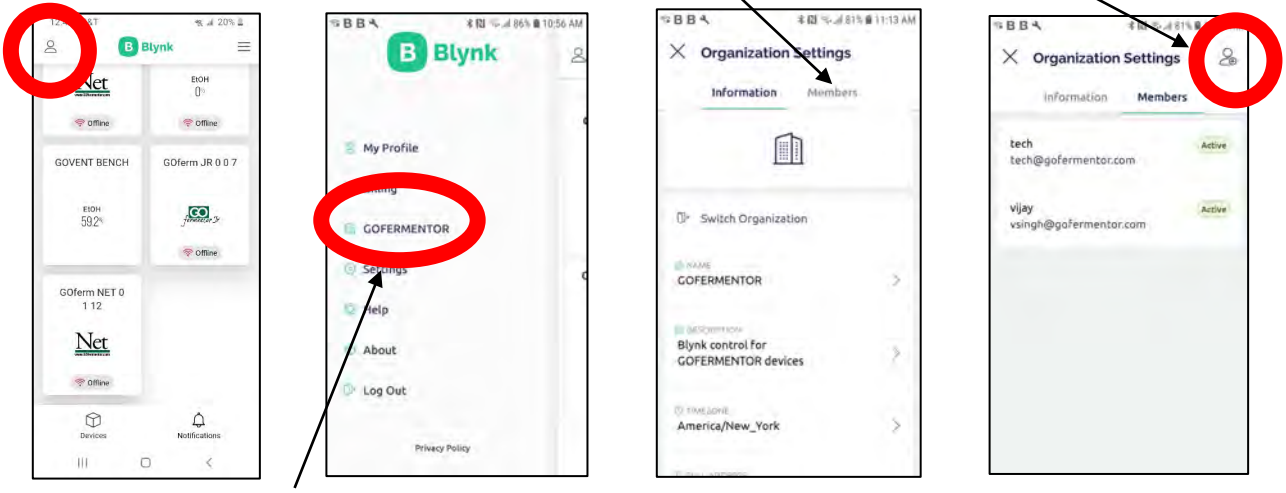
SHARING DEVICES

A user can allow others access to their devices. This involves adding new users to your ORGANIZATION:

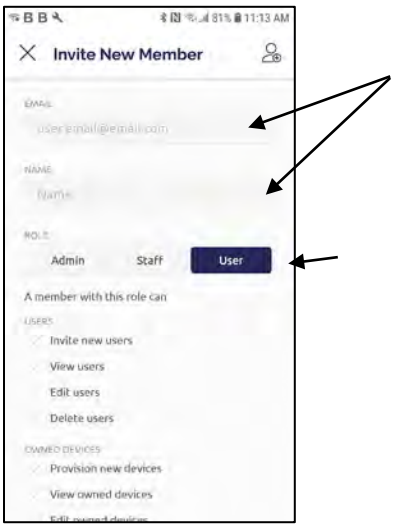
Click on  icon (left top)

Click on Members

+invite new member



Select your ORGANIZATION
(GOFERMENTOR is just example.)



Provide a valid email and user name

Select ROLE as **USER** (will NOT allow user to pick Admin or Staff).

Scroll to bottom and click **INVITE**. Email will go to the new user with a link to sign up on Blynk.

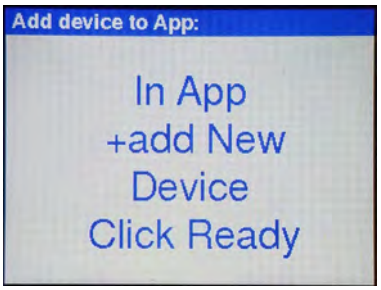
The new user should then download the Blynk app and login with their email and chosen password. They can now view and control all the devices in the ORGANIZATION.

ALL DEVICES in the ORGANIZATION will be visible to all members of the particular ORGANIZATION. Devices in other ORGANIZATIONS are not visible.

A1.2 JR LOCAL CONTROLLER OPERATION

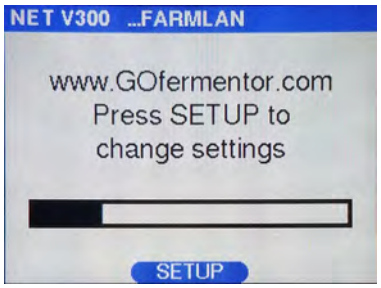
FIRST TIME USE

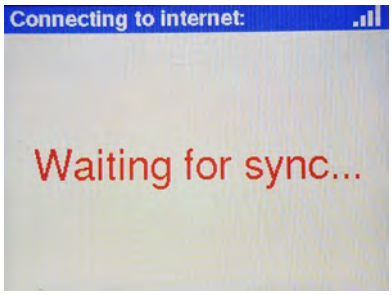
A WiFi internet connection is required. First set up the SmartPhone app as described earlier. Now power up JR you should see this screen. It indicates that the JR is NOT connected to any network and is waiting to connect to the App.

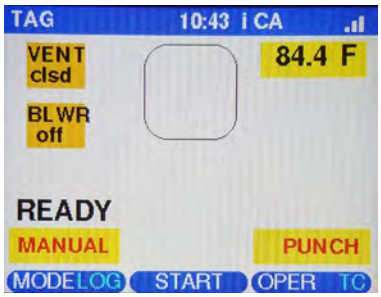


NORMAL OPERATION

Once the GOfermentor JR has been added to the App, it will automatically connect to the network selected on power up. Click SETUP to enter SETUP, otherwise it will connect and show the main screen:







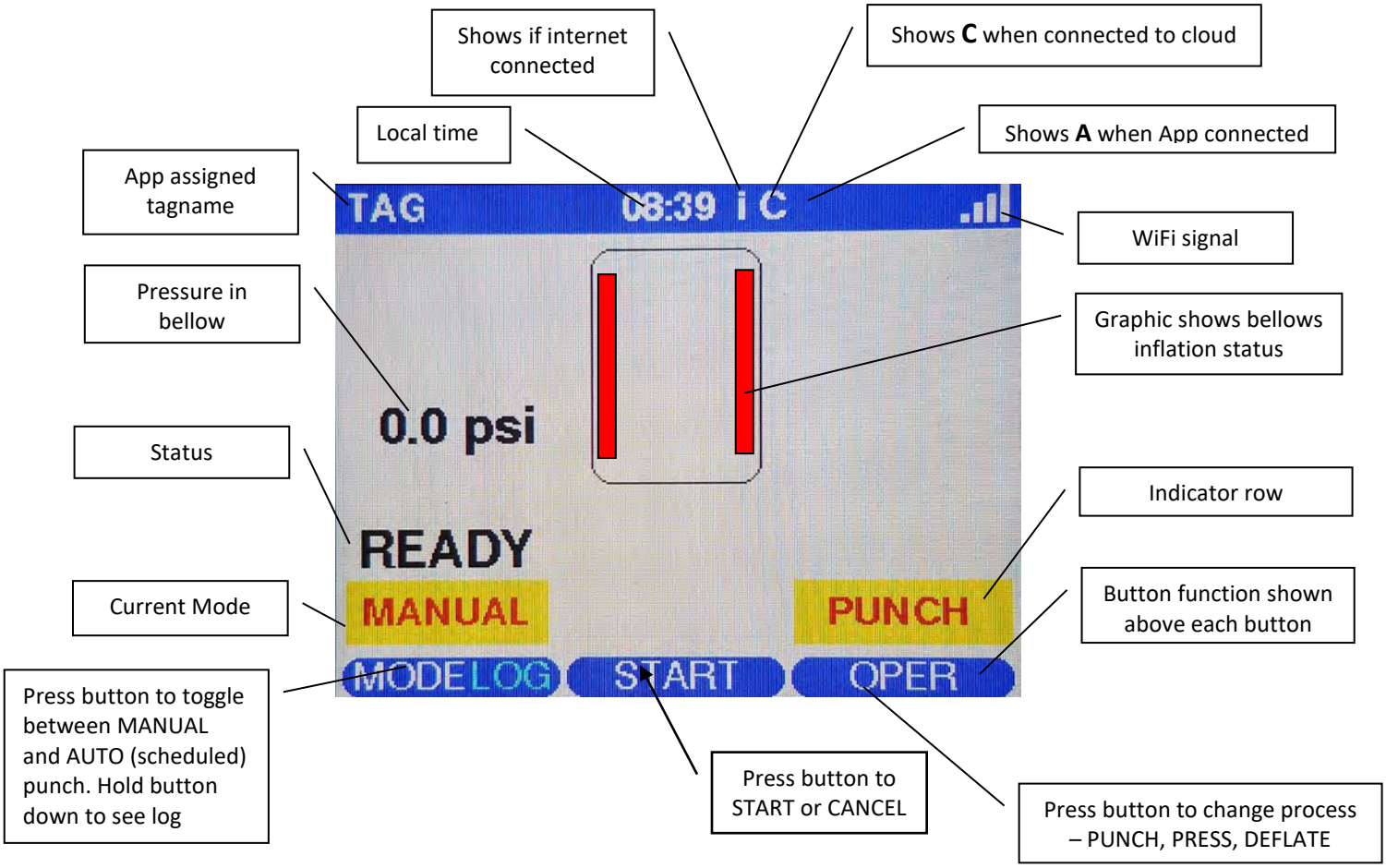
The GOfermentor MUST be connected to WiFi internet to provide remote monitoring and control using the SmartPhone App. Use the SmartPhone App for all operations. The local control panel on the GOfermentor is for backup and for these operations that are not possible from the App:

1. Set date/timezone/DST
2. Reset the WiFi SSID
3. Update firmware
4. Change parameters
5. Perform PRESS/DEFLATE operations

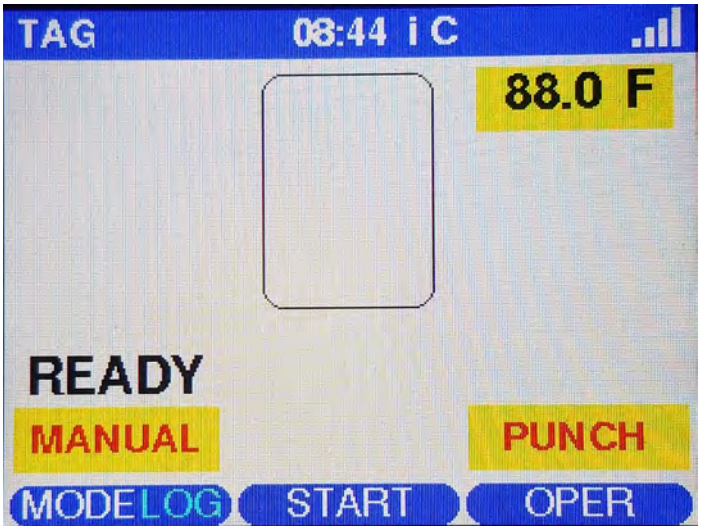
OPERATING THE BUTTONS

The GOfermentor panel has just three buttons so a clever method is used to select options. If a button has only one function, then the caption is printed in the center of the button. If the button has two functions: the function on the left is printed in white and corresponds to a short click. The caption on the right is printed in cyan and is activated by a long click.

