

Operating Instructions for Buck Scientific Atomic Absorption Spectrophotometer; model 210 VGP

Page references to BUCK SCIENTIFIC 210 / 211VGP ATOMIC ABSORPTION SPECTROPHOTOMETER manual. For alignment information read pp. 16–19 of manual. If readings are lower than you expect, see Section 3.2 (p. 25) of manual or Section 10.2 Troubleshooting (pp. 46–49).

1. Press red power button on back of instrument. (different than page 6 of manual; power button not on side).
2. Slide lamp into lamp holder on left side. Note the number on the plug. (Figure 1)

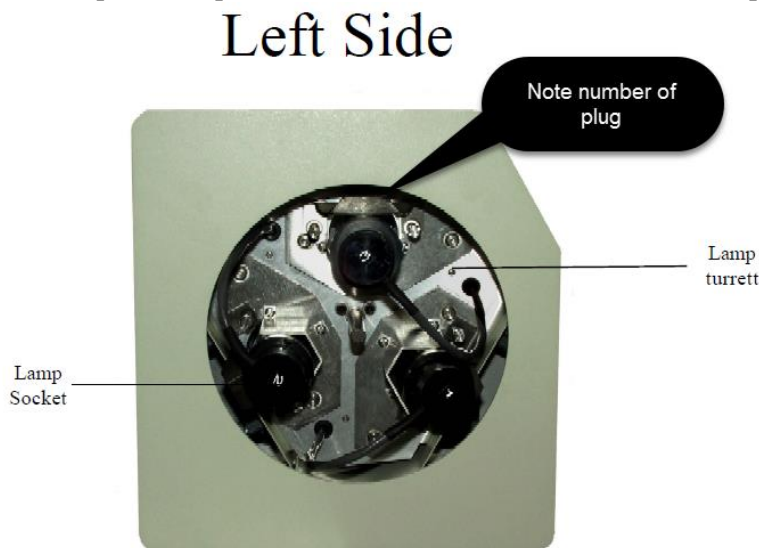


Figure 1. Lamp Holder. (Manual p. 6)

3. Using a white card or piece of paper, see that the radiation goes over the slit on the burner head where the flame will appear. The radiation should go over the full length of the slit and should be parallel to the top of the burner head.
 - a. If the radiation is not over any portion of the slit, use the controls below the burner head to move the burner head front to back until radiation is over the slit.
 - b. If the radiation is over only a portion of the slit, make sure that the slit is parallel to the radiation by moving the burner head until parallel and/or use the controls on the lamp holder to move the radiation parallel or perpendicular to the top of the burner head.
4. Load the analysis (see Figure 2). Make sure that the Active Analysis lamp number matches the number on the lamp plug. If the lamp number is incorrect, press the “SEL” button until the correct number is linked with the Active Analysis. If the element is incorrect, use the up and down arrows to select the correct element from the library under library (the elements in the library are in element symbol alphabetical order). When you have the correct element, press 2. When everything is set, press ESC to finish.



Figure 2. Front Panel.

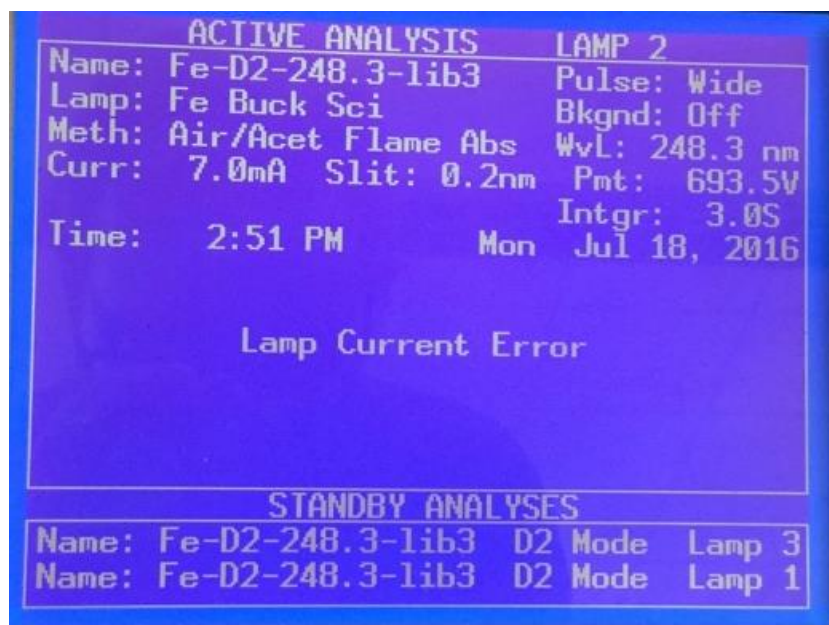


Figure 3. Active Analysis Screen.

