

AeroTrak™ Cleanroom Condensation Particle Counter



Model 9001

Automatic and Manual Pump Priming Procedure

Description

The Model 9001 AeroTrak® Cleanroom Condensation Particle Counter (CPC) is manufactured with three (3) supply pumps that deliver water to the wicks and one (1) drain pump. When the CPC is not used for extended periods, these pumps can require priming to initiate proper operation once again.

The purpose of this document is to provide instructions on how to resolve “**Prime Wick Failed**” errors, when observed upon “**Start-up**” in the field.

If a pump sticks, once it is started again and is filled with water, it’s operation should be reliable, unless it dries out again from extended storage.

If using the pump priming tool (syringe), always first prime the drain pump, and if needed move on to the wick pumps.

It is worth noting that the 9001 is a high-precision analytical instrument that is optimized to detect 10 nm and larger particles. The 9001 works best when it is in use continually. If it is turned off for extended periods (more than a few days), difficulties can arise during start-up due to the technical complexity of the unit. This instruction booklet is intended to provide suggestions for resolving some common startup issues that may arise. Because there are both water and air flows in the instrument, caution should be observed to avoid allowing water getting into the optics flows.

Startup Procedure – 9001

It is recommended to follow these steps when starting up the 9001 (full details follow this summary):

1. Power on normally after instrument setup per the Quick Start Guide and/or Manual. If the automated startup sequence, which includes wick priming, completes normally (“**Prime Wicks Succeeded**”), **no further action is required to use the instrument.**
2. If the initial automated startup generates a “**Prime Wicks Failed**” error, use the onboard maintenance screen to manually initiate a “Prime Wicks” command. (**Setup tab → Device → Maintenance → Prime Wicks**). **If the unit completes the Prime Wicks successfully, no further action is needed.**
3. If the unit still generates a “**Prime Wicks Failed**” error after manually initiating the prime wicks command, use the pump priming tool in the following sequence.
4. **Prime Drain Pump.** Follow the instructions in this pump priming tool manual to use the tool to prime the drain pump during the “**Prime Wicks**” command. Only use the tool during when “**Draining Wick #(1, 2, 3)**” is displayed for priming the drain pump.
5. **If the 9001 completes the wick priming successfully after priming the drain pump, no further action is needed to use the instrument.**
6. **Prime Wick Pumps.** If the “**Prime Wicks Failed**” error is still generated after priming the drain pump, use the wick priming tool again to prime the wick pumps using the detailed instructions in this manual. Only use the tool when “**Priming Wick #(1, 2, 3)**” is displayed. **DO NOT** use the tool when “**Draining Wick #(1, 2, 3)**” is displayed.
7. If the 9001 completes the wick priming procedure successfully, begin using the instrument. If it still generates a “**Wicks Not Primed**” error, contact TSI® Technical Support.

NOTICE

Only use the pump priming tool to address water pump issues. **DO NOT** use the pump priming tool if there is a Purge Flow error. The purge flow and sample pumps are air pumps and cannot be helped using this tool. It is possible to flood the CPC tubes or purge flow lines by using the pump priming tool incorrectly.

Tools Needed

- 9001 Pump Priming Accessory (P/N 700425)
- 20 mL Ultra-Pure or Deionized Water

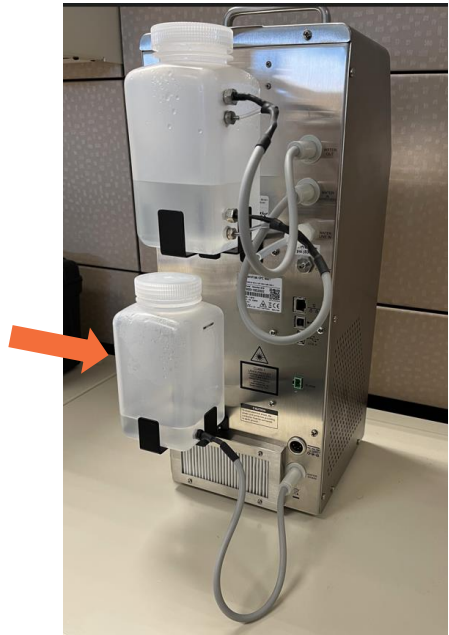


AeroTrak™ Condensation Particle Counter Model 9001 Pump Priming Procedure – Drain Pump

NOTICE

Attempt to prime pumps using the onboard Maintenance Prime Wicks function before attempting the pump priming accessory).

1. Locate Drain Bottle.



2. Disconnect drain line to water drain, as shown.



3. Connect Pump Priming syringe (empty of water and with plunger fully inserted) to the **Water Drain** connection on the 9001 lower back panel.



4. Power on unit or initiate **"Prime Wicks"** from the maintenance screen.
5. When the 9001 warm up window indicates **"Draining Wick 1,"** pull out on the syringe plunger gently to apply suction in order to ensure the drain pump is working properly. Continue to apply gentle suction during the **"Drain Wick"** messages only.
6. You will hear the pumps "ticking" and should feel some small pressure pulses. The pump will allow the syringe to be retracted slightly during each "tick" if it is not stuck.



Warming up...