ELEMENTS OF THE DISPLAY

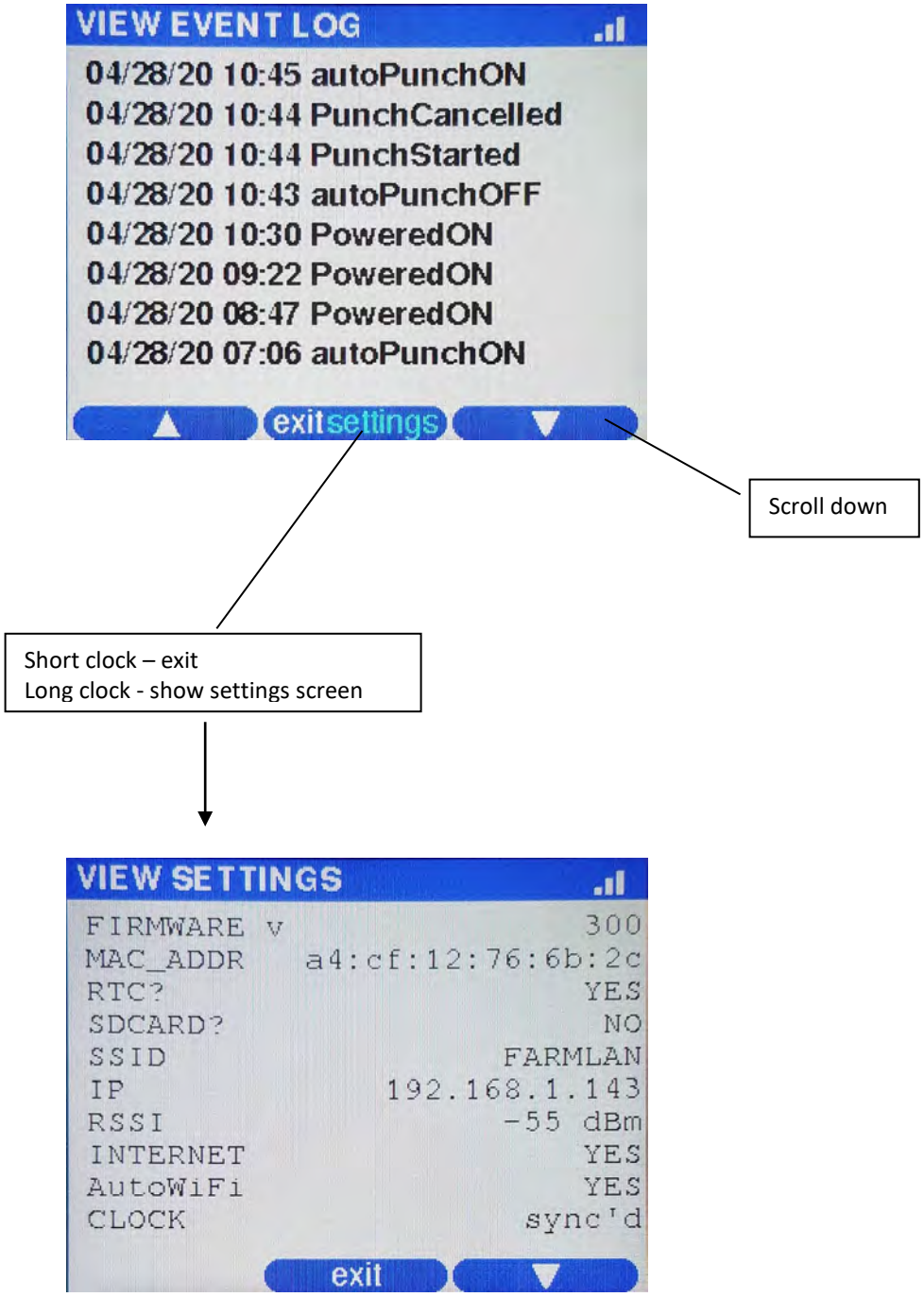


GOfermentorJR+ has additional temperature control display:



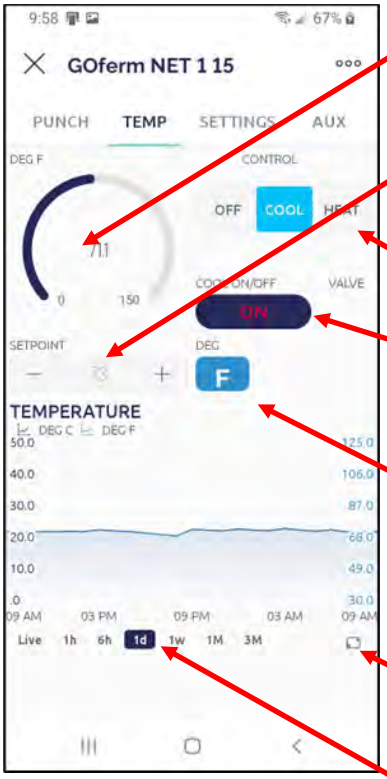
VIEWING THE EVENT LOG

The last 12 events are retained in a log file. You can view the log by holding down the button under the MODE LOG caption. Remember the white legend is short click and the cyan legend is long click. The log file will look like this.



A1.3 TEMPERATURE CONTROL - GOFERMENTOR JR+ ONLY

If temperature control is ENABLED and a temprature probe is connected the GOfermentor will monitor and control temperature. The main screen has a tab to access the temperature functionality.



Temperature reading

Control setpoint

Control MODE OFF, COOL, HEAT

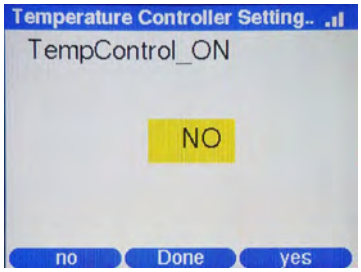
Click to turn temperature control OFF/ON

