Start-Up
Guide

# Pack in a Box Kit
# Dual Piston Pump

(Cat.# 26408)

RESTEK Pure Chromatography www.restek.com

## Contents

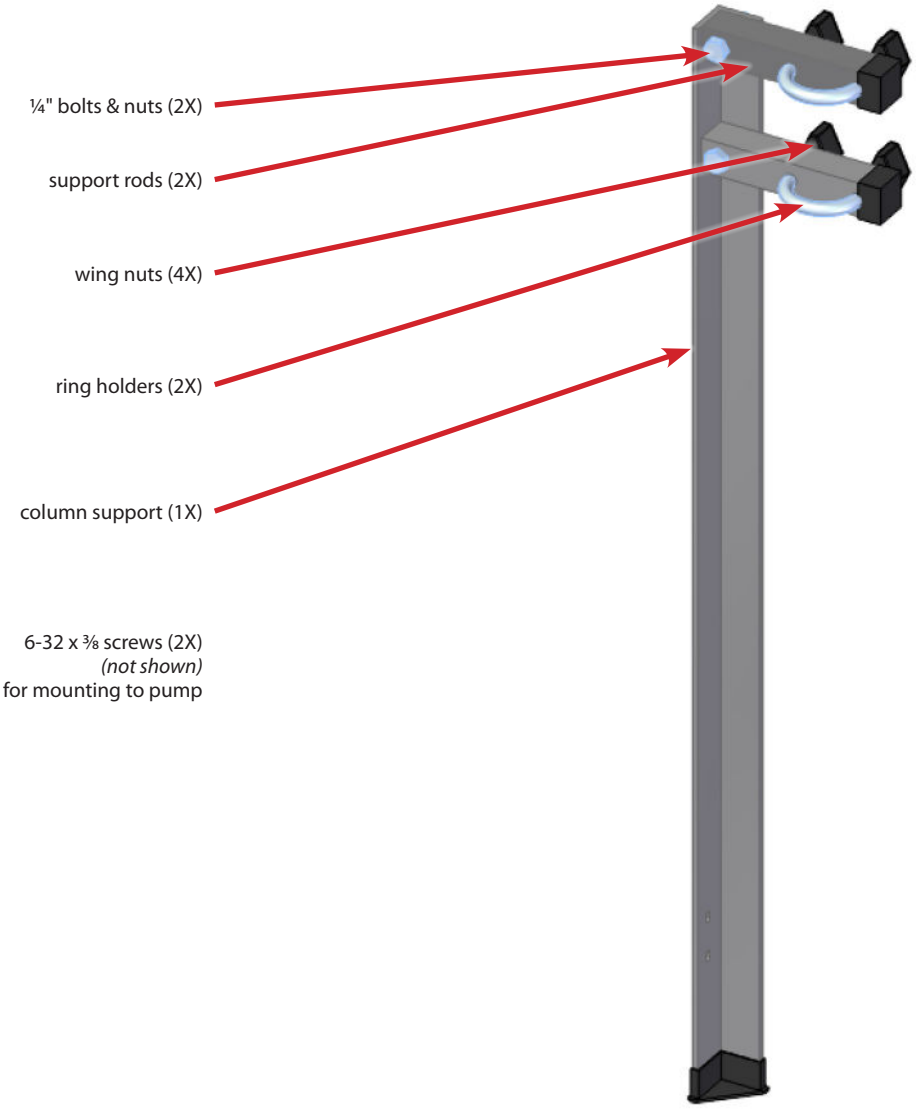
The following components are included with the Pack in a Box System.

### CP Class Constant Pressure Pump

- Dual-piston, stainless steel pump
- Constant pressure mode for column packing applications
- 0.01 to 24.00 mL/min flow rates
- 10,000 psi upper pressure limit (across the flow range)

### Column Packer Bracket Assembly

- Mounts to side of pump to supply column packer



## Contents (continued)

The following components are included with the Pack in a Box System.

## Column Packer Assembly

- 20 mL slurry reservoir assembled with inlet for 1/16" tubing and outlet adaptor for 4.6 mm ID (5/16" OD ) column

1/16" inlet cap assembly (1X)
*(nut & ferrule included)*

column packer nut (2X)

20 mL reservoir (1X)

outlet cap assembly (1X)

4.6 mm pre-column tube (1X)

4.6 mm column adaptor (1X)

1/4" compression adaptor (1X)
*(packaged separately)*

4.6 mm seal ring (2X)
*(packaged separately)*

## Contents (continued)

The following components are included with the Pack in a Box System.

### Documentation

- Start-Up Guide
- Operator's Manual
- CE Declaration
- Quick-Set Software CD

### Cabling

Power cord (1X)
*AC power input*

10-pin connector (1X)
*Analog pump control*

RS-232/USB cable (1X)
*Quick-set communications*

Micro USB cable (1X)
*Firmware updates & communications*

### Tubing

Start-up tubing kit (1X)
*Inlet tubing, fittings, filter*

SS tubing kit (1X)
*Connecting pump to column packer*

1/16" nut & ferrule (1X)
*Fittings for 1/16" SS tubing*

Plastic syringe (1X)
*For pump priming*

### Column

4.6 x 150 mm column assembly (2X)

## Additional Equipment and Chemicals

Below are several components not included with the Pack in a Box System, but are required to assemble and utilize the system.

### Tooling

- Adjustable Wrench
- Phillips Head Screwdriver
- Laboratory Spatula

### Chemicals

- C-18 Packing Material
- Methanol (for example)
- Chloroform (for example)
- Other Chemical Solvents

### Additional Items

- 30 mL Beaker
- Waste Container
- Balance
- Computer
- Ultrasonic Bath

### Assemble Bracket as Shown

Mounting hardware, wing nuts, column packer ring holders, and mounting screws are included.

Correctly mounted column packer assembly also shown here.

Mount bracket to pump before attaching column packer assembly.

