

SHUTDOWN AND RESTART PROCEDURE 253PLUS WITH KIEL IV

This procedure can be used to shutdown (vent) and restart (pump down) a running system of a 253Plus with Kiel IV when a scheduled event, for example a main power or compressed air shutdown, is known.

-Venting system

1. Close the manual valve for the reference refill bottle (otherwise when the system vents air would mix with CO₂ gas in the bottle).
2. Drop down the sample vials of both lines of the Kiel IV.
3. Set both trap temperatures to 30°C.
4. Switch off all 253Plus heaters and wait for 15-30 mins.

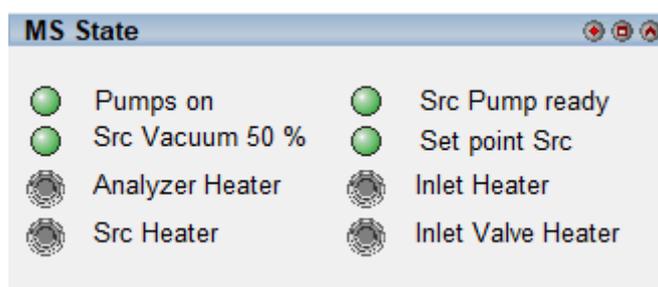


Figure: MS State with heaters off

5. Switch off the ion source.
6. Set the amplifier housing vacuum valves to "0" position (turn anti-clockwise when it was set to HV).

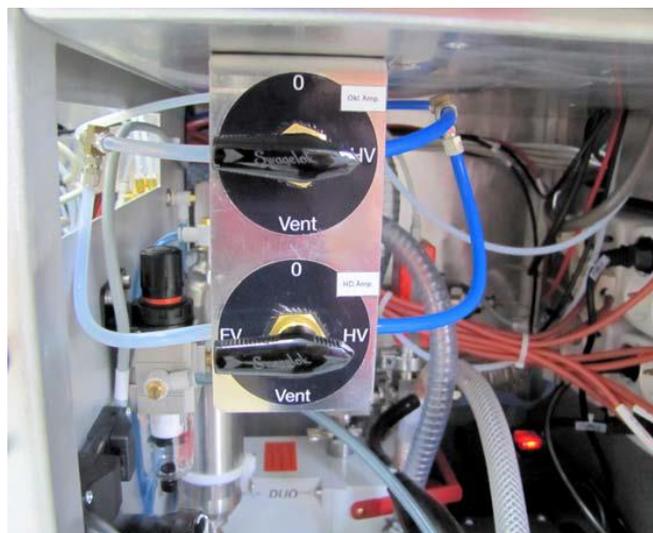
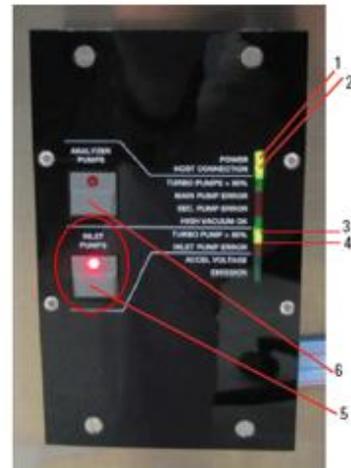


Figure: amplifier vacuum switch valve

- Turn off the vacuum of the Kiel IV and the 253Plus by pressing the switch and wait till it vents.



Figure: pump switch panel 253Plus



Labeled Components: 1=power LED, 2=host connection LED, 3=status LED of turbomolecular pump, 4=error status LED of this pump, 5=Inlet Pumps switch, 6=Analyzer Pumps switch

Figure: pump switch panel Kiel IV

- If the main building power is switched off as well; shutdown the computer and afterwards turn the main switch to off on both instruments.



Labeled Components: 1=10 A fuses, 2=main switch, 3=power plug

Figure: main power switch 253Plus

-Restart (Pumping Down) System

When the pressurized air and/or main power is back up and running, you can follow the previous procedure the opposite way but take in account the following:

1. Turn on the pumps and wait to achieve a good vacuum (at least 5.0×10^{-7} mBar).
2. Turn on the ion source and inlet valve heaters of the 253 Plus and wait for 15-30 mins.
3. Proceed with the amplifier housings re-connection to the high vacuum system (keep the source off during this process):
 - When the valve was positioned at "0":
 - Turn the valve knob carefully clockwise from "0" to HV and monitor the high vacuum in the Isodat software at the same time when possible.
 - Wait until the high vacuum is stable.
 - When the valve knob was at the vent position or when you know that the amplifier housing(s) has been vented:
 - Turn the valve knob to FV and wait for at least 1.5 hours to pump down and monitor the FV in the Isodat software.
 - After this, turn the valve knob clockwise (over "0") to HV and monitor the high vacuum in the Isodat software.
 - Wait until the high vacuum is stable.
4. Set the HV (high voltage) manually to 5 kV and set the emission to 0 mA.
5. Switch on the ion source and check HV is stable. Wait for the vacuum to stabilize.
6. Increase emission to 0.2 mA, wait for the vacuum to stabilize and check Trap and Box currents are as expected.
7. Bake out the complete instrument, also the valve blocks of the Kiel IV and Dual Inlet overnight and with all valves open to the main vacuum (turbo pump) but with the manual valve for the Ref Refill still closed:

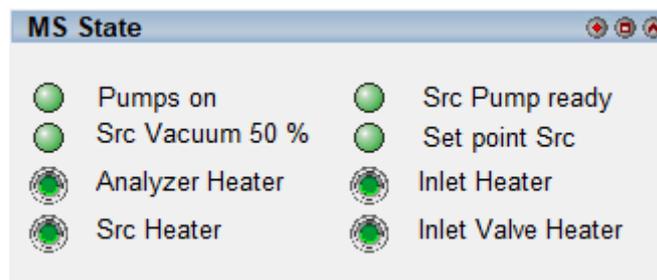


Figure: MS State window with heaters on

- The manual switch of the valve block heaters of the Kiel IV are located at the right bottom side of the electronic compartment of the Kiel IV.

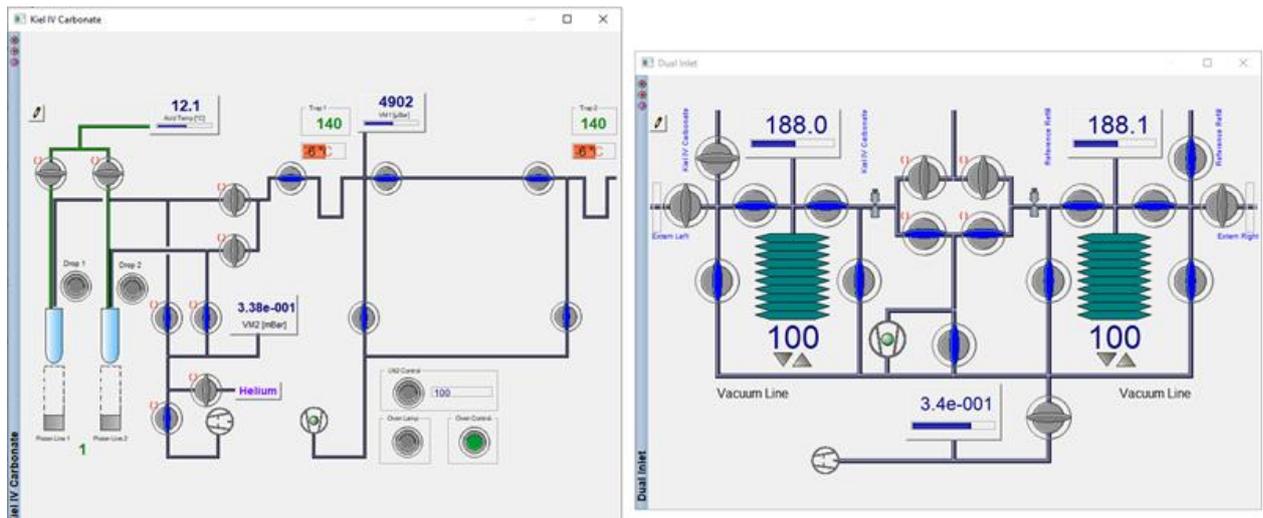


Figure: Dual Inlet with Kiel IV flow schematic with valves open

8. Once the bake out is completed and the instrument is cooled down, set the HV in steps of 1 kV to the working value (around 9.5 kV) and check if there is signal in all cups. Wait for 10-15 minutes between the HV steps before increasing to the next step.
9. Close all valves of the Dual Inlet and open the manual the reference refill valve when this is needed to fill the left bellows with CO₂ gas.
10. Run a magnet scan and check backgrounds, if acceptable you can increase the emission to the working mA (1.5 mA) and wait for the system to get fully recovered (vacuum and backgrounds).
11. In case CO₂ results of the measurements are unstable, especially d18O, it might be necessary to also bake out the heatable capillaries of the Dual Inlet and Kiel IV. When baking these for 1 hour make sure that the valve blocks on both sides of the capillaries are heated as well to prevent condensation. Make sure that the valves are in the open position and connected to the high vacuum when baking.