Concentrate Flow Adjustments

Rev 3

Barnstead Pacific TII
Barnstead Pacific RO
Barnstead Smart2Pure
Barnstead LabTower EDI, RO & TII

Unity Lab Services
Part of Thermo Fisher Scientific

Concentrate Flow Adjustments – Definitions & Tools

- Concentrate – Water that is rejected by the membrane to Drain
- Permeate – Water that has been purified - Product Water which flows to the tank
- CCW – Counter Clock Wise (direction of concentrate pressure valve adjustment)
- CW – Clock Wise (direction of concentrate pressure valve adjustment)
- To adjust the Concentrate Flow, you will need the following:
  - Phillips Screwdrivers
  - Volumetric Flask or Cylinder
  - Stopwatch

Concentrate Flow

- After installation of any unit with an Reverse Osmosis Membrane, the Concentrate Flow **MUST** be adjusted.

- Due to possible changes in feed water temperature and pressure the concentrate flow must be checked and readjusted (if necessary) every 3 months to ensure proper water production, and to maximize life of membrane.

- Failure to adjust concentrate flow can result in membrane damage, or failure.

Measuring Concentrate Flow

- All Flows (concentrate & permeate) are listed in Liters Per Hour (LPH)
- The “36 Second” Rule:
  - To save time, you do not want to measure the concentrate (reject) flow rate for one hour. The 36 second rule is based off a simple mathematical formula :
    - 60 seconds x 60 minutes / 100 = 36 seconds
  - When units are in production mode (making RO water) fill a Volumetric flask or cylinder with the concentrate for 36 seconds (using a stop watch).
  - Measure the volume of water in the flask or cylinder and multiply by 100. Your results will be the concentrate flow in LPH.
    - Example:
      - 320ml of concentrate x 100 = 32LPH Concentrate Flow

Models Needing Concentrate Flow Adjustment

- Below are the models which need the Concentrate Flow adjusted during installation and approximately every 3 months.

  - Barnstead Smart2Pure
  - Barnstead Pacific TII
  - Barnstead LabTower RO
  - Barnstead Pacific RO
  - Barnstead LabTower EDI
  - Barnstead LabTower TII

Smart2Pure Concentrate Adjustment

- The unit must be producing water – measure the concentrate Flow
  - If storage tank is full, you will need to drain enough water from the tank to lower the float. After a 3 minute delay, the unit will start producing water again.

- Locate the Concentrate Tubing
  - ¼” tubing going to drain

Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour
Smart2Pure 3	3	50*
Smart2Pure 6	6	50**
Smart2Pure 12	12	60
Check and readjust every 3 months		

- Based on 17% recovery - could adjust the concentrate flow so more water is produced, especially if there are problems filling the tank. More water going to concentrate, lower back pressure on membrane to produce water.
- * Adjust concentrate flow to down to 15 is acceptable if necessary for permeate production.
- ** Change to 30 is acceptable if necessary for permeate production
- Following the 36 second rule, compare the concentrate flow against the chart above. If the flows are not correct, adjustment is necessary

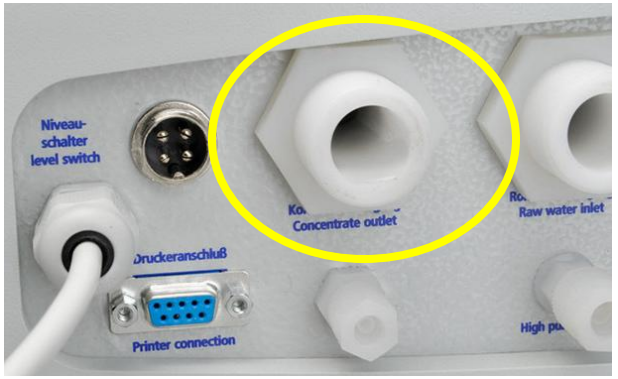
Smart2Pure Concentrate Adjustment

- Remove Blue Cover and locate the Pressure Hold Valve (V2)

- Turn the concentrate valve CCW to increase or CW decrease concentrate flow in order to obtain the correct concentrate flow.