### Column Packer Assembly

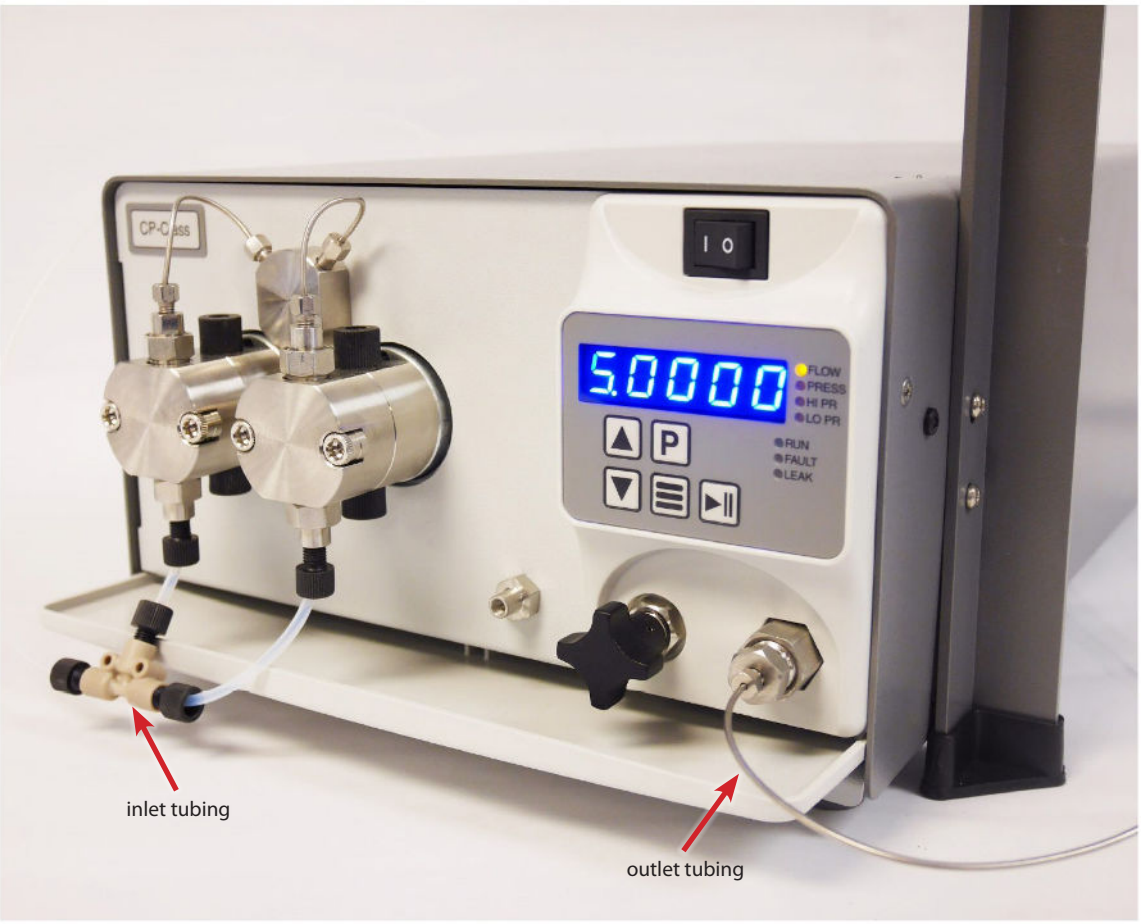
Comes pre-assembled for supplied column hardware.

### Mount Packing Stand to Pump

Screw stand to side of pump using the two screws provided.

## Plumbing the Pump

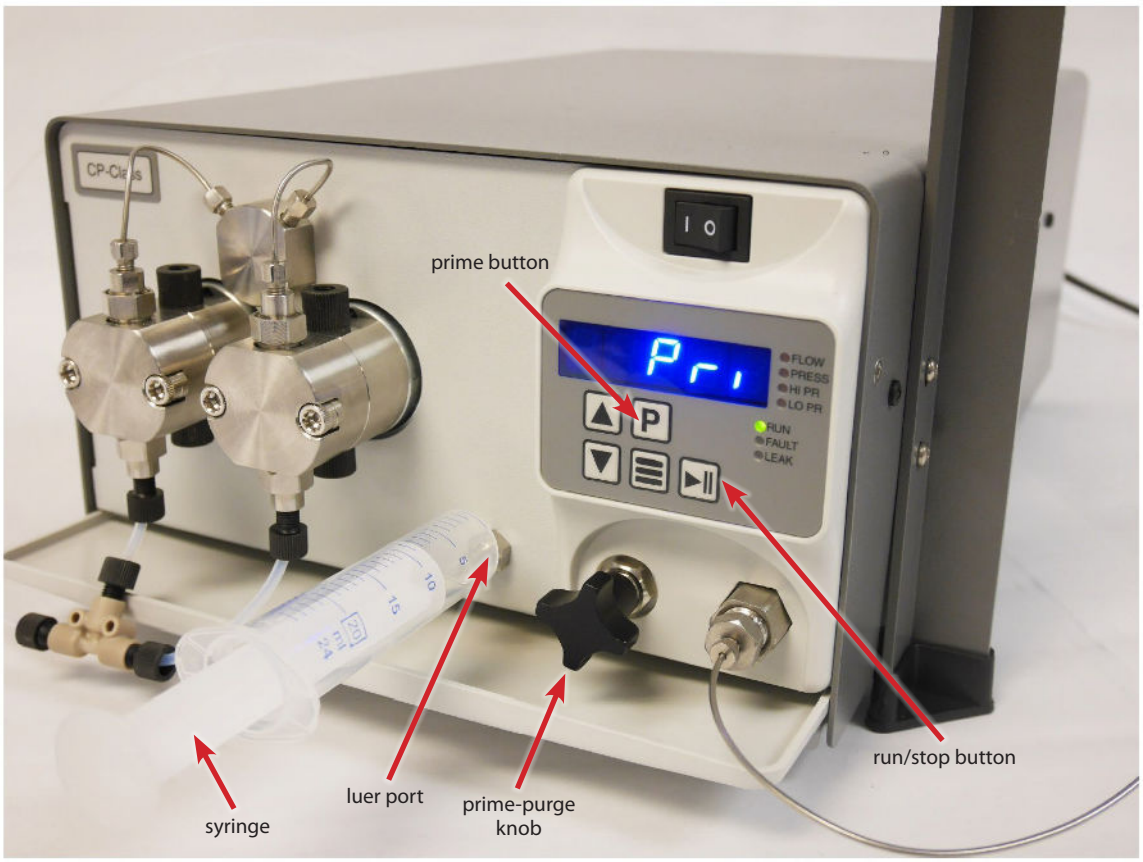
Connect plastic inlet tubing and stainless steel outlet tubing as shown. The appropriate gland nuts and ferrules are included.




Place inlet filter in solvent reservoir. Connect outlet tubing to the Packing Reservoir.

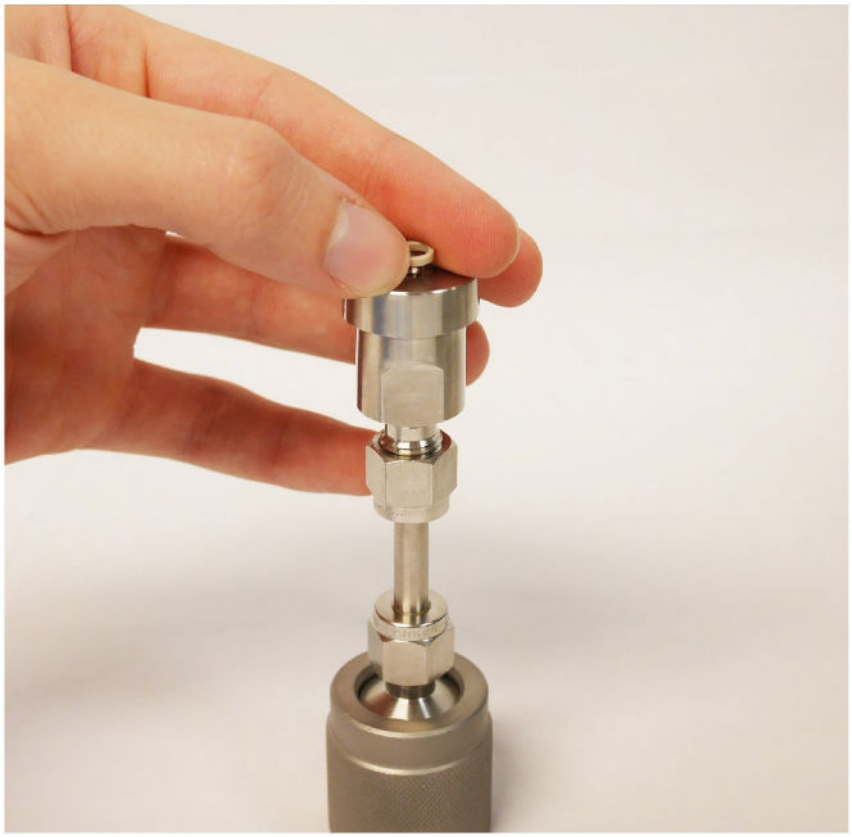
## Priming the Pump

- Open the prime-purge knob on the front of the pump by turning it counter-clockwise.
- Insert the supplied syringe into the luer port.
- Press the prime button on the front panel. The pump will run at its max flow rate.
- Use the syringe to draw solvent through the pump and into the syringe.
- Draw about 20-30 mL of fluid. Place excess back into solvent reservoir.
- When primed, close the prime-purge valve and hit the run/stop button.



