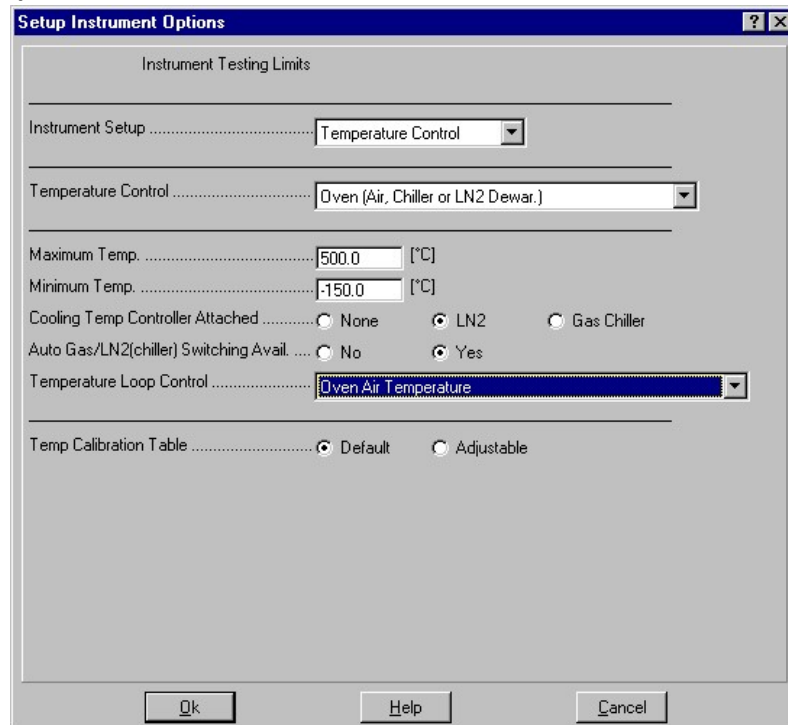


Operating LN2 Controllers with ARES V6/V8 and RDA-3 Instruments

- (1) First make sure that Instrument is “CONFIGURED” to work with LN2 in the hardware. This is done by going into the Instrument Configuration Screen (**UTILITIES > SERVICE > INSTRUMENT CONFIGURATION....** And Selecting Temperature Control Setup at the top Instrument Setup dropdown list).
- (2) The Oven should be selected as the Type of Temperature Control.
- (3) The maximum and minimum temperature limits should be properly set. For most instruments, the Max. Limit is 600C, however some instruments may have a value lower than 600C. The minimum Limit should be -150C with LN2 Controllers.
- (4) LN2 should be selected as type of Cooling Attached as shown in the screen below.
- (5) If you wish to turn ON the Automatic Switching between LN2 and Gas/Air, then Auto Gas/LN2 switching Available should be selected as YES.
- (6) Next step depends on the type of fixture you are going to use. **For Torsion Rectangular fixtures, the Temperature Loop Control Should be selected as Mode 3.**
- (7) Leave the Temp. Calibration Table to DEFAULT.



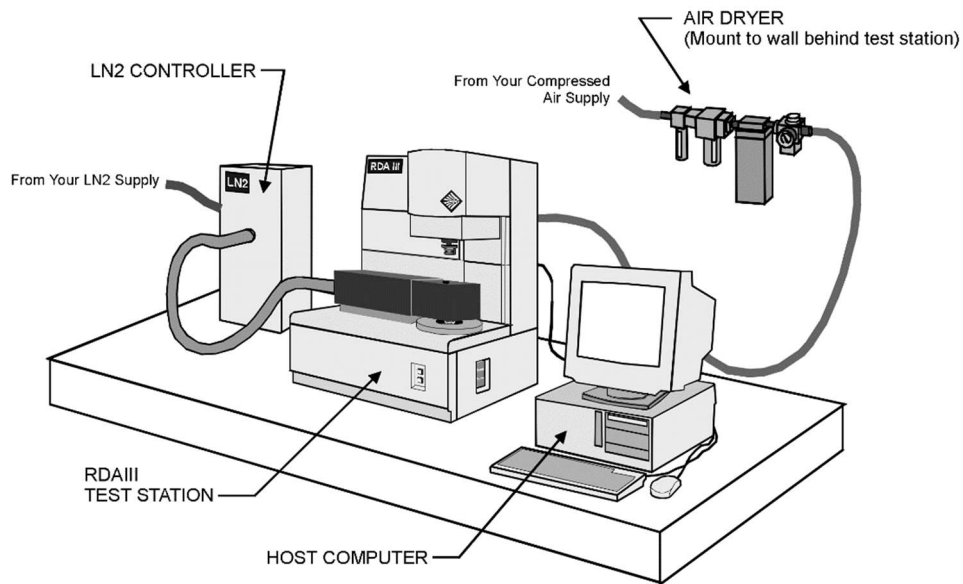
ARES V6/V8 and RDA-3 Temperature Control Setup Screen with Oven and LN2

- (8) Click OK when done. These settings will be saved into the non-volatile memory (EEPROM) of the CPU Board for that instrument.

