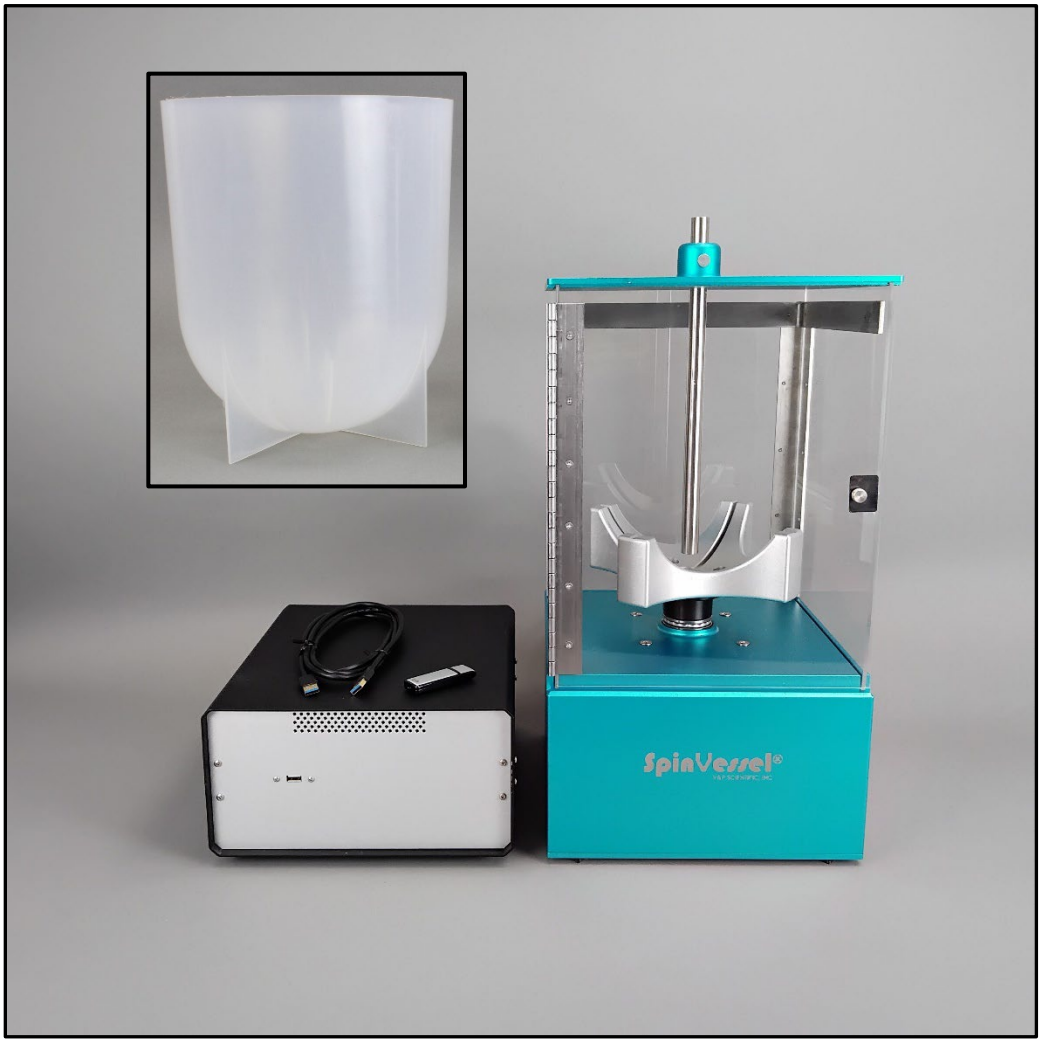
OPERATING INSTRUCTIONS FOR
6 Liter SpinVessel®
VP 418SV2-6L

US Patent #11,623,188
European (BE, FR, DE, NL, CH, SE, & UK) Patent #3887049



SpinVessel® System, with Computer Control feature, for the 6 Liter SpinVessel®: SpinVessel® System VP 418SV2-6L-CC includes Motor Unit, Spin Base, Enclosure and Lid and Controller. Inset shows the VP 830SV-6L SpinVessel® which is sold separately.