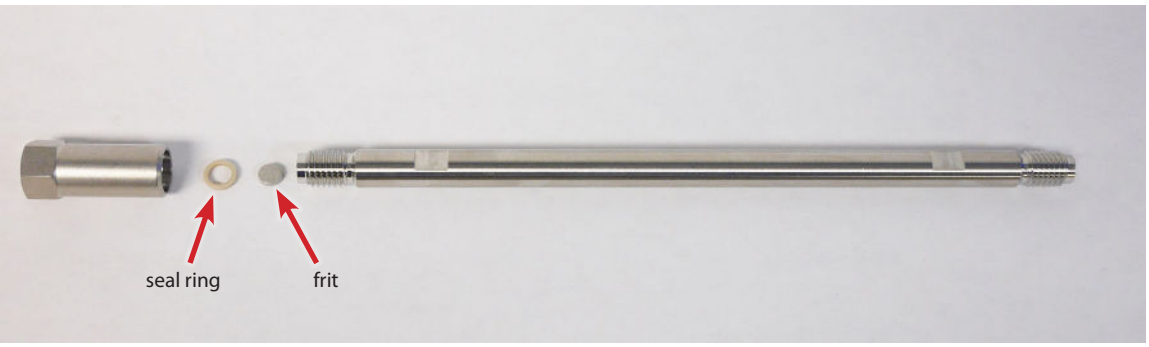
## Packing Ring Seal Installation

Place ring in adapter as shown.
Make sure ring is flat in bottom of adapter.
Set ring by attaching column (column assembly shown on next page).



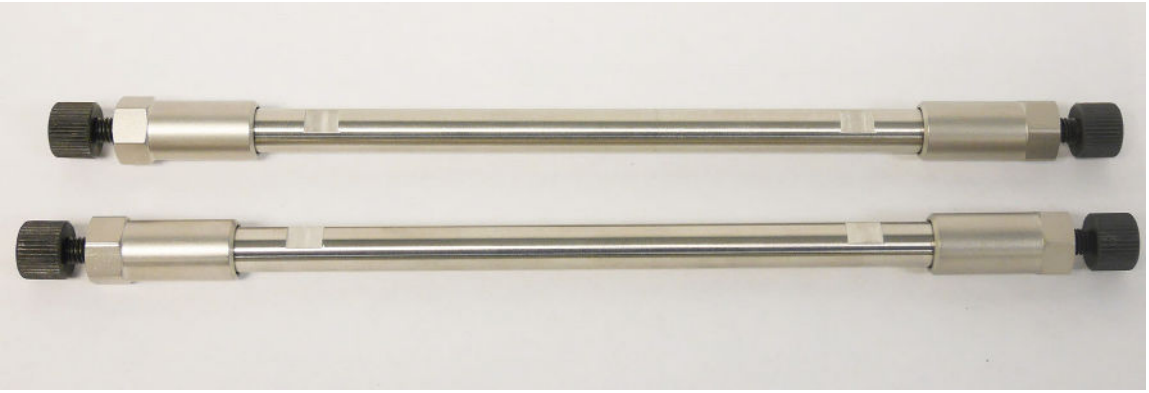
## Column Assembly

Column assembly during packing process (install frit and seal ring on column outlet; set aside the second frit and seal ring to seal column after it is packed). Keep plug in column outlet until ready to begin packing with solvent.



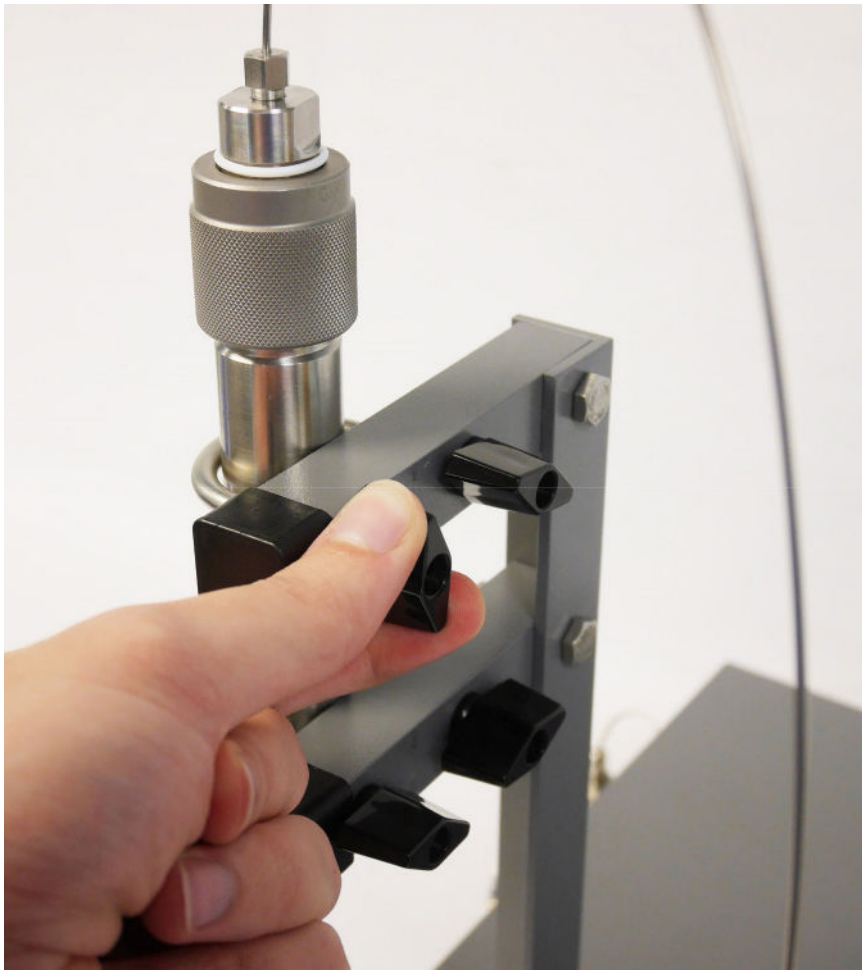

Column assembly after packing process.

Finished columns with plugs installed.



