

# ***Startup and Shutdown Procedures Nova system***



*Instrument scientist: Dr. Nancy Vogelaar*

## **Startup Procedure**

1. Boot the computer
2. If needed, open the valves to the water feed and return on the wall behind the diffractometer near the electrical box. These are labeled “Nova.” When valves are open, the knobs are parallel to the hose.
3. Turn on the water bath unit in the x-ray cabinet. Make sure both power switches are on.
4. Turn on the x-ray generator by pressing the generator power button. (There will be an audible alarm until there is a vacuum in the optics assembly, but the pump will not be turned on until the next step).
5. Turn on the high voltage for x-ray generation by pressing the “HV on” button. You should hear the pump start at this point. You may have to hold the button in for a few seconds.
6. There are two ways to bring up the generator power: manual and computer-controlled. Computer-controlled is preferable.
  - a. Computer-controlled
    - i. Launch the CrysalisPro software.
    - ii. Choose the x-ray button at the top of the right-most panel. Click on the “x-ray on” button
    - iii. set the voltage and current to 20 kV and 0.5 mA and wait for the generator to power up.

- iv. set the voltage and current to 49.5 kV and 0.9 mA and wait for the generator to power up.
    - b. Manual: set the voltage and current as indicated, turning the voltage up first.
      - i. 20 kV, 0.5 mA wait 10 seconds
      - ii. 30 kV, 0.9 mA, wait 10 seconds
      - iii. 40.0 kV wait 10 seconds
      - iv. 49.5 kV, wait 10 seconds
7. Wait for the CCD camera to cool. You will know it is ready for data collection when the green light is on.

### **Shutdown Procedure**

1. Power down the x-ray source either manually or by computer control.
  - a. Computer controlled
    - i. Launch the CrysalisPro software if not running
    - ii. Choose the x-ray button at the top of the right-most panel.
    - iii. Set the voltage and current to 10 kV and 0.05 mA and wait for the generator to power down.
    - iv. Click on the x-ray off button
    - v. Manually turn the HV off
    - vi. Push the Power button to turn the power off.
  - b. Manual: set the voltage and current as indicated, turning the current down first.
    - i. 40.0 kV wait 10 seconds (Current will be about 0.9 mA)
    - ii. 30.0 kV wait 10 seconds
    - iii. 0.5 mA, 20 kV wait 10 seconds
    - iv. 0.05 mA, 10 kV wait 10 seconds
    - v. turn "HV off"
    - vi. Push the power button to turn the power off.
2. Leave the water bath unit on unless a complete shutdown is needed.
3. Warm up the cryojet by pressing the **set** button and raising the temperature to 298.
4. When warm, turn off cryojet controller.
5. Close down CrysalisPro program