Alltesta™ Analyzer with Gradient Instruction Manual

Manufactured by Newcrom Co. division of SIELC Technologies, Inc.

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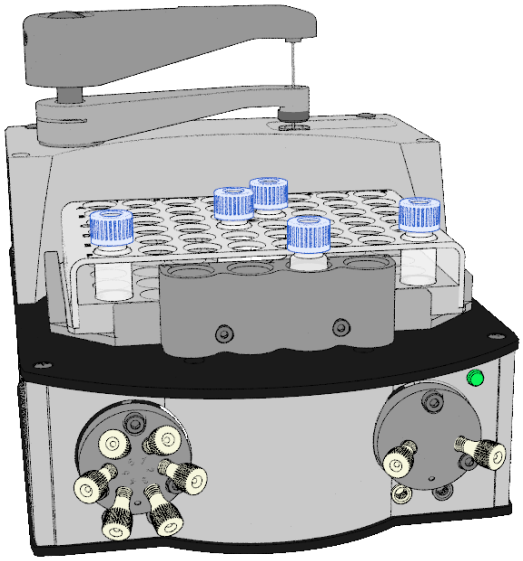
Introduction

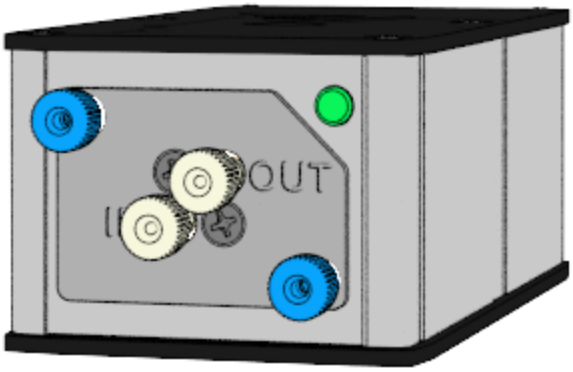
The Alltesta™ Analyzer is a powerful instrument that utilizes high performance liquid chromatography (HPLC), the most popular analytical technique in the world.
It is designed to perform multiple liquid chromatographic analytical experiments of a diverse nature. Even though it is smaller and simpler than standard HPLC instruments from other manufacturers, it provides more than enough capabilities to conduct various analyses of numerous real-life samples.

The instrument is controlled by web-based software that requires an Ethernet connection to perform analytical experiments. It incorporates multiple units that include:

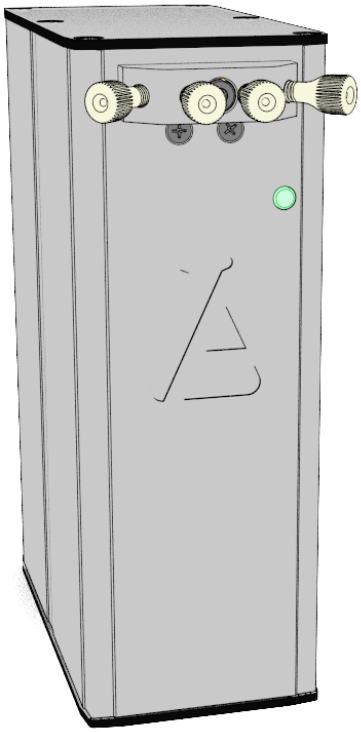
- Random Access Autosampler
- 2 Syringe Pumps
- UV/VIS Multi-Wavelength Detector
- Electronic module (Power Tower)