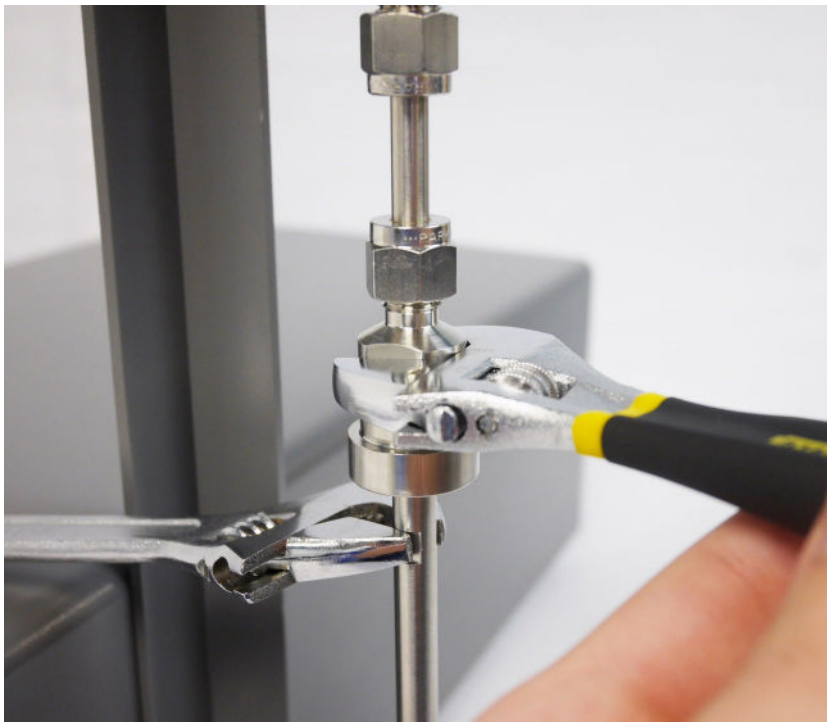
**Packer Mounted to Stand**

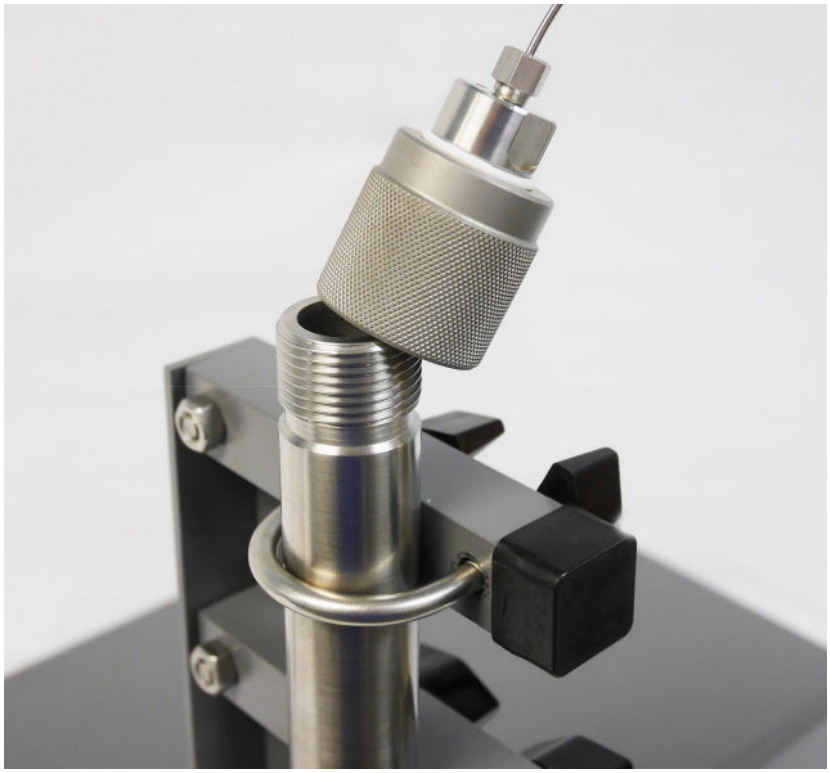
Mount Packer to stand and hand-tighten wing nuts.



### Tighten Column to Packer

- Use two adjustable wrenches (or ¼" and ⅝" wrenches) to snug column to packer.
- Do not over tighten. A ¼ turn past snug is sufficient.
- Fill column with 3 mL of packing solvent (unscrew top cap from reservoir and pour in solvent). Make sure the plug is installed in the column outlet.





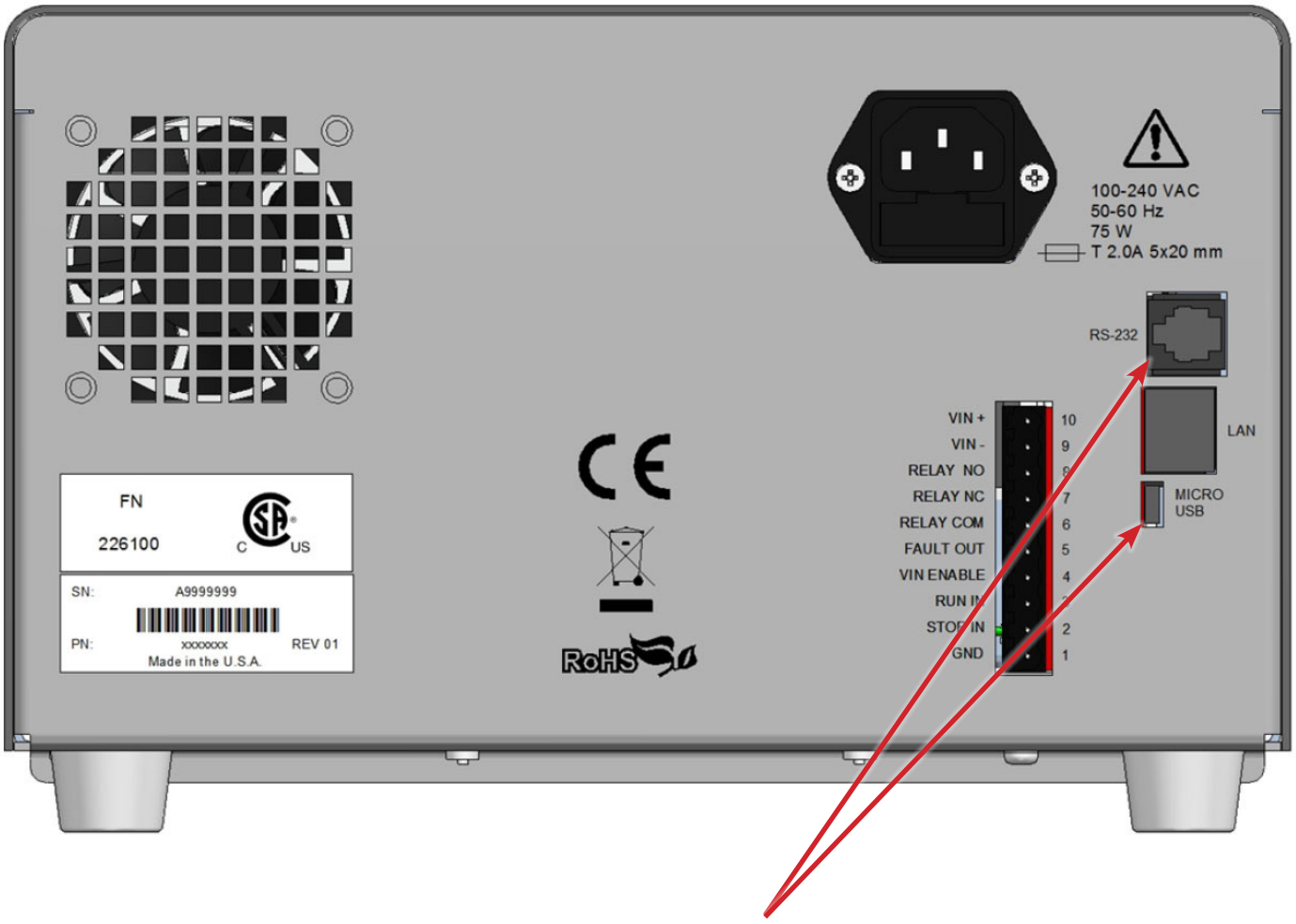
## System Assembled Correctly

Be sure to place the inlet filter into a solvent reservoir.