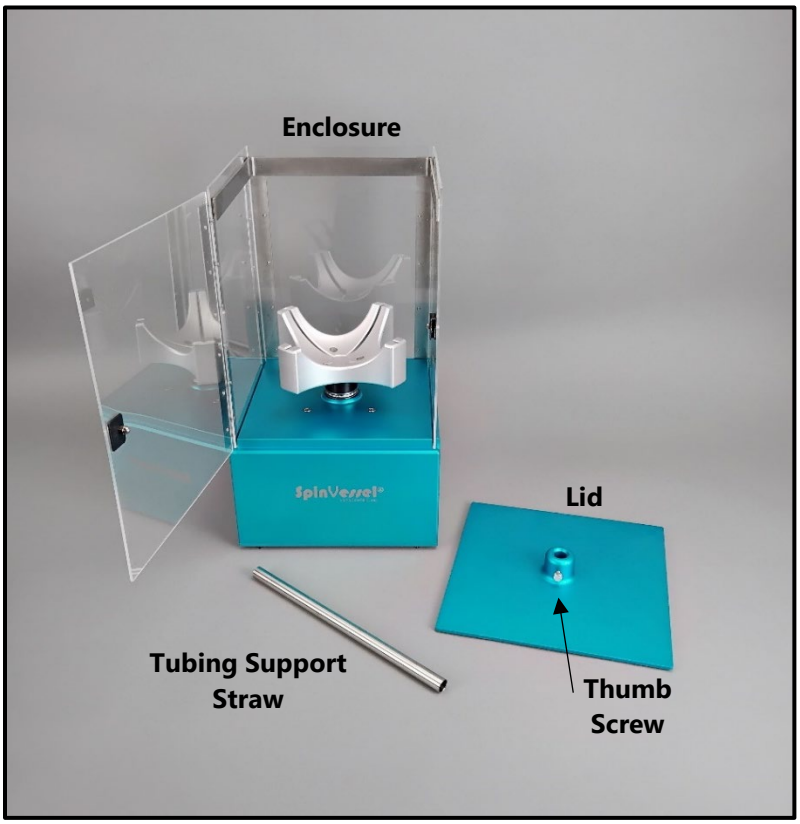
SET-UP

POSITION THE SpinVessel® SYSTEM NEXT TO A DISPENSER or PUMP

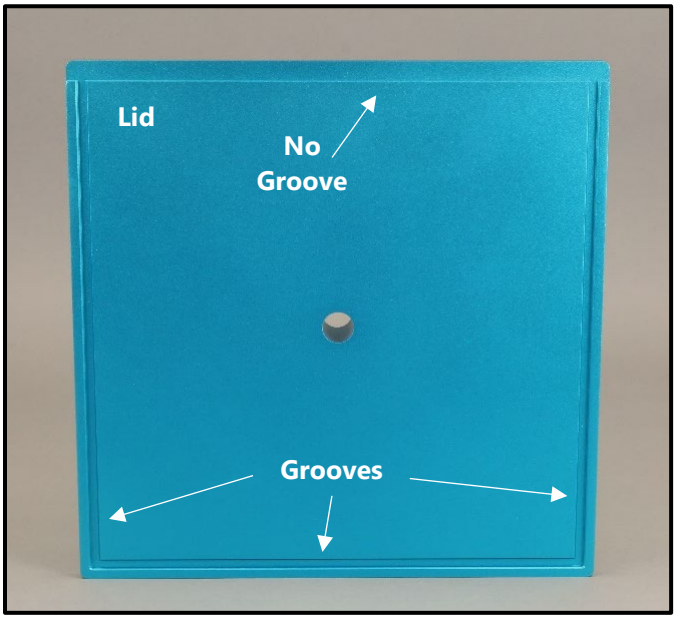
1. Place Motor Unit right next to microplate dispenser or peristaltic pump on a *very sturdy* lab bench or table.
   Warning: Do not use the Spin Base as a handle to move the SpinVessel. Hold the Motor Unit with both hands to position the SpinVessel where desired.
2. SpinVessel® Motor Unit needs to be placed close to the microplate dispenser so that the aspiration tubing can reach the bottom of the SpinVessel® Tube. Alternatively, longer tubing can be used.
3. Since Controller Cable is 6 feet long, Controller and computer can be placed at a distance from the Motor Unit.