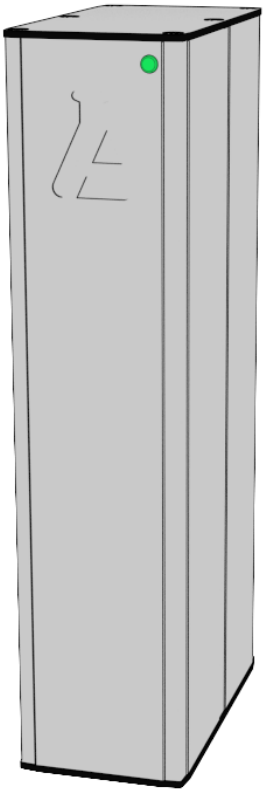
Autosampler



UV VIS Detector



Syringe Pumps



Power Tower

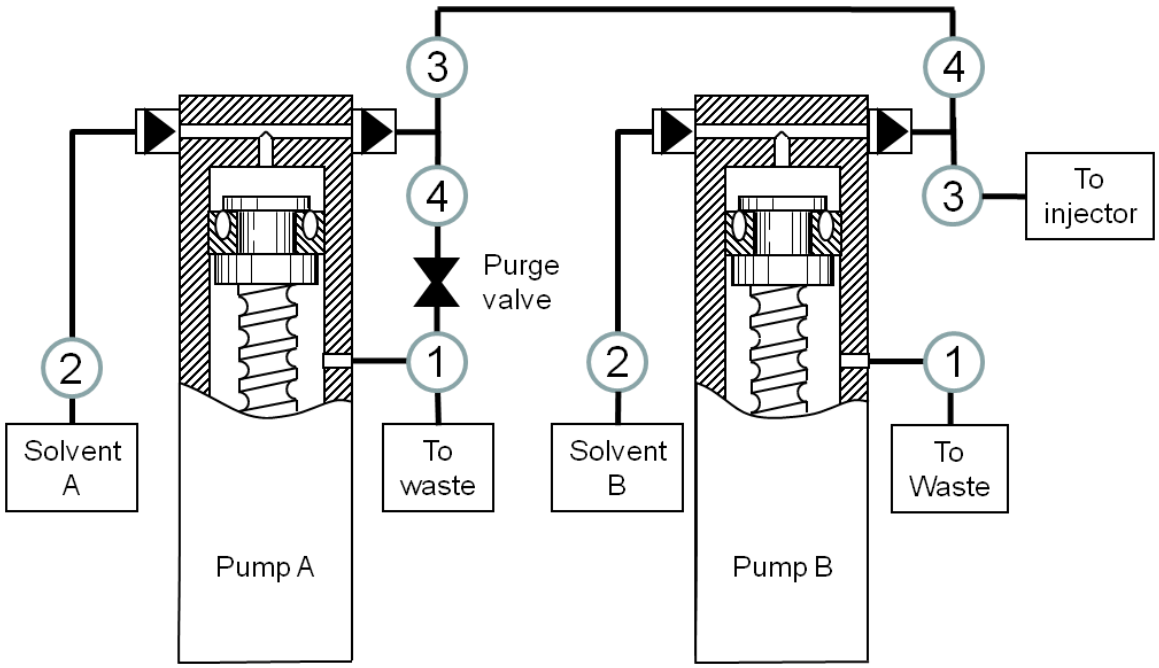
Allen Key

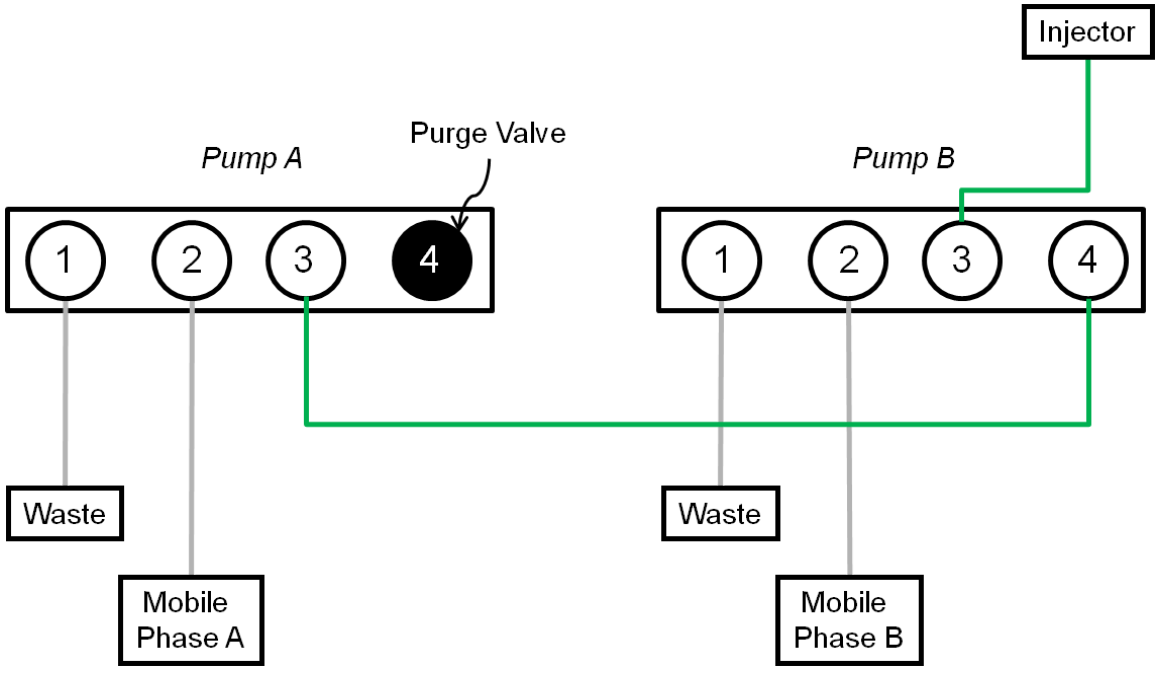
The Power Tower includes a power unit and a communication unit (StreamLC).

All modules are electrically interconnected via power and USB cables to the Power Tower.

The Power Tower is powered via an AC power outlet (110-240V) and connected to the Internet using a CAT5 ethernet cable and is a part of the local computer network.

Below are two diagrams. The first one shows the flow path of solvent through the gradient system. The second depicts how each port should be connected. The numbers correspond to the positions on the front of the pump. The exact steps will be described below.
The output from Position 1 on each pump is connected internally to a space behind the plunger seal. It allows for the area behind the plunger to be washed with mobile phase solution or pure water in order to prevent crystal formation in the cavity when using mobile phases with a high buffer concentration.





Building your Alltesta™ Analyzer

1. Now that you have received the components to your Alltesta™ Analyzer system, it's time to put it all together.

2. Place the Alltesta Power Tower and base plate on a flat surface.

3. Take the included Allen key and place it in the screw on the top of the mounting bracket on the side of the UV VIS Detector, and rotate the key counterclockwise until it stops.

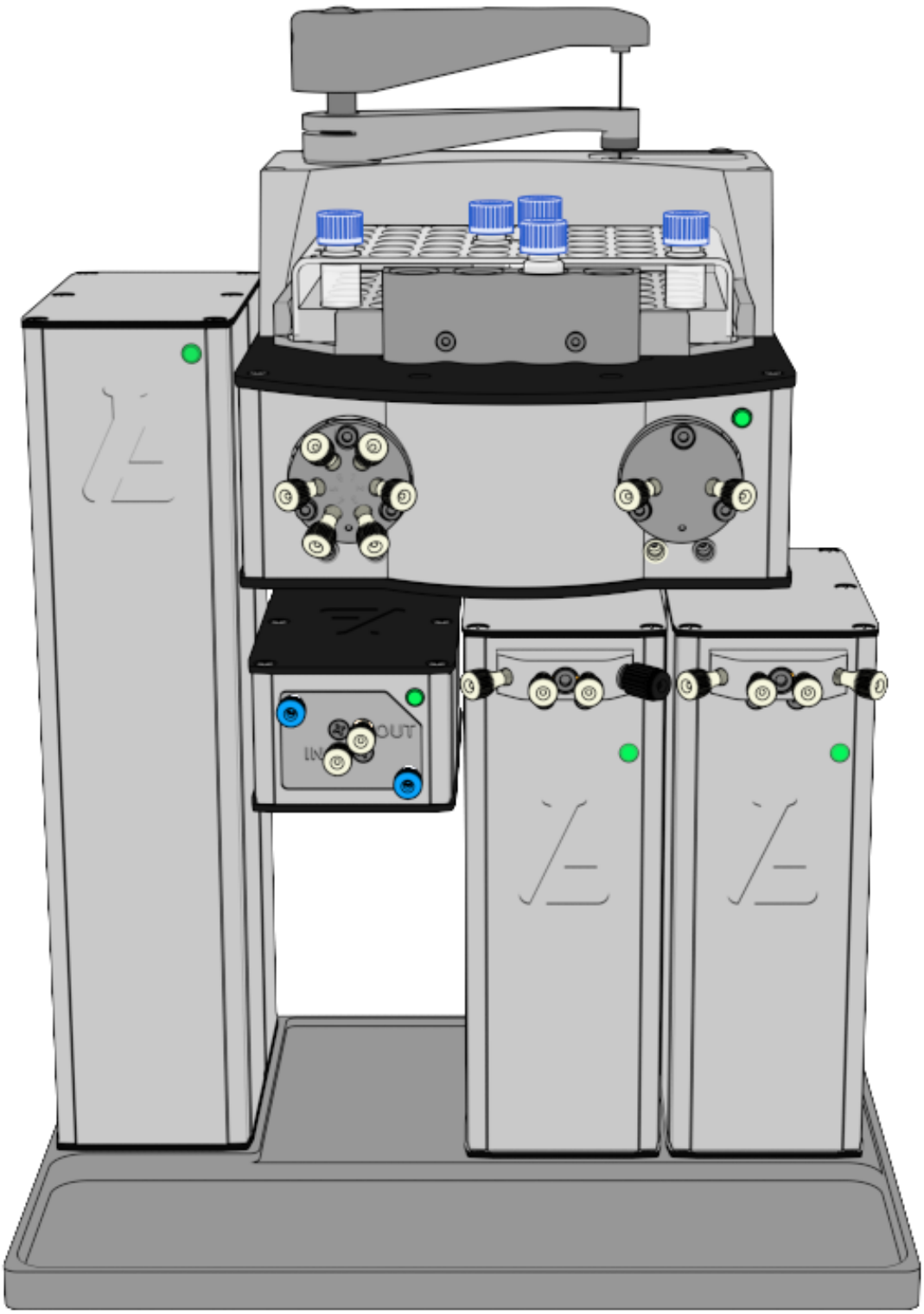
4. Slide the UV VIS Detector down the track of the Power Tower until it is about 50% down.

5. Place the Allen key back on the side of the UV VIS Detector and rotate clockwise to tighten the detector in place (Keep one hand on the detector while tightening to prevent it from falling).

6. Repeat steps 3-5 for the Autosampler, but slide it down the track so that the top cover is level with the top of the Power Tower (**Careful! The Autosampler is fairly heavy, so make sure to keep an extra hand underneath it to support it while tightening it to the track**).

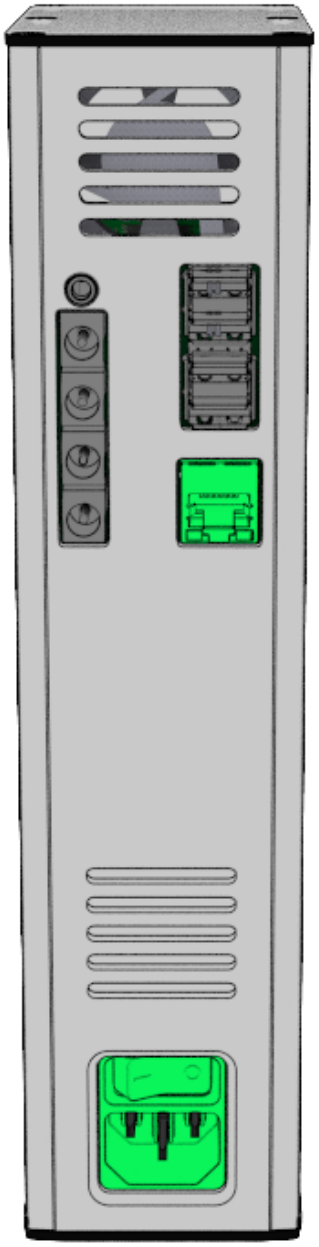
7. Place the two Pumps on the right side of the base. Pump A will have a Purge Port installed in the far-right port, and Pump B will have a regular fitting in that port.

