ONEPUMP VERSAFLOW PUMP SYSTEM MODEL F492990

FOR GENERAL SPACES

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1. Safety Precautions

Anyone operating or working near the OnePump VersaFlow pump must be aware of the following:

- Read and understand the operator's manual before operating or servicing the equipment. Failure to follow instruction could result in user injury or system damage.
- Prior to operation, ensure that the pump is fully assembled and that the pump and sensors are properly connected to their connection ports on the system.
- Ensure proper precautions and procedures are followed for operating this equipment in your environment.
- Any alteration of the system from factory specification, either hardware or software, may cause unsafe conditions and will void the product warranty.
- Use appropriate power supply cables and receptacles for the area where the pump is installed.

Hazards during electrical connection

- Unplug the power cord prior to servicing electrical components, but only if it is safe to do so in the environment.
- Service should only be performed by trained and authorized personnel.
- No electrical or communications connections may be connected or disconnected while the pump is active.

Risk of rupture

- Use caution when opening and closing valves or clamps that may be upstream or downstream of this equipment. Failure to open or close valves at appropriate times may result in highpressure conditions, product loss, damaged filters, chemical spills, and pump damage.
- Prior to each use, carefully inspect all hoses and tubes for kinks or restrictions that could result in pressure buildup and possible rupture of hoses and tubing.
- When using peristaltic pump head modules, use tubing rated for use with peristaltic pumps. Replace the tubing per the manufacturer recommendations. Prior to use, inspect the tubing for wear.
- Carefully check that the tubing elements are properly installed or connected to the pump head. Failure to correctly install the pump elements can result in over pressurized tubing and bursting.

Transportation

- Never move the system while there is liquid in the pump element or while the system process is operating
- Never move the system when the environment is not deemed safe to do so

Pinching and entanglement hazards

- Do not place your hands near the internal mechanism of the pump while the system is energized. The internal mechanisms present a potential pinching hazard. The pump head should never be removed when the system in in operation.

2. Equipment Description

This section details the critical components and optional components that comprise the OnePump VersaFlow Pump System package as per the selection specified in the attached Pump Option Selection sheet, filled out by the manufacturer per the customer requirements.

The fully automated system is designed for use in a biopharmaceutical clean room environment for general fluid transfer applications.

The pump features multiple interchangeable pump heads that can be swapped out with minimal tooling and training.

The automation system is based on the Unitronics platform. It is configured to run automated processes and features a user-friendly interface. The software features an openloop controlled dosing system which shall dose fluid based on a selected pump RPM and dosing time, as well as pressure control and flow control settings. The dosing parameters are userconfigurable on the HMI. The pump features ports for 1 Pendotech pressure sensor and 1 Flowmeter.

This pump package features 1 Flowmeter to accommodate 1/8"x1/4" Tube.
This pump package feature 1 Pendotech PT-60 Transmitter and adapter cable.

The mechanical layout features easy accessibility for daily operation, equipment servicing, cleanability, and material compatibility. NonProcess surfaces such as the enclosure housing are 316 Stainless Steel, with welded seams ground and polished to a #4 finish, with an Ra ≤ 35 microinches. Additional hardware consists of OEM-supplied polymer or Stainless Steel materials.

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3. Operating Requirements

The following utilities are required to run the OnePump VersaFlow Pump:

120 VAC, 1 phase, 20A

4. Engineering Information

Operating conditions:

Temperature: 10℃ to 40℃ in a non-condensing environment

Storage conditions:

Temperature: 10℃ to 55℃ in a non-condensing environment

5. Mechanical Installation

The following procedure describes how to replace one pump head module with another on the OnePump VersaFlow pump. This feature allows the user to utilize different pump head scales and technologies.

Step 1. Ensure the pump is not operating. If the pump is on, press the "pump off" button. Ensure that "speed control" is the control selected and "pressure control" and "flow control" are not selected.

Step 2. Identify the thumb screws in the corners of the pump mounting subplate.
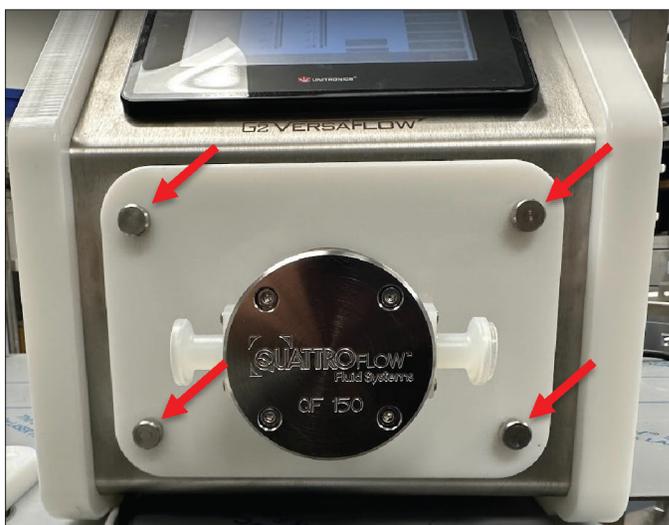
Step 3. Turn the screws counterclockwise to unfasten the thumb screws. The pump head's weight is supported by the mounting posts, but as a precaution, support the pump head so it does not back off of the mounting posts until you are ready to remove the head.


Step 4. Once all four screws are removed, pull the pump head to dismount it from the mounting posts.

Step 5. Visually inspect the red rubber spider bushing in the shaft coupling. Ensure that it did not dismount while removing the pump head. Note the position of the spider coupling.