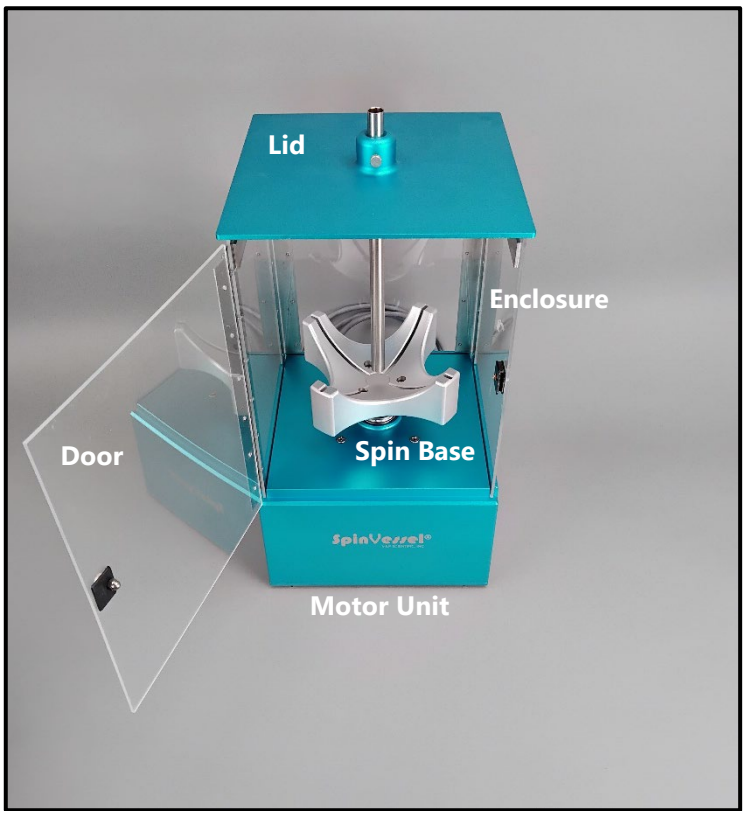
ASSEMBLE THE SpinVessel® SYSTEM WITH SpinVessel® ENCLOSURE AND LID

1. When placing the Enclosure on top of the Motor Unit, position the door of the Enclosure to the front of the Motor Unit where "V&P SCIENTIFIC, INC" is inscribed. Make sure that the Enclosure rests firmly in the groove around the top of the Motor Unit.