5. On the right hand side of the instrument, input the approximate wavelength specified under name and the slit width mentioned under slit (note that slit width markings on the instrument are in Å) (see Figure 3).
6. Press “align”. Adjust the wavelength until the current is maximum. Press a/z.



Figure 4. Air Supply.

7. To turn on the flame:
 - a. Open the acetylene tank to ~12 psi.
 - b. Turn yellow handle on air supply attached to wall above instrument to be parallel with tube (Figure 4).
 - c. Turn air/N₂O value to air (Figure 5). You will observe the air reading on the flow meter. You have no control of the air flow on the instrument.
 - d. Turn up the fuel switch, adjust the fuel level by adjusting the “Fuel Adjustment Valve” (Figure 5). Generally, start the flame with slightly more fuel than air.

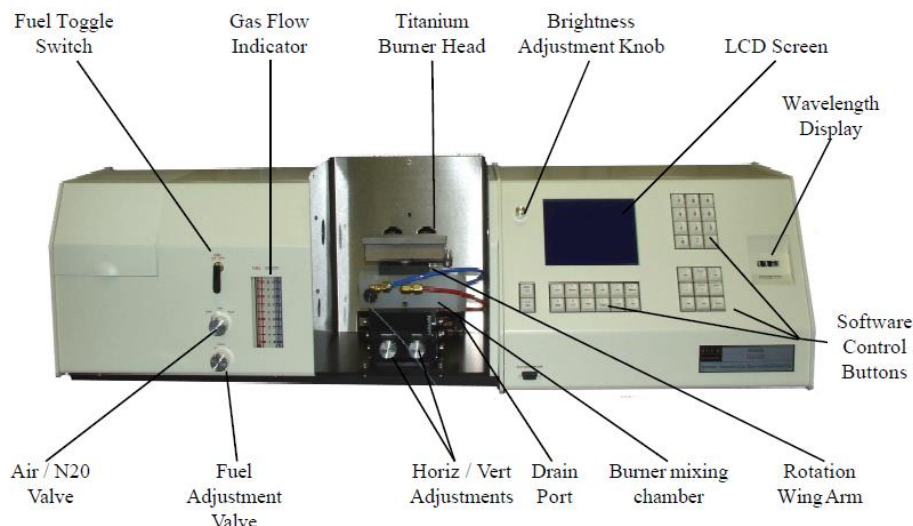


Figure 5. Front View of Instrument. (p. 5 of manual)

- e. **NOTE: **When turning ON, start air before acetylene, to turn OFF, turn off acetylene before air. Otherwise you may have a small explosion.****
- f. Use the flame starter just over the burner head to light flame.
8. When not taking readings, have capillary tube in distilled, deionized water. To take background, press the A/Z button with the capillary tube in water.
9. Wipe off the sample capillary tube with a KimWipe before transferring the tube to another container.
10. To take a reading: place clear tube in sample, press “read”.
 - a. Watch the sample uptake closely. If you see a sudden change in signal, check to see whether any sample is entering the flame. If not, carefully adjust the knurled nebulizer adjustment. If you do this during an analysis, check the sample uptake rate. The capillary tube can easily become clogged.
11. At the end of the day:
 - a. Close the gas tank, turn off air supply, and purge the fuel and oxidant lines by opening the fuel and oxidant valves on the burner control unit until the regulator gauge reads 0.
 - b. Run distilled water for several minutes before shutting down the flame.

Hints:

1. If you see an orange or purple flame instead of a blue or white acetylene/air flame, you probably have sodium (orange) or potassium (purple) in the system (burner head, spray chamber, or sample-uptake tube). To fix:
 - a. Take off the burner head and rinse with deionized water
 - b. Pour about 200–300-mL deionized water into spray chamber, or
 - c. Run more water into sample introduction system with flame on.
2. If the flame appears to have “holes” in it at the top of the burner head:
 - a. Turn off the flame and run the thin, metal piece that comes with the AA in the slot.