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Step 6. Rotate the shaft coupling so that it aligns with the gap in the spider bushing. When assembling a Quattroflow pump head onto the motor, do so without the single-use pump head installed. You may use the center screw on the front of the swash plate to align the pump coupling by hand.
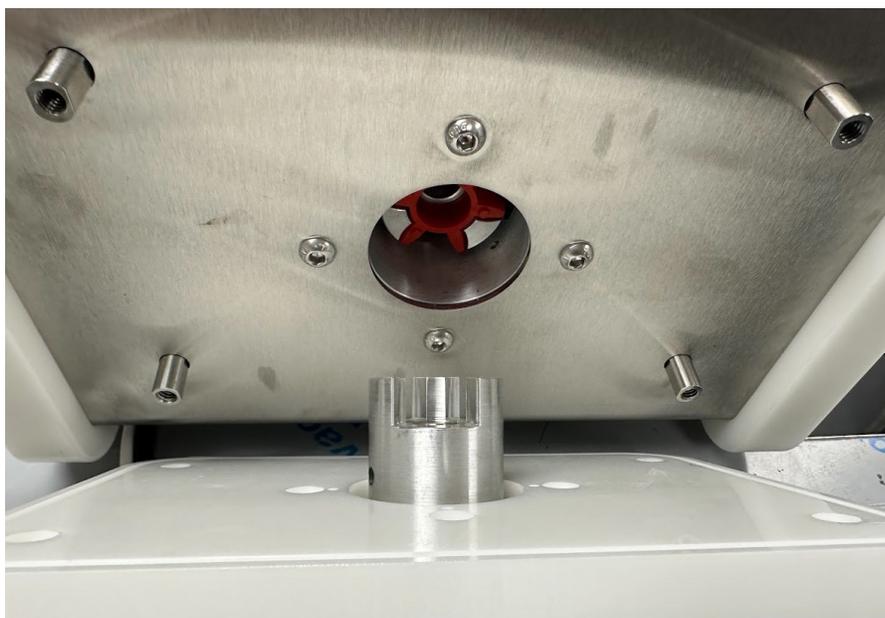

Step 7. Slide the mounting plate onto the mounting posts. If you meet resistance, this may mean that the shaft coupling was not correctly aligned. Gentle pressure may be necessary to push the mounting plate onto the mounting posts.

Step 8. Replace the thumbscrews onto the mounting posts to secure the pump head to the OnePump VersaFlow console. Alternate diagonally which screws are fastened. Once all the screws are replaced, check each screw for tightness one more time.

Step 9. From the "Pump" selection screen, select the appropriate pump model that has been installed. Press the check mark button to confirm your selection, and then "Home" to reconfirm.
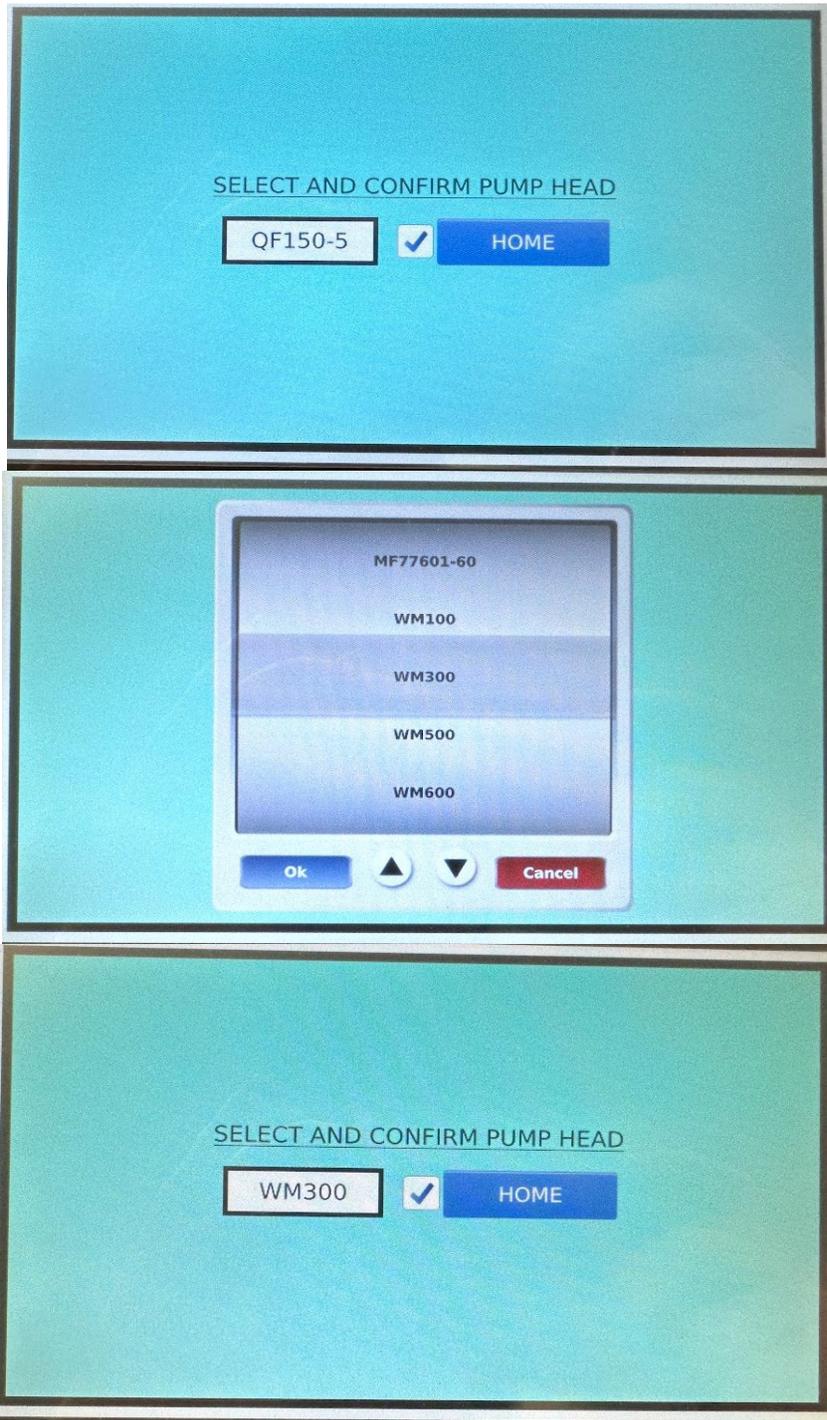
6. Operation