Place waste beaker underneath column.

## Connect the Pump to a Computer

Customer supplied computer or laptop can be used to control the pump with supplied Quick-Set computer software (described in the next section).

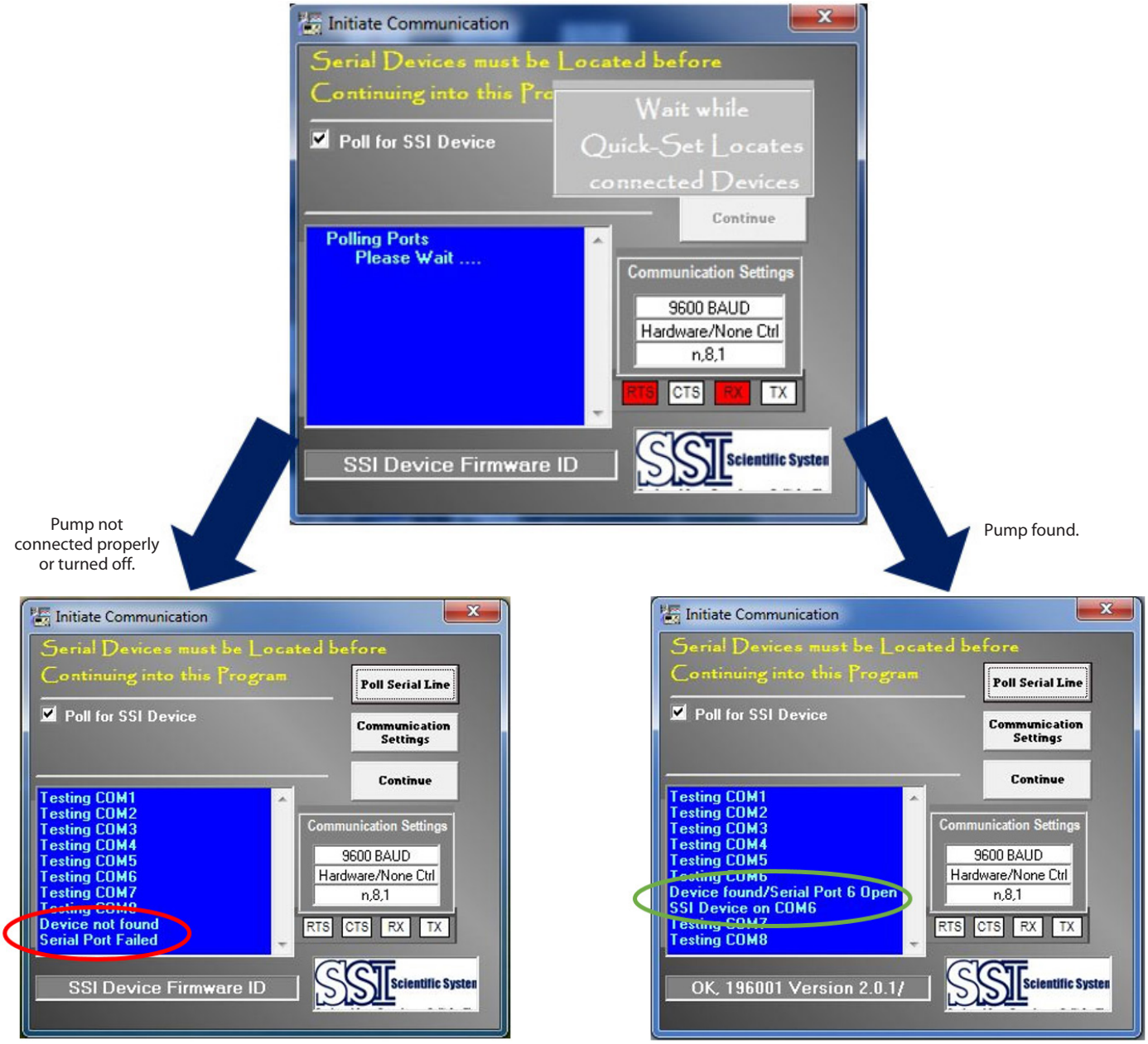



Connect the pump to the computer using either the RS-232 or Micro USB cable.

## Installing Quick-Set

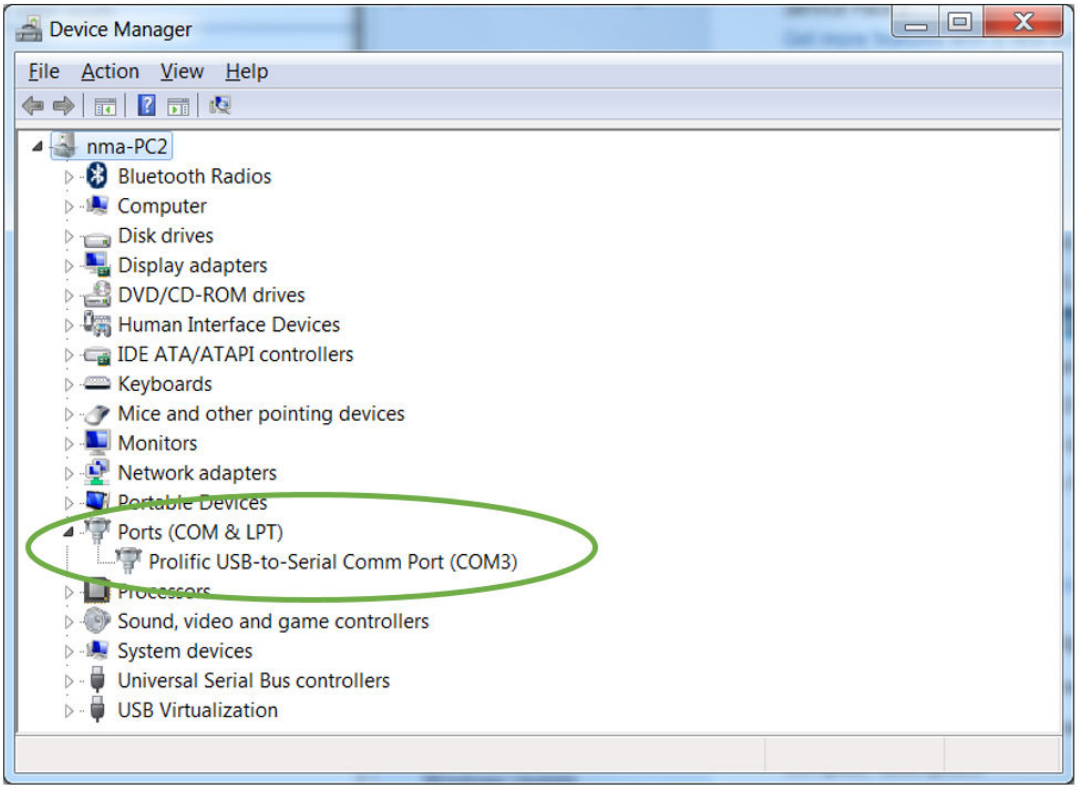
- Insert the Quick-Set disk or run the executable file, and follow the prompts to install.

