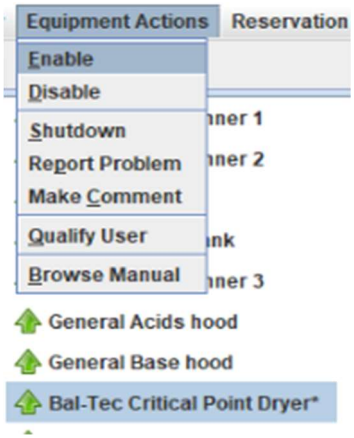
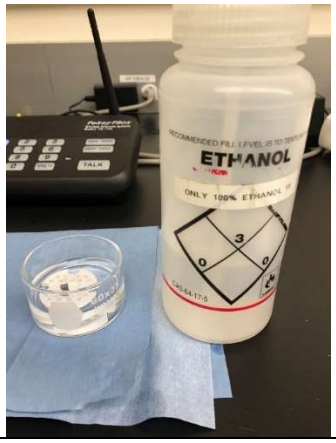
COLUMBIA | NANO INITIATIVE

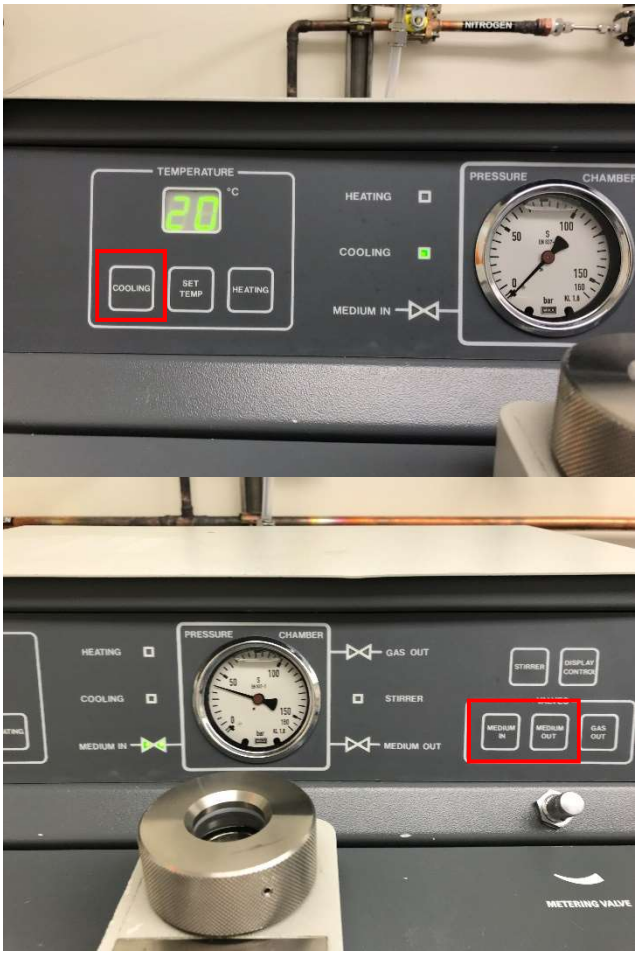
Bal-Tec Critical Point Dryer Standard Operating Procedure