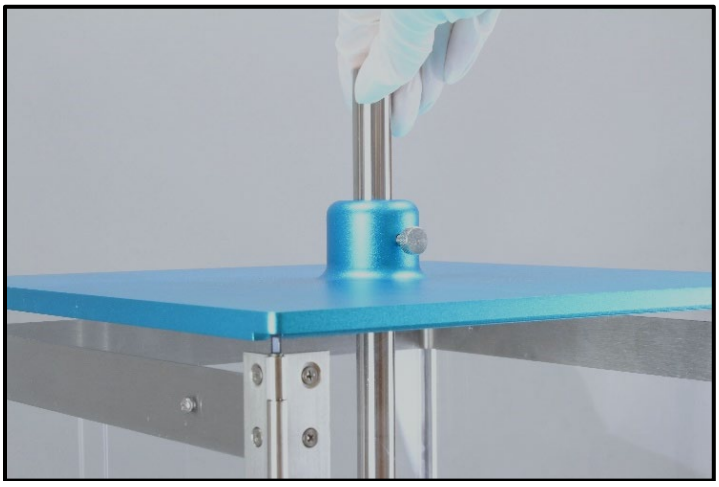


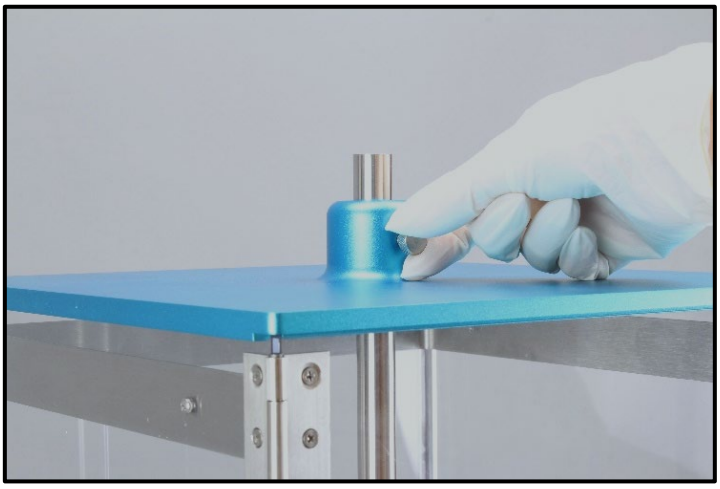
2. Place the Lid on top of the Enclosure also making sure it is resting firmly in the groove on the underside of the lid. In addition, position the one side of the lid that does not have a groove above the door of the Enclosure.





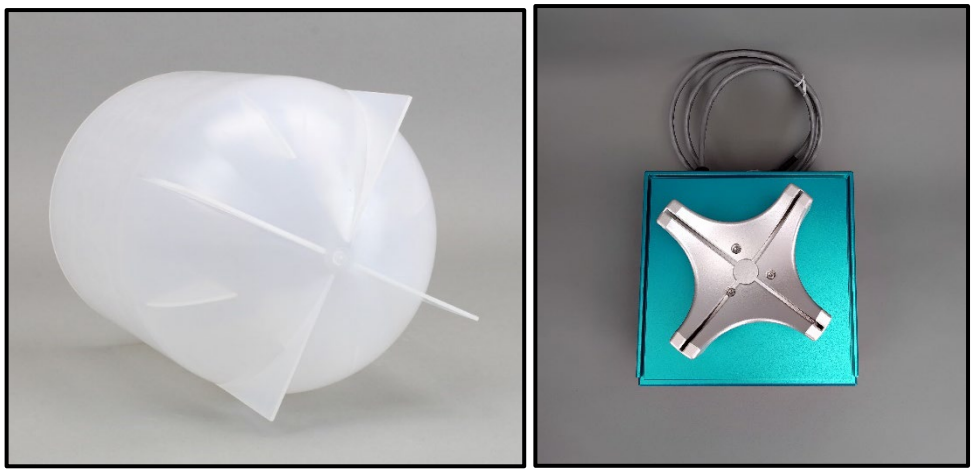
3. Insert the Tubing Support Straw into the hole in Lid and position it close to the bottom of the SpinVessel®.
4. Then insert the aspiration tubing bundle of the plate dispenser or aspiration tubing for a peristaltic pump into the Tubing Support Straw. Push the bundle until the tubing anchor or the end of the tubing is just visible at the bottom of the Tubing Support Straw but not touching the bottom of the SpinVessel®.