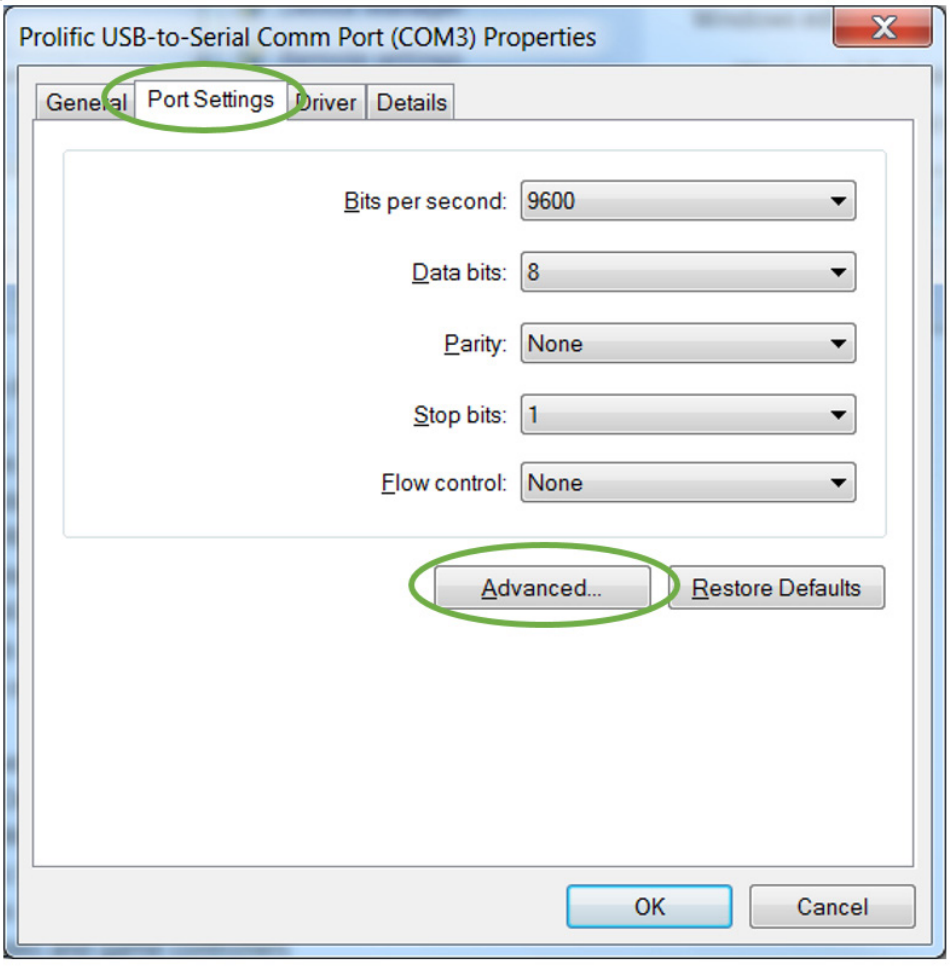

- Depending on your Windows version, your PC may have newer files than the ones being loaded. You will be prompted for a course of action. When in doubt, "keep" your existing files or "ignore" other messages.
- After installing, make sure that the pump is powered ON, and click on the icon to start the program:

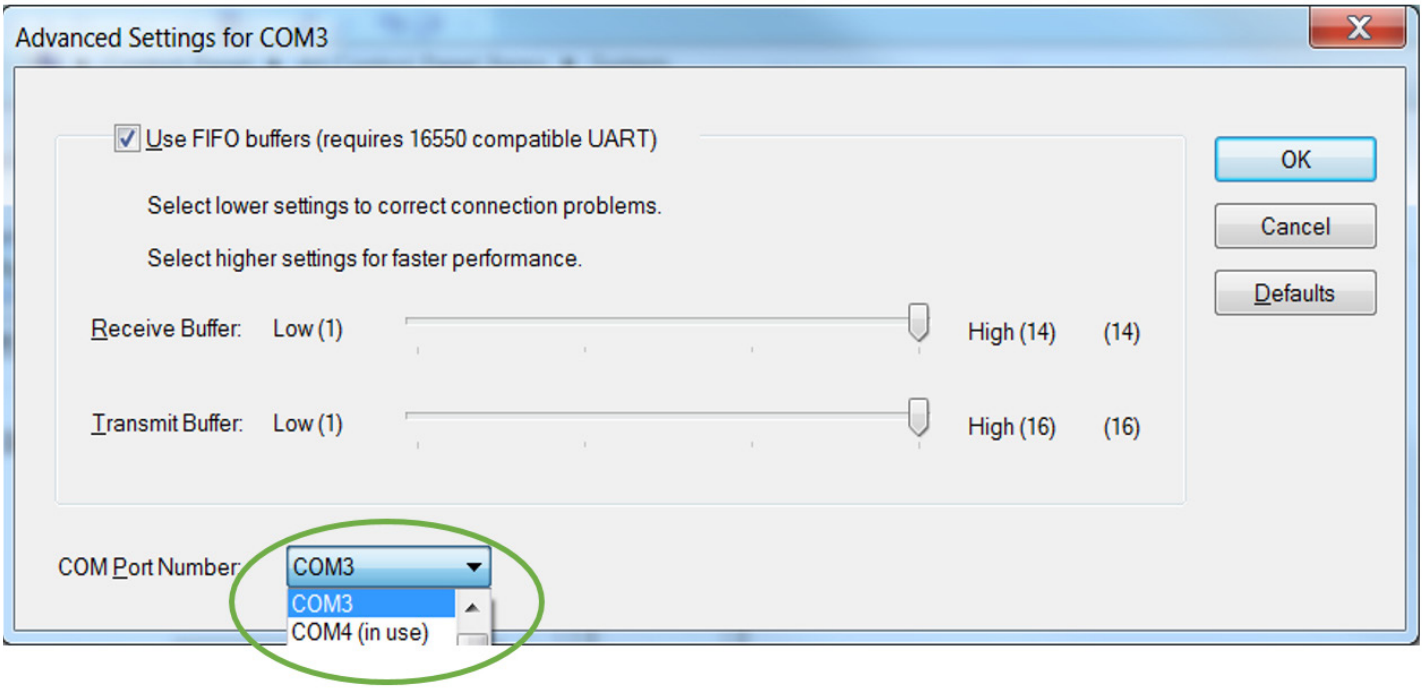




The program will automatically begin polling for the pump. Make sure that the pump is on and connected to the computer (use the supplied RS-232 to USB cable). To poll again, click on the "Poll Serial Line" button.