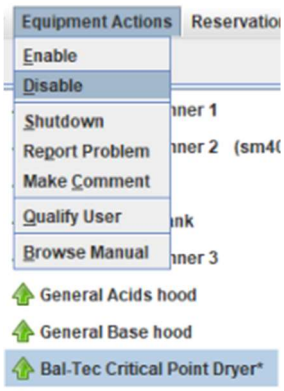
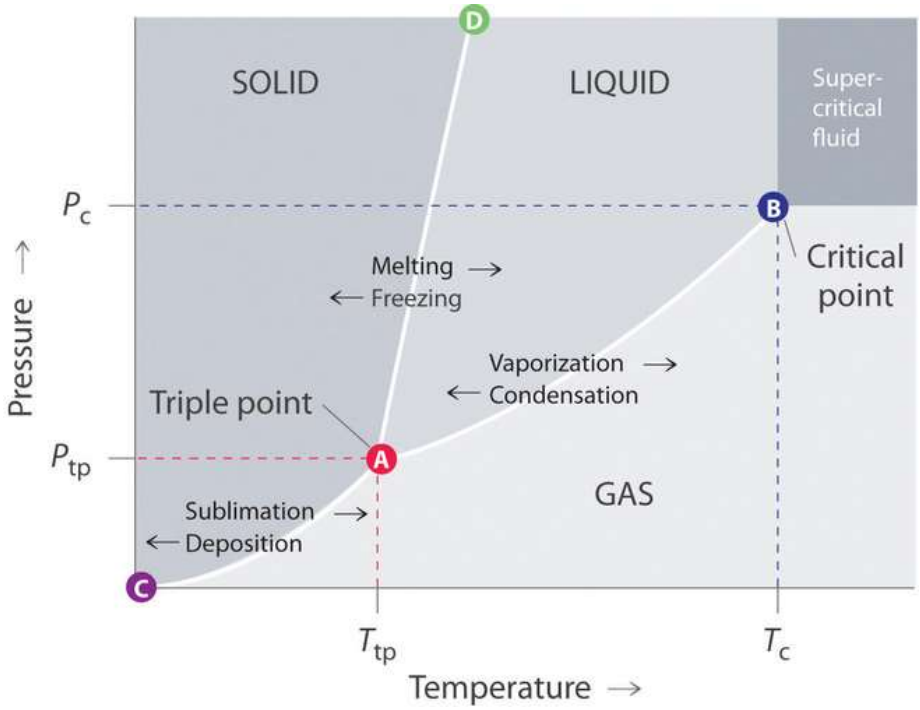
These instructions are intended for reference only, and will *not* replace the thorough training required for proper system operation. Contact a clean room staff member with questions or to report a system problem.

Based on instructions on manufacturing manual.
Edited by Melody Gonzalez and Gaurang Bhatt

1.	**BADGER:** Enable the tool on Badger.	
2.	**START:** **Note: Sample needs to be in 100% ethanol.** a. Make sure the chamber lid is screwed finger tight. b. Open the CO2 tank near the critical point dryer. c. Flip green switch to turn the critical point dryer on	

3.	**CLEAN THE CHAMBER:** a. Press “MEDIUM OUT” to outgas the remaining CO2 and once the pressure drops to 0, press the button again to close the valve. b. Press “MEDIUM IN” for 30 seconds (or until the pressure reaches 25 bar) and press the button again to stop. c. Press “MEDIUM OUT” until 0 and press the button again to close. d. **REPEAT THIS SEQUENCE 3 TIMES** -------- e. Press “MEDIUM IN” for 30 seconds and press the button again to stop. f. Press “GAS OUT”, and turn the metering valve all the way open until the pressure drops to 0 and press the button again to stop. Turn the metering valve to the left to close the metering valve. g. **REPEAT THIS SEQUENCE 3 TIMES**	
4.	**SAMPLE INSERTION:** Make sure “MEDIUM OUT”, ”MEDIUM IN”, and ”GAS OUT” buttons are turned off and the metering valve is closed all the way to the minimum. Remove the lid to open and fill the chamber with 200 proof ethyl alcohol	

	Place the sample on a Teflon boat inside the chamber (make sure it's secured so sample won't fall) Take a pipette, nitrogen blow, and use it to take out excessive ethyl alcohol, leaving at least 2mm of liquid above sample. Close the lid tightly.	
5.	**COOLING:** Press "COOLING" button and keep it on. When temperature reaches the set point (~6°C), look into the front window of the chamber and: a. Press "MEDIUM IN" to flow CO2 (keep this on) b. Press "MEDIUM OUT" and press again **quickly** to let medium out. **Be quick and make sure the sample is always under the surface of the medium.** c. Wait until medium level increases a little bit d. Press "MEDIUM OUT" and press again **quickly** to let medium out. **REPEAT STEPS A-D 15 TIMES** e. Press "COOLING" button to stop cooling	

6.	**HEATING:** Press “HEATING” button and wait until temperature reaches the set point (~40°C) and pressure is above 85 bar. **Keep heat on** and wait 5 minutes for machine to stabilize. **Make sure metering valve is closed.** Press “GAS OUT” and wait for 1 minute to let it stabilize. Turn the metering valve slowly to the right to let the exhaust process isothermal/adiabatic. Increase the metering valve little by little as the pressure drops in the chamber. Once at room pressure, turn off “HEATING”, “GAS OUT”, and unscrew the lid and take the sample out.	
7.	**POWER DOWN:** Leave tool as you found it by closing the chamber and turn off the power. The chamber will quickly fill with CO2 just to keep it pressurized. Close CO2 tank and valve	

8.	**LOG OUT:** Always to remember disable tool on Badger.