6.1. Start-Up

To turn on the OnePump VersaFlow pump system, press the "Power" button the top left hand corner of the console. Pressing the button shall latch the button down.

When the pump is turned on, the pump shall be in a safe state. The pump shall not operate until the user completes

The client shall press the blue "reset" momentary push button located in the top middle of the control console. Pressing this button shall activate an alarm, alerting the user before the pump enters an energized state. The user must acknowledge the alarm by navigating to the alarm screen and acknowledging the alarm. Once the user acknowledges the alarm, the pump shall enter a normal operating state.

6.2. Navigation

The right hand side of the screen features a column of controls associated with screen navigation. From this pane you may navigate all of your system menus. These navigation buttons include controls, pump, system, recipes, trending, and login. The alarm screen may be accessed from the bottom right or from the center bar on each screen. See "Alarm History- Press to view" below.
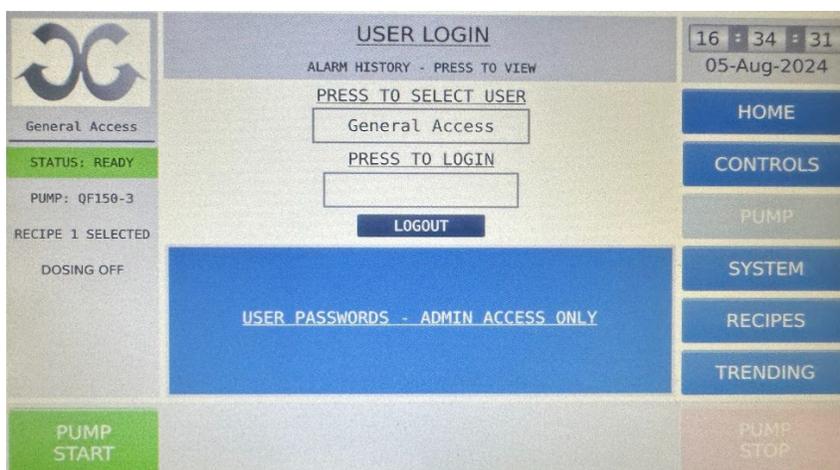

Home Screen
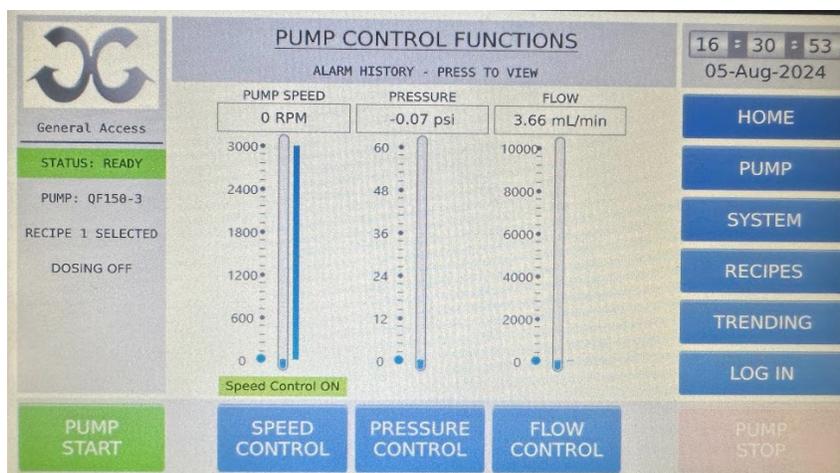
Control Screen

6.3. Logging in.

The OnePump VersaFlow system shall automatically log into the "General Access" User configuration. From the LogIn screen the operator may also access presets for several operators, Supervisors, and Administrator.
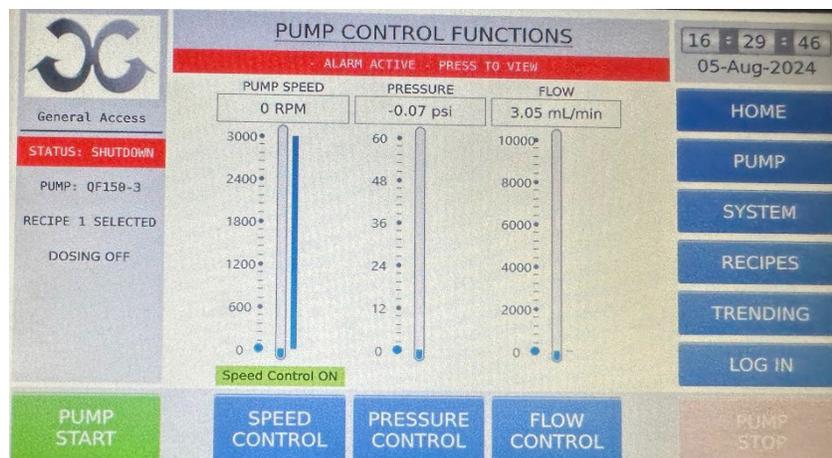

Log-In Screen

To Log in, the operator must select the appropriate user level, and then fill in the correct password.