Pacific RO Concentrate Adjustment

- Locate the Concentrate tubing to measure the concentrate flow

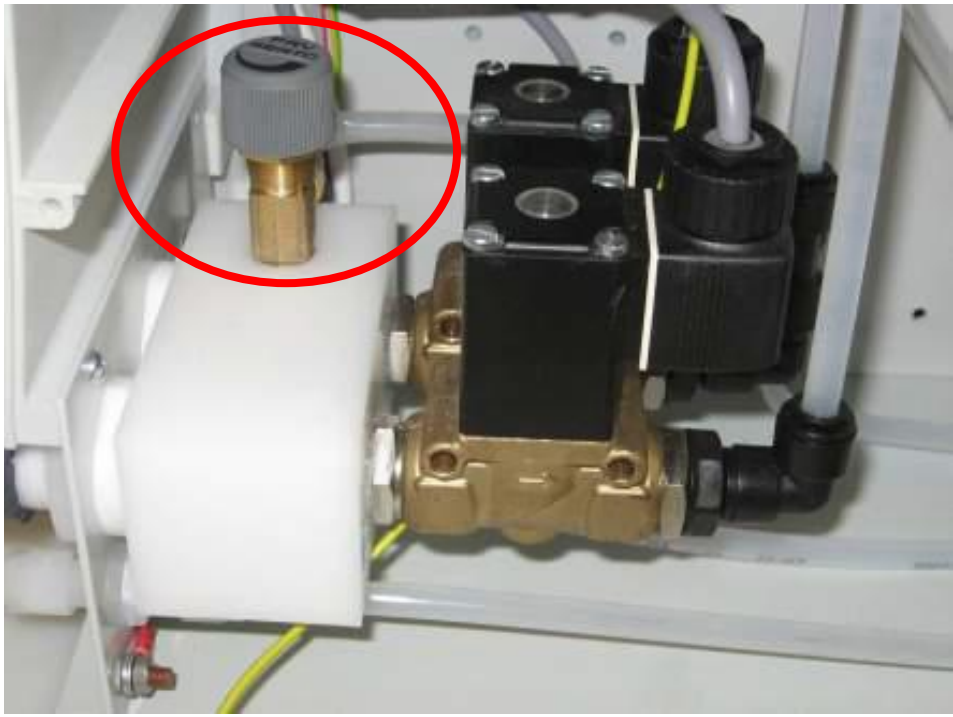


- Following the 36 second rule, compare the concentrate flow against the chart below. If the flows are not correct, adjustment is necessary (see next page).

Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour)
Pacific RO 3	3	9
Pacific RO 7	7	21
Pacific RO 12	12	36
Pacific RO 20	20	60
Pacific RO 40	40	120
Check & readjust every 6 months		

Pacific RO Concentrate Adjustment

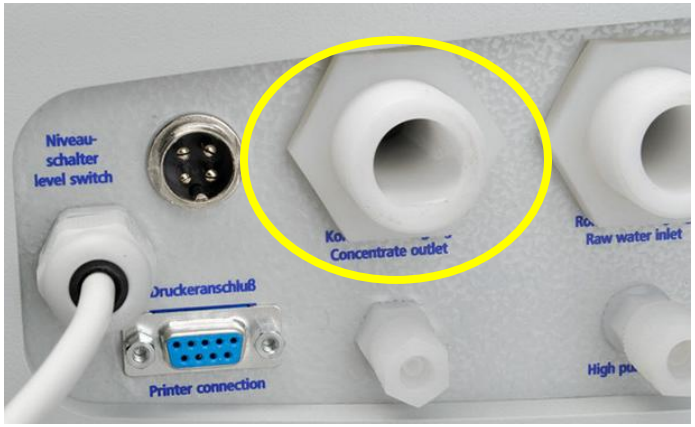
- Remove the back panel and locate the Pressure Hold Valve (V2)
  - Located at the top of the Distribution Block
- Turn the concentrate valve CCW to increase the concentrate flow or CW to decrease the concentrate flow.