8. Fully assembled, it should look like the image below.


IN
OUT

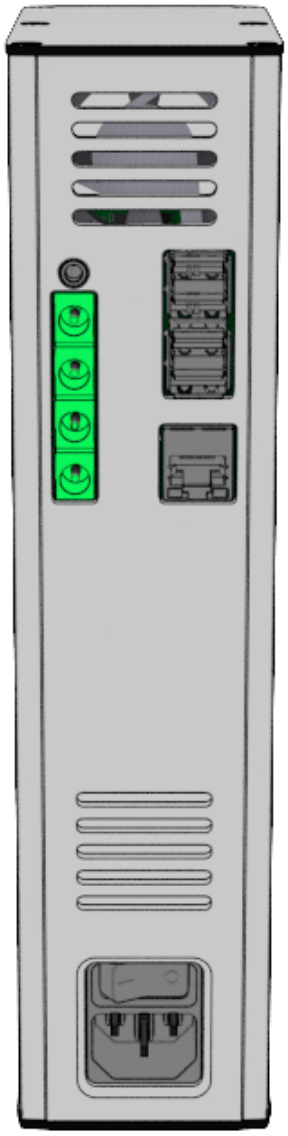
Setting Up Your Alltesta™ Analyzer

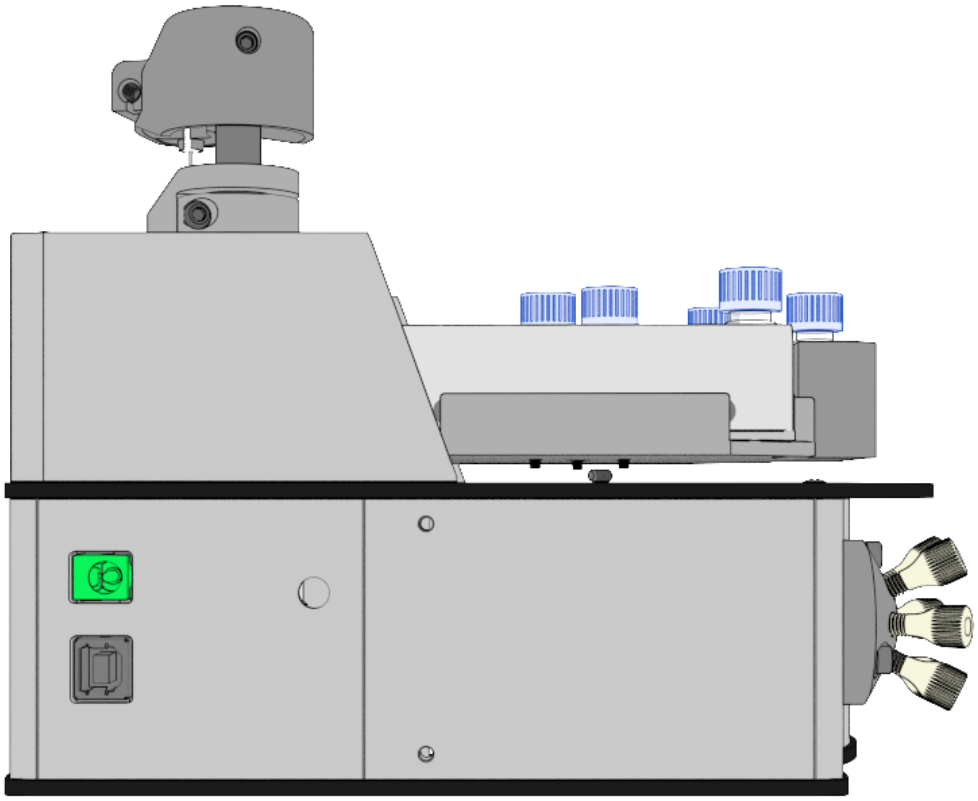
1. Plug in the power connector, as well as the CAT5 ethernet cable to the Power Tower, as shown in the image below (**Green** ports).



2. **DO NOT SWITCH THE POWER ON YET.** This will be done later on.

3. Plug in a **24 V power cable** into an available outlet on the Power Tower along with the Alltesta™ Autosampler as shown in **Green** in the picture below:

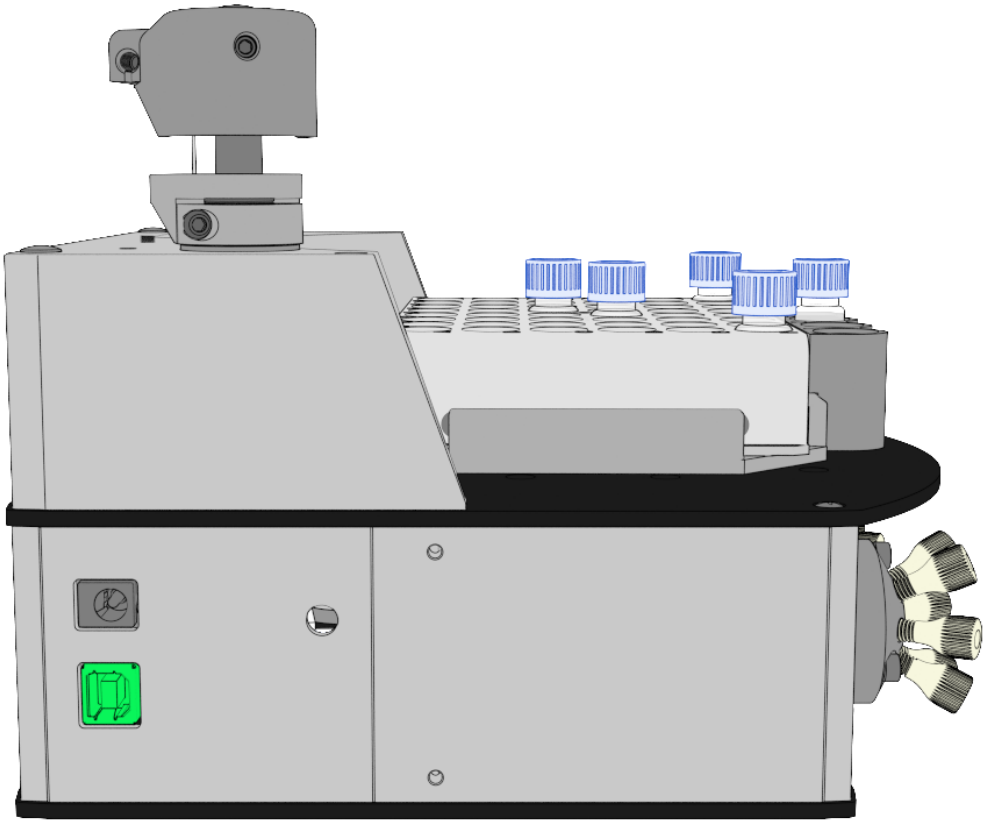




4. Connect 2 more **24 V cables** to the Power Tower and to the back of each **Syringe Pump**:

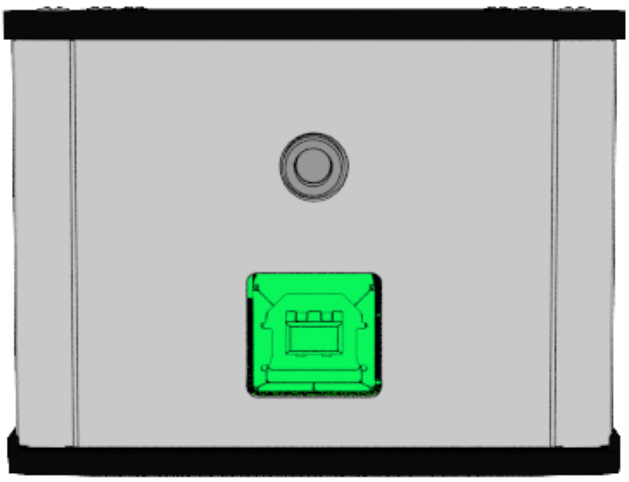
5. Now, take each of the 3 **USB A-male to B-male** cables and plug the USB-A side into the available USB-A ports in the back Power Tower (the order does not matter).