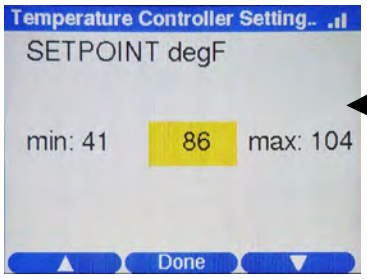
Click to switch degF/degC temperature

Click to enlarge graph

Graph – click to change time scale

Long click

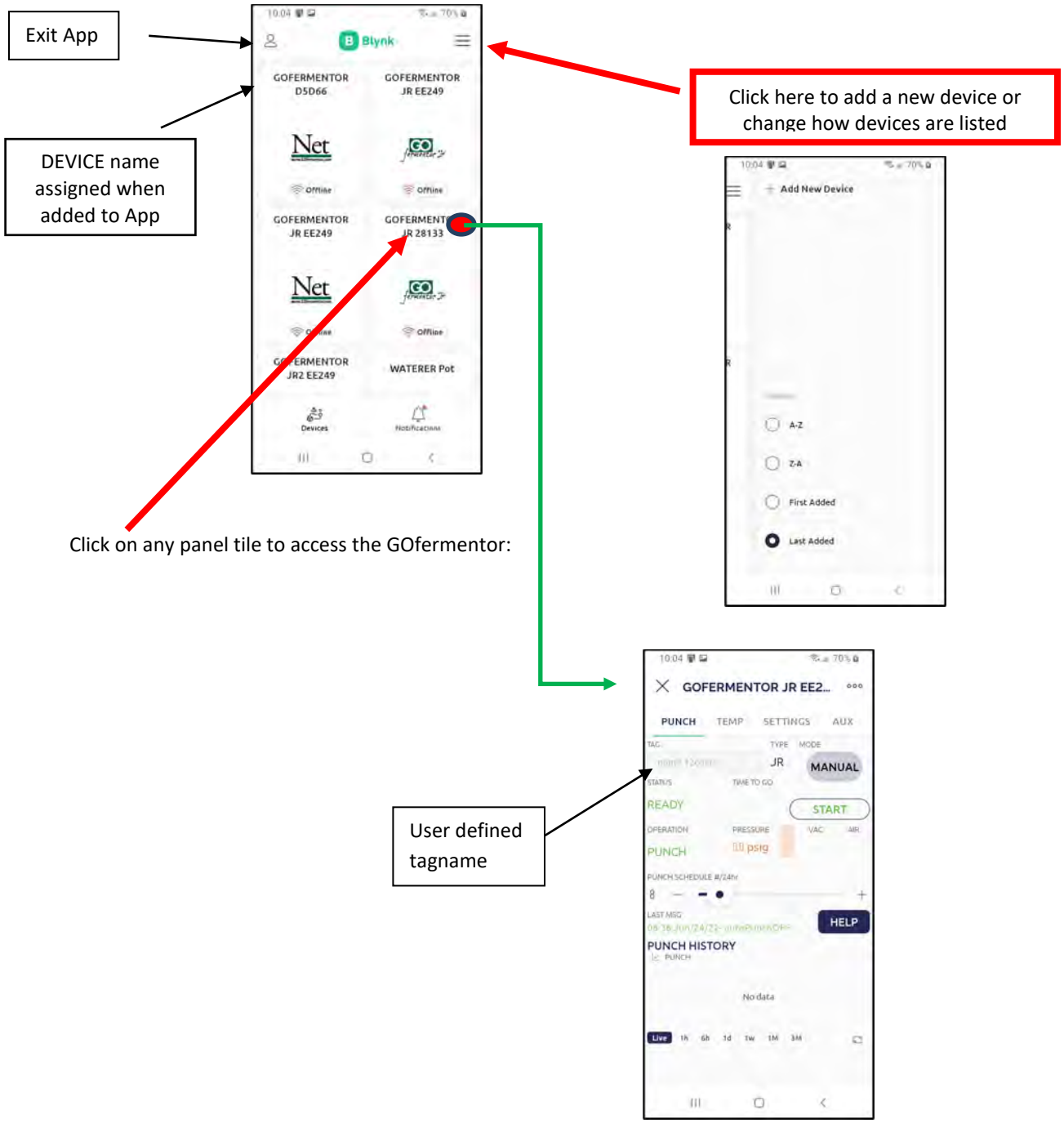




A1.4 GOFERMENTOR APP ADDITIONAL FEATURES

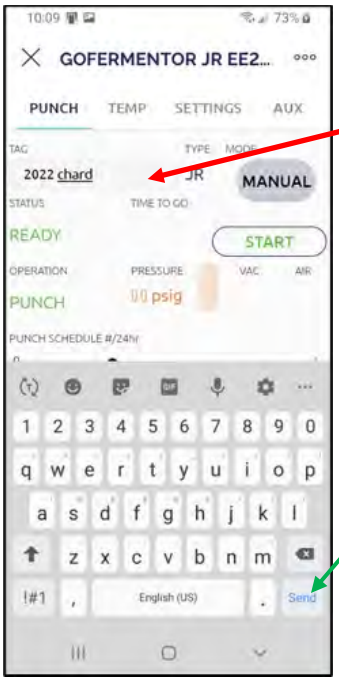
MULTIPLE GOFERMENTOR PANEL DISPLAY

All GOfermentors in the login account are shown when the App is opened:



TAG LABEL

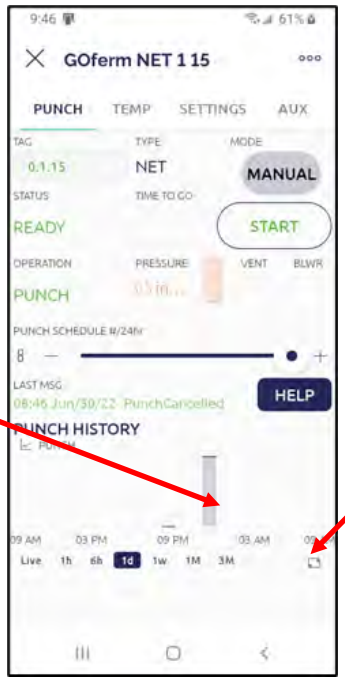
The GOfermentor can be assigned a tag from the App. This could be the batch number or some other information that helps you identify the unit. The tag is also shown the controller display



Enter tag using pop-up keypad. Then press SEND

PUNCH HISTORY

You can see the punch history and duration on the main PUNCH tab:

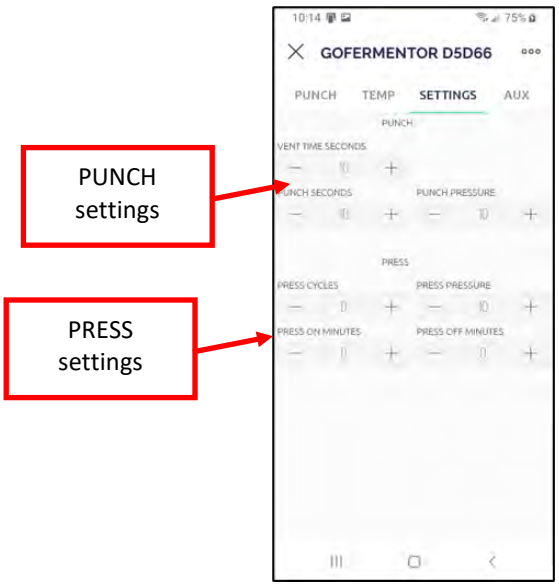


Shows time each punch occurred and duration

Click to enlarge graph

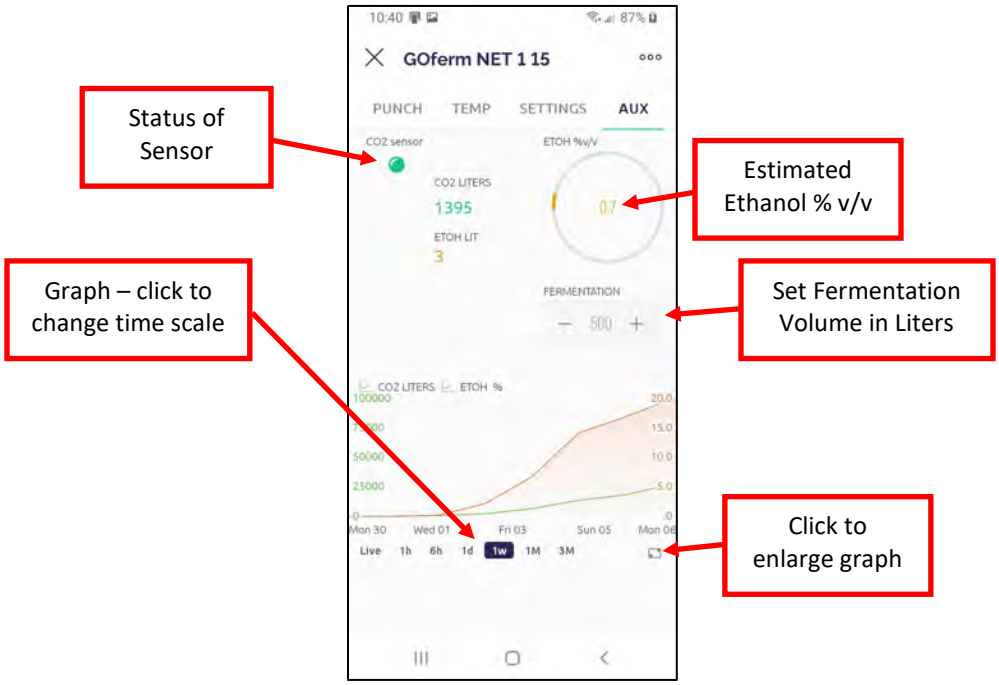
SETTINGS

Various settings (see Appendix A5 for details of each parameter) can be adjusted from the SETTINGS tab:



AUX SCREEN

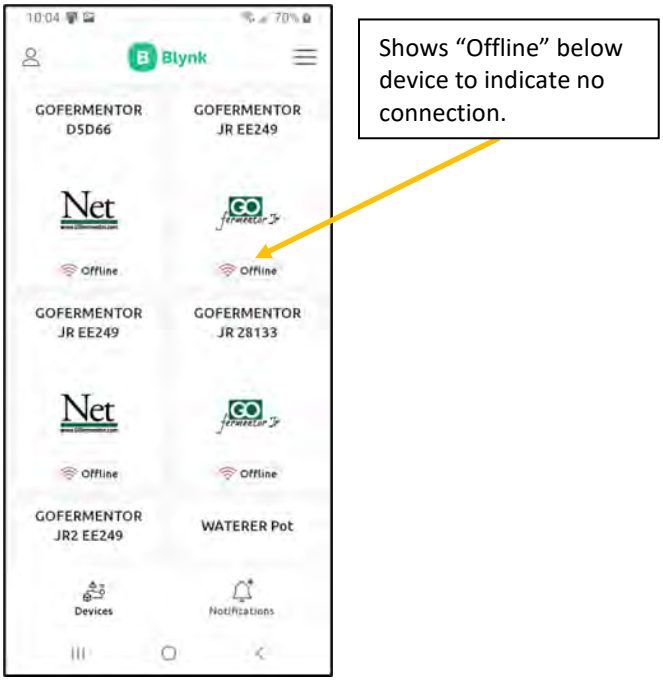
The optional ethanol concentration data derived from CO2 evolution from the GOfermentor can be accessed from the AUX screen. You must have the JR equipped with gas flow sensing hardware.



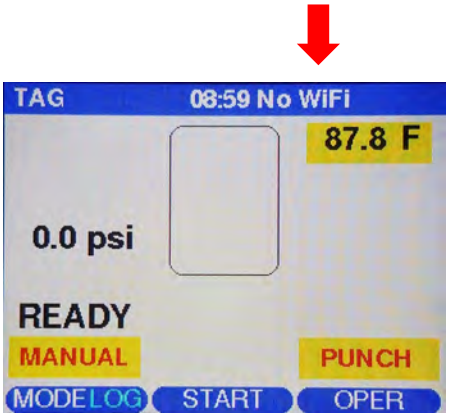
A1.5 OPERATION WITHOUT WIFI ACCESS

The GOfermentor JR is an IOT (internet-of-things) device. It is intended to be permanently connected to the internet. It is not recommended to operate the GOfermentorJR without continuous internet connection via WiFi. However, in the event that internet connection is not available, the equipment can be configured to operate without the internet. It will not have remote access via SmartPhone app and firmware updates cannot be made. You will also need to set the real-time clock on first power up. The clock has battery backup and will retain correct time later when power is switched off. The controller will display **No WiFi.**

If the GOfermentor is connected to the internet and then connection is accidentally lost, it will continue to operate normally except that no remote access is possible.
If connection to the WiFi router is lost, the controller will display **WIFI LOST** and the App will show the device is "Offline". The unit will periodically try to reconnect.
If internet service fails, the controller will reboot and display **INET FAIL**. If pressure is detected in the liner, a deflate cycle will run to prevent punching and potential overflow issues. A manual reboot of the controller will be needed to restore connection.



Shows "Offline" below device to indicate no connection.