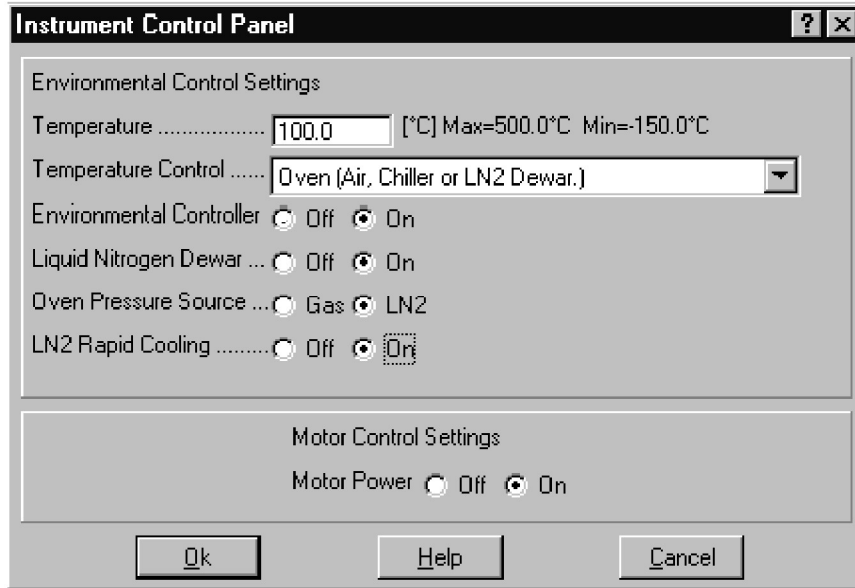
LN2 Preparations:

- (1) **ELECTRICAL CONNECTIONS:** Make sure that your LN2 Controller is properly connected to the rear of the Instrument. There is ONE CONTROL CABLE (707-008xx) coming out from the rear base of the LN2 Controller. That cable splits “Y” shape behind the instrument into two connectors as follows;
 - a. One connector is a 15-Pin DB Type connector which should be connected to the rear of the instrument to the connection marked “N2”.
 - b. The other connector is a small round black connector which plugs into the rear right side base of the instrument into the connection marked “N2 Heater” on the Power Box for the Oven (Near the Blue Main Power Cord).

- (2) **LIQUID NITROGEN CONNECTIONS:** Make sure that LN2 Controller is properly connected to the External “LOW PRESSURE” Liquid Nitrogen SUPPLY Tank. The word “LOW PRESSURE” means tank with 22 PSI Relief Valve. You can also check the pressure gauge on the tank to verify the pressure on the tank. Under no circumstances that external supply tank pressure should be higher than 30 PSI, otherwise a damage could occur to the internal components of the LN2 Controller. All warranties are VOID if the supply tank of incorrect pressure is attached to the LN2 Controller.



- (3) FILLING THE LN2 CONTROLLER is achieved through the software, AFTER Opening the Liquid withdrawal valve on the supply tank by selecting the software settings as follows;
- Click on the Control Panel (Thermometer) Icon. A screen similar to the one shown below will appear.



- Select the temperature below ambient (e.g. -60C).
 - Temperature Control should be left to OVEN.
 - Environmental Controller should be set to ON.
 - Liquid Nitrogen Dewar should be set to ON.
 - Oven Pressure source should be set to LN2.
 - LN2 Rapid Cooling is NOT necessary when going to -60C. The Rapid Cooling feature ONLY works when Set Temperature (Step b above) is less than -125C (i.e. -125.1C or lower). So leave that to OFF, unless the set temperature is -126C or below.
 - The operation of the Motor has nothing to do with the operation of the Oven/LN2. However, if the motor was OFF, you can turn it ON as well in this screen.
 - Click OK when done.
- (4) Do **NOT** Close the Oven Door yet, Leave it OPEN. Until you get **LN2 Ready**, the temperature control of the Oven is not going to work, if you selected Source as the LN2.

- (5) **OBSERVATIONS DURING FILLING OF LN2 CONTROLLER:** When the OK is selected on the previous screen, the following should occur in that order...
- a. The **LN2 Fill** indicator should come on in **Yellow** Color at the bottom of the software screen.
 - b. A clicking sound should occur from the LN2 Controller's FILL and DUMP solenoids opening. Opening of FILL Solenoid allows liquid to start filling. Opening of the DUMP solenoid allows venting of naturally boiled off Liquid to gas.
 - c. That action allows the liquid to start coming into the LN2 Controller's flask and then simultaneously the venting of gas starts occurring from the muffler on the rear of the LN2 Controller. You should also hear the gas venting sound which is usually a little bit louder initially but starts to diminish as filling continues. At some point that venting will be very little if LN2 is filling properly. *If venting of gas is NOT occurring, the LN2 Controller will never fill, even though you may have correct LN2 tank pressure and tank is full. This is an indication that something is wrong with the LN2 Controller itself or one or more of its electronics boards. Contact Patel Scientific for service on your LN2 Controller.*
- (6) If your LN2 Controller is new or recently refurbished by Patel Scientific, it should take about 5 to 7 minutes to get the **LN2 Ready** indicator in **Green** Color at the bottom of the software screen. Older LN2 Controller which leak or have been in use for more than 7 years may need to be rebuilt/refurbished in order to prevent leaks. *A very important thing to NOT select the RAPID COOLING in the software screen, because the LN2 Ready indicator uses same space as RAPID COOL on the bottom of the software screen. If you leave RAPID COOL selected in the Control Panel screen, then you will never see the LN2 Ready.*
- (7) After you get LN2 ready indicator, then wait for another 2 to 3 minutes and then Close the Oven Door.
- (8) If all is well, (no issues with Oven, PRTs, LN2 Controller), then you should get good temperature control.