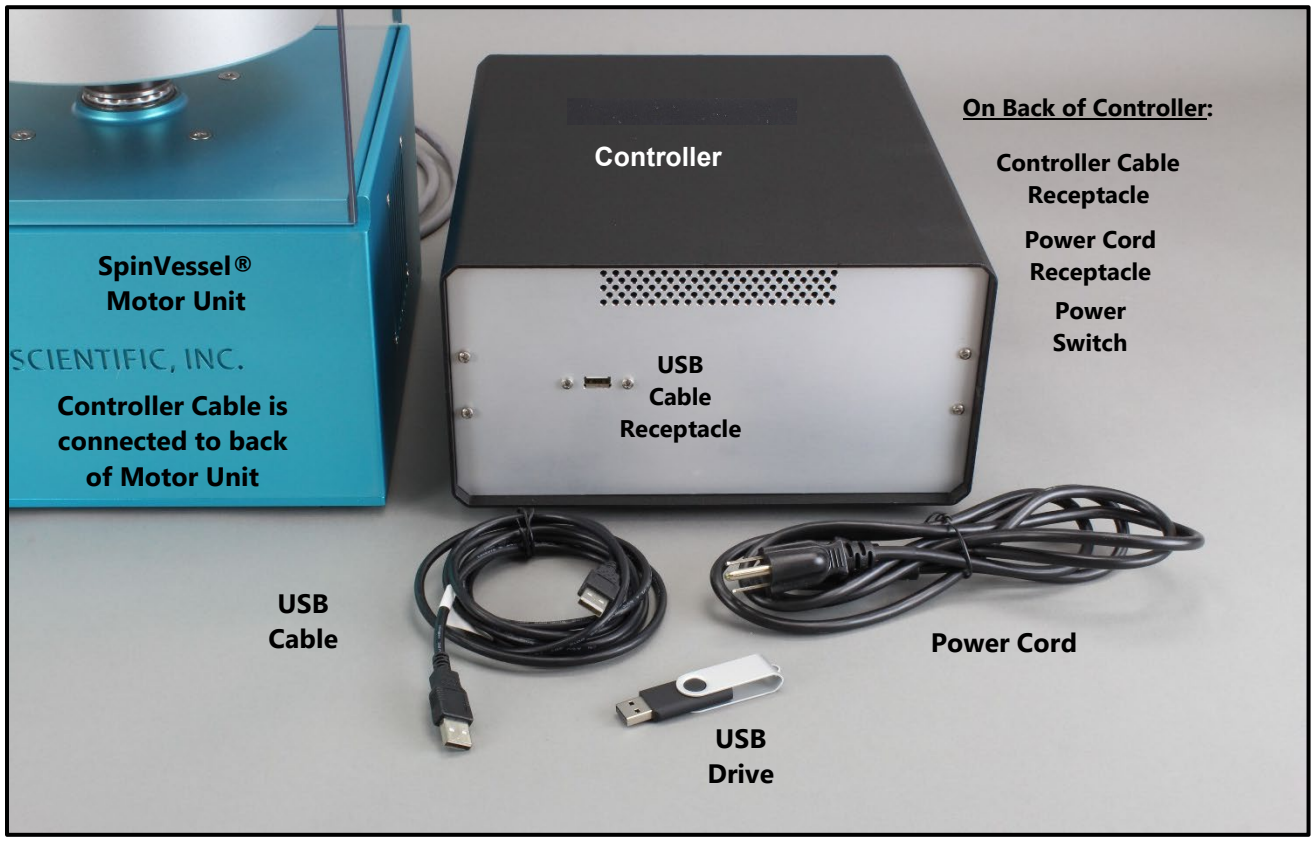


5. The Lid is made of anodized aluminum and Tubing Support Straw of stainless steel so that both can be sterilized by autoclaving. It is recommended that they be autoclaved assembled so that there is no need to touch the Tubing Support Straw when placing the Lid and Straw on top of the Enclosure.

6. Insert the SpinVessel® VP 830SV-6L into the SpinVessel® Spin Base. Ensure that the tabs on the outside of the SpinVessel® are seated flat and registered to the slots in the aluminum Spin Base.



