

Startup and Shutdown Procedures PX-scanner system



Instrument scientist: Dr. Nancy Vogelaar

Startup Procedure

Due to the nature of the interlocks, *THIS PROCEDURE MAY ONLY BE PERFORMED BY:*

- *The Instrument scientist and principal user, Dr. Nancy Vogelaar*
- *Persons specifically designated by the instrument scientist*
- *Trained persons from Oxford Diffraction Inc.*

The following procedure assumes that the system is completely off.

1. Boot the computer
2. If needed, open the valve from the water feed behind the scanner and make sure the drain hose is secure in the drain.
3. Turn on the water bath unit in the x-ray cabinet (the special key is needed to open the front door panel). Make sure both power switches are on: the left one for the x-ray tube, the right one for the ccd camera.
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 vacuum 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. The yellow HV-on lamp will light, but no x-rays are generated since the voltage and current are 0 kV 0 mA.

6. Turn up the generator manually using the following procedure, turning the voltage up before turning up the current.
 - a. 20 kV, 0.5 mA wait 10 seconds
 - b. 30 kV, 0.9 mA, wait 10 seconds
 - c. 40.0 kV wait 10 seconds
 - d. 49.5 kV, wait 10 seconds
 - e. see how high the current will go up to 1.0 mA

7. Wait for the CCD camera to cool. You will know it is ready for data collection when ODBench records a Peltier cold side temperature of about -40 C.

Shutdown Procedure

1. Remove your crystallization tray from the unit, if desired.
2. Power down the x-ray source manually: Set the voltage and current as indicated, turning the current down first in a current/voltage pair.
 - 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.
3. Leave the water bath unit(s) on unless a complete shutdown is needed. If possible, allow the x-ray tube cooling unit to run for 20-30 minutes before turning off.
4. Close the controller software.

EMERGENCY Shutdown Procedure.

PUSH THE BIG RED BUTTON

Only to be used if:

- **Suspected X-Ray Exposure**

- **Sudden Instrument Malfunction Endangering People or Instrument**

- **Water Flooding the Instrument or Room**

- **Emergency in Immediate Area or Building Evacuation**