

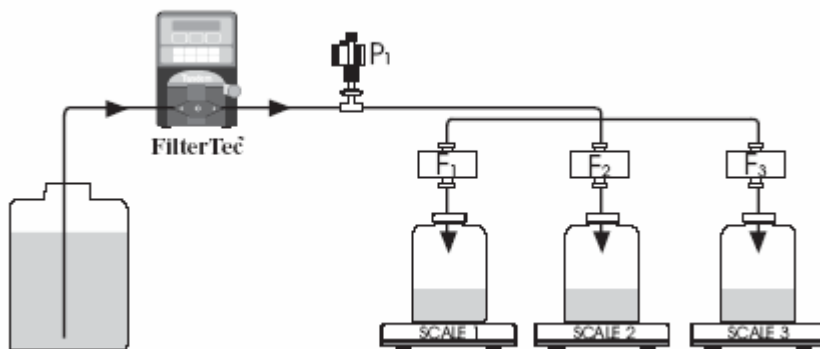
FilterTec Plus

The **FilterTec Plus** is shipped in conjunction with a 3-Filter Testing Station. This Station consists of 3 balances with cables, the Serial3 Balance Interface box, and a stand and clamp set for holding your 3 filters over the balances. A 6-way Rotary Valve may also be purchased with this system and its actions controlled in the Programmable R-P (Rate or Pressure, Constant or Scanned) Mode.



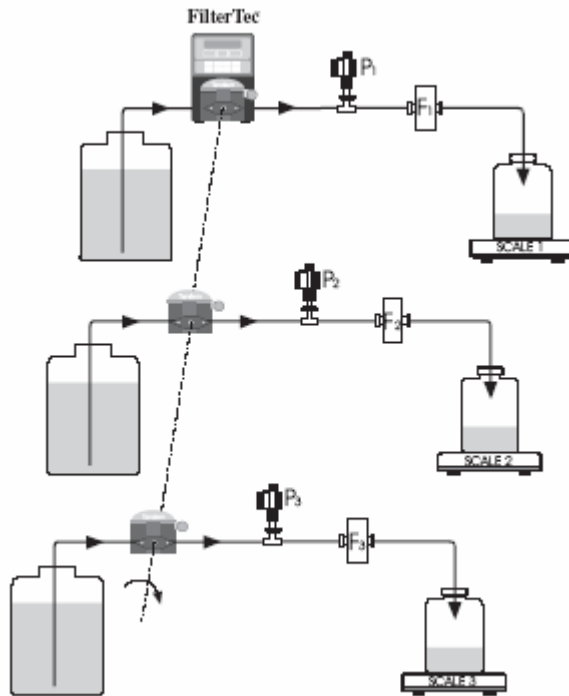
This system is designed around a set of 3 matching balances, and can have several different parallel or serial configurations.

The first of the more common ones uses one head to provide solution through a manifold to 3 filters while monitoring or controlling the pressure of a single sensor, with each filter ending above its own balance, as shown below:



A constant pressure can be easily maintained, and the collection rates achieved will be based upon the dynamics of the filter. If the filters are the same, the Feed Rate will be roughly split into thirds.

The second common configuration utilizes 3 pump heads, 3 sets of tubing, all 3 sensors and balances, with everything running in parallel.



This setup puts the control of the feed rate in the hands of channel 1 with channels 2 and 3 being similar, but not always identical. To minimize differences, use tubing from the same manufacturer and lot whenever possible.

Also, while only one of the 3 sensors will be used for control, each sensor and balance will provide independent alarms based on the system's settings. When in Constant Pressure Mode, the source sensor's channel is controlled, and the other channels again will be similar but not identical.

In both configurations, re-calibration of the pump will result in higher precision feed rates.

The Serial3 Balance Interface box is labeled for Balance 1, 2, 3, etc, and care must be taken with the following:

1. Make sure all cables are tight. This assures solid communication paths.
2. Match up P1 with Scale 1, P2 with Scale 2, and P3 with Scale 3 so that the data generated; P1 (Pressure at P1), Q1 (Filtrate Quantity on Balance 1), C1 (Collection Rate on Balance 1) are a properly coordinated.