In order for the pump to be found, the Comm Port number must be within COM1 to COM8. If the port number is higher than 8, use the Device Manager to change the port number (please refer to the following screen shots).


Device Manager
File Action View Help
nma-PC2
Bluetooth Radios
Computer
Disk drives
Display adapters
DVD/CD-ROM drives
Human Interface Devices
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Ports (COM & LPT)
Prolific USB-to-Serial Comm Port (COM3)
Sound, video and game controllers
System devices
Universal Serial Bus controllers
USB Virtualization

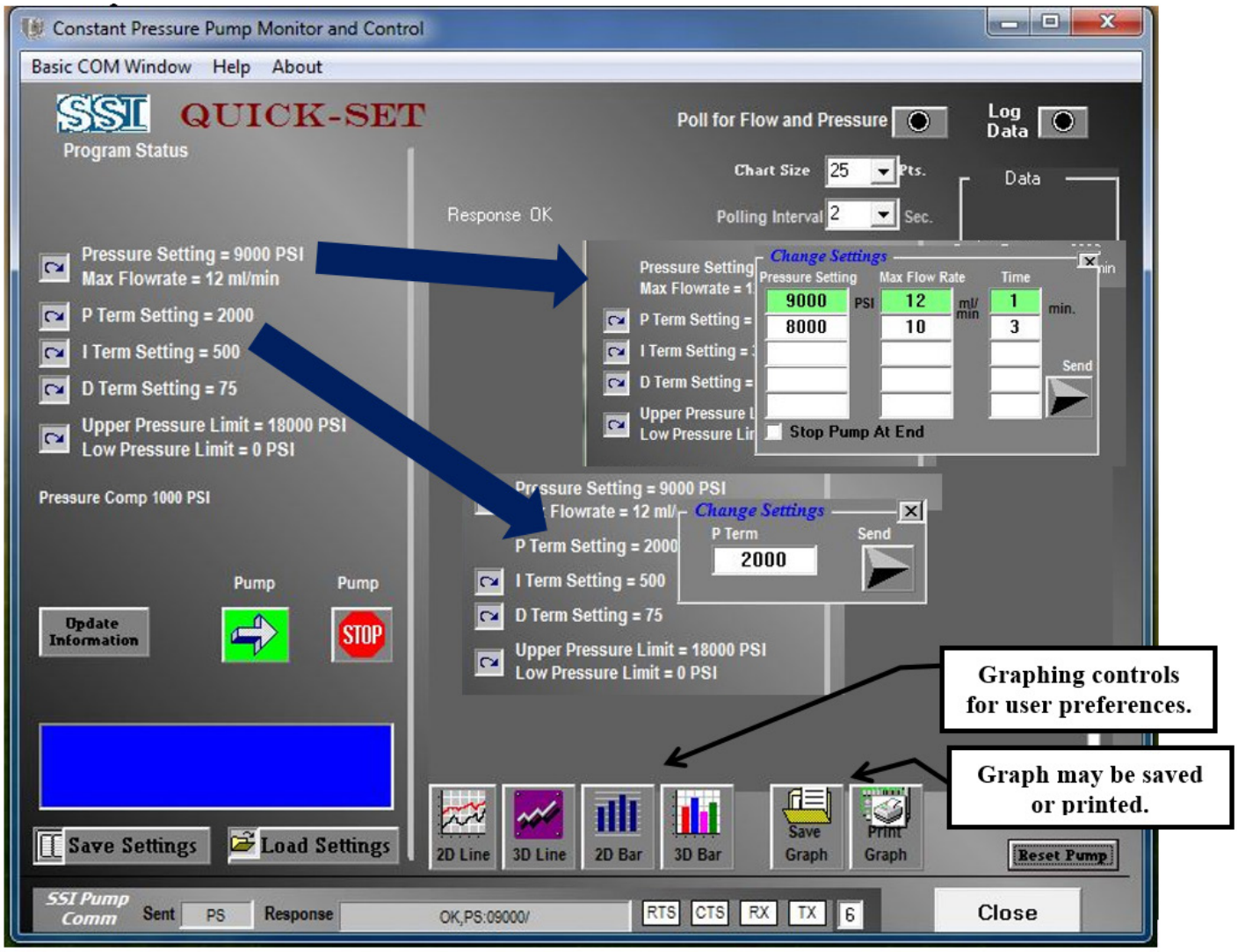

Prolific USB-to-Serial Comm Port (COM3) Properties
General
Port Settings
Driver
Details
Bits per second: 9600
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None
Advanced...
Restore Defaults
OK
Cancel




When the pump is found, click the "Continue" button to proceed. Be sure the pump is found before moving on. This assigns a port to communicate with the pump for all remaining screens.

## Quick-Set

Below is the Main Operation Window, where the majority of controlling the constant pressure pump will occur. Here you can create your flow and pressure method, set the pressure, flow rate, and time interval, with a maximum input of 5 steps. You can also set the PID loop variables, as well as the upper and lower pressure limits.



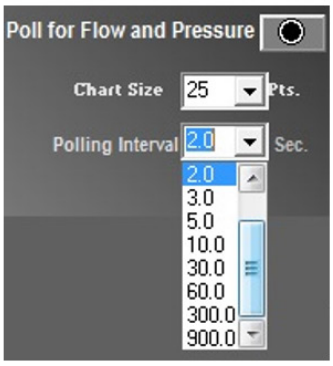

To enter your method, click on the button next to "Pressure Setting" and "Max Flowrate".

Enter your pressure, flow, and time interval. Once a time interval has been entered, the timer button will appear in the Main Window.

To start the method, click on the timer button. To stop the method, click on the timer button again. To reset the timer, click on the re-zero button.

## Quick-Set

Click "Poll for Flow and Pressure" to begin collecting data. Click the "Log Data" button to save your data under the file name of your choice.





Pump flow and pressure may be graphed and logged (to a comma and space delimited text file). Click the "2D Line", "3D Line", "2D Bar" or "3D Bar" to change the graph type view.

Note:
Zero readings are not graphed.
All entries in the text file are time stamped.
Text files can be easily imported into EXCEL, but do not require EXCEL on the machine collecting the data.