Conditioner temperature	■		
Initiator Temperature	■		
Moderator temperature	■	Instrument Status	■
Temperature	■	Water bottle empty	■
Purge flow	■	Wicks not primed error	■

Draining Wick #1
Counter: 95

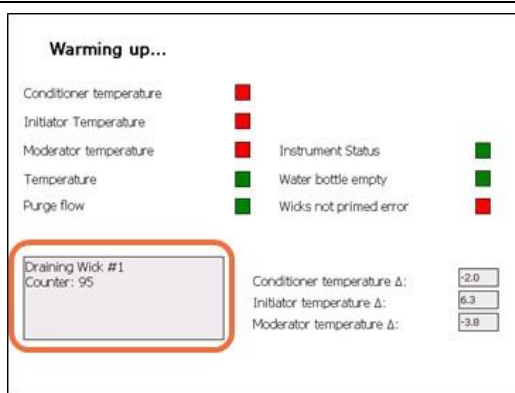
Conditioner temperature Δ:	-2.0
Initiator temperature Δ:	6.3
Moderator temperature Δ:	-3.8



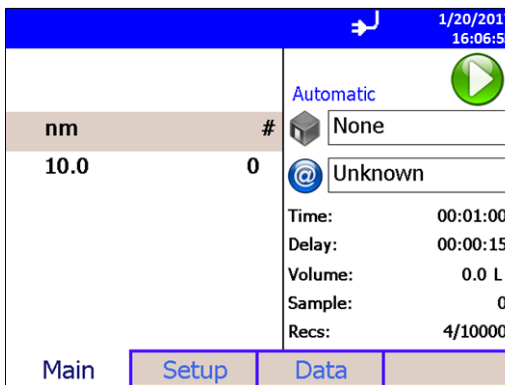
NOTICE

Only eject (withdraw) water during Draining Wick #1, #2, and #3 messages. Expect to experience a small amount of back pressure when ejecting water. Very small amounts of water are ejected.

7. **Eject** water during Draining Wick #1, #2, and #3 messages.
8. See orange box on the screen shot below.



9. Pump Priming is successful when the Main sampling screen appears after the full wick priming sequence is complete.



10. Disconnect Pump Priming Accessory from drain line.



11. Reconnect drain bottle connector to the **“Drain Line”** port.
12. If the 9001 is running normally after priming as indicated in step 7, no further action is required.
13. If a **“Prime Wicks Failed”** error is displayed after priming the drain pump, proceed to priming the wick pumps.



AeroTrak™ Condensation Particle Counter Model 9001 Pump Priming Procedure – Wick Pumps 1–3

1. Locate Fill Bottle.



2. Disconnect bottom connector, as shown.



3. Fill Syringe with Ultra-Pure or Deionized water.
4. Firmly connect syringe to the tubing section of the Pump Priming Accessory.



5. Bleed air from the tubing connector by opening the spring check valve in the CPC connector (using a stylus or similar object) and pressing the syringe until water appears at the check valve.



- Connect the Pump Priming Accessory into the bottom “Water In” sensor port.



- Power on unit or initiate “**Prime Wicks**” from the maintenance screen.
- Slowly press the syringe and inject water into the instrument when the Priming Wick #1, #2, and #3 messages appear on the **Warming up...** screen (see orange box).
- Approximate water consumption is 7 to 9 mL for wick #1 and 3 to 5 mL for wicks #2 and #3.



Warming up...			
Conditioner temperature	■		
Initiator Temperature	■		
Moderator temperature	■	Instrument Status	■
Temperature	■	Water bottle empty	■
Purge flow	■	Wicks not primed error	■
<div style="border: 2px solid red; padding: 5px; display: inline-block;"> Priming Wick #1 Counter: 165 </div>		Conditioner temperature Δ:	<input type="text" value="-8.3"/>
		Initiator temperature Δ:	<input type="text" value="5.0"/>
		Moderator temperature Δ:	<input type="text" value="-5.3"/>

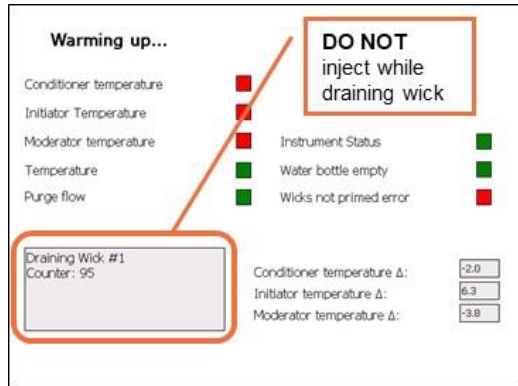


NOTICE

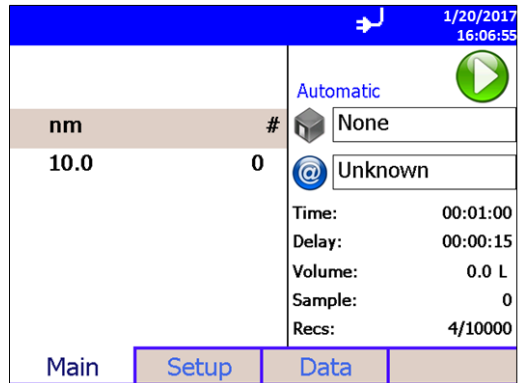
Only inject water during Priming Wick #1, #2, and #3 messages. Expect to experience a small amount of back pressure when injecting water.

10. **DO NOT** inject water during Draining Wick #1, #2, and #3 messages.

See orange box on the screen shot.



11. Pump Priming is successful when the Main sampling screen appears.



12. Disconnect Pump Priming Accessory.



13. Reconnect fill bottle connector to the **“Water In”** port.



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