

# STANDARD OPERATING PROCEDURES

## Spectra Physics BeamLok 2080-12 Argon Laser (Revised 1/22/04)

### Important things to know:

- Always run the laser in **current mode**. This operates at a more consistent output, and avoids problems with current spikes when the wavelength is tuned or the aperture changed. If you need real power stability, it is actually better to run in constant current with beam pointing on, and then set up an external power meter and feedback to the analog input on the power supply
- Always try to run the laser with currents **30-32 Amps**. Lower or (higher) currents will damage the tube life. The lower currents will lead to sagging in the filament. If you need more power, you can go to 45.
- Always run the laser for a **minimum of 2 hours**. Running longer is better.
- For best results always allow the laser to **warm up for 30 minutes** prior to running any experiments
- Don't turn alignment knobs if there is no laser output
- Always let the cooling water be on 5-10 min after the laser is shut down. (check to see that the return water is no longer warm)

### Daily Start-Up Procedure

1. Turn on building cooling water supply and return. These are the large handles in the chase just inside the door to the left. The valves are open when the handles are perpendicular to the wall and parallel with the water pipes.
2. Place a beam block in front of the laser, or make sure that the beam path is confined, and open the shutter on the laser if closed.
3. Turn on chiller ( flow should be ~4-5 gpm, Pressure ~65psi, Temperature 20 degrees Celsius). Check the water level if there is enough circulation water .
4. Make sure key switch on remote control box is off.
5. Make sure the current knob (left knob) is turned all the way counter clockwise. When the power is on, and the water is on, there should be no lights lit up in the STATUS area of the controller.

6. Turn on the main power (switch on the wall in the chase). The power supply status (P.S. STATUS) indicator should come on (green LED on the power supply).
7. Make sure the controller is in current mode
8. Make sure no lights are lit in STATUS area of the controller.
9. Turn on the key switch on the remote control box. The emission indicator turns on, there is a relay click from the power supply (plasma ignition) several seconds later and the laser is ready to lase. After another several seconds, the current reading will jump to 17.2Amps. Depending on what wavelength, the laser may start lasing right away.
10. Turn off BeamLok if it's on.
11. Turn up the current slowly, at a rate of no more than 1A/second. Stop at 23 A if the laser is not lasing, and then find the line you want. Peak up and continue slowly increasing the current to ~30 Amps.
12. After 30 minutes warm up, retune the vertical and horizontal adjustments on the back mirror (high reflector) to yield maximum power for your specific current level. Check the water temperature and flow.
13. During routine operation, the system can be run with BeamLok enabled. This keeps the output beam aligned during operation.
14. **Be sure to record your hours of operation, wavelength, current, voltage, and power for every running of the laser. Also be sure to sign and date your log book entry.**

## Changing the Laser Line

1. Change the **calibration dial** (upper left on the back of laser head, NOT the one on the upper right) to the wavelength value you'll be using.
2. Turn the **vertical coarse** knob slowly until you see the desired line lasing. The indicator next to the coarse knob also turns and shows the wavelength approximately. Maximize the output by turning the vertical coarse knob.
3. After finding the line, fine tune with the **vertical fine** adjustment and **horizontal fine** adjustment knobs. See the power is maximized by fine tuning. If the power reading values are jumping, try changing the scale on the controller.

## Shutdown Procedure

1. Turn off BeamLok if enabled.
2. Slowly turn down the current to its minimum setting. It should read 17.2A
3. Turn off the key switch. Be sure to leave the key in the remote control unit.
4. Turn off the main switch on the wall.
5. Leave the chiller running for 5-10 minutes after laser shut down. Check to make sure the water is cool before shutting off chiller.
6. Turn off the chiller by the red STOP button on the front panel of the chiller.
7. Turn off cooling water supply and return valves on the wall.
8. **Be sure to enter the information in the laser log!!!**