FilterTec *Plus* System Setup:

1) Electrical.

- a) Plug in and turn on all 3 balances.
- b) Connect the Balance Cables to the Serial3 Interface Box, making sure all connections are tight.
- c) Connect the Serial3 Interface to the rear of the FilterTec *Plus* using the Balance Port, again making sure the connection is tight.
- d) Connect the RS-232 cable between the FilterTec *Plus* and your PC.
- e) Plug in any Disposable Pressure Sensors being used into the ports marked P1, P2, P3, and set them near their appropriate balances for connection to your tubing later.
- f) Connect the Temperature Probe to its port on the rear of the system, prepare to connect it to the tubing set of your choice. (Only one probe is available.)

2) Plumbing.

- a) Select the appropriate tubing to use for your tests. If using multiple channels, obtain enough from the same manufacturer's lot to do all the plumbing if possible.
- b) Cut the tubing to the appropriate lengths required to reach from your solution reservoir through the pump head and to the pressure sensor and filter.
- c) The Temperature Probe is supplied with its own Luer tee fitting and can be placed in the fluid stream where appropriate.
- d) A Fittings kit is included with the FilterTec plus when shipped, and any barbed Luer connectors required can be found there. Also included are small cable ties that should be used to reinforce the barbed fittings, in particular where high pressures will be encountered.

3) Operation.

- a) Turn on all the balances, and then the FilterTec *Plus*. Upon powering up, the system will detect the Serial3 Balance Interface during its self-test. This also updates the list in Setup Mode, adding Scale2 and Scale3.
- b) We strongly recommend testing and calibration of the system with distilled water before using your test solutions.
- c) Review and set the parameters of the system. Most items have usable and recommended defaults. In particular, you will need to set the Pump Rate in Constant Rate Mode and Pump Pressure in Constant Pressure Mode as they default to zero.
- d) Please refer to the FilterTec manual for descriptions of the parameters and modes. A copy of the Ohaus Adventurer Pro balance configuration and the Re-Cal procedure in Constant Rate Mode follow this section for your convenience.

4) Data Collection:

- a) Install SciDoc if purchased for data collection, otherwise use HyperTerminal as described in the FilterTec manual.
- b) The minimum requirements for SciDoc are:
 - i) Windows 98 Operating System.
 - ii) Excel 2000.
- c) Install WinWedge Standard V3.0 provided with the package to the default directory of C:\Program Files\Winwedge32.
- d) Copy the contents of the FilterTec SciDoc Rev. E3 disk to the same directory and create a shortcut for the spreadsheet file on your desktop.
- e) This version of SciDoc works the same as that mentioned in the FilterTec manual with only a few changes:
 - i) The ability to communicate with up to Com 8 has been added.
 - ii) C1, C2, C3 and CT are the Collection Rates for the 3 balances, with CT being the Total Collection Rate.
 - iii) Q1, Q2, Q3 and QT are the Filtrate Quantities collected on the 3 balances, with QT being the Total Filtrate Quantity.
 - iv) Individual Charts for P1 & C1 vs. Elapsed Time, P2 & C2 vs. Elapsed Time, and P2 & C3 vs. Elapsed Time, as well as Vmax1, Vmax2 and Vmax3 have been added.
 - v) Due to the complexities involved, the CRQ (Constant Rate Quantity) and CPQ (Constant Pressure Quantity) values are no longer being calculated.

Please Note: It is important that the SciDoc spreadsheet be configured to be in the same Mode as the FilterTec *Plus* system. Press the "Data Sheet Setup" button and choose the appropriate mode and number of sensors.