6.4. Acknowledging Alarms

To acknowledge an alarm, press the view alarm button in the center of the page. When an alarm is active it shall be denoted with a red bar. Before acknowledging the alarm, review the cause of the alarm and that it has been resolved or deemed noncritical. To acknowledge the alarm, press the "Acknowledge" button in the top left of the screen.

6.5. Recovery from Emergency Stop

To recover from an Emergency stop condition, first identify that all potential hazards have been resolved. Next, twist the E-Stop button clockwise to unlatch the button. Then, press the blue "reset button" to reset the safety relay to the normal-operating state. Pressing the reset button shall activate an alarm, prompting the user to once more reassess that the equipment and environment is in a safe state. Finally, acknowledge the alarm. The pump system is now in a normal-operating state.
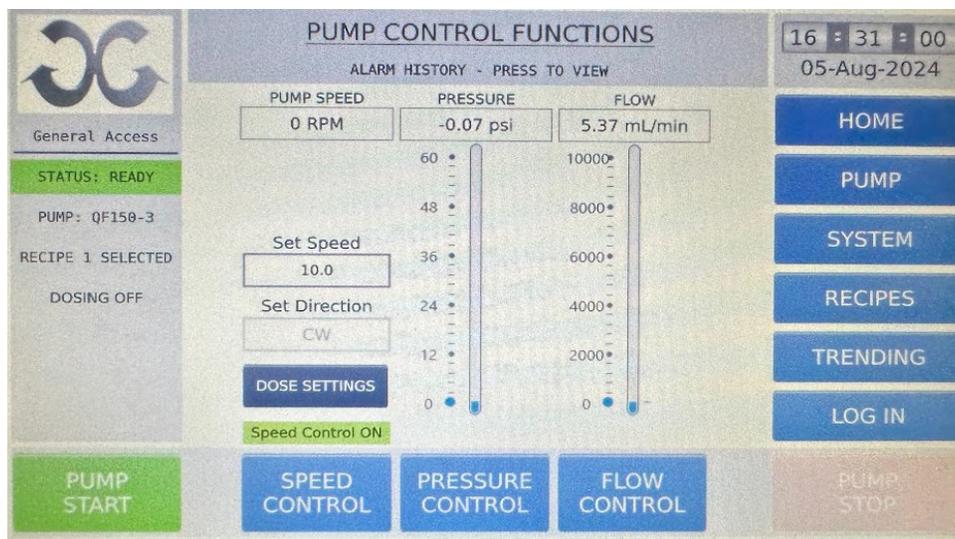
6.6. Speed Control

The most basic pump operation is referred to as "Speed Control". In this control state, the pump shall operate at a selected "rotations per minutes" or RPM. The pump maximum RPM is determined by the pump head selected in the "Pump" screen, as in section 5 of this manual.
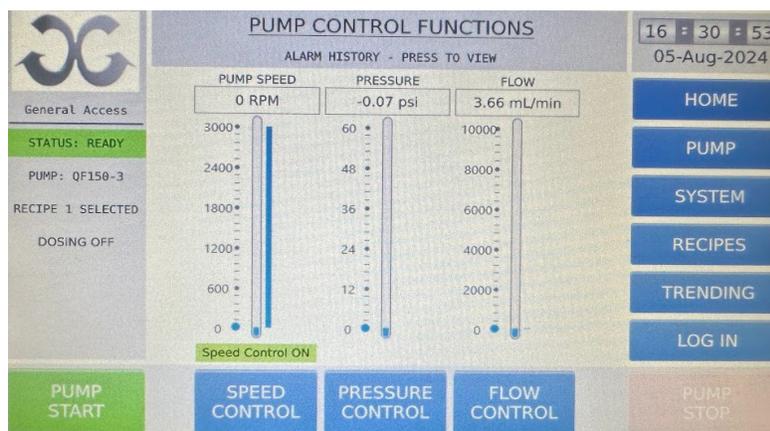

Press the "Speed Control" button in the bottom pane of the screen to active the speed control setting. The selection of this control scheme is denoted by "speed control on" inside the green bar above the button. The gauge above each button denotes the current process parameter, if it is active.

To access the speed control settings, press the "speed control" button. The control settings for speed control shall appear on the screen, as seen below. From this control view, you may set a speed setpoint, select the pump rotation direction, and turn on or off the dosing timer. The pump direction shall only be accessible for peristaltic pumps that are safe to pump in reverse. QuattroFlow pumps shall not have this setting enabled.

