# MODEL 6540/6545
# PHOTOSTABILITY CHAMBER
# OPERATIONS MANUAL


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Dear Valued Customer:

Thank you for purchasing CARON Products & Services equipment. We appreciate your business and look forward to being your preferred supplier of controlled environment equipment products in the future.

At CARON, we are committed to continuous quality improvement. Our goal is to supply our customers with highly reliable equipment at a fair price. In order to openly monitor our performance, we would appreciate your feedback on our products and services.

If you have questions, or any suggestions for improvement based on the installation or operation of the equipment you have purchased, please contact our service department at service@caronproducts.com or 740-373-6809.

Thanks again for your business!

**WARRANTY INFORMATION**

# EQUIPMENT LIMITED WARRANTY

Please review this section before requesting warranty service. At CARON, one of our primary goals is to provide customers with high levels of personal service and top quality products, delivered on time, backed by technical service and supported for the life of the product.

**Before contacting us for warranty service, please be aware that there are repairs that are not covered under warranty.**

## WARRANTY DEFINED

Caron Products & Services, Inc. (herein after CARON) hereby warrants that equipment manufactured by CARON is free from defects in materials and workmanship when the equipment is used under normal operating conditions in accordance with the instructions provided by CARON.

## COVERED:

- Parts and labor for a period of one (1) year from date of shipment.
- Any part found defective will be either repaired or replaced at CARON's discretion, free of charge, by CARON in Marietta, OH. Parts that are replaced will become the property of CARON.
- If CARON factory service personnel determine that the customer's unit requires further service CARON may, at its sole discretion, provide a service technician to correct the problem, or require the return of the equipment to the factory or authorized service depot.
- CARON will have the right to inspect the equipment and determine the repairs or replacement parts necessary. The customer will be notified, within a reasonable time after inspection, of any costs incurred that are not covered by this warranty prior to initiation of any such repairs.

## NOT COVERED:

- Calibration of control parameters.
- Improper installation; including electrical service, gas and water supply tubing, gas supplies, room ventilation, unit leveling, facility structural inadequacies or ambient conditions that are out of specification.
- Cost of express shipment of equipment or parts.
- Any customer modifications of this equipment, or any repairs undertaken without the prior written consent of CARON, will render this limited warranty void.
- CARON is not responsible for consequential, incidental or special damages; whether shipping damage or damages that may occur during transfer to the customer’s point of use. When the equipment is signed for at the customer’s site, ownership is transferred to the customer. Any damage claims against the shipping company become the responsibility of the customer.
- Repairs necessary because of the equipment being used under other than normal operating conditions or for other than its intended use.
- Repair due to the customer's failure to follow normal maintenance instructions.
- Parts considered consumable; including: light bulbs, filters, gases, etc.
- Damage from use of improper water quality.
- Damage from chemicals or cleaning agents detrimental to equipment materials.
- Force Majeure or Acts of God.

This writing is a final and complete integration of the agreement between CARON and the customer. CARON makes no other warranties, express or implied, of merchantability, fitness for a particular purpose or otherwise, with respect to the goods sold under this agreement. This warranty cannot be altered unless CARON agrees to an alteration in writing and expressly stated herein shall be recognized to vary or modify this contract.

Ohio Law governs this warranty.

## EQUIPMENT INTERNATIONAL LIMITED WARRANTY

Please review this section before requesting warranty service. At CARON, one of our primary goals is to provide customers with high levels of personal service and top quality products, delivered on time, backed by technical service and supported for the life of the product.

**Before contacting your distributor for warranty service, please be aware that there are repairs that are not covered under warranty.**

## WARRANTY DEFINED

Caron Products & Services, Inc. (herein after CARON) hereby warrants that equipment manufactured by CARON is free from defects in materials and workmanship when the equipment is used under normal operating conditions in accordance with the instructions provided by CARON.

## COVERED:

- Parts for a period of two (2) years from date of shipment.
- Any part found defective will be either repaired or replaced at CARON's or their authorized representative's discretion. Parts that are replaced will become the property of CARON.
- If CARON or their authorized representatives determine that the customer's unit requires further service, CARON or the representative may, at its sole discretion, provide a service technician to correct the problem, or require the return of the equipment to the an authorized service depot.
- CARON or their authorized representative will have the right to inspect the equipment and determine the repairs or replacement parts necessary. The customer will be notified, within a reasonable time after inspection, of any costs incurred that are not covered by this warranty prior to initiation of any such repairs.