CONNECT PARTS OF THE SpinVessel® SYSTEM



1. Plug Power Cord to an outlet.
2. Connect Power Cord into the receptacle on the back of the Controller.

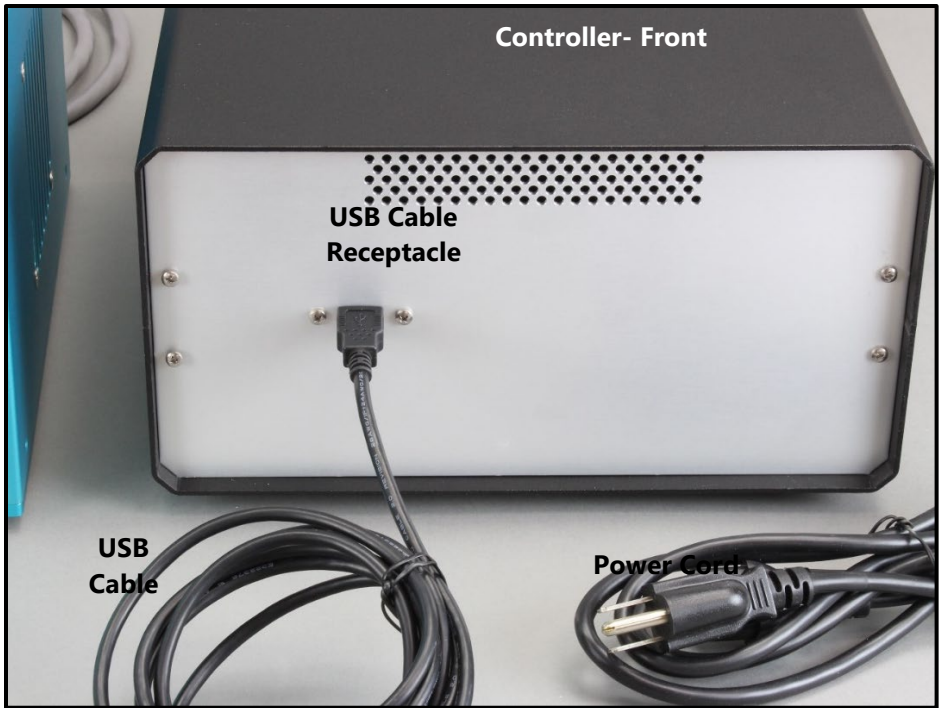
   Warning: Do not plug Controller in while power is on. Ensure that the Power Switch is in the off position ("0" is pressed in). Always have Controller plugged in before powering up.

3. Connect Controller Cable from the Motor Unit to the Controller. This is a 6-pin connector that needs to be secured by rotating the knurled ring around the plug.

4. Connect the USB Cable from the Controller to the computer.


Controller- Back
Controller
Cable
Receptacle
Power
Switch
Power Cord
Receptacle
Controller
Cable
Controller
Cable Plug
Power Cord


Knurled Ring
on Controller
Cable Plug



OPERATION

POWERING UP THE SpinVessel® SYSTEM

1. The Power Switch (I/O) is located on the back of the Controller, just above the Power Cord.
2. To power up the Controller, depress the "I" of the switch.

OPERATING THE SpinVessel® SYSTEM WITH COMPUTER CONTROL

The SpinVessel® Models with "-CC" in the part number are controlled using a computer. In this configuration, the control unit does not have a manual Touch Screen Controller. The Controller for the computer controllable SpinVessel® is connected by a USB communication cable to a computer. The Controller accepts simple ASCII commands to set the speed of the rotations, the number of rotations (including fractions of a rotation), duration of pause before reversing direction and degree of ramping to set speed.