Pacific TII Concentrate Adjustment

- Locate the Concentrate tubing to measure the concentrate flow

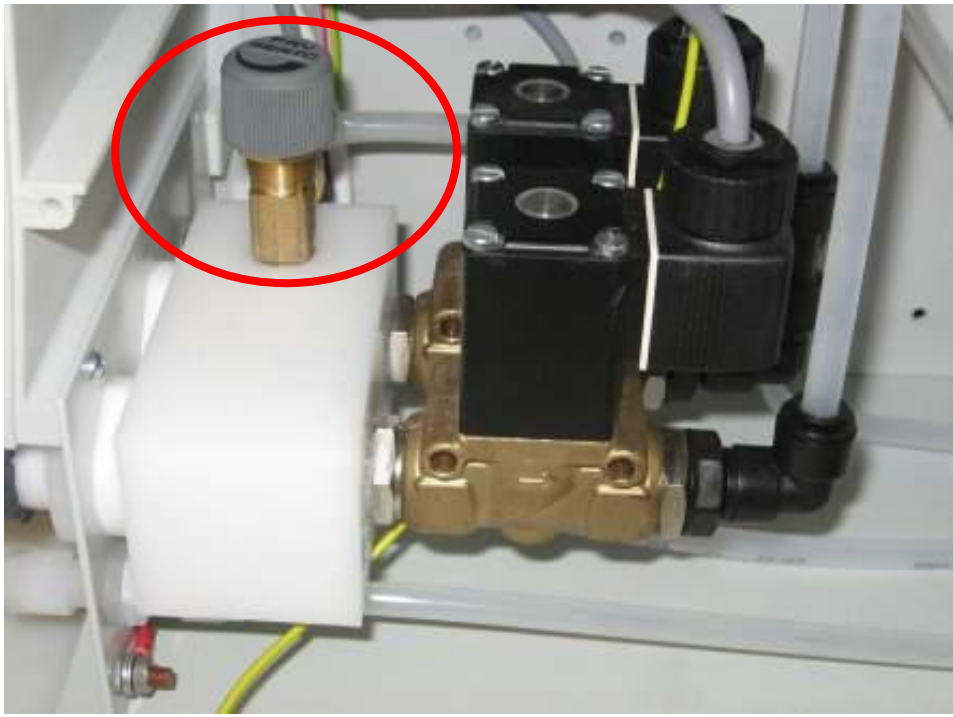
- Following the 36 second rule, compare the concentrate flow against the chart below. If the flows are not correct, adjustment is necessary (see next page).



Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour)
Pacific TII/TII UV 3	3	9
Pacific TII/TII UV 7	7	21
Pacific TII/TII UV 12	12	36
Pacific TII/TII UV 20	20	60
Pacific TII/TII UV 40	40	120
Check & readjust every 6 months		

Pacific TII Concentrate Adjustment

- Remove the back panel and locate the Pressure Hold Valve (V2)
  - Located at the top of the Distribution Block
- Turn the concentrate valve CCW to increase the concentrate flow or CW decrease concentrate flow in order to obtain the correct concentrate flow.



LabTower EDI Concentrate Adjustment

- The LabTower EDI will need it's RO Concentrate and EDI Product & Concentrate Flows adjusted.
  - Adjust the RO Concentrate Flow first

- Locate the Concentrate tubing to measure the concentrate flow
  - Concentrate Outlet is located in the front of the unit, below the blue cover

- You will also need to remove the front panel of the LabTower base and adjust the EDI Flow rates via adjustable flow meters (V8 & V9)

- Following the 36 second rule, compare the concentrate flow against the chart below. If the flows are not correct, adjustment is necessary (see next page).

Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour)	Concentrate Flow EDI (Liters/Hour)
LabTower EDI 15	15	60	2
LabTower EDI 30	30	90	4
LabTower EDI 45	45	135	5
Check & readjust every month			

LabTower EDI Concentrate Adjustment

- Remove the back panel and locate the Pressure Hold Valve (V2)
  - Located at the top of the Distribution Block towards the front of the unit
- Turn the concentrate valve to increase or decrease concentrate flow in order to obtain the correct concentrate flow.

LabTower EDI Product & Concentrate Adjustment

- After adjusting the concentrate flow, the EDI Product & Concentrate Flows must be adjusted while the unit is running. Start with the Product Flow:
- The Product Flow should be adjusted to the model by the flow meter
  - LabTower EDI 15 = 15LPH
  - LabTower EDI 30 = 30LPH
  - LabTower EDI 45 = 45LPH
- The Concentrate Flow should be adjusted by the flow meter to ~ 10% of the Product
  - 15LPH – Concentrate setting:1.5-2LPH
  - 30LPH – Concentrate setting: 3LPH
  - 45LPH – Concentrate setting: 4.5-5LPH

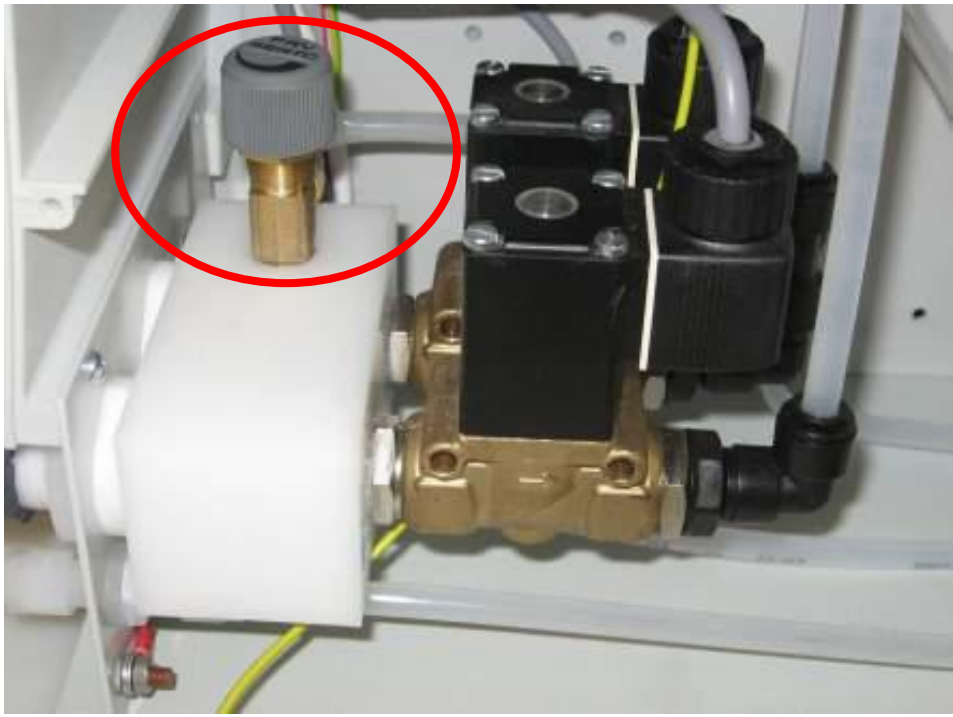
LabTower RO Concentrate Adjustment

- Locate the Concentrate tubing to measure the concentrate flow
  - Concentrate Outlet is located on the front of the unit, below the blue cover
- Following the 36 second rule, compare the concentrate flow against the chart below. If the flows are not correct, adjustment is necessary (see next page).

Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour)
LabTower RO 20	20	60
LabTower RO 40	40	120
LabTower RO 60	60	180
Check & readjust every month		

LabTower RO Concentrate Adjustment

- Remove the back panel and locate the Pressure Hold Valve (V2)
  - Located at the top of the Distribution Block
- Turn the concentrate valve CCW to increase the concentrate flow or CW decrease concentrate flow in order to obtain the correct concentrate flow.