To disable WiFi/internet:

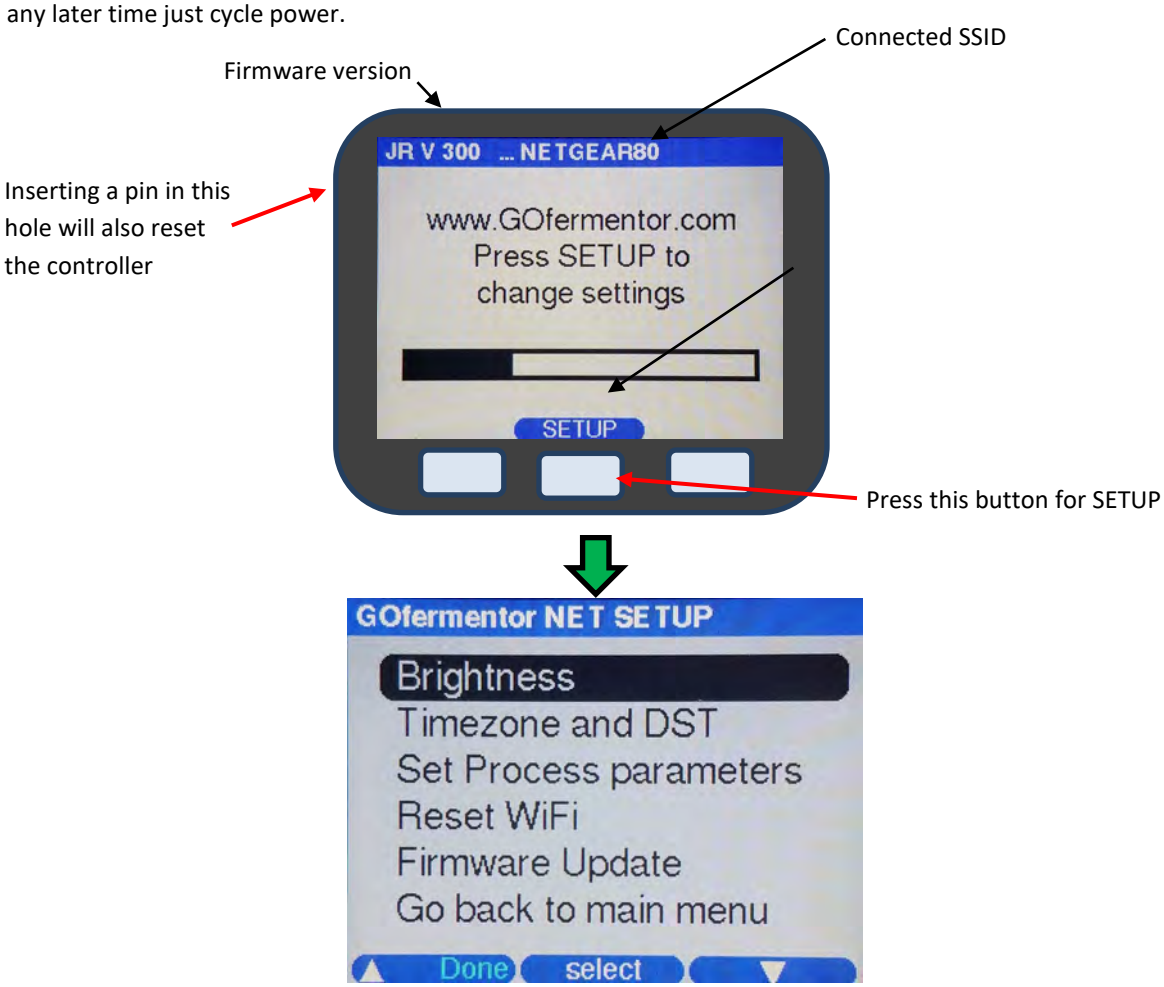
1. **Cycle power and press SETUP within 30 seconds**
2. **Select option SET PROCESS PARAMETERS**
3. **Press OK**
4. **AutoWiFi is displayed. Press NO to disable. Press DONE**
5. **WiFiEnbl is displayed. Press NO to disable. Press DONE**
6. **Now keep pressing DONE until the header displays CLOCK settings**
7. **Enter the current local time at the prompts.**
8. **Press DONE until the end of the menu and unit will reset.**

The GOfermentor will now show the main control screen and all actions are enabled. The header will show **NoWiFi** indicating the WiFi and internet access is disabled.

APPENDIX 2 CONTROLLER CONFIGURATION

SETUP MENU

On power up click the center button within 30 seconds to enter the setup menu. If you need to enter setup menu at any later time just cycle power.



BRIGHTNESS

BACKLIGHT BRIGHTNESS SET THE DISPLAY BRIGHTNESS. - DEFAULT 50%
INACTIVITY TIMEOUT SET BACKLIGHT TIMEOUT. - ALWAYS ON

TIMEZONE AND DST

Set the local time zone relative to UTC. EST is -5. PST is -8. Set Daylight Savings Time to ON if daylight saving time is currently in effect. GOfermentor always handles time in UTC and local time is only for display purposes.

SET PROCESS PARAMETERS

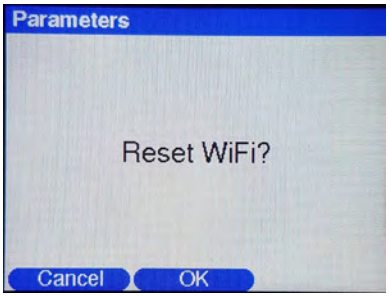
Certain process parameters can be set by the user to customize the programming. Select SET PROCESS PARAMETERS to change. Changes are retained on power down. If you mess up simply select DEFAULT and the unit will reset to factory settings. Be aware that this will also erase any logged events.

Only advanced users should change these parameters. Consult with tech@GOfermentor.com .

PARAMETER	DESCRIPTION	RANGE	DEFAULT
CO2Enbl	CO2 SENSOR ENABLED	NO/YES	NO
AutoWiFi	RETRY WIFI IF CONNECTION LOST	NO/YES	YES
WiFiEnbl	ENABLE WIFI CONNECTIONS	NO/YES	YES
PunchINflMins	INFLATION TIME DURING PUNCH (MINS)	0 TO 20	2 MINUTES
PunchPsigx10	INFLATION PRESSURE DURING PUNCH	0 TO 20 (PSIX10)	3 (0.3PSI)
PunchDefMins	DEFLATION TIME DURING PUNCH (MINS)	0 TO 30	7 MINUTES
PunchTOmins	PUNCH TIMEOUT (MINS)	0 TO 30	10 MINUTES
PressINflMins	INFLATION TIME DURING PRESS (MINS)	0 TO 30	15 MINUTES
PressPsigx10	INFLATION PRESSURE DURING PRESS	0 TO 20 (PSIX10)	10 (1.0PSI)
PressDefMins	DEFLATION TIME DURING PRESS (MINS)	0 TO 60	10 MINUTES
PressTOmins	PRESS TIMEOUT (MINS)	0 TO 30	15 MINUTES
HR	LOCAL TIME- HOUR	0 TO 23	SET BY INTERNET
MIN	LOCAL TIME - MIN	0 TO 59	SET BY INTERNET
MONTH	LOCAL TIME- MON	1 TO 12	SET BY INTERNET
DAY	LOCAL TIME -DAY	1 TO 31	SET BY INTERNET
YY	LOCAL TIME - YEAR	0 TO 99	SET BY INTERNET
TCON	TEMPERATURE CONTROL ON (JR+ ONLY)	NO/YES	UNUSED
TSPx5	TEMP SETPOINT DEGC X 5 (JR+ ONLY)	25 TO 200	150 (30 C)
DEGF	TEMPERATURE UNITS (JR+ ONLY)	NO/YES	YES
TempEnbl	TEMPERATURE SENSOR ENABLED (JR+ ONLY)	NO/YES	NO
TCRTL_MODE	0=OFF 1=COOLING 2=HEATING (JR+ ONLY)	0,1,2	0 (OFF)
CO2yield	CORRECTION FACTOR FOR CO2 YIELD CALC	80 TO 100	100

RESET WIFI

If you cannot connect to a WiFi network because you moved the unit to another location, or the network no longer exists then select **Reset WiFi** and press OK. This will make the controller “forget” the network it wants to connect to. It will now behave as brand-new unconfigured device. Then open the GOfermentor SmartPhone app and add this as a new device as described in SECTION 6.1. The GOfermentor will then connect to this new network. This new network (SSID) is then remembered for the next power up.



APPENDIX 3 SPECIFICATIONS

PART #	GOCONTROLLER JR
Description	GOfermentor controller JR
Dimensions (LxWxH)	12in x 6in x 5in
LCD display	Color TFT with local push button
Punch control	Manual using pushbutton or user defined interval
Press control	Manual using LOCAL pushbutton
Temperature control	GOfermentor JR+ only – sensor jack and AC outlet for pump/valve
Communications	WiFi IOT device - INTERNET ACCESS RECOMMENDED
Power requirement (control panel)	115 VAC 1A. Standard USA plug. 230 VAC special order

INCLUDED STANDARD ACCESSORIES

PART#	DESCRIPTION	FUNCTION	
Sampling/Press Tube	Stainless tube with TriClamp cap	For sampling, pressure relief and pressing. GOfermentorJR+ tube has temperature probe and cooling coil	
TriClamp and Gasket	2 “segmented TriClamp and rubber gasket	Clamp and gasket to secure tube assembly to liner.	
Rubber Bellows assembly	3 rubber bellows with base plate	Bellows are placed in the drum and used to punch and press the fermenting must	
Pressure relief Valve	¾ NPT valve	Screws into sampling tube when fermenting to relieve excess pressure (>0.1psi).	
Press tubing	¾ NPT barbed adaptor with hose	Replaces pressure relief valve during PRESS operation. Used to pipe pressed wine into collection vessel	
Inflation Tubing Manifold	Tubing with fittings	Connects the bellows to the controller for inflation/deflation	
Hose crimp	3/8-inch hose crimp	Use to secure bellows port stem to inflation manifold. Pliers required	
U-bolt clamp		Holds liner port firmly above lid	
Hose clamp	2inch hose clamp	Use to close fermentation liner after filling	

OPTIONAL ACCESSORIES

PART#	DESCRIPTION	FUNCTION	
GOSAMPLER	Sampler	Plastic hand pump to draw samples.	

GOLINER SPECIFICATIONS

PART #	**GOLINER_JR**
Description	Single-use wine fermentation liner
Product contact film	2 ply metallocene linear low-density polyethylene
FDA-approved resins	Meets FDA 21 CFR 177.1520 for food contact.
EU-approved resins	EU 10/2011 & EU 1935/2004
Additives	None. No BPA. No animal or GMO derived components.
Fill port	Open top
Vent/Sample/Press port	2” TriClamp
Minimum operating capacity	50 lb (22 Kg) crushed grapes
Maximum operating capacity	110 lb (50 Kg) crushed grapes
Liners per box	3

APPENDIX 4 SOURCES

BOOKS AND PUBLICATIONS TO READ

Here are some books and publications that you should read to gain an understanding of basic winemaking. Just remember, these books talk a lot about sanitation, sulfite additions, and difficulties in pressing. None of which are a concern with a GOfermentor JR.

