

Summit

Automated Plate SEC Fraction Collector Quick Guide

The Summit instrument is a fully automated platform for high-throughput isolation and concentration of extracellular vesicles (EVs) using 24-well size-exclusion chromatography (SEC) plates. It can isolate 4-48 samples at time and collect up to 3 fractions per sample*. Fractions may be concentrated down to 0.1 mL to increase EV concentration. The Summit instrument is also capable of running 4 - 24 Apex columns.

1. Summit Specifications

SUMMIT INSTRUMENT SPECIFICATIONS		
Units	<i>Imperial</i>	<i>Metric</i>
Dimensions (W x D x H)	36" x 27" x 30"	91 x 69 x 76 cm
Weight	133 lbs.	60 Kg
Bottle Capacity	1 U.S. gallons	4 L
User Interface	5.6"	143 mm
Environmental Temperature	50°F-75°F	10°C -24°C
Relative Humidity	30-80% RH	
Input Power	100~240 VAC (50-60 Hz)	
Power Supply Unit	24 VDC, 5 A, 120 W	
Connectivity	USB 3.1 for software update	
Chemical Compatibility	PBS, DI, 70% ethanol, < 0.5% NaClO (Bleach), < 0.5M NaOH	

2. Summit Consumables

Part Name	Vendor (Mfg)	Vendor Part # (Mfg Part #)
1. Apex 24-well SEC plate	Everest Biolabs	APEX-4B-PLATE24 APEX-6B-PLATE24
2. Altitude 10k UF Plate (2 pack)	Everest Biolabs	ALTITUDE -10K-2
3. Altitude Collection Plate (10 pack)	Everest Biolabs	ALTITUDE-COLLECT-10
4. Deep well plate	Fisher (Eppendorf)	E0030504305 (0030504305)
5. Pipette tips	Fisher (Fluotics)	NC2195934 (LHA1000.ST)
6. Alternative pipette tips	Thermo Fisher	904-021
7. 2.0 mL Low Bind Tubes	Fisher (Eppendorf)	13-698-795 (022431102)

3. Summit Acceptable Configurations

SEC Type	1 Fraction	2-3 Fractions	Smart Reuse	Cleaning Solution
1 Plate	All options available	96 Deepwell plate required for >8 samples	All options available	Available with wash only
2 Plates	96 Deepwell plate required for >24 samples	Not available	All options available	Available with wash only
1 Column Adapter	All options available	96 Deepwell plate required for >8 samples	Can not skip wells	Available with wash only
2 Column Adapter	All options available	Not available	Can not skip wells	Available with wash only

3.1. Sample Loading

Load samples starting at A1 and column 1 before moving to row B. Load the input into the Summit with A1 in the back right of the input plate holder. The same procedure is used for loading samples in the 24-tube rack.

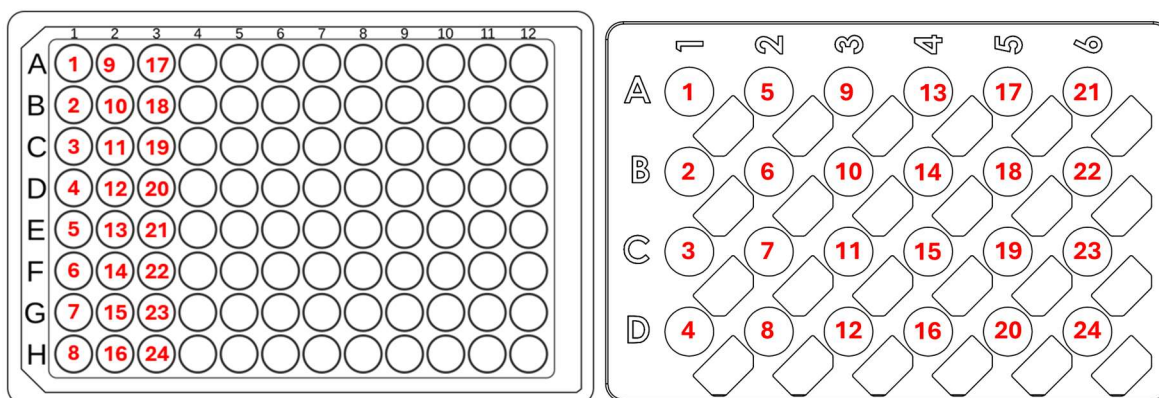
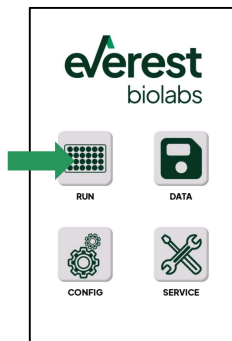


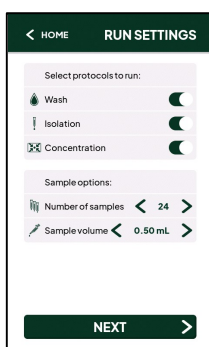
Figure 1. Sample locations for input and output plate

3.2. Setting Up a Run

1. From the home screen press the “RUN” button.



2. On the “RUN SETTINGS” screen, configure your collection parameters. First, select the processes you want to run: **Wash**, and/or **Isolation**, and/or **Concentration**.