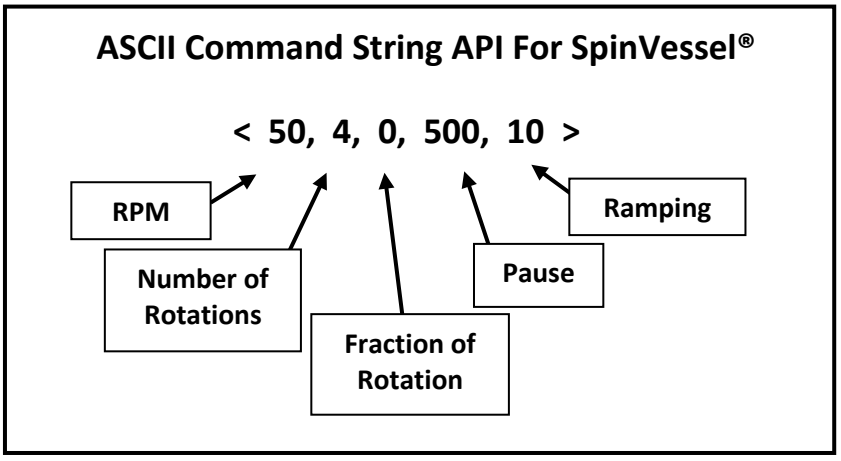
Software details

1. The SpinVessel® Controller uses an internal CH340G USB to Serial Converter (set to 9600,8,N,1) which will require driver software. Windows may already have the needed USB driver software installed. If not, download the "CH340 USB DRIVER" from the provided USB flash drive and run "CH341SER.exe" to install it (Windows typically auto-installs once downloaded). If your company policy does not allow the use of the provided USB stick, this driver is also available for download from the internet (contact your IT department for assistance if necessary).
2. The basic command language for this computer-to-stirrer communication is ASCII.

3. Commands can be sent from the computer using a standard terminal program like HyperTerminal or Realterm. Or, if needed, download the V&P Scientific Serial Terminal program from the provided USB flash drive. If your company policy does not allow the use of the provided USB stick, we suggest asking your IT department for a recommendation.
4. Alternatively, the ASCII commands can be sent by an automated liquid handler's software to control the SpinVessel®. Since there are many different automated liquid handlers available, please contact a technical representative from the company that makes the liquid handler.

Connecting and sending commands

1. Set up the system as described in the Set-Up section of the SpinVessel® Technote with the USB cable connected to the computer to be used.
2. Open the Serial Terminal program (V&P Scientific version or other).
3. Turn on the SpinVessel® instrument as described.
4. Select the appropriate COM port and click CONNECT to establish a line of communication between the instrument and the computer.
5. Create ASCII command strings as outlined in the diagram shown below to control the instrument with the following parameters:
    a. Speed of rotation in revolutions per minute (RPM).
    b. Number of rotations before reversing direction.
    c. Fraction of a rotation (input 0-9 for fractions of a rotation).
    d. Pause, in milliseconds, before reversing direction.
    e. Ramping, 0-100, where 0 is no ramping (rapid acceleration) and 100 is full ramping (slow acceleration)
6. Hit ENTER to send command and start rotation of the SpinVessel® instrument.
7. To stop, type <0> and hit ENTER.



USING the 6L SpinVessel® SYSTEM

The optimal stirring mode is dependent upon the application and needs to be empirically determined. Factors to consider in determining optimal 6L SpinVessel operation are the density of the particulates, their size and shape, as well as the volume and viscosity of the liquid. Start with 50 RPM and 4.0 rotations before reversing direction, then test to determine the appropriate RPMs and number of rotations for the particulate's density, fragility, and solution viscosity. We have found that smaller circumference SpinVessels® require higher RPMs than larger circumference SpinVessels®, because the critical factor is the linear speed generated at the circumference not the RPMs. See page 501 of our SLAS Technology paper for a full discussion of this phenomenon.