The dosing function state is accessed from the speed control screen, as shown below. This toggle shall active the dosing duration and speed, per the recipe selected on the recipe screen. The recipe selection is displayed in the left-hand display pane.
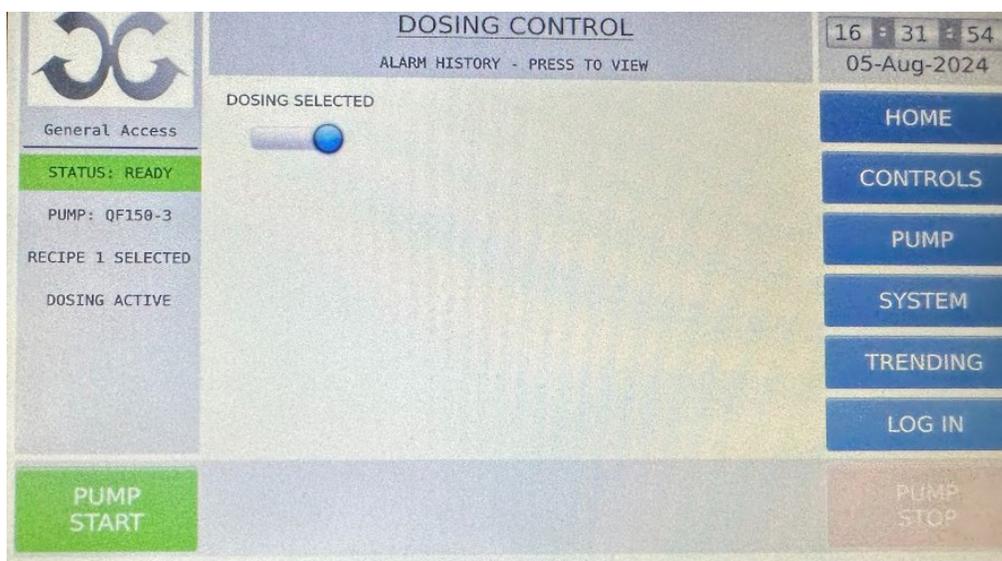
6.7. Pressure Control

Selecting the pressure control scheme with the center button shall activate "pressure control" mode. From this sub-menu, you may access the pressure control parameters.
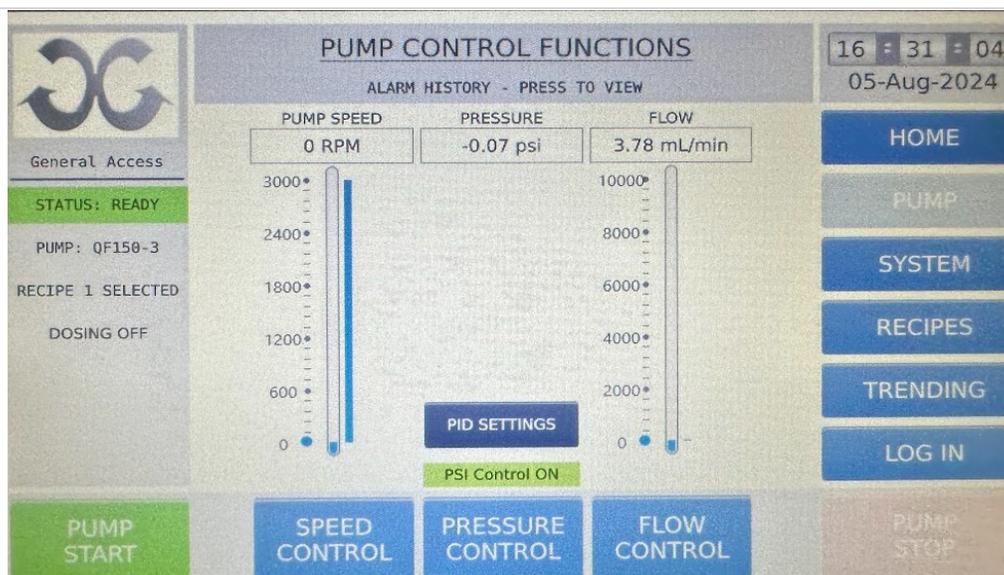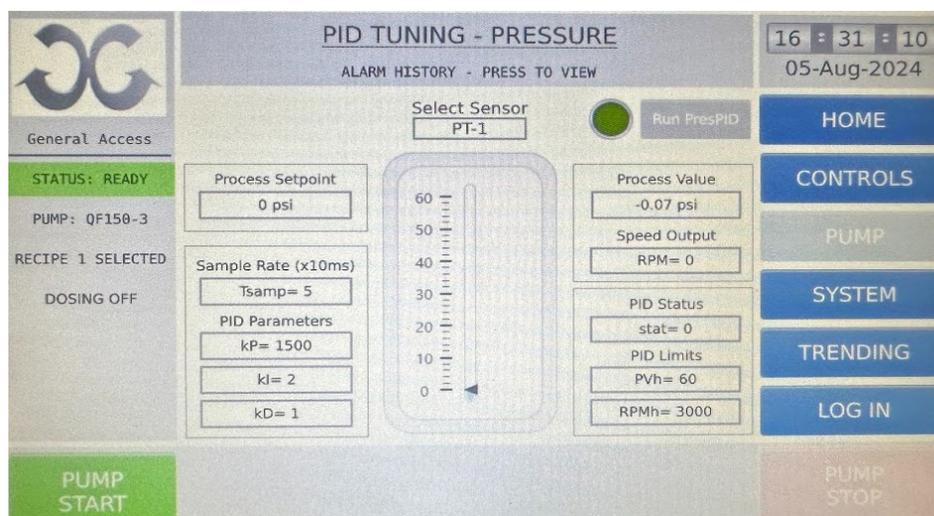
The user shall set the desired pressure by pressing "Process Setpoint" and selecting a pressure from 0 to 60 psi. The user may also access PID parameters including the timing sample rate, proportional control, integral control, and derivative control. The ideal PID settings may depend on the user's flow path and system back-pressure.

