

**STANDARD OPERATING PROCEDURE
FOR
Q-SUN XENON CHAMBER**

1. Basic Safety Precautions for operating the Xenon chamber

- a) Heat and electric shock hazards are present at some places inside the Xenon chamber (like the Humidifier unit, Xenon Lamp unit etc.) and such locations needs to be accessed carefully during any maintenance.
- b) The Xenon lamps produce UV light and hence the chamber door interlock is provided to prevent accidental exposure.
- c) During calibration, do not keep the CR20 sensor inside the Xenon chamber for more than 5 minutes.

2. Main Components of the Xenon Chamber

- a) Figure showing Voltage Stabilizer, water purification system and Xenon chamber
- b) Figure showing front Display panel of the Xenon chamber
- c) Figure showing front keypad of the Xenon chamber



3. Powering up the Chamber :

- a) Switch on the 3 phase AC mains on wall
- b) Switch on the Voltage Stabilizer
- c) After the “Output Normal” LEDs in the Voltage Stabilizer turn GREEN, the user can proceed to switch on the Xenon chamber (using black switch on chamber front panel).

4. Programming the Chamber to set up different test conditions

- a) Press “Program” key in the front keypad of Xenon chamber.
- b) The status window will show “P1 Set Test Duration”. By pressing the UP and DOWN arrow keys, the user can navigate to the various sections.

- c) Press the UP arrow key to reach the status: “P3 Create, Modify or Delete Cycle” and then press ENTER key.
 - If a cycle (recipe) already exists in the system, it will show up as “Modify Cycle X Name=ABC”. The cycle no. (X) can be changed by using UP / DOWN arrow keys. Press ENTER to modify the cycle. After doing the modifications, user can press ENTER to save changes or press ESCAPE to exit without saving.
 - To create a new recipe, keep pressing UP arrow key till
- d) Refer to Annexure I for a detailed flowchart for programming the chamber.

5. Calibration of the Irradiance Sensors

- a) The irradiance sensors must be calibrated after every 500 hours of operation. Also, it is recommended to calibrate the sensors whenever the test cycle conditions are changed.
- b) There are 2 types of irradiance sensors provided with this chamber – 365 nm and TUV. Based on which type of sensors is attached to the chamber, the user needs to choose the appropriate Calibration Radiometer.
- c) Calibration of the chamber should be done in a light cycle, under normal operating temperature and irradiance (with the test samples in place, if possible).
- d) The white diffuser in the UV detector needs to be cleaned using IPA and lint-free cloth.
- e) The calibration radiometer (CR20) can be hung from the front door, and its calibration port has to be connected to the Q-Sun control panel. The CR20 will indicate which wavelength is being measured (and chamber will automatically give error message if the radiometer type does not match the sensor type).
- f) Pull the specimen tray out of the chamber and place the CR20 UV detector in the calibration port present on the sample tray (place in left-most port first).
- g) Lay the specimen tray back in the chamber and after closing the chamber door, run the light cycle and wait till the actual irradiance of the respective lamp becomes equal to the set value (displayed in Q-Sun control panel).
- h) Hold down the CR20’s “CAL 1” button until the appropriate channel’s calibration light flashes in the CR20 unit. The CR20 reading will be transferred to the Q-Sun controller.
- i) Repeat steps (d) – (f) for the other ports (2 and 3).
- j) Recheck the calibration of each port and if the calibration does not match, push the CAL button again.
- k) Above calibration procedure needs to be completed within 5 minutes and if one fails to complete, it is recommended to take out the CR20 sensor and cool the chamber to room temperature before re-attempting the calibration.

6. Calibration of the Black Panel Temperature Sensor

- a) The black panel temperature sensor has to be calibrated every 6 months, using the CT202/BP calibration thermometer.
- b) The CT202 calibration unit has to be hanged from the lamp unit door.
- c) The CT202 sensor has to be placed next to the BPT sensor on the specimen tray (using the screw).

- d) Close the chamber door and operate the Q-Sun in a light step at the normal irradiance and temperature settings.
- e) Allow the Q-Sun to stabilize at the irradiance and temperature set points.
- f) Press the PROGRAM key on the Q-Sun control panel, then scroll to “P4 Calibrate Temperature Sensors” and press ENTER key.
- g) To select the sensor, scroll to “BLACK PANEL” and then press ENTER.
- h) Press ENTER to confirm that the Calibration Reference is in place.
- i) The Q-Sun will display “REFERENCE TEMPERATURE = XX.X”. Use the UP and DOWN arrow keys to make the reference temperature same as the temperature displayed on the CT202, and then press ENTER.
- j) Finally press ENTER to save the changes.
- k) Remove the CT202 sensor from the specimen tray.

7. Replacement of the RH & Air Temperature Sensor

- a) This sensor is designed to be replaced once a year and cannot be re-calibrated.
- b) To remove this sensor, the specimen tray has to be taken out and then the sensor (located at bottom right corner of the chamber) has to be removed (by pushing up and then pulling).
- c) To disconnect the cable from the sensor, push the connector release lever.
- d) Connect the new sensor to the cable and place it at the slot properly.

8. Data logging using STRIPCHART software

- a) The STRIPCHART software is used to log the operating parameters of the Xenon chamber.
- b) After starting the Xenon chamber, open the STRIPCHART software on the desktop connected to the chamber.
- c) Go to Tools → Configure Testers
- d) In the pop-up window, click on “Add Testers”.
- e) A new row will appear in the display. Enter the IP address of the tester (12.1.1.2) in the space provided and then press ENTER.
- f) Click on the “Enable/Disable Recording” button on top of the window.
- g) If the Xenon chamber is detected, a success message will pop up and the “Connection OK?” column and the “Recording” columns will show blue ticks. If not, check the configuration of the Xenon chamber (in the Q-Sun Control Panel: Menu → scroll to P6 SET INTERNET ADDRESS), and the connected computer (Network & Sharing center → Ethernet properties → IPv4 properties) as given below:

Q-Sun Control Panel Menu P6 Set Internet Address	Connected Computer
<ul style="list-style-type: none"> • P6.3 IP Address = 12.1.1.2 • P6.4 Subnet mask = 255.255.255.0 • P6.5 Default Gateway = 12.1.1.1 • P6.6 Destination Port = 9100 	<ul style="list-style-type: none"> • IP Address = 12.1.1.1 • Subnet Mask = 255.255.255.0 • Default Gateway = . . . • Preferred DNS Server = 12.1.1.1 • Alternate DNS server = . . .