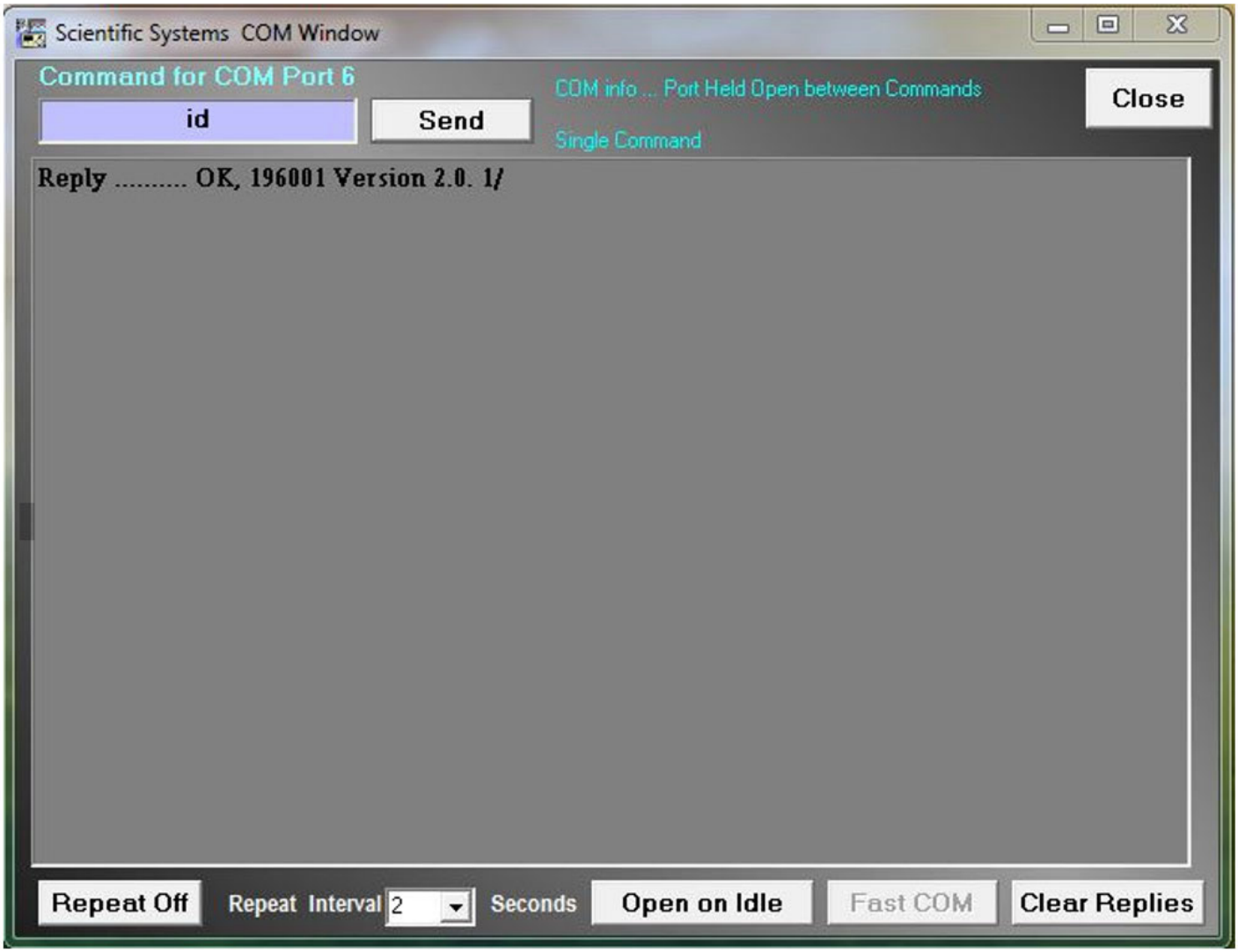
Absolute accuracy of the polling interval is not guaranteed, (this is a Windows limitation.) The Graph will start when the "Poll for Flow and Pressure" button is pressed.
To Log the data Click the "Log Data" button and follow the prompts.

Data may be logged multiple times per second or as slow as one point every 15 minutes. Click on the "Chart Size" or "Polling Interval" to customize the graphical view.

The "Save Settings" and "Load Settings" buttons can be used to save or load user methods. The saved method parameters include the Flow, Pressure, and Time Interval for a maximum of 5 steps, the check box to stop the pump at end of the method, the P, I, and D Terms for the PID setting, the Upper Pressure Limit, and the Lower Pressure Limit.

## Quick-Set

Within the menu, click on the "Basic COM Window" tab to go to a screen where serial commands may be entered manually (shown below). See Appendix A of the Pack in a Box Dual Piston Pump Operator's Manual for more information on the constant pressure serial commands available.




To repeat commands, click the "Repeat Off" button; it will change to "Repeat On" and repeat the entered command until pressed again.

To return to the Main Window, click "Close".

For questions or additional assistance, please contact Technical Support at support@restek.com

## Making the Packing Slurry

The following is an **example process** for creating packing slurry. Other solvents and amounts of packing material can be used depending on the setup.

- Weigh 3 grams of silica into a 30 mL beaker.
- Add 20 mL of 50:50 Chloroform/Methanol into the 30 mL beaker (pure methanol can be used, but it is not as efficient).
- Use a spatula to break up packing and stir slurry.
- Place in an ultrasonic bath until uniformly dispersed.
- Pour slurry into packing reservoir as soon as possible and pack the column.

## Adding Slurry

- Use 20 mL of silica slurry and pour carefully into reservoir.
- Fill reservoir with washings of beaker and close.
- Make sure the reservoir is full with slurry.
- Remove silica from threads.
- Hand tighten top nut.

## Final Checklist

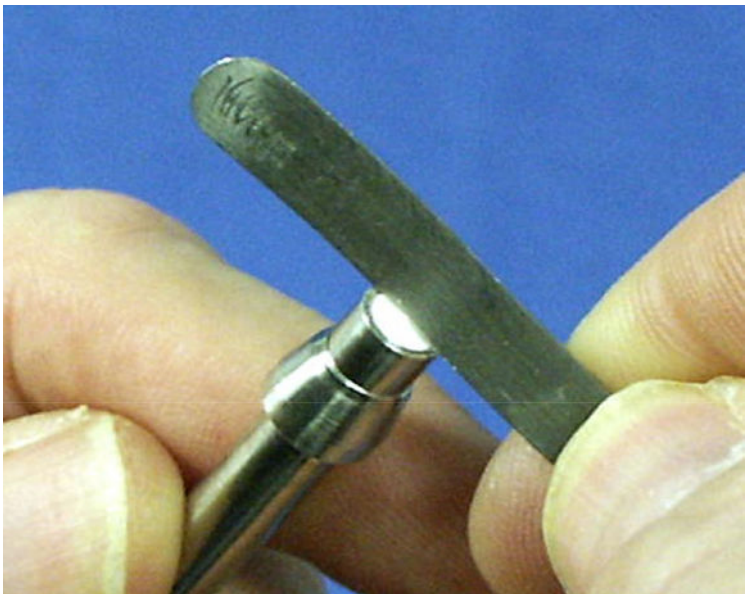
- Is the method loaded?
- Is the pump primed?
- Is there a waste collection vessel or beaker below the column?
- Did you tighten all of the fittings?
- Is there slurry in the reservoir and is the reservoir closed?
- Are you set to graph the process and save your data?

When all of the above are complete, proceed and run your method.

## Removing the Column

After your method has been run:

- Stop the pump and let the pressure drop to 0 psi.
- Carefully unscrew the column and use a flat spatula or razor blade to remove excess silica.
- Remove silica from threads if present.
- Place end fitting and frit on column and seal.



Removing Excess Silica

## Getting Ready to Pack Again

- Pump remaining silica from the pre-column for reuse or disposal.
- Empty waste reservoir.
- Install the next column and repeat previous steps.

**Questions about this or any other Restek product?**
**Contact us or your local Restek representative (www.restek.com/contact-us).**



**www.restek.com**

**#730-51-001** Rev. date: 09/23

RESTEK
Pure Chromatography