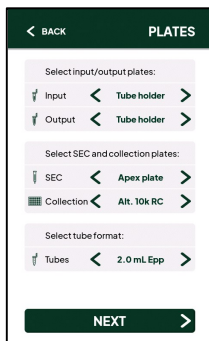


Then choose the sample options.

- a. Number of samples: 4-48
- b. Sample volume: 0.1-1.0 mL

NOTE: Apex columns cannot be used if you select greater than 24 samples

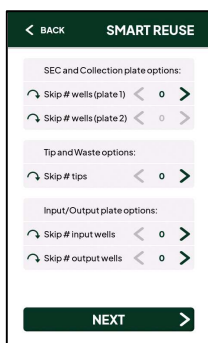
3. Select “NEXT” to go to the “PLATES” screen. This screen lets you set the additional options:
set



- a. Input Plate: Tube holder, Epp96 plate, none
- b. Output Plate: Tube holder, Epp96 plate, none
- c. SEC: Apex plate or Apex columns
- d. Collection: Alt. 10kRC, Alt. 10kPES, Alt. Collection,
- e. Tube Format: 2.0mL Epp

NOTE:

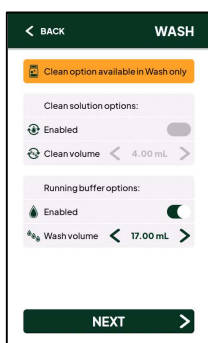
- The “none” option on the input plate, is only an option when using the concentrate only protocol. Sample must be manually loaded directly into the filter plate.
- If “none” is selected on the output plate, then samples will remain in the collection plate and not be transferred to the output plate.



4. Select “NEXT” to go to the “SMART REUSE” screen.

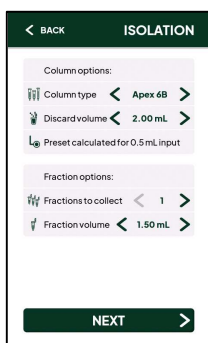
You can skip wells in the SEC and collection plate, rows of pipette tips, and rows in the input and output plates. This allows you to use partial plates or tips and reduce waste.

NOTE: It is not recommended to use partial concentration plates. The membrane is very delicate and used wells may not hold vacuum properly.



5. Select “NEXT” to go to the “WASH” screen.

You can only enable the regeneration option if Wash is the only protocol selected in the RUN SETTINGS screen. Regeneration wash will dispense regeneration wash buffer followed by the standard buffer wash.



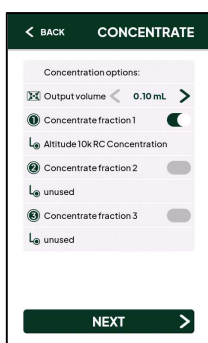
6. Select “NEXT” to go to the “ISOLATION” screen. Here you define the column options and fraction options.

Column Options.

- a. Column type: Apex 4B, Apex 6B, or Apex MM
- b. Discard Volume: 0-4.0 mL

Fraction Options.

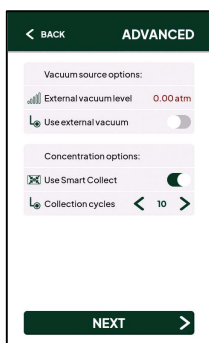
- a. Fractions to collect: 1-3
- b. Fraction volume: 0.5-2.0 mL



7. Select “NEXT” to go to the “CONCENTRATE” screen.

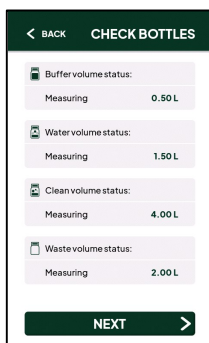
Here you select which fractions (or plates) to concentrate and the final volume of the resuspended sample.

The type of plate needed is shown after making this selection

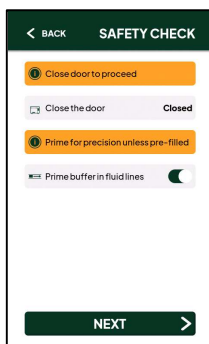


8. Select “NEXT” to go to the “ADVANCED” screen. This screen allows:
 - a. select house vacuum or internal vacuum
 - b. Configure concentration options. Smart Collect will transfer samples to the output as they complete concentration. Turning this off will transfer all samples once the last one has completed.

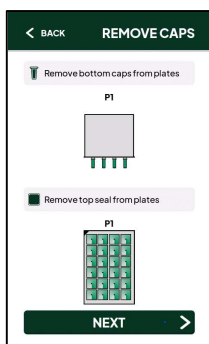
NOTE: House vacuum must reach 0.3 atm or lower to use on the Summit



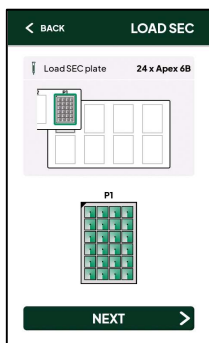
9. Select “NEXT” to go to the “CHECK BOTTLES” screen. This screen uses liquid level sensors to determine if you need to add additional volume or empty the waste container. You cannot proceed until all check marks are green.