If multiple sensors are connected to the system, you may select the desired control setpoint sensor by pressing "select sensor" at the top of the center pane.
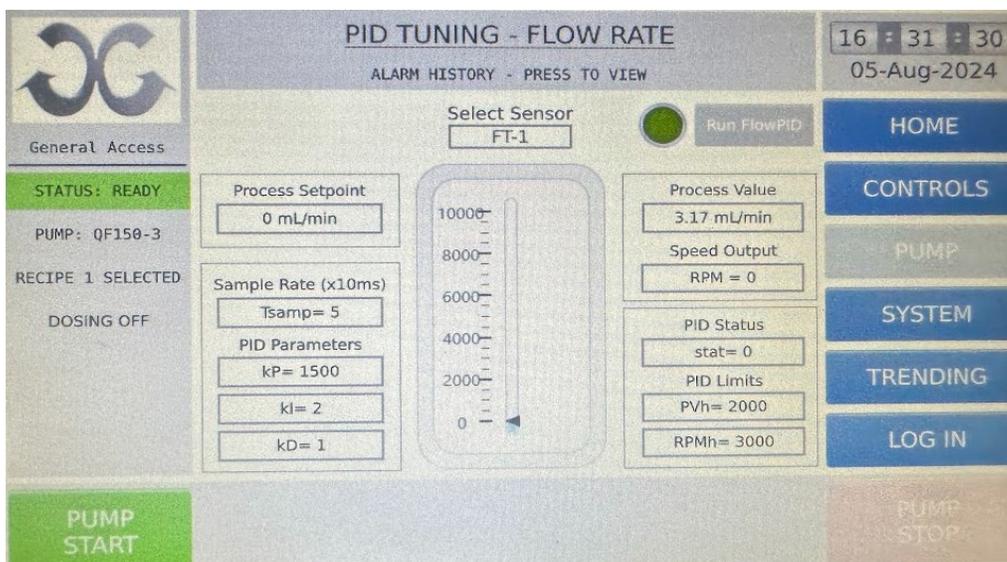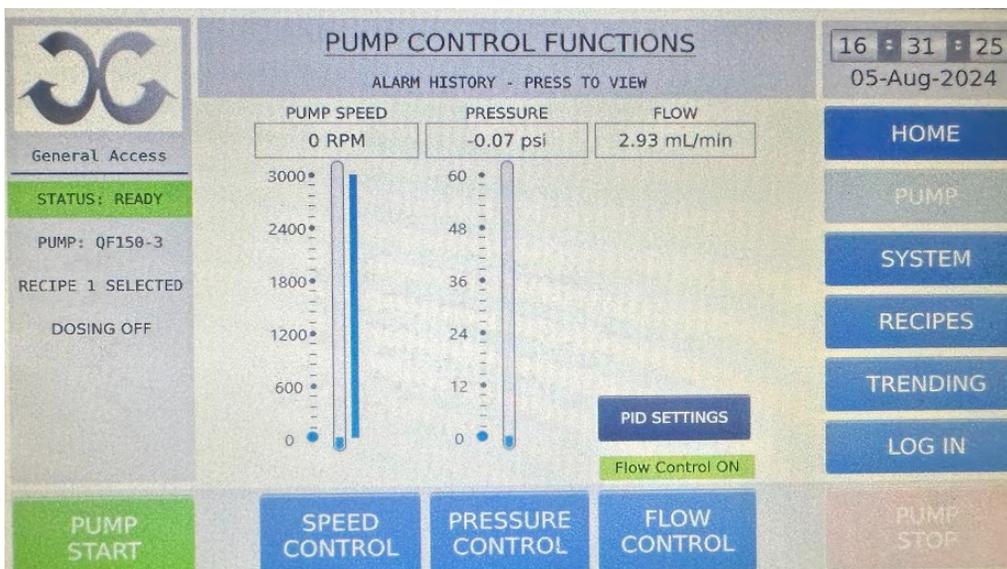
Once the user has input their desired settings, the pressure control loop may be activated by pressing the "Run PresPID" radio button. Once this is done, press "Pump Start" and the pump shall begin operating in pressure control mode.

The process values may be seen on the right hand display pane. These process values include the pressure reading from the pressure sensor, and pump RPM.

6.8. Flow Control

Selecting the pressure control scheme with the center button shall activate "Flow control" mode. From this sub-menu, you may access the pressure control parameters.

The user shall set the desired pressure by pressing "Process Setpoint" and selecting a desired flow rate. The user may also access PID parameters including the timing sample rate, proportional control, integral control, and derivative control. The ideal PID settings may depend on the user's flow path and system back-pressure.

If multiple sensors are connected to the system, you may select the desired control setpoint sensor by pressing "select sensor" at the top of the center pane.

Once the user has input their desired settings, the pressure control loop may be activated by pressing the "Run FlowPID" radio button. Once this is done, press "Pump Start", and the pump shall begin operating in pressure control mode.

The process values may be seen on the right-hand display pane. These process values include the pressure reading from the pressure sensor, and pump RPM.

6.9. Recipes

Recipes are preset timer functions that define the speed and duration of the dosing function. This pump has functionality for three pre-set recipes. The selected recipe is highlighted in yellow. The user may press "Set Time" to input a desired timer duration, set speed (RPM) to select a desired pump speed, and "set direction" to select the desired pump direction.

