

Operating the Gyrotron

1. Before turning on the gyrotron make sure that the probe is cold.
2. If the sample is spinning and it is in auto mode, put it to manual.
3. Turn on the gyrotron using the ON button.
4. The filament current will increase from 0 to the set value (110 mA). It might be stuck for some time at the RF calibration stage, be patient, and it will go to the set value in few minutes. You can go and get some coffee in the meantime, and I promise it will be at the set value when you come back.
5. Wait till the temperature equilibrates. During this time the spinning frequency will change due to heating effect.
6. Adjust the spinning frequency using the drive pressure and put it back to **AUTO** mode again.
7. When you are done, put the spinning to MANUAL, and the gyrotron to **STANDBY** mode (not OFF).

Instruction for general users

Please use only the **ON** and **STANDBY** modes for the gyrotron as the gyrotron has been calibrated to work best for standard bi-nitroxide radicals. In case you have accidentally turned OFF the gyrotron, please wait for some time (5 mins) and then turn it ON again. It will take some time for the filament to warm up. Please be patient. Thank you.

The screenshot displays the Gyrotron control interface with the following sections:

- System Control Settings:** Includes a dropdown for Set Operation Mode (ON), buttons for OFF, STANDBY, and ON (the ON button is circled in red), and a User Level dropdown (Operator). There are also Error Reset and Recover buttons.
- Tube Control:** Displays Cathode Voltage [V] (Set: 15000, Readback: 15039), Filament Current [mA] (Set: 1817, Readback: 1826), and Collector Current [mA] (Set: 65.10, Readback: 65.1).
- Cavity:** Displays Temperature (Set: 27.50, Readback: 27.53) and Flow (Readback: 3.71). It also shows State Event indicators.
- Collector:** Displays Temperature (Set: 20.00, Readback: 19.97) and Flow (Readback: 11.74). It also shows State Event indicators.
- Tube Monitor:** A detailed status section with a High Voltage warning icon and a list of parameters including HV Supply Status, MicroWave Power, Cathode Current, Body Arc, Body Transient, Body Degr, Coil Arc, Coil Transient, Coil Degr, Waveguide conn., Window Arc, and Operating Hours. Each parameter has a corresponding State Event indicator and a numerical value.
- Hardware Monitor:** A section for hardware status with parameters like Vacton Pump Current, Vacton Pump Voltage, Gun Cooling Flow, Quench Detection 1, Quench Detection 2, Control Unit Status, High Voltage Shutdown, and Crowbar State, each with a State Event indicator and a numerical value.

Instruction for trained users

You can change the collector current but make sure that you do not go above 130 mA. Please keep an eye on the temperature of your sample when you do so. You can also do an error reset in case there is some error, but please inform and write it in the log book by the gyrotron.

The screenshot displays the gyrotron control interface with the following sections and data:

- System Control Settings:** Set Operation Mode is ON. OFF, STANDBY, and ON buttons are visible. User Level is Operator. Error Reset and Recover buttons are present.
- Tube Control:** Cathode Voltage [V] (Set) is 15000, (Readback) is 15039. Filament Current [mA] (Set) is 1817, (Readback) is 1826. Collector Current [mA] (Set) is 65.10, (Readback) is 65.1.
- Cavity:** Temperature Set [°C] is 27.50, Readback [°C] is 27.53. Flow State Event is ON, Readback [lpm] is 3.71.
- Collector:** Temperature Set [°C] is 20.00, Readback [°C] is 19.97. Flow State Event is ON, Readback [lpm] is 11.74.
- Tube Monitor:** High Voltage is ON. HV Supply Status is ON. MicroWave Power is 0.277 V. Cathode Current is 65.62 mA. Body Arc, Body Transient, Body Degr, Coil Arc, Coil Transient, Coil Degr, Waveguide conn., Window Arc, and Operating Hours (348.59 h) are all monitored with green status indicators.
- Hardware Monitor:** Vactron Pump Current is 0.00001 mA, Vactron Pump Voltage is 3329.05 V, Gun Cooling Flow is 250.97 lpm, Quench Detection 1 and 2 are 0.00 V, Control Unit Status is ON, High Voltage Shutdown is ON, and Crowbar State is ON.