## NOT COVERED:

- Calibration of control parameters.
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- Repairs necessary because of the equipment being used under other than normal operating conditions or for other than its intended use.
- Repair due to the customer's failure to follow normal maintenance instructions.
- Parts considered consumable; including: light bulbs, filters, gases, etc.
- Damage from use of improper water quality.
- Damage from chemicals or cleaning agents detrimental to equipment materials.
- Force Majeure or Acts of God.

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CARON agrees to an alteration in writing and expressly stated herein shall be recognized to vary or modify this contract.

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**Caron Products & Services, Inc.**
PO Box 715 · Marietta, OH 45750
740-373-6809

# TABLE OF CONTENTS

# INTRODUCTION

CARON's 6540 series photostability chambers are designed specifically to meet ICH, FDA EMEA, and Health Canada requirements for photostability testing according to ICH Q1B option II. UVA (black) and VIS (cool white) lamps provide sequential light exposure.

The chamber conditions are conveniently displayed at eye-level and controlled through the touch-screen display. Calibrated photon detectors measure light intensity. Lights can be manually turned on/off or automatically based on exposure level (W-hr/$m^2$ or Lux-hr) or time. To enhance reliability, temperature and humidity (optional) conditions are monitored and controlled throughout the test.

## Specifications

| | |
|---|---|
| Lamp Type, UVA | Fluorescent, near UV (black lamp) |
| Lamp Type, VIS | Fluorescent, cool white |
| Temperature Range | 10 to 35°C |
| Temperature Control | ± 0.2°C |
| Humidity Range (model 6545) | 40 to 70% RH |
| Humidity Control (model 6545) | ± 3% |
| Interior Dimensions | 683 W x 610 D x 711 H mm (296 L; includes lamp space) |

## Features

Controls

- Icon based, easy to use, eye-level, touch-screen interface
- Automatically turns off lights at end of programmed exposure
- Alerts operator when lamps need changed
- Temperature and humidity deviation alarms
- Security lockout to prevent accidental tampering

| | |
|---|---|
| Light Detectors | VIS and UVA, calibrated |
| Shelves | Two, sliding, 22 lbs (10kg) maximum load each |
| Construction, Interior | Stainless steel |
| Reflective Interior Surfaces | Specular aluminum |
| Chamber Footprint | 955 W x 767 D mm |
| Chamber Height | 1168 mm with leveling feet |
| Power | 115V 60Hz, 208/230V 60Hz, or 230V 50Hz |
| Access Port | Two (44 W x 51 H mm each) |
| Door | Light tight, magnetic gasket seal |

Room ambient conditions must be 20ºC to 25ºC, non-condensing. Exceeding 25ºC can result in operational failure. The temperature and humidity ranges can be extended (optional). Humidity limited by 6ºC dew point.

Models 6540-1 and 6545-1 were formerly models 6540A and 6545A respectively.
Models 6540-3 and 6545-3 were formerly models 6540E and 6545E respectively.

## INTERNATIONAL SYMBOLS AND DEFINITIONS

Warning of hazardous area

Warning of dangerous electric voltage

Earth (ground) protective conductor

## WARNINGS

Local government may require proper lamp disposal

Use eye protection, gloves and aprons if exposure to hazardous materials could occur

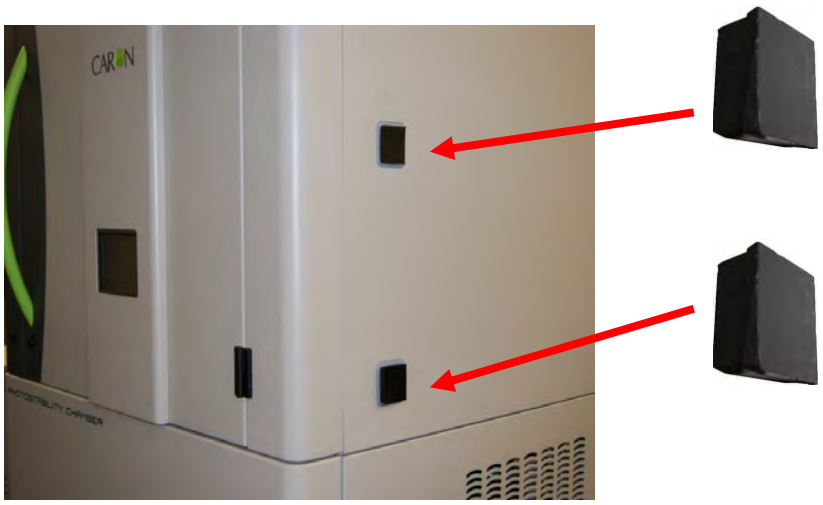
# INSTALLATION

**Unpacking**
This product has been completely tested, cleaned and packed for shipment. Carefully remove all packing material. Please examine the chamber completely. Should any damage be found, notify the delivering carrier immediately. Report any shortages to your local distributor or contact CARON customer service at 740-373-6809, 800-648-3042 (USA only) or service@caronproducts.com.

