User Manual

For complete information, please refer to the ***Vortex™*** 3E Pump user manual (HB4101) available for download at www.tsi.com.

> **Note:** For shipping purposes, the ***Vortex™*** 3E Pump will be delivered with the battery approximately 30% charged. Please charge the product before use.

Controls



Blue light flashes when pump is running

Red light flashes when there is a fault or during charging

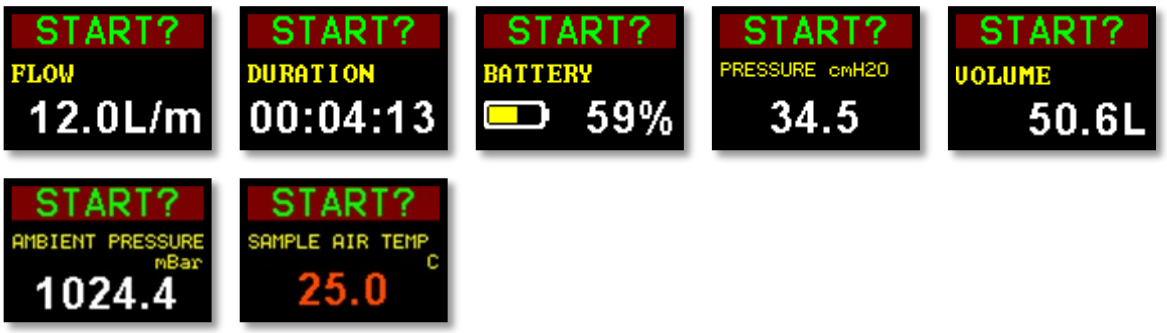
Turn the pump on/off

To turn on the pump:

Press ⏻ to turn on the pump.



This is followed by the seven scrolling dashboard screens showing data from the last run.



To turn off the pump:

Press and hold ⏻ until the countdown has finished to turn off the pump.



Note: The pump cannot be turned off during a sampling run.

Setup before starting a run

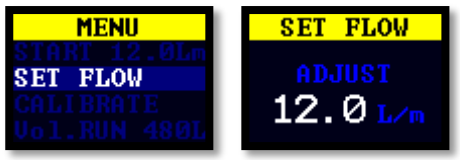
Depending on sampling requirements the following setup procedures may need to be performed prior to starting a sampling run.

To access the menu items described below:

1. Ensure the pump is turned on, and then press ⌄ to display the menu.
2. Press ⌄ or ⌃ to highlight the menu item you want to alter, and then press ↵.

Set the flow rate

1. Navigate to **SET FLOW**, and then press ↵.



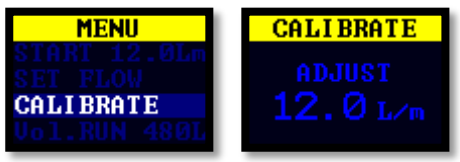
2. Press ⌄ or ⌃ to change the flow rate, and then press ↵.

Calibrate the pump

Always calibrate the pump at the required sampling flow rate for the greatest accuracy.

Note: If using a filter with a small pore size or if operating at a high flow rate, which results in a high back pressure, it may take the pump a little longer to stabilise when adjusting the calibrated value.

1. Attach a sampling head or other flow-measuring device to the pump's inlet nozzle. The flowmeter should be connected to the inlet of the sampling head.
2. Navigate to **CALIBRATE**.



3. Press ↵ to start calibration.

4. Press or to adjust the pump flow until the meter flow rate and the pump flow rate match.
5. Press to stop calibration.

Start/stop a sampling run

Ensure the pump is calibrated and set to the correct flow rate.

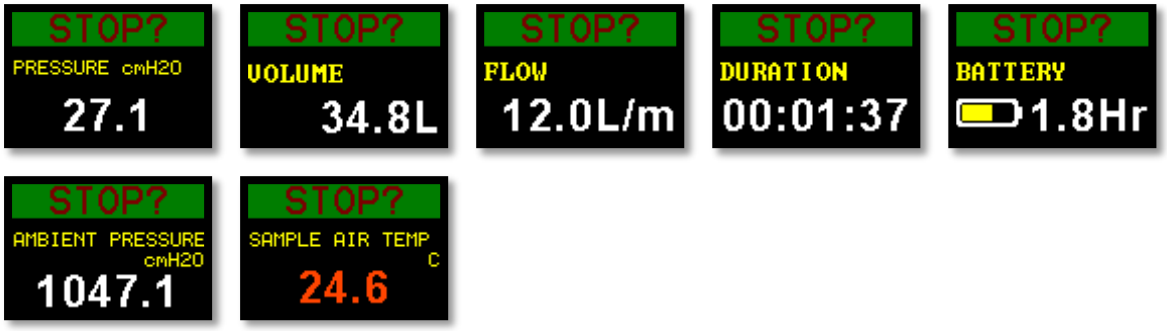


To start a sampling run:

1. Turn on the pump.
2. Press the key. Select 'New Run' to start. Press and hold for 3 seconds.



The pump will scroll through the screens below showing data for the current run.



To stop or pause a sampling run:

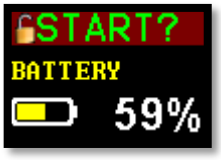
Press and hold for 3 seconds.



Lock and unlock the pump

Partial lock

Partial lock mode is denoted by a half open padlock icon and can be set in Run or Stop modes. While partially locked, the user may stop and start the sampling pump but has no access to the menu or other functions.



To partially lock and unlock the pump:

Press and hold , and then press 3 times in quick succession. The partial lock icon will be displayed.

Note: To remove partial lock when the pump is running, perform the partial lock procedure twice, the first time the pump will enter full lock mode the second time the pump will be unlocked.

Full lock

Full lock mode is denoted by a closed padlock icon and can only be set when the pump is running. While in full lock mode, the keypad is fully de-activated, and the user cannot stop or disturb the pump by any key presses.



To fully lock the pump:

Press and hold , and then press 6 times in quick succession. The full lock icon will be displayed.

To unlock the pump:

Press and hold , and then press 3 times in quick succession.

Errors

If the pump cannot maintain the target flow rate within 5% for more than 20 seconds (due to a kinked tube or inlet blockage) then it will automatically stop sampling and show the Blocked Retry message.





After one minute the pump will attempt to re-start. If the pump has not been able to re-start after the specified number of retry attempts, the pump will terminate the current sampling run and display an error message.