To make use of this functionality to accurately dose with your own tube-set, it is recommended that the user calibrates their desired volume by testing a recipe setpoint with a pre-determined speed and duration, and measuring the volume dispensed empirically, either volumetrically or gravimetrically with a graduated cylinder or scale, respectively.
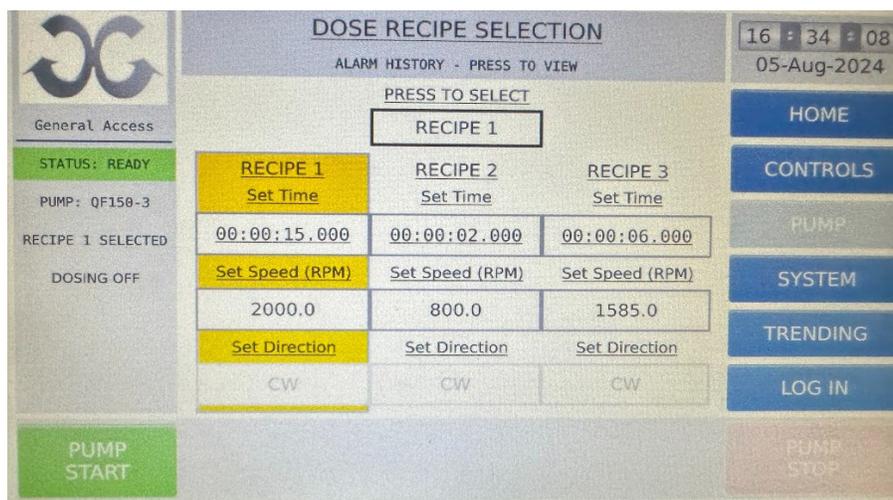
6.10. Trending

The user may view process parameters over time by accessing the "Trending" screen. From this screen, they user may select which process parameter they would like to view by pressing "next curve" to toggle through the sensors. "Recording on/off" radio button shall begin data recording to a storage device via ethernet. The camera button shall save a screenshot of the current screen to a storage device.
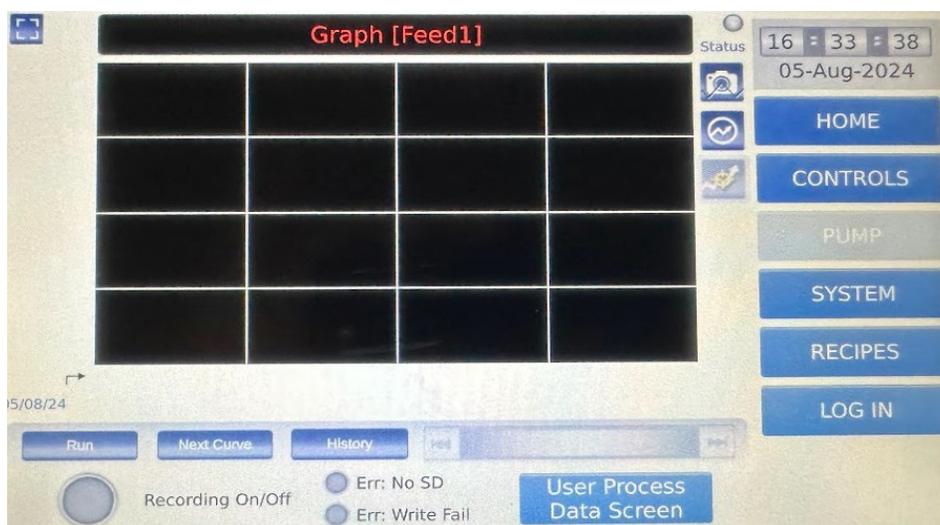
6.11. System View

The user may access the system status and signals by pressing the "System" button in the right hand navigation pane. This screen shows the active digital and analog inputs from the sensors and auxiliary equipment connected to the pump, as well as the time remaining on the dose setting.

To reset the dose timer, the user must press and HOLD for three seconds the "timer reset" button.

The user may access the flowmeter and pressure sensor data reading from the "Flow" and Pressure buttons. These displays will show all readings taken globally.