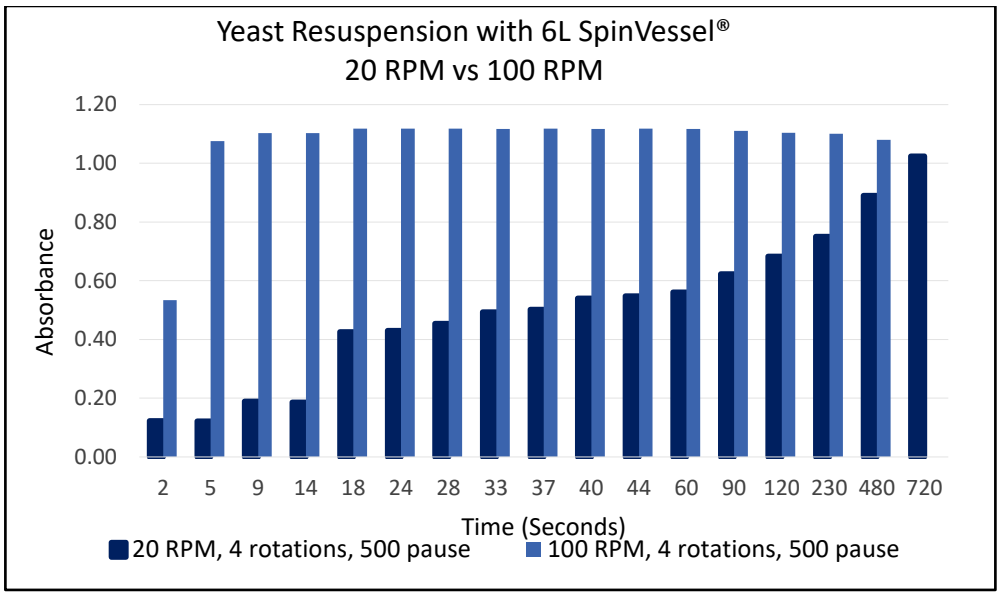
The following settings are ones to use when starting out with the VP 418SV2-6L-CC:

Speed: 50 RPM **Rotate: 4.0 times** **Pause: 500 milliseconds** **Ramp: 10**

It is always a good idea to practice with water in the SpinVessel® to determine safe RPM, rotation, pause and ramp numbers before using expensive reagents.

The VP 418SV2-6L-CC SpinVessel® is designed to be used with VP 830SV-6L SpinVessel® tubes. Please contact V&P Scientific for pricing.

See below for an example of low versus high RPM for a solution of yeast cells in a large circumference, 6-liter SpinVessel®. Note that, when given a longer mixing time, even the slower speed (20 RPM for more gentle mixing) was able to suspend the yeast cells.



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It is also important to note that any aspiration tubing used must be bundled in an organized fashion. Uneven tube lengths can introduce bulges within the stainless-steel straw as the tubing is inserted. These bulges will stop the tubing from advancing further down the straw.

PRODUCT MAINTENANCE

GENERAL PRODUCT CARE

When not in use, turn the power switch off.
Do not place the Controller in chambers with temperatures above 40°C. Do not block air opening on front and or fan outlet on back of Controller as constant air flow is needed to prevent overheating.
To clean the stirrer, wipe down with a cloth and mild detergent followed by a water wipe.
Do not immerse SpinVessel® Motor or Control in liquid.
The motor of the SpinVessel® is a stepper motor, 100-240 Volts, 50/60 Hz, CE compliant. The voltage will auto-switch.

SAFETY PRECAUTIONS

The use of motor controls, like that of all utilization of concentrated power, is potentially hazardous. The degree of hazard can be greatly reduced by proper design, selection, installation, and use, but all hazards cannot be completely eliminated.

The following safety precautions must be observed during all phases of installation, operation, service, and repair of this motor control product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the products. V&P Scientific assumes no liability for the customer's failure to comply with safety requirements and practices.

WARNING
To avoid personnel injury caused by electrical shock, do not remove the cover of the controller when the power is ON.

CAUTION
Do not disconnect motor during operation. Otherwise, over-current breakdown may result.

WARRANTY

V&P Scientific, Inc. warrants this product to be free from defects in material and workmanship when used under normal laboratory conditions for one year. This warranty begins from the date of delivery by V&P Scientific.

In the event this product fails under normal laboratory conditions within the specified period of time because of a defect in material or workmanship, V&P Scientific will, at its option, repair or replace the product. Damage to the product caused by user negligence is not covered.

This warranty is made in lieu of other warranties expressed or implied including the warranties of merchantability and fitness for a particular purpose. V&P Scientific shall not be liable for loss or damages arising from the use of these products nor for consequential damages of any kind.

Please keep the special shipping carton in case the unit needs to be shipped back to V&P Scientific. Contact V&P Scientific for return authorization and shipping instructions or for any other assistance at 858-455-0643 or sales@vp-sci.com.