6. Then, plug one of the USB-B connectors into the **Autosampler's** USB-B port.



7. Now plug one USB-B connector into each **Syringe Pump's** USB-B port.

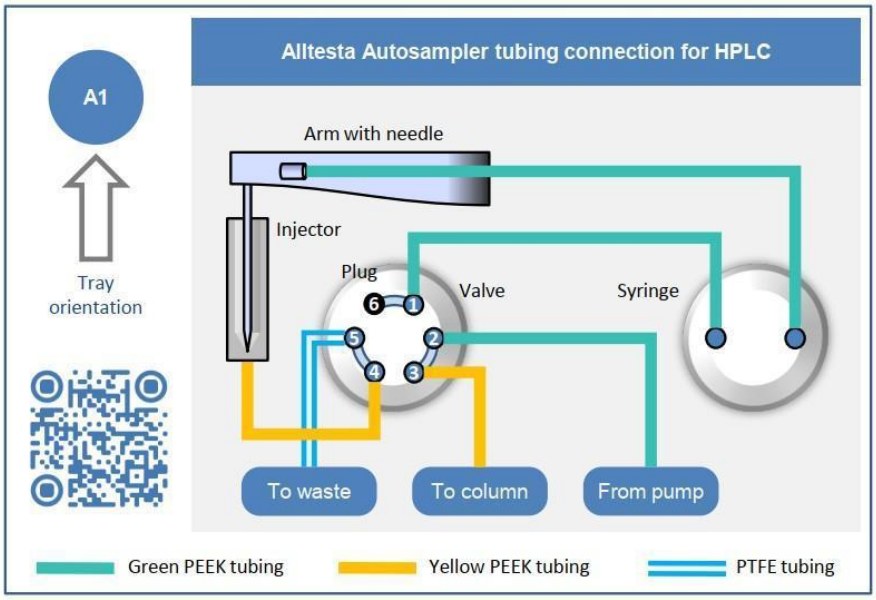
8. Lastly, plug one USB-B connector into the **Detector's** USB-B port.



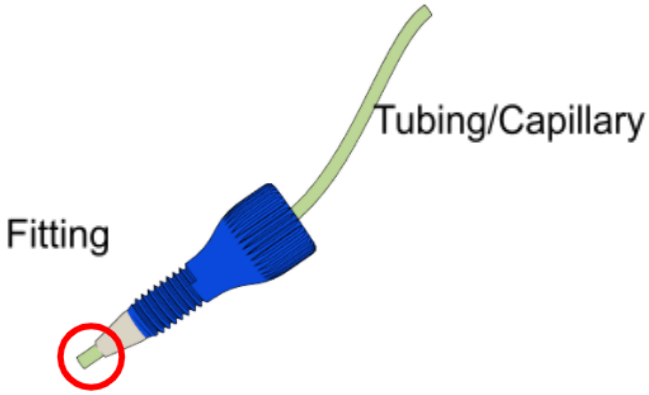
Setting up your Alltesta™ Analyzer

1. Now let's connect the tubings correctly.

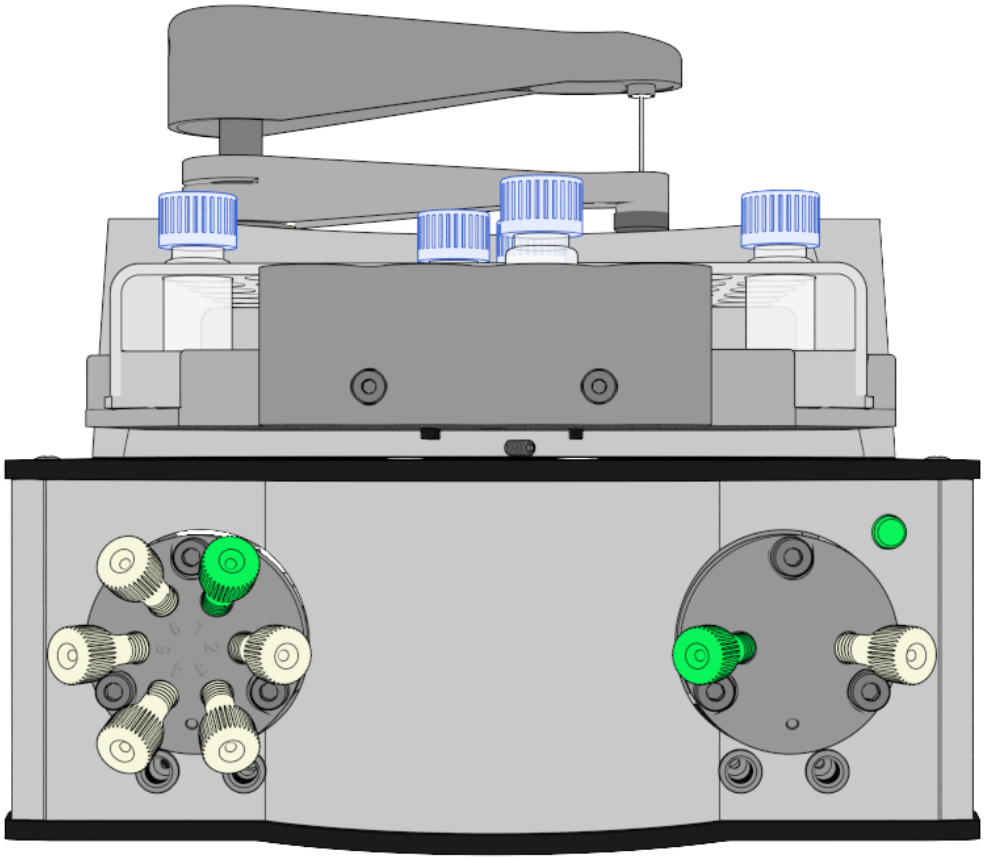
2. On the autosampler tray, there is a sticker detailing how the tubing should be set-up. It looks like this:



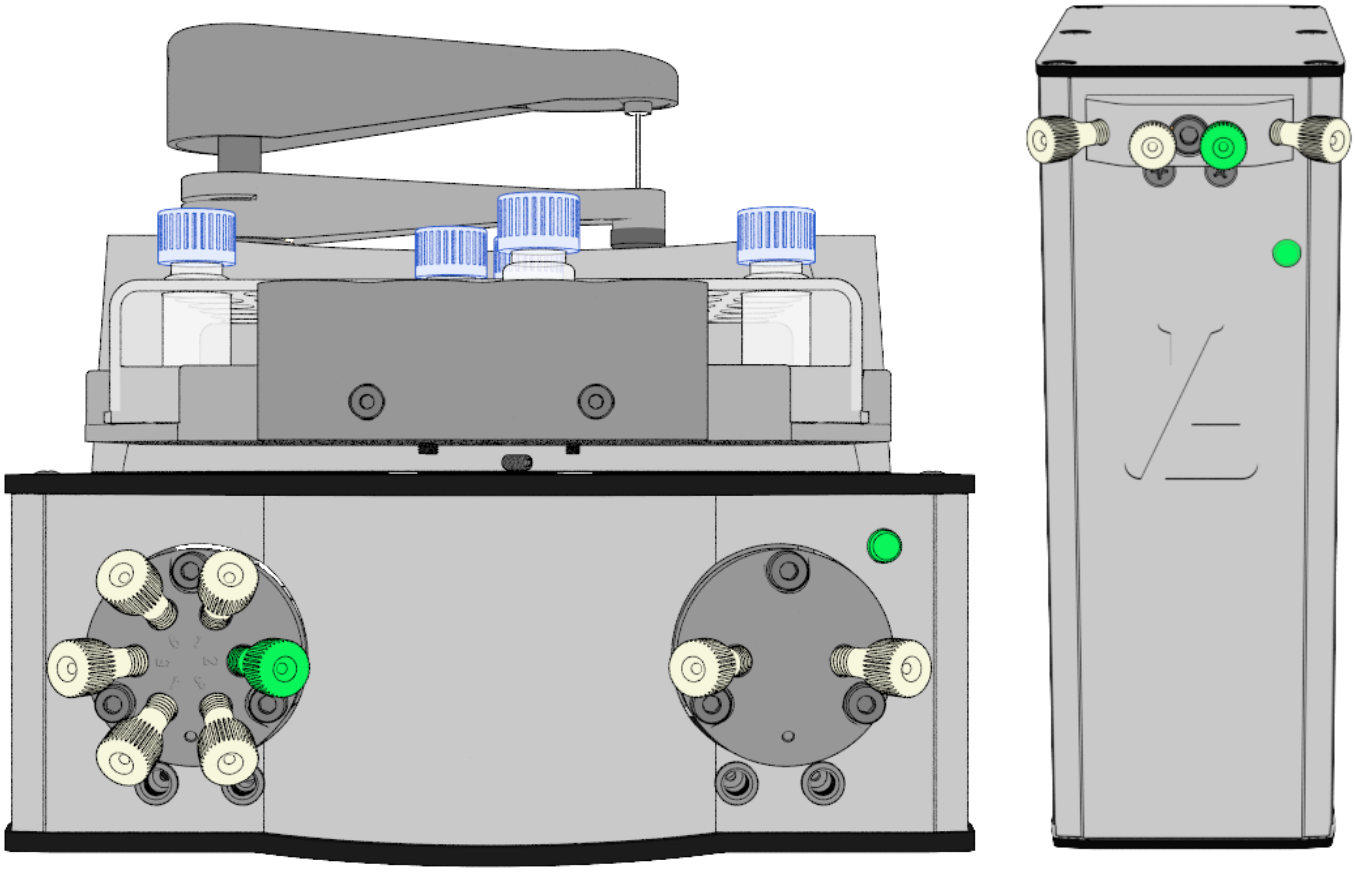
3. Three types of tubing - **Yellow**, **Green**, and **Clear** - should be used. The **Yellow** and **Green**tubing is made of a special plastic, PEEK, and they are used for the high-pressure connections of the system. Clear tubing, made of Teflon, is used for low-pressure liquid connections. Before you start, make sure that when you insert tubing into the fittings they stick out about 3 mm like in the picture below:
    a. **Note**: The fittings need to be inserted along with the capillaries. You cannot insert the fittings beforehand. While you are inserting fittings, gently push the capillary toward the port to ensure the end of the capillary extends beyond the fitting tip after it is installed. Tighten the fitting with maximum force using your fingers, and **do not** use any tools to tighten.



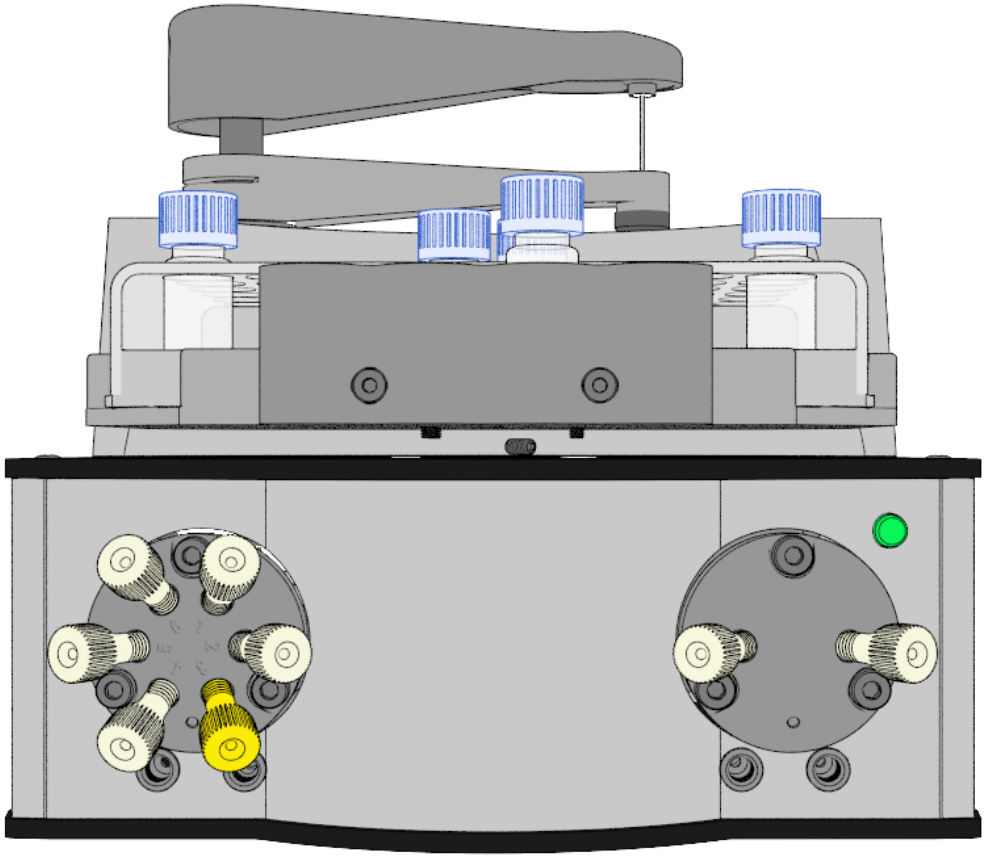
4. In **Position 1** of the autosampler valve outlet (left), connect a short **Green** capillary to the **left-most** autosampler syringe outlet (right).

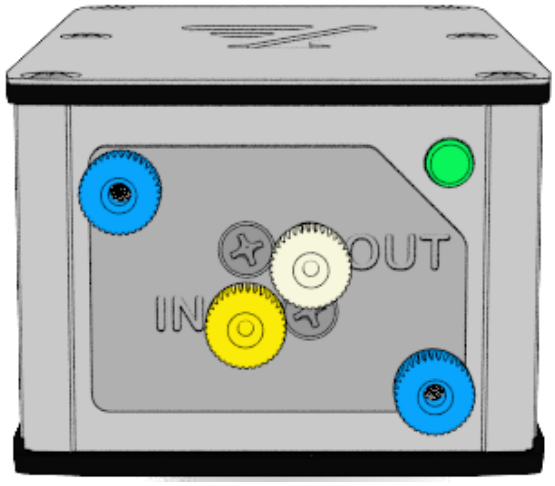


5. In **Position 2** on the Autosampler, connect a **Green** capillary to the **middle-right** port (Position 3) of Pump B as shown below.