Home Winemaking Step by Step by Jon Iverson. This is an excellent book for beginners and goes over basic concepts of pH adjustment, yeast preparation, and fermentation control. Also, basic instructions for racking and aging wine.

Kit Winemaking by Daniel Pambianchi. This focuses on kit wines which are not our main concern here but a lot of basic useful information.

Concepts in Wine Technology by Yair Margalit. This is book for commercial wineries but very well written. Explains simple to complex concepts. A must read.

Wine Science by Ronald S. Jackson. This is standard textbook for winemakers. Quite dense, but a useful reference book. Everything you would ever want to know about grapes and winemaking.

Also consider taking the online winemaking course offered twice a year by UC Davis.

MoreWine has a nice set of guides that are worth reading:
https://morewinemaking.com/content/winemanuals

ON-LINE RESOURCES AND SUPPLIERS

You can readily find equipment and supplies from various vendors on-line. Here is a list of few we have used. They are listed in no particular order. We have no financial or other connection to any of these vendors and simply list them for your convenience.

morewine.com
gwkent.com
theVintnervault.com
Midwestsupplies.com
eckraus.com
piwine.com

GRAPES

Wine grapes can be hard to find. Fresh grapes are only available in the USA from July to November. Talk to local produce suppliers and see when they have wine grapes available. You may be able to preorder.

If you are lucky enough live near a vineyard, go around harvest time and buy some cases of grapes off them. Vineyards are quite happy to sell you a few hundred pounds if you are willing to pick them up.

If all else fails or you want to ferment over Christmas you can use frozen must. This is essentially grapes that have been destemmed and frozen. Be careful that you are buying frozen whole grapes not some chemically or heat treated concentrate. Frozen *must* makes excellent wine and the wine yield is actually slightly higher. Commercial wineries do not use frozen grapes because they are quite expensive. But for home winemaking it is a viable alternative.

A reputable supplier of frozen must is **brehmvineyards.com**. They have many varietals available and can ship UPS. Tell them GOfermentor sent you!

APPENDIX 5 TROUBLESHOOTING AND FAQ

Solutions to some typical problems and frequently asked questions are listed here. Please check our website www.GOfermentor JR.com for updates. Email tech@GOfermentor.com if there is something you need to ask.

I know nothing about wine making.

Wine making is not difficult. With the GOfermentor JR it is also not messy or smelly. The single-use liner eliminates problems of cleaning and proper sanitation that are essential to good wine. Automation assures proper punching and the press takes out the mess. You need to know nothing about to make wine to be successful with GOfermentor JR. Just follow the instructions. Several books provide a basis for understanding wine making. They are listed in the appendix to the GOfermentor JR manual. Home *Wine Making* by Jon Iverson is a good start, then get *Concepts in Wine Technology* by Yair Margalit. It is not for the home winemaker, but important concepts are explained well and will give you a foundation for serious winemaking.

Do I need a permit to make wine?

No. Federal law passed Feb 1, 1979 makes it legal for a single adult household to make up to 100 gallons of wine and beer each year, and up to 200 gallons for a household with two or more adults. By 2013 all States also made these limits legal. Sale is not permitted. Neither is distillation.

What sort of space do I need for the GOfermentor JR?

You need an area about 2 ft x 2ft. The unit is 20 inches in diameter and 28 inches tall. The space should be cool (60-70 F). You need a 110 VAC household power outlet.

What do I need besides the GOfermentor JR?

You need 100lbs grapes, yeast, and yeast nutrients. You need an inexpensive ($160) wine pump to transfer wine and associated tubing. You need wine collection/aging vessels or liners. You should have some basic lab gear – weighing scale, graduates, mixing spoons and thermometer. It is nice to have a pH meter and a refractometer to measure sugar (Brix). You can buy bottles, cappers etc. from winemaking supply store or online. The manual versions are quite inexpensive. Remember you DO NOT need a press!

Can I use supermarket grapes?

No. Table grapes do not make good wine because they are large with low skin to volume ratio. In essence they are sugar water bombs. Wine grapes are much smaller because the color and flavor is from the skins. You can get wine grapes from produce suppliers. Another good source is local vineyards so go ask them for a few hundred pounds. Remember grapes are seasonal and you will only get fresh grapes in the Northern Hemisphere from July to November. It is possible to get grapes from Chile, S. Africa, and Argentina in the off-season but these can be expensive. You can google the internet for suppliers of frozen grapes. These, while expensive, work quite well. For good red wine you need to start with grapes. Concentrates and juice are not satisfactory. However, white wine works well from juice and you can buy juice, either fresh or frozen.

Can I make wine from frozen grapes?

Yes. Frozen grapes can be obtained from online suppliers. They are too expensive for commercial production but quite suitable for the home winemaker. They also give you the option of making wine out of season. Make sure you are buying crushed frozen grapes and not a chemically treated concentrate. You thaw the must and let it warm up to at least 65F before you add yeast for fermentation.

Can I make wine from concentrates or juice?

While white wine works well from fresh or frozen juice, we do not recommend making red wine from concentrates or juice.

Where can I get yeast from?

You need wine making yeast. There are hundreds of different yeasts available and choosing the right one for your grape variety and wine style is a matter of artistry and experience. Yeast is supplied in freeze-dried packages which can be stored for many years. Follow the manufacturer instructions for rehydration and add to the grapes in the GOfermentor JR to start the fermentation. There are many online suppliers for yeast and other wine making supplies.

How much yeast do I need?

Typically you need 10 grams of dry yeast for 100lb of grapes.

What other additives do I need besides yeast?

Besides yeast you need to add some yeast nutrients. Typical nutrients are dynastart, goferm. You can purchase these from online wine making suppliers. Check the manufacturer's instructions for amounts needed. Typically, the yeast nutrients are added and mixed into the grapes right before the yeast addition. You need to measure pH of the grapes and adjust by adding tartaric acid if needed. Winemakers add some potassium sulfite to the grapes to prevent oxidation and spoilage but we discourage this practice. The sealed GOfermentor JR liner will provide sufficient protection.

Why does wine contain sulfites?

We have all seen the warning labels on wine bottles. Potassium sulfite is added to wine during the fermentation and aging process and then again at bottling. The sulfite is really a preservative that prevents oxidation of the wine due to air contact. With the closed GOfermentor JR system you minimize air contact so you can make sulfite-free or very low sulfite wine. The key is to avoid air contact. You should add yeast as soon as possible to avoid the grapes oxidizing and to avoid the growth of undesired organisms. After fermentation press the wine into a closed container and avoid any headspace where air could contact the wine. GOfermentor aging liners are a cheap and reliable solution. Also, pay attention during bottling to minimize air contact. You may want to add a slight amount of sulfite at bottling if your procedures are not perfect.

Cannot get a sample – clogged?

It is possible for some skins to get into the sample line and prevent you from getting a sample. This is easy to fix. The blockage is usually in the quick-connect fitting. Simply unscrew this fitting off the cap and flush it with water. Check that it is clean and replace on the cap. Now the sample should come out freely in the hand sampler

Hand sampler does not suck out sample.

There is a little float valve in the hand sampler that prevents liquid from being sucked into the mechanism. Sometimes this gets stuck. Remove the collection bottle and tap the valve so it not stuck in the upper position. DO NOT OPERATE THE HAND SAMPLER UNCONNECTED TO THE SAMPLING PORT. THIS WILL CAUSE THE INTERNAL VALVE TO HANG UP AND YOU WILL NEED TO REMOVE THE BOTTLE AND TAP IT BACK TO BOTTOM POSITION.

How long does the process take?

Fermentation takes about 8 to 10 days depending on the temperature, grape variety, and yeast. You know the fermentation is done when all the sugar is gone. Pressing the wine using the built-in press will take an hour or so. Collect the wine in a suitable vessel taking care not to have any headspace where air might contact and spoil the wine. Our GOfermentor aging liners are a cheap and reliable solution. You can drink the wine now but it will be yeasty. Let the wine settle for a month (area should be 55 to 65F), then transfer to another container using an inexpensive wine pump. Watch the transfer and stop when you see sediment being transferred. Discard the sediment. Let it settle another 2-3 months. You can add oak chips into the aging vessel (or liner) at this time if you want an oaky flavor. Oak products are available from online wine making suppliers. Next, taste and if you like it you are ready to bottle some. Let the rest age for another 3-6 months and then bottle. The wine should be drunk within 5 years.

How do I know the fermentation is done?

We are trying to make “dry” wine. This means that all the sugar in the grapes has been converted to alcohol and the residual sugar is less than 1%. This is very important because if there is residual sugar the wine might referment in the bottle with disastrous consequences. So the fermentation is done when the sugar is gone. You can tell this by 1) tasting – there should be no perceptible sweetness and 2) you can purchase a residual sugar kit (based on AimTab) for about $30 that gives you the sugar concentration.

What is the alcohol content of my wine?

Measuring ethanol is complex and requires some sophisticated equipment. However, you can easily estimate it if you know your starting sugar (Brix using refractor). Take the brix of the starting grape must and multiply by 0.57 to get the expected alcohol concentration in the resulting wine. For example, the starting crushed grapes were measured at 24Brix. So 24 x 0.57 = 13.7% will be the approximate alcohol concentration of the resulting wine.

My wine is not fermenting. Stuck?

With the GOfermentor JR it is unlikely you will have a “stuck” fermentation. Typically, the fermentation liner should look puffed up within a day or so indicating that fermentation has started. Some causes of a stuck fermentation -1) must too cold (should be at least 60F); 2) yeast stale or not rehydrated properly; 3) must sugar concentration too high (more than 26 Brix). Consult a winemaking book for solutions.

Can I reuse the fermentation liners?

No. The whole idea is to start with a sanitary fermentation vessel. The used liner contains the waste skins and seeds after pressing. You can use the liner to cleanly transport this waste pomace to your compost heap. Then toss the liner out. They have no plasticizers or UV blocks and will degrade rapidly in solid waste landfill.

Can I reuse the rubber bellows?

The rubber bellows are designed to be reused indefinitely. If you puncture one you can repair it using duct tape of a tire patch. Or you can purchase a replacement. The bellows work as a set of three and you only need to replace any one that is damaged. It is wise to wipe down the bellows after each fermentation to ensure that no particles adhere to the bellow that may lead to a puncture.