From these screens, the user may also tare the pressure and flow sensors. To do so, press the "Sensor Adj." button to access this control. Next, select the appropriate sensor. Then you may choose to tare the sensor, or implement a correction factor "K-Offset"
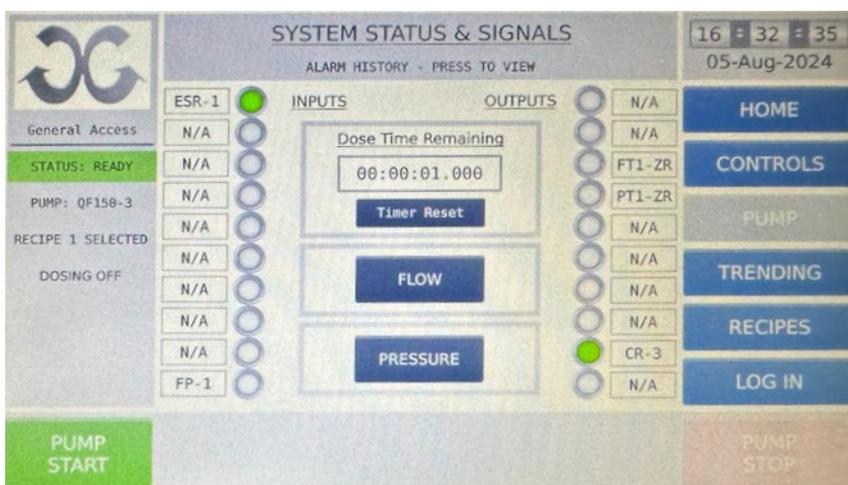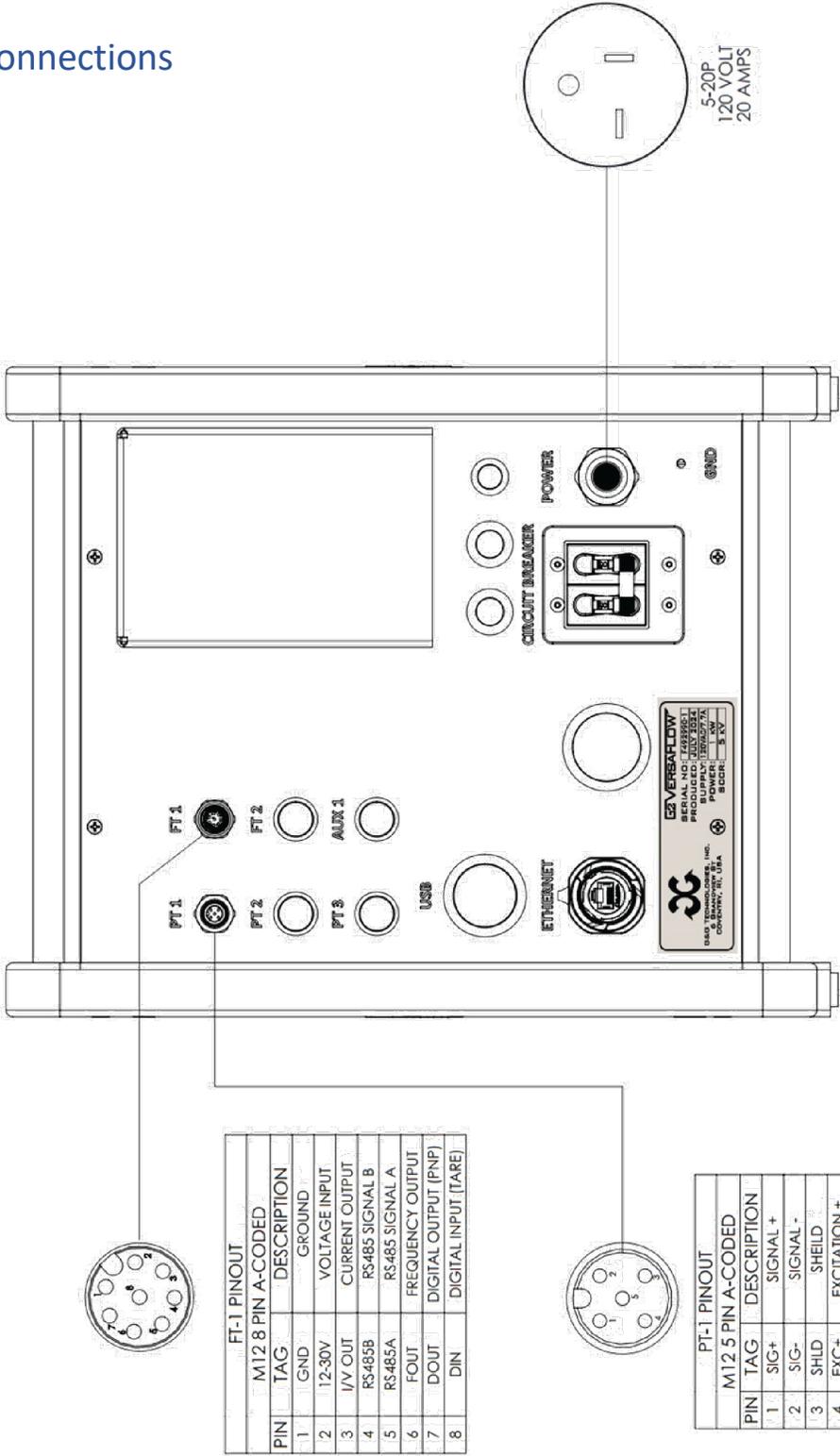
6.12. Shut Down

To perform a system shutdown properly, make sure that all output devices, if any, are stopped and that the process is not running. Once it has been deemed safe to do so, the operator may press the "power" button to unlatch it, cutting power to the system.

7. Maintenance

During pump head installation, it is recommended that the user inspects the condition of the red rubber spider in the coupling mechanism for placement and condition. If the spider coupling bushing becomes dislodged from its position, the user may place it back in the coupling attached to the motor. It is recommend to regularly inspect the spider coupling, and replace as necessary. Contact Purity One for replacement spares of the spider coupling bushing.

8. Electrical Connections

FT-1 PINOUT
M12 8 PIN A-CODED

PIN	TAG	DESCRIPTION
1	GND	GROUND
2	12-30V	VOLTAGE INPUT
3	I/V OUT	CURRENT OUTPUT
4	RS485B	RS485 SIGNAL B
5	RS485A	RS485 SIGNAL A
6	FOUT	FREQUENCY OUTPUT
7	DOUT	DIGITAL OUTPUT (PNP)
8	DIN	DIGITAL INPUT (TARE)

PT-1 PINOUT
M12 5 PIN A-CODED

PIN	TAG	DESCRIPTION
1	SIG+	SIGNAL +
2	SIG-	SIGNAL -
3	SHLD	SHEILD
4	EXC+	EXCITATION +
5	EXC-	EXCITATION -

9. Technical Support

For System Troubleshooting, contact a Purity One representative in the US.

Call 413-320-4650 or contact a representative by email at sales@purityone.com. You can visit our web page for additional contact information at www.purityone.com