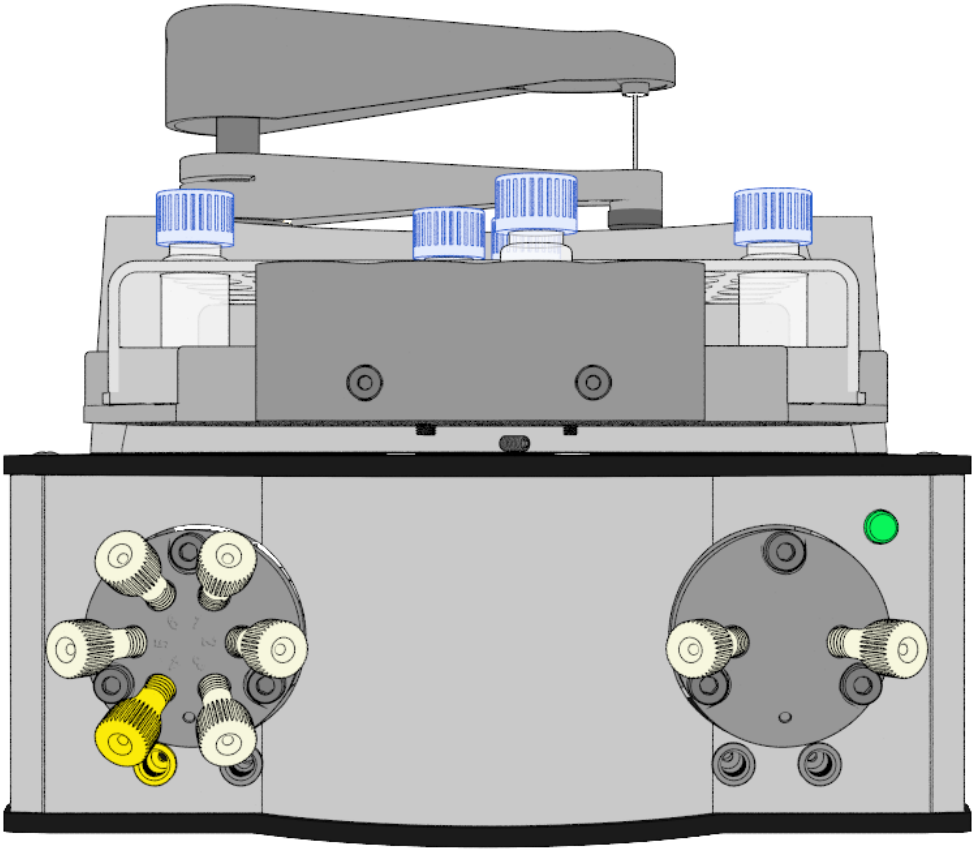


6. In Position 3 of the Autosampler, connect a Yellow capillary to the inlet of the column. Then use another Yellow capillary to connect the outlet of the column to the IN position of the **Detector** (shown below in Yellow).
    a. **Note:** Make sure to remove the black plugs in each end of the column.
    b. **Note:** The arrows on the column label indicate the flow direction of the column. Attaching it correctly will ensure proper column operation. Attaching it incorrectly can harm the column's performance and lifetime.

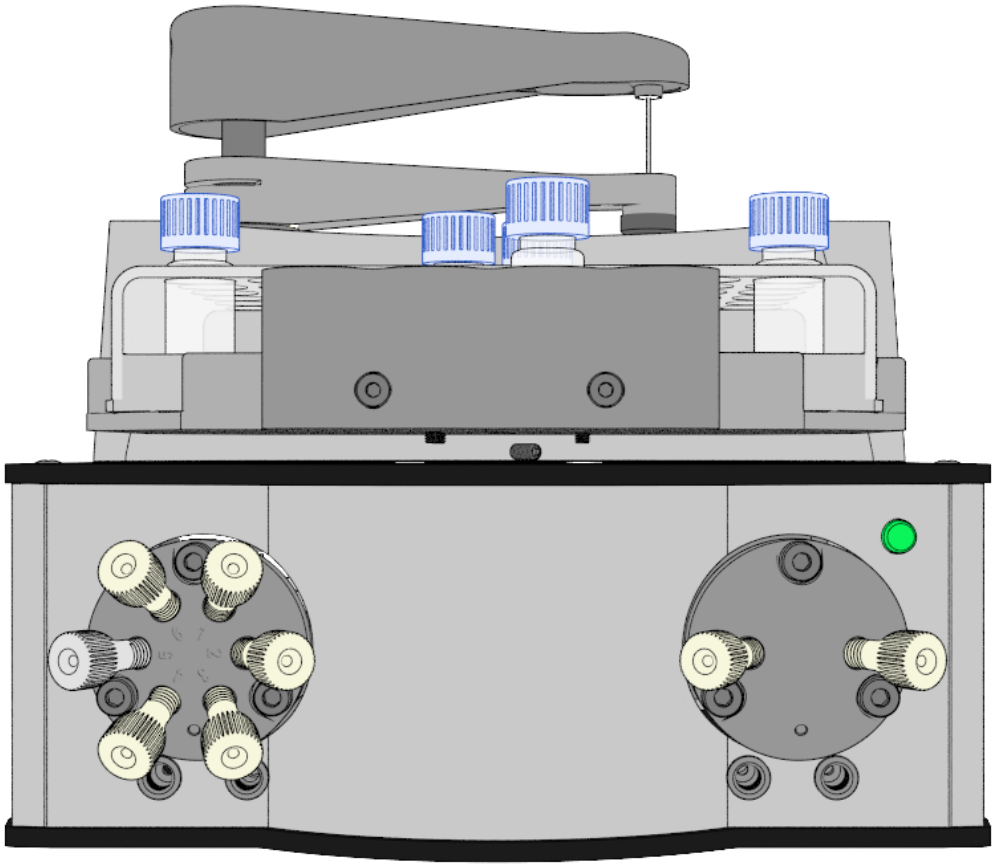




7. Connect the Yellow capillary that is already coming out of the **bottom left** hole on the front of the autosampler to Position 4.