Note on Re-calibration of FF (Feed Rate):

The FilterTec system contains volumetric calibration curves for various motor/head/tubing combinations that are factory installed. This value is displayed and output to SciDoc as FF. In most cases the Pump Rate (FF) is merely a starting or reference point, and the weight related data, Q1, C1, etc, is of greater importance. These are measured values of the Filtrate Weight Collected (Q1, 2, etc) and Collection Rate (C1, 2, etc), and are used in the Vmax data and Chart that are included in the SciDoc spreadsheet.

The Pump Rate setting in Constant Rate Mode refers to the aforementioned curves, and it can be re-calibrated to improve the accuracy of the displayed FF value. In a multi-channel situation this will only be for Channel 1, and the others will be close to that value if the tubing is from the same Manufacturers' lot, and the occlusion setting (if applicable) on the pump head is the same. Instructions for this Re-calibration follow on the next page.

2.18 Pump Re-calibration:

The FilterTec software contains a permanent calibration table for each of the nine (9) tubing sizes: 13, 14, 16, 25, 17, 15, 24 & 35. For a given pump tube size, the calibration table relates the pump motor RPM with the pump output in terms of ml / min. However, the user can update the FilterTec pump calibration very easily.

NOTE: The FilterTec usually is configured with a 160-rpm motor, and the built-in calibration curves for that motor. If your flow rate needs require, the FilterTec is also available with either a 600-rpm or 8-rpm motor. In order for the FilterTec to properly display the correct flow rates and cumulative volume when using these motors, access SETUP:PUMP:Motor RPM and select the appropriate RPM for the installed motor. The FilterTec will then implement the factory installed calibration curves for that particular motor. (This will have been done for you at the factory prior to testing and shipping, and should only need to be changed if you purchase and install a different motor subassembly.)

In order to use this recalibration feature, first select (in **EDIT**) the pump tube size you are using, e.g. size #17, then select the pump rate, e.g. 250ml/min. Press the **EXIT** key and then the **EXEC** key. FilterTec will now show the following display:

SET: T17 PR: 250ml/m Press RUN when Ready
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You're now ready to recalibrate your #17 pump tubing. For calibration purposes, pump water into a container, e.g. 1000grams, placed onto a top-loading balance with no filter attached. Alternatively use a 1000ml volumetric flask. Press the **RUN** key and begin dispensing. Press the **STOP** key (not **EXIT**) to stop pumping when 1000 grams have been dispensed. Press the **Star (★)** key and the following display will be shown:

DV:1000	AV:1000
Incr.	Decr. Select

Adjust (increase or decrease) the AV (Average Volume) parameter to 1000, or whatever the actual dispensed weight is, press **Select**, the calibration table for #17 pump tubing has now been updated.

NOTE: The selected calibration volume or weight should be 4+ times the selected pump rate. For example, if your selected pump rate is 250 ml/min. the minimum calibration volume / weight should be between 1000 mls or grams.

5.1 Setup: Scale

The Ohaus Adventurer Pro Balance is the balance sent with the system when purchased. If a different balance is required, please contact SciLog for configuration info.

5.11 Ohaus Adventurer Pro Balance Parameters:

Press and hold the Menu button until MENU appears on the display. Release this button, and now use the Yes, No, and Back buttons to navigate the Sub-menus.

Please set the following Menu Items, all others are left at their factory defaults:

ReadOut

AutoZero	Off
Filter	Low

Print-1

Output

Whenstable	Off
AutoPrint	Continuous

Content

Num Only	Off
Header	Off
Gross	Off
Net	Off
Tare	Off
Reference	Off
Result	<u>On</u>
GLP	Off

Layout

Line Format	Multi
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RS232-1

Baud	600
Parity	7 No Parity
Handshake	Off

In the Setup Mode, Scale Manufacturer, select "OHAUS3". By making this selection, the FilterTec will implement the correct parameters for communicating with the Adventurer Pro Series balance. You will also need SciLog P/N 080-067PGS, Balance Interface Cable. (Note: The 080-066 SciLog Ohaus Balance interface cable will not work with this balance series, and these settings will not work with any other SciLog system!)