What is the purpose of the circular bottom plate?

The three bellows are connected to the bottom plate with cords. The fermentation liner sits on the circular plate and in between the bellows. The weight of the filled liner on the bottom plate prevents the bellows from riding up in the outer drum when the bellows inflate and deflate.

Must all 3 bellows be connected to the inflation manifold?

Yes. All three bellows must inflate together to crush the fermenting must equally from all sides.

Can I operate without the lid attached?

NO! The lid with reinforcement hoop must be attached at all times. Inflating the bellows during punch or press without the lid secured clamped will damage the rubber bellows and may cause injury. You should fill the liner with grapes. Close the opening with the hose clamp and protective tape. Now place the lid and reinforcement hoop then attach with the drum clamp. The 2inch TriClamp port will stick out of the center opening of the lid and all subsequent operations will be done through this port. MAKE SURE the clamp is secured correctly. The lid clamp should only be opened AFTER pressing AND the bellows are deflated. With the clear lid it is easy to check whether the bellows are fully deflated.

Bellows do not seem to inflate during punch.

The bellows take about 3 to 5 minutes to inflate. You can verify inflation by looking into the clear lid. If the bellows are not inflating – 1) check that air is not leaking from the circular pressurization manifold and that each of the three bellows is connected correctly. 2) check that the manifold tube is firmly connected to the air outlet fitting on the controller. 3) check that the controller is set to the correct operation and powered. If only one bellow is not inflating check the tubing to that bellow and also for possible puncture.

Pressing but no wine comes out. Panic?

First of all, verify that 1) You have REMOVED the pressure relief valve that is used fermentation and 2) replaced it with the press fitting and 3) connected this press tubing to your wine collection vessel. Also check lid clamp is secure. When you start PRESS, the bellows inflate. You should be able to see them inflating through the clear lid. First the CO2 in the liner is forced out so no liquid is seen. Then suddenly the wine will gush out. Do not panic. This will happen – just takes 3 to 5 minutes before it starts.

I have pressed but I feel there is still wine in the liner I could get.

The built-in press pushes out about 90% of the wine in the unit. The remaining wine is trapped in the press tube and folds. Connect a wine pump to the press tube and you can pump out this material. Another way to increase yield is to wait 30 minutes after pressing and restart the PRESS operation. Use the pump during this second pressing to get wine that has percolated down through the must. This technique is very effective for getting the

most juice out during white grape pressing. You can repeat the step more time if you want. Finally, nothing will come out.

How can I oak the wine?

Oak adds some interesting flavors and also softens the tannins. You can add oak products such chips, staves, or cubes to the wine during aging. Taste frequently and stop when you feel the oak flavor is sufficient.

When can I drink the wine?

One of the remarkable things about the GOfermentor JR process is that the gentle punching really extracts color and flavor. The gentle built-in press does not crush the seeds so the wine is never bitter. In general, wine made in a GOfermentor JR tastes a year older than in traditional equipment. So, you can drink the wine as soon as the yeast settles (month or so). Ideally, you want to wait about 6 months and remove the settled material a few times during this period (racking). Bottle some then and the rest after a year.

How do I bottle my wine?

Home winemaking stores or online supplier offer many options for home bottling. You can also buy custom labels for your wine.

Can I sell my wine?

No. Federal law prohibits sale of homemade wine. It is expressly for your personal consumption.

Do I need to pay taxes on the wine I make?

No. No taxes and no permit necessary.

Can I just use juice instead of grapes?

You can. For white wine this is a good source. For red wine it is much better to use whole grapes.

Difficulty connecting to WiFi?

Check that the WiFi LAN is in range and switched on. If all fails cycle power – press SETUP – select Reset WiFi and retry to add to App.

Want to connect from outside the network?

The GOfermentor JR can communicate to your smartphone app from anywhere in the world. The only requirement is that it must have WiFi internet connection and be added to the GOfermentor SmartPhone app.

Getting +add New Device Click Ready screen

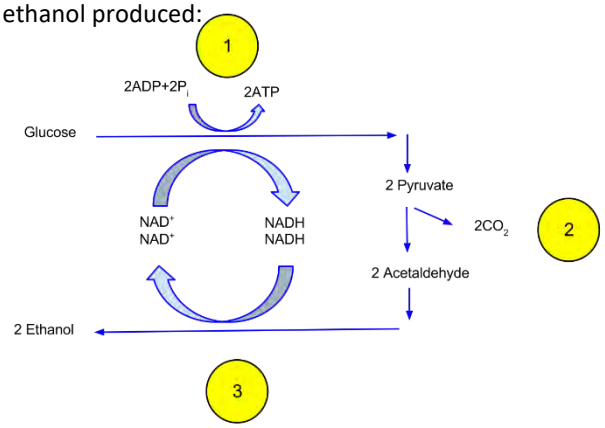
The GOfermentor JR is an IOT (internet-of-things) device and requires to be connected to the internet via WiFi. Read the ***Built-in WiFi*** instructions in the GOfermentor JR manual for help.

APPENDIX 6 ETHANOL ESTIMATOR (OPTIONAL)

Instantly determine the ethanol concentration is your fermenting wine. GOFermentor JR option.

Determining alcohol concentration in fermenting wine is the holy grail of the winemaker. In addition to determining when the sugar is depleted, knowing the rate of ethanol production can provide insight into whether the fermentation is “stuck”, complete, or progressing normally. While ethanol can be measured – all methods require removing a sample and performing an analysis. Refractive index measurement is inexpensive, but requires careful compensation. Other offline methods include tedious enzymatic methods, distillation, ebulliometry, or expensive FTIR instruments.

True online measurements involve either weight-loss monitoring or measuring gas evolution. Weight monitoring is not very practical at small scale because compensation needs to be made for sample removals, evaporation etc. Measuring the volume of gas evolved is much easier. Once fermentation is underway, the evolved gas is almost entirely CO2 with some water vapor and evaporating ethanol. The stoichiometric equation below shows the relationship between CO2 evolved and ethanol produced:



Based on this equation for every mole of CO2 vented, a corresponding mole of ethanol is produced. If the fermentation is conducted in a closed bag or vessel then by measuring the cumulative amount of CO2 vented, it is possible to estimate the amount of ethanol that has been produced to that point in time. Since we are interested in estimating the concentration of ethanol in v/v %, we need to calculate the liters of ethanol co-produced with 1 liter of CO2. From stoichiometry:

EtOH (liters) = CO2 (liters) x 0.00243

The concentration can then simply be determined by dividing by the fermentation volume:

EtOH v/v% = EtOH(liters)/fermentation volume(liters) * 100

Fermentation Volume Estimation:

Accurate estimation of the fermentation volume is needed for calculation of the ethanol concentration.

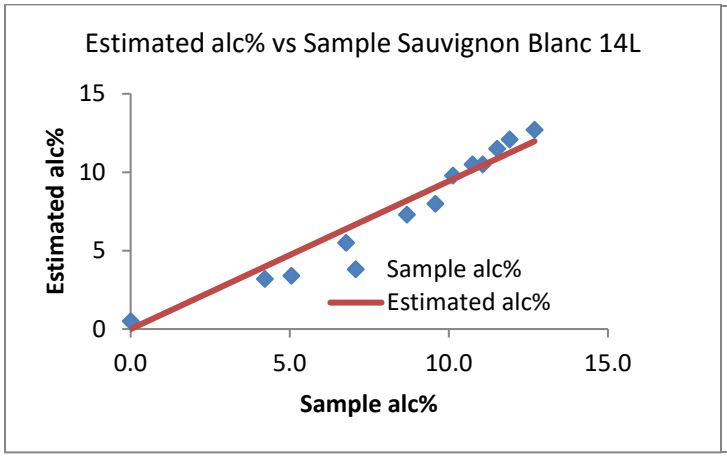
For white wine or any fermentation of only liquid, the volume of juice is entered as liters into the app.

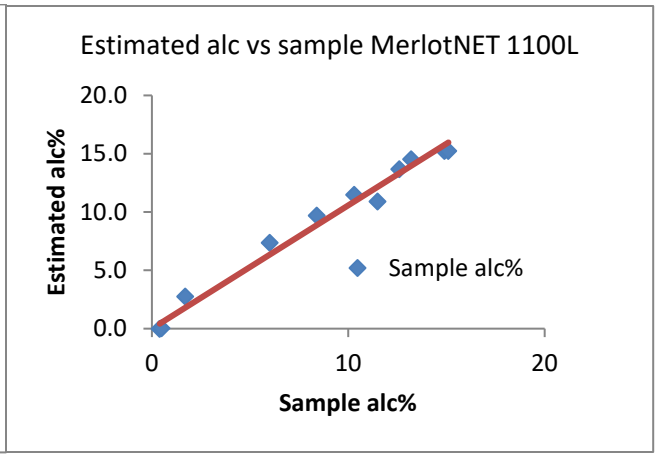
For red wine or any fermentation on skins, multiply the weight in kilograms by 80% to calculate the volume.

Data Analysis – Accuracy of ethanol estimation solely from evolved CO2:

Fermentations were run in GOfermentorNET and GOfermentorJR. In the NET, volumes ranged from 500 to 1100 liters of grape *must*. In the smaller JR device, the fermentation volumes ranged from 12 to 40 liters of grape *must*. Several different varietals were used. Both red and white wine fermentations were conducted. Ethanol concentration was determined periodically by taking samples and analyzing using a Foss OenoFoss FTIR instrument. This instrument was calibrated for the type of wines being made.