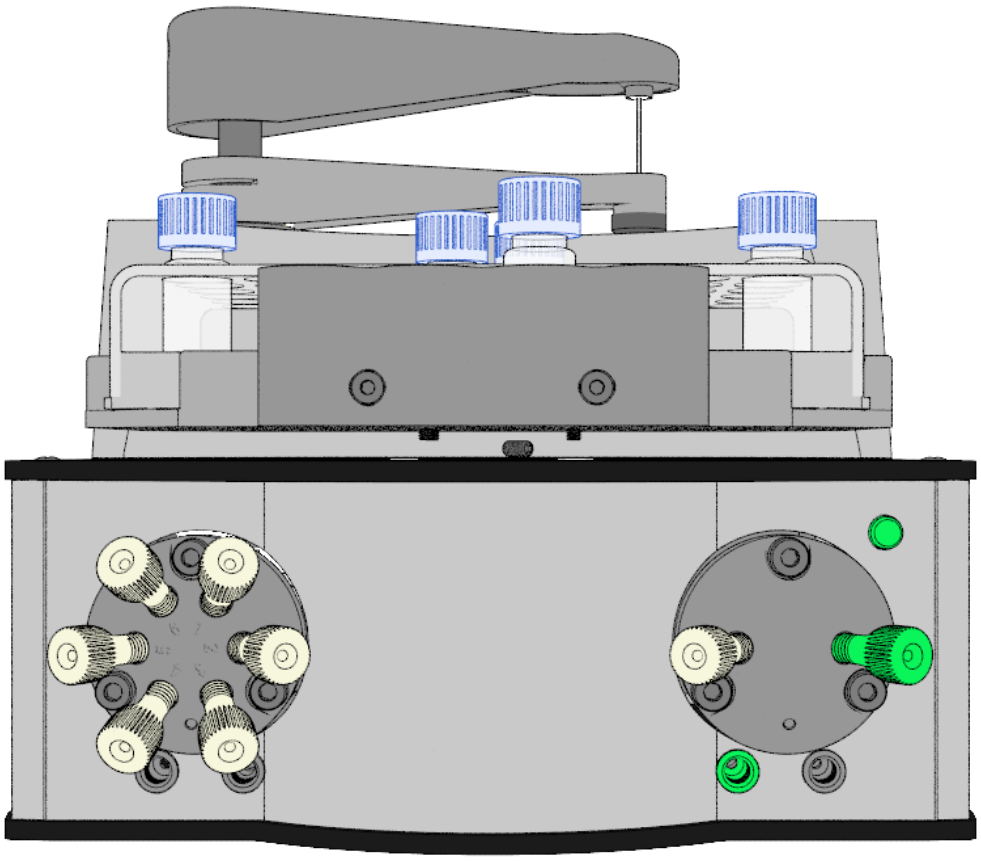


8. In position 5, connect a **Clear** capillary with the other end connected to a waste flask.

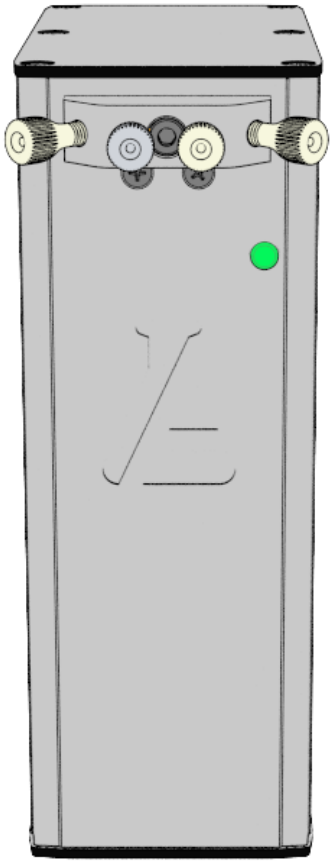


9. Position 6 will not connect to anything and should have a **PEEK Plug** in it.

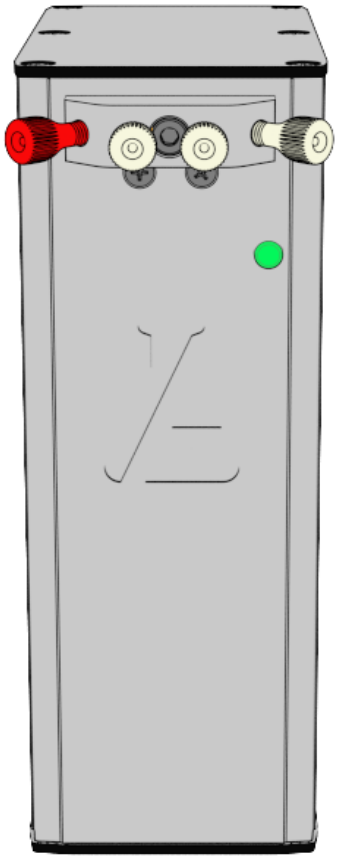
10. The **bottom left** hole on the front of the syringe side of the Autosampler with the **Green** capillary coming out of it should be connected to the **right-most** position of the Autosampler syringe stator as shown below in **Green**.



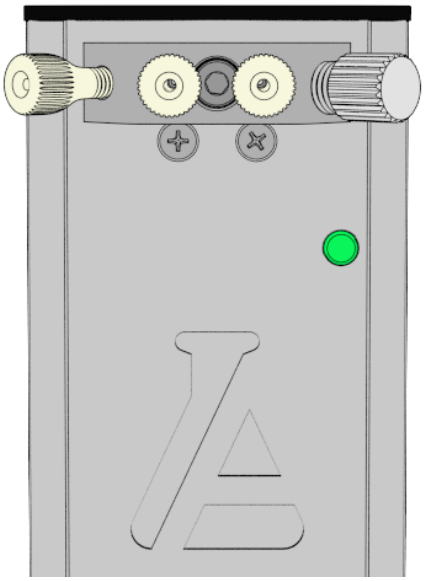
11. Connect each pump’s center-left position (Position 2) with a **Clear** capillary to the bottle with its corresponding **Mobile Phase**.



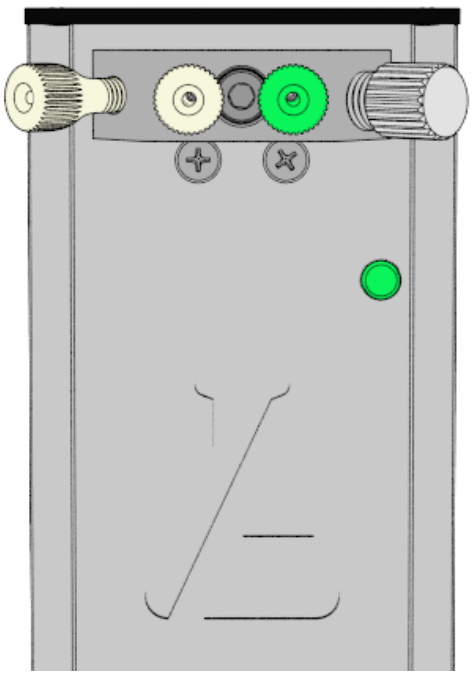
12. Position 1 on each pump is an additional liquid port (shown in **Red** below). This connection is used to wash the pump's back seal with solvent to protect it from the build-up of salt when a buffer with a high salt content is used.

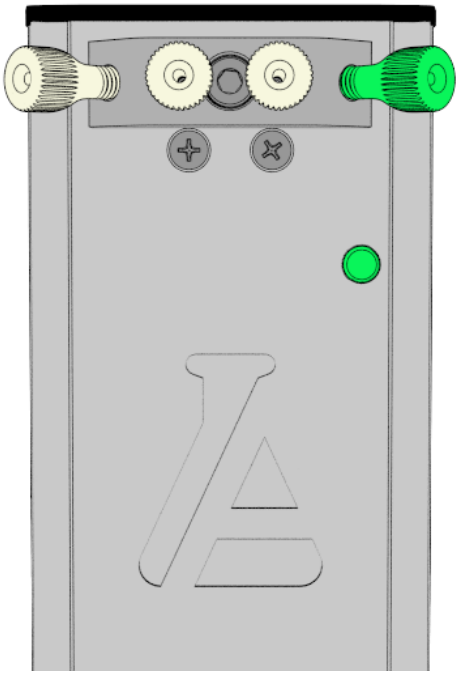


13. On the far-right side of Pump A there is a connection called the **Purge Port** in Position 4. This port is used to quickly replace the contents of the pump with a new mobile phase or to get rid of air if the pump was used dry.
    a. To replace the mobile phase or to remove air, unscrew the Purge Port cover. Turn the pump **ON** (via the HPLC.cloud application). Doing this will bypass the column and quickly flush out the solvent. Alternatively (to replace the old mobile phase), the new mobile phase can be pushed through the column with a normal flow rate while the Purge Port remains closed.

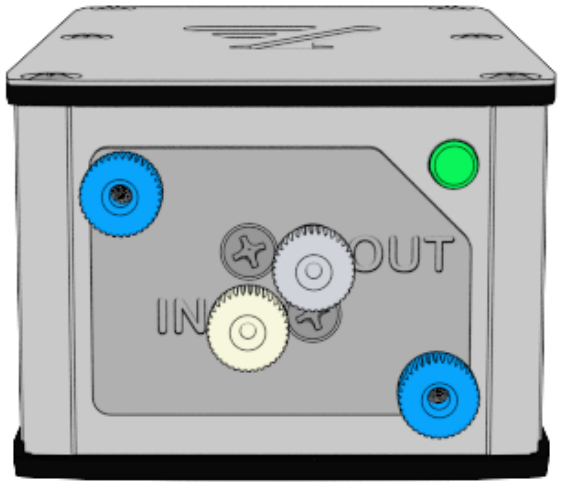


14. To set up the rest of the Gradient system, connect a fitting with a short **Green** capillary from Position 3 on Pump A to Position 4 on Pump B.