10. Select “NEXT” to go to the “SAFETY CHECK” screen where you are required to close the door. You may also choose to prime buffer lines. We recommend priming whenever precision dispensing is required. After selecting next, the instrument will initialize all hardware required for the selected run

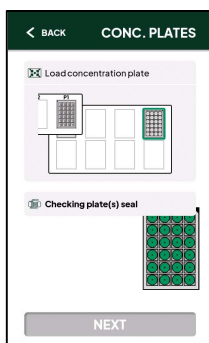


11. Remove bottom caps from the plate or columns at this point. Remove the top seal from the plate after you place it in the holder, to avoid droplets falling.



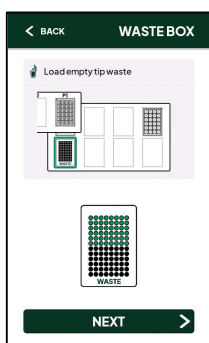
12. Select “CONTINUE” to go to the “LOAD SEC” screen. Place the plate on the correct position as indicated on the screen. Finally, remove the upper plate seal.

If only a fraction of the plate is being used (<24 wells), after placing the plate in the SEC plate position, gently cut the plate seal using a blade before removing the upper plate seal from the wells to be used. This will keep the unused wells sealed.

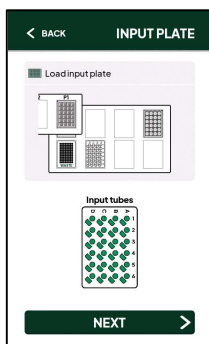


13. Select “NEXT” to go to the” CONC. PLATES” screen where you are asked to load Altitude UF filter plates for the SEC fractions. If you are not concentrating, you are asked to load Altitude collection plates. Vacuum is applied to the plate to ensure it is properly seated. If the plate fails this test and is properly seated, replace it with a new plate.

NOTE: Place the plate in the rocker and press down until it **snaps into place**. Concentration plates can only be used one time, even if they are partially used. Once the membrane is wetted and dried, it may crack and lose its integrity.

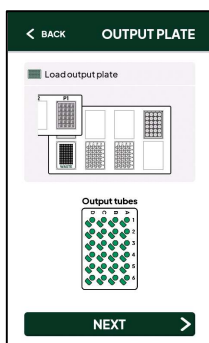


14. Select “CONTINUE” to go to the “WASTE BOX” screen, where you are asked to load an empty tip waste collection box.

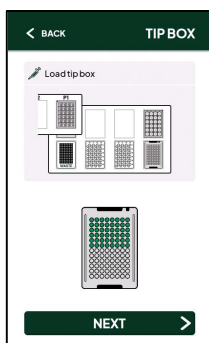


15. Select “CONTINUE” to go to the “INPUT PLATE” screen where you are asked to load your input plate. Use only the recommended deep well plate or tube rack. Refer to plate map for additional information on loading samples.

NOTE: Load an additional 25uL sample in the input plate to account for the well dead volume.

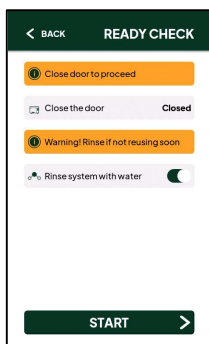


16. Select “CONTINUE” to go to the “OUTPUT PLATE” screen where you are asked to load the output plate. Use only the recommended deep well plate or tube rack.

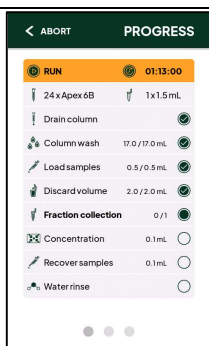


17. Select “CONTINUE” to go to the “TIP BOX” screen, where you load a box of the compatible 1 mL tips. Place the front edge of the tip holder in the box first, then press the edge closest to you. Make sure the tips snap into place.

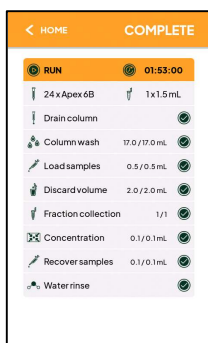
NOTE: Only use the tips recommended in this document.



18. Select “CONTINUE” to go to the “READY CHECK” screen. Close the door and press “START” to begin the run. If you are planning to use the instrument again the same day, you may turn off water rinse. Otherwise, we recommend leaving it on.



19. The “PROGRESS” screen shows the steps the instrument will perform, along with the current step, and experimental time.



20. The “COMPLETE” screen is displayed when the run has finished successfully. You may now retrieve your samples. Select “HOME” to return to the HOME screen.