CO2 offgas volume was measured using the GOvent sensor. Predicted ethanol was calculated using the previous equations and then plotted versus the measured sample ethanol concentration. The relationship is linear as predicted by stoichiometry, and the regression R^2 is better than 0.99. Typical plots are shown in the figures below:

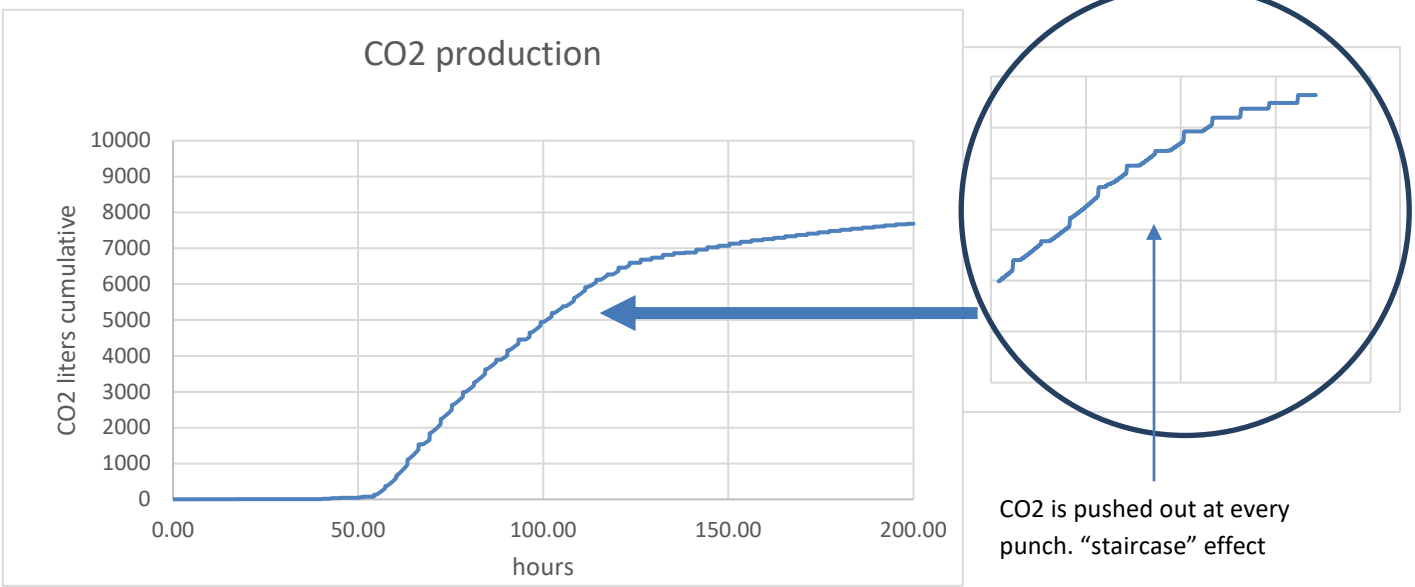




The linear relationship allows the prediction of ethanol concentration in real-time from the measured cumulative volume of gas vented. With a knowledge of fermentation volume, the accuracy of the predicted ethanol concentration can be better than ± 0.25% v/v. This is certainly sufficient for process monitoring.

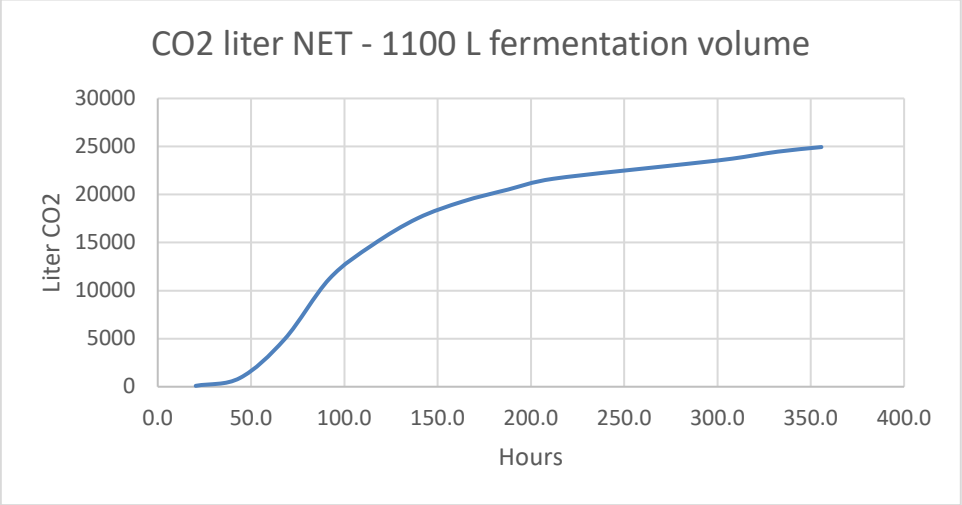
Data Analysis – Monitoring of fermentation process ethanol concentration:

Here is an example of CO2 gas evolution in real-time as the fermentation progresses.



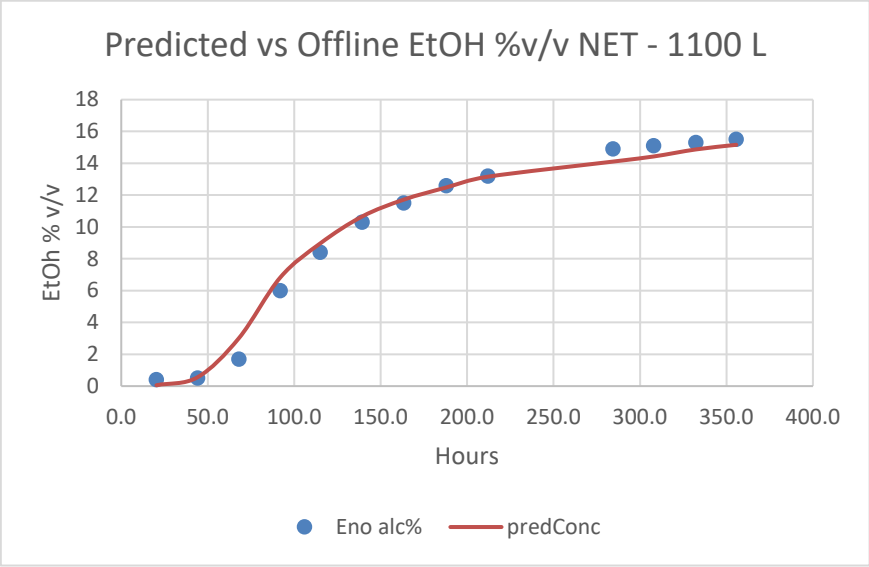
GOfermentor in which most of the gas is expelled during a punch operation. In this operation, the vent valve is forced open, and CO2 is expelled out of the fermenting *must* by the pressure applied by the inflating secondary chamber. Each step in the graph is a punch operation. No gas is essentially expelled until the next punch unless pressure builds up and is released by the spring in the vent valve. The cumulative CO2 and the rate of change is indicative of the fermentation trend: lag, exponential increase, and final flattening. Ethanol production and concentration can be estimated from the CO2 evolution.

Here is another dataset from a Merlot fermentation performed in GOfermentorNET. It was run at maximum capacity of 1 ton of grapes (approx. 1100 liters of *must*).



The fermentation lasted just over 14 days. A cumulative 25,000 liters of CO2 was evolved and the trend in time is shown in the above figure. Note that monitoring the CO2 profile is very helpful is understanding the lag in the beginning and then the rapid fermentation, followed by the eventual flattening as all the sugar is consumed. It is easy to identify a “stuck” fermentation.

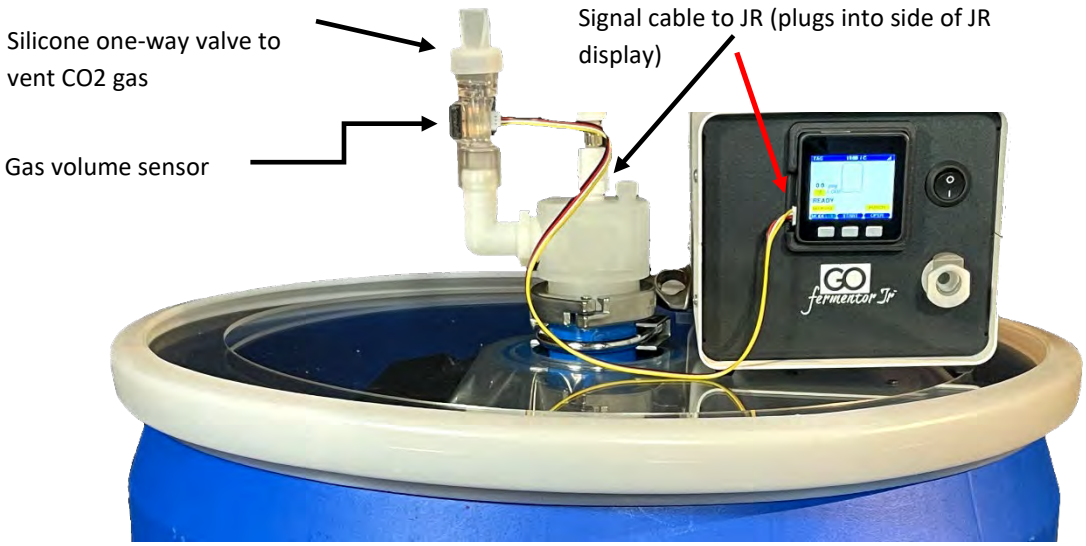
Ethanol was estimated automatically in real-time from the CO2 data and is shown below. The orange line is the estimated ethanol concentration. Samples were taken and assayed daily. These measurements are shown as blue dots. The predicted values are within +/- 0.25 %v/v proving the utility of the GOvent estimation system.



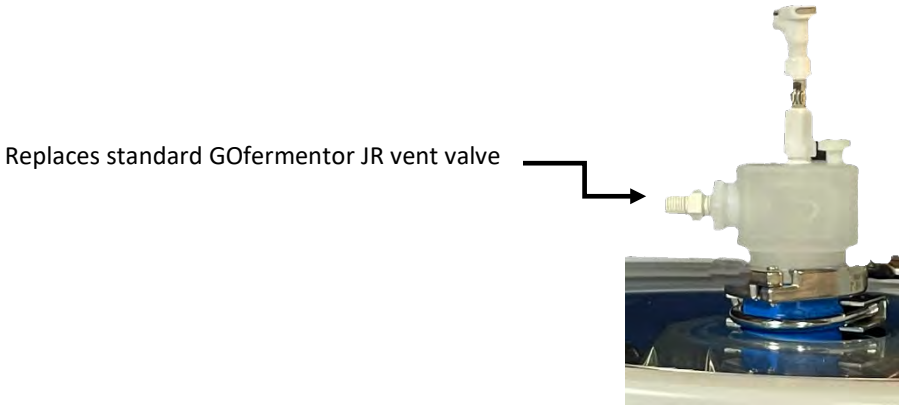
GOfermentor JR version:

GOfermentor Jr has a pressure-sensitive vent valve that releases gas whenever the pressure in the liner exceeds 0.1 psig. The GOvent option replaces this valve with one with an integral gas flow sensor. A cable connects the new sensor-equipped valve to the JR controller unit. The JR controller screen shows the cumulative volume of gas vented, and the free internet JR app shows the ethanol produced and concentration in the fermentor.