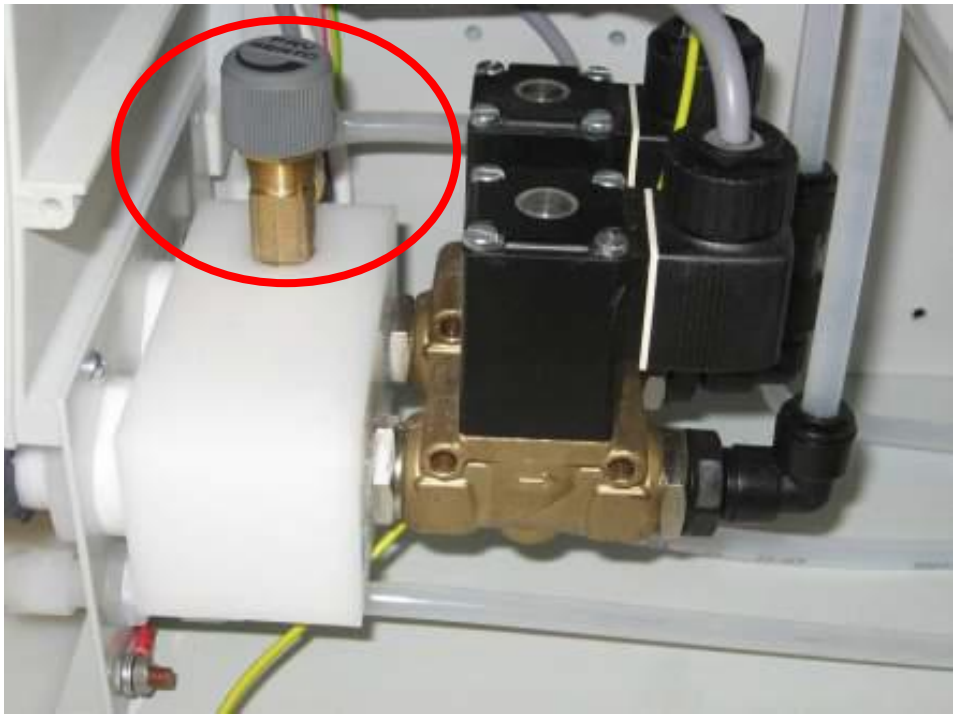
LabTower TII Concentrate Adjustment

- Locate the Concentrate tubing to measure the concentrate flow
  - Concentrate Outlet is located on the front of the unit, below the blue cover
- Following the 36 second rule, compare the concentrate flow against the chart below. If the flows are not correct, adjustment is necessary (see next page).

Version:	Permeate Flow (Liters/Hour)	Concentrate Flow (Liters/Hour)
LabTower TII/TII UV 20	20	60
LabTower TII/TII UV 40	40	120
LabTower TII/TII UV 60	60	180
Check & readjust every month		

LabTower TII Concentrate Adjustment

- Remove the back panel and locate the Pressure Hold Valve (V2)
  - Located at the top of the Distribution Block
- Turn the concentrate valve CCW to increase the concentrate flow or CW decrease concentrate flow in order to obtain the correct concentrate flow.



Revisions

Revision	Change	Date
1	Initial Release	March-2012
2	Page 10, 12, 15 & 17 concentrate flow correction to 110lph Page 15 & 17 permeate flow correction to 60lph	
3	Changed concentrate flow adjustements based on updates in manuals for LabTower (50153117 Rev A May 2020 and Pacific units (50152835) Rev A May 2020) This is based on 25% concentrate flow recovery.)	August 2020
3	Suggestions for S2P concentrate adjustment could have more room for adjustment is based on 17% recovery per Charlie Serpa Permeate/(Permeate+ Concentrate) = % concentrate recovery	August 2020

We support your laboratory so you can

focus on the science

We implement and manage service programs daily for our customers.

Let our expertise complement yours.