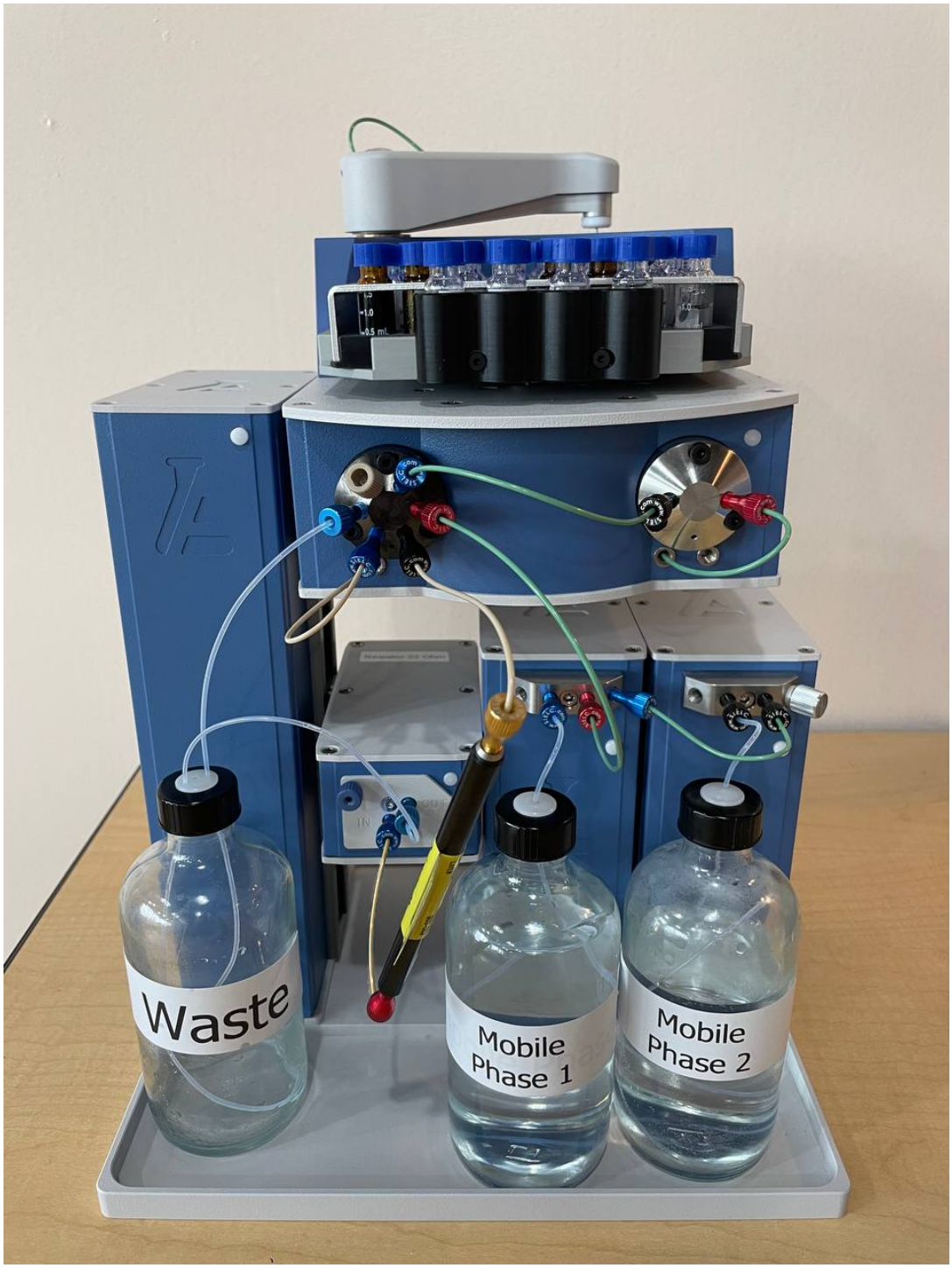
15. To finish setting up the **Detector**, connect a Clear capillary tubing to the IN position of the **Detector**, and place the other end of the tubing into a **Waste** flask.



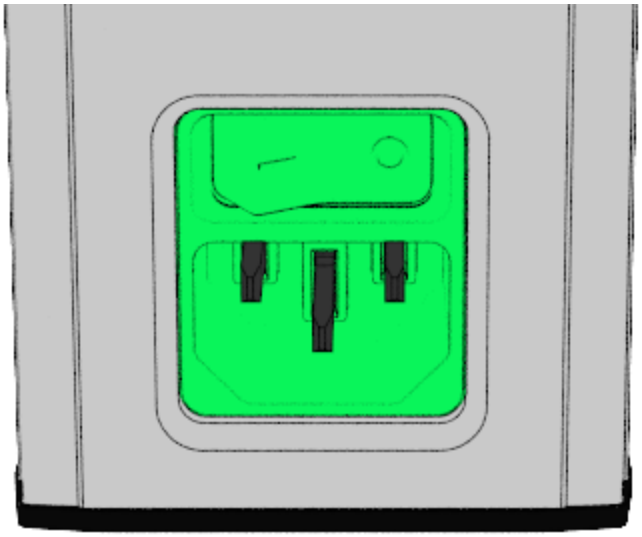
16. Check over all the fittings by turning them firmly clockwise to make sure everything is tight and secure to ensure no leakage. If any connection exhibits a small leak once you start the pump, it can be tightened by an additional clockwise turn (fingers only).

17. Lightly pull on all the capillaries that are inserted into the fittings and columns. If they hold their place, that means they are secure; if you can wiggle any of them or even pull one out, then that capillary needs to be re-inserted with the fitting to become properly secure.

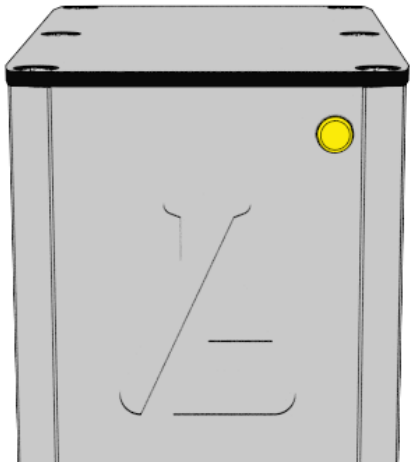
18. If you have done everything correctly, your system should look like the image below:
    a. **Note:** In the photo below, Pump A is on the right, and Pump B is on the left. As long as the ports are connected correctly, you can place them in either position.



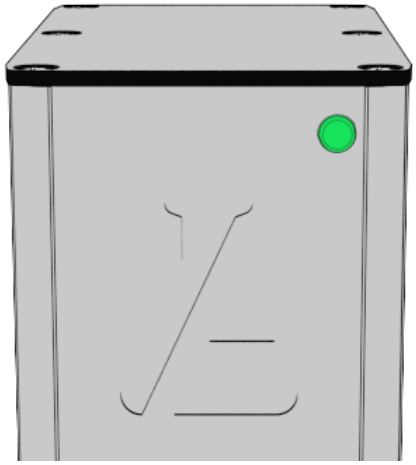
19. Now that you have all the liquid and electrical connections installed, flip the switch in the back of the Power Tower to the **ON** position.



20. Please allow for the tower to boot up and come online as it needs to install the software. This may take a few minutes. Wait until the front indicator light turns yellow.



21. If the unit can communicate with the cloud server, the light on the front of the Power Tower will turn green. This may take a few minutes. If it turns green, the instrument is ready to be used and the cloud software should be up and running.



22. For reference, there are a total of **5** colors that can appear on the instruments:
    - **Green slow blinking light**: System is Ready;
    - **Yellow slow blinking light**: Booting up software, instrument is getting ready;
    - **Magenta**: Analysis is in progress;
    - **Cyan Short Blink**: Software updating;
    - **Red Short Blink**: Hardware/Software Error.

23. The lights also serve as physical buttons with different functions depending on the device:
    - Pump: hold for 1 sec to offset pressure sensor to 0;
    - UV VIS Detector: hold for 1 sec to calibrate LEDs;
    - Holding down the button for about 10 sec on any unit will reboot that particular unit.

24. When the system is properly installed and the light on each unit (including the Power Tower) is green, go to hplc.cloud to begin using the cloud software to set up your injections.

25. Follow the ***HPLC Cloud Software Set-Up Manual*** to set up your system and to learn how to use the Gradient system.