New JR devices can be ordered with gas measuring vent instead of the standard vent. Older units (prior to 2022) can be retrofitted. Please contact tech@GOfermentor.com.



NEW GOvent valve with gas volume sensor for use with GOfermentor JR.



APPENDIX 7 WARRANTY, SUPPORT, LIABILITY, AND RETURNS POLICY

The GOfermentor hardware is warranted to be free of defects in material or workmanship for 12 months after delivery to the first purchaser for use, providing that the units have not been misused. Since we have no control over the operation, we cannot guarantee against failure or loss of product in the unit. Our obligations hereunder, at our option, are limited to the replacement, repair, or refund of the purchase, and parts which upon examination prove to be defective within the warranty period.

Disposable items, such as fermentation liners, are meant for single use. They are warranted against any defects and will be replaced if found to be defective. Damage caused by improper installation or user error is not covered under the warranty. Unused liners are not returnable.

In no circumstances are we liable for any product loss due to the use of our product. The user is cautioned that this is experimental technology and they agree to accept the risk inherent in using new technology.

RETURNS

- Call 877 377 5359 or email sales@gofermentor.com if you have any problems with the GOfermentor. In most cases we can resolve the issue.
- Email tech@gofermentor.com for a Return Material Authorization (RMA) number before returning any item.
- Put the RMA on the outside of the shipping label.

APPENDIX 8 TERMS AND CONDITIONS OF SALE

When you purchased your GOfermentor JR you agreed to the following Terms & Conditions of Sale. If for some reason you feel that you are unable to abide by these conditions please return the equipment in as-new condition for a full refund (minus shipping charges). Contact sales@GOfermentor.com for Return Authorization.

The following Terms and Conditions of Sale (hereinafter, this "Agreement") constitute a binding agreement between you (hereinafter, "PURCHASER") and Engineering Investments, LLC dba GOfermentor ("hereinafter "COMPANY").

COMPANY and PURCHASER are sometimes hereinafter referred to individually as a "Party" and jointly as "the Parties."

1. **DEFINITIONS.** As used in this Agreement,
   a) "Effective Date" means the date on which Purchaser purchases any Product(s) (as defined below).
   b) "Party" refers to PURCHASER or COMPANY individually, and "the Parties" refers to PURCHASER and COMPANY jointly.
   c) "Product(s)" means any of the Products sold or provided to PURCHASER by COMPANY.
2. **COMMENCEMENT OF AGREEMENT.** This Agreement takes effect upon purchase by PURCHASER of any of the Products and constitutes good and valuable consideration for COMPANY's sale of such Product(s) to PURCHASER. PURCHASER acknowledges and agrees that s/he has entered into this Agreement voluntarily, intelligently, and with full knowledge of its consequences.
3. **LIMITED WARRANTY AND EXCLUSIONS**.
   a) **Limited Warranty**. COMPANY warrants that all Products shall be free from defects in workmanship and materials under normal use and conditions for a period of one (1) year from the date of purchase, except that with respect to GOliners and SmartBarrel Liners (or any other Product that has a one-time use), the foregoing warranty expires upon use. THIS LIMITED WARRANTY IS GRANTED ONLY TO THE ORIGINAL PURCHASER AND IS VOID UPON SALE OR TRANSFER OF THE PRODUCT TO ANY THIRD PARTY.
   b) **What is not covered by the Limited Warranty**. The Limited Warranty does not cover (i) the use of any Product for other than its intended purpose; (ii) normal wear and tear; (iii) damage caused by faulty installation; (iv) failure to follow instructions; (v) lack of reasonable care; (vi) misuse; (vii) abuse; (viii) accident; (ix) alteration; (x) modification; (xi) tampering; (xii) any negligent act or omission on the part of any person other than COMPANY; or (xiii) repair or service not expressly authorized by COMPANY in writing.
   c) **Exclusion of all other warranties**.
      (i) Except for the Limited Warranty provided in Section 3.a above, all Products are sold "as is" and COMPANY expressly disclaims all other warranties, whether express or implied, including any implied warranties of merchantability, quality, or fitness for a particular purpose. No oral or written information or advice given by COMPANY or any of its representatives shall create any warranty, express or implied, or in any way alter the scope of the Limited Warranty or the Parties rights or remedies provided in this Agreement.
      (ii) Some jurisdictions do not allow the exclusion of implied warranties, so some of the exclusions contained in this Agreement may not apply to PURCHASER. In such event, any implied warranty shall be limited in duration to ninety (90) days from the date of invoice or to the minimum period prescribed by law, and the remedy for breach of such implied warranties shall be limited to the Sole and Exclusive Remedy specified in Section 4 below.

(iii) By purchasing any Product, PURCHASER acknowledges and agrees that COMPANY has made no representations or warranties, express or implied, to or for the benefit of PURCHASER which contradict any of the foregoing.

4. **PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND LIMITATIONS ON LIABILITY**.

   a) **Sole and Exclusive Remedy**. All warranty claims must be made by PURCHASER within the Warranty Period for the applicable Product, and are subject to verification by COMPANY. In the event of any breach of warranty, COMPANY will, at COMPANY's option and expense, repair or replace the Product. This remedy is intended to be the sole and exclusive remedy of the buyer under this contract. Should this Sole and Exclusive Remedy fail of its essential purpose, however, COMPANY will return the purchase price of the Product to PURCHASER minus the shipping costs for return of the Product to COMPANY. PURCHASER and COMPANY further agree that, regardless of the failure of the Sole and Exclusive Remedy, COMPANY will not be liable for any consequential damages of any kind or nature whatsoever, including but not limited to the loss of grapes, or dissatisfaction with the quality of wine produced using any of the Products.

   b) **Limitations on Liability**. IN NO EVENT SHALL COMPANY OR ITS PRINCIPALS, OFFICERS, EMPLOYEES, OR REPRESENTATIVES ("COMPANY'S RELATED PERSONS") BE LIABLE TO PURCHASER OR ANY OTHER PERSON FOR ANY LOST PROFITS, LOST BUSINESS OPPORTUNITY, LOSS OF PRODUCT OR PRODUCTION, LOSS OF GOOD WILL, OR ANY CONSEQUENTIAL, INDIRECT, SPECIAL, INCIDENTAL, OR PUNITIVE DAMAGE INCURRED BY PURCHASER ARISING OUT OF OR RELATED TO THIS AGREEMENT OR TO PURCHASER'S USE OR MISUSE OF, OR INABILITY TO USE, ANY PRODUCT. THESE LIMITATIONS SHALL APPLY REGARDLESS OF WHETHER COMPANY OR ITS RELATED PERSONS WERE ADVISED, KNEW, OR SHOULD HAVE KNOWN OF THE POSSIBILITY OF SUCH DAMAGE.

   c) **Intention of the Parties to Exclude Consequential Damages.** The Parties intend the exclusion of consequential damages in Sections 4.a and 4.b above as independent agreements apart from the Sole and Exclusive Remedy provided herein.

5. **ASSUMPTION OF RISK and RELEASE AND WAIVER**.

   a) **Assumption of Risk**. PURCHASER acknowledges that the Products are currently experimental in nature and assumes any and all risks and liabilities associated with the use or misuse of, or inability to use, any of the Products, whether or not such risks are now known to PURCHASER.

   b) **Release and Waiver**. In consideration of being permitted to purchase any of the Products, PURCHASER, on behalf of him/herself and his/her personal representatives, guardians, heirs, successors, assigns, and any other person claiming through PURCHASER ("PURCHASER's Related Persons"), hereby releases, waives, and discharges COMPANY and COMPANY's Related Persons from any and all claims, demands, losses, expenses, and damages of any kind or nature whatsoever, and covenants not to sue COMPANY or COMPANY's Related Persons in connection therewith.

   c) **Indemnification**. PURCHASER, on behalf of him/herself and PURCHASER's Related Persons shall and hereby does indemnify and hold harmless COMPANY and COMPANY's Related Persons from and against any and all claims, demands, losses, expenses, and damages of any kind or nature whatsoever (i) resulting from or arising out of the use, misuse or inability to use any of the Products, or (ii) resulting from any claim, demand, lawsuit, or action by PURCHASER or PURCHASER's Related Persons that would constitute a breach of any obligation, covenant or promise by PURCHASER in this Agreement.

6. **Non-Applicability of United Nations Convention on Contracts for the International Sale of Goods**. The Parties hereby agree that the United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement.

7. **Governing Law and Exclusive Venue**. Any and all matters of dispute between the Parties, whether arising out of or related to this Agreement or from alleged extra-contractual dealings, interactions, or facts prior to or subsequent to the purchase of any Product, including, without limitation, claims for fraud, misrepresentation, negligence, or any other alleged tort or violation of contract (collectively, "Claims"), shall be governed by and construed, interpreted and resolved in accordance with the laws of the **State of New Jersey**, regardless of the

legal theory upon which such matter is asserted and without regard to the State of New Jersey's choice of law provisions. All Claims shall be submitted exclusively to the federal and state courts of competent jurisdiction located in **Somerset County, New Jersey**, and the Parties hereby unconditionally and irrevocably consent and submit to such exclusive jurisdiction and venue, and waive any objection they may now or hereafter have with respect thereto.

8. **California Code of Civil Procedure Section 1542**, If California Code of Civil Procedure Section 1542 is, for any reason, found applicable to the purchase of any of the Products or this Agreement, Purchaser hereby acknowledge and agrees as follows:

   a) California Code of Civil Procedure section 1542 provides that: ""A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him must have materially affected his settlement with the debtor;"

   b) PURCHASER hereby expressly waives any and all rights and/or benefits that s/he may have against COMPANY and COMPANY's Related Persons under California Civil Code section 1542 or any other statute or common law principles of similar substance and effect; and

   c) PURCHASER represents, acknowledges, and agrees that s/he is knowingly and voluntarily waiving the provisions of California Civil Code section 1542 as a part of this Agreement.

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