**Chamber Location**
The photostability chamber is an instrument and should be treated accordingly. The chamber must be located in a dry, clean, and level area. Allow a 2 inch (51 mm) clearance from the back of chamber for proper air circulation. Locate the chamber in an area out of direct sunlight and away from heating and cooling ducts. Ambient temperature should be 18°C - 25°C and avoid locations where there are excessive ambient air temperature fluctuations. The chamber can exhaust 4000 BTU/hr (1170 W) into the surroundings. The chamber operates quietly around 60 dBA at 6 ft (2 m) away.

Caution: Do not put more than 10 lbs (4.5 kg) on top of unit.

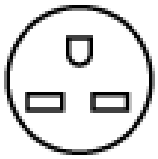
The figure below shows a right view of the chamber with access port locations. Install rubber stoppers into both access ports. Press in firmly.



**Power Requirements**
The Power Cord of this chamber is equipped with a grounded plug to minimize the possibility of electrical shock from the chamber. CARON recommends that the chamber have a dedicated wall outlet. Verify correct power supply required for particular unit.

Models 6540-1 and 6545-1
Plug is NEMA configuration 5-15P for 115V, 15A (Hubbell 5266C).

Models 6540-2 and 6545-2
Plug is NEMA configuration 6-15P for 208/230V, 15A (Hubbell 5666C).



Models 6540-3 and 6545-3
Modular cord set has continental European CEE 7/7 10/16A plug. Connector type is IEC 60320 C14 (or C20 with options).

Style C14

Style C20

**Water Drain**

Plumb the water drain connection to a facility drain. The drain should handle 1 liter per day.

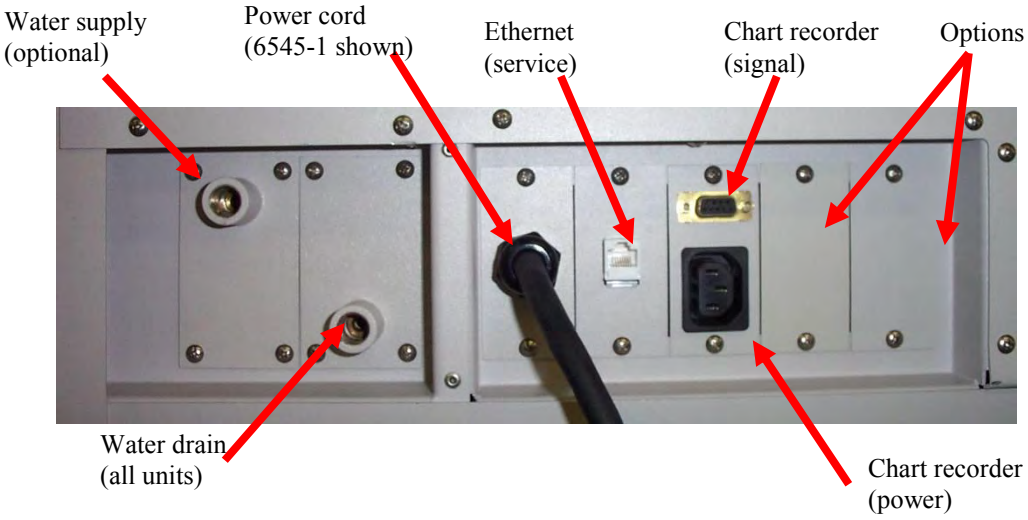
| | |
|---|---|
| 6540-1, 6540-2, 6545-1, 6545-2 | Connect to 1/4FPT fittings on back of unit with 1/4MPT fitting. |
| 6540-3, 6545-3 | Connect to 1/4BSPP male (British Standard Pipe Parallel, also known as ISO parallel) on back of unit with a 1/4BSPP female fitting. |

Note: Under certain ambient (room) temperature and humidity conditions, the cooling system will condense moisture from the air. A drain is required, even if the chamber does not have humidity control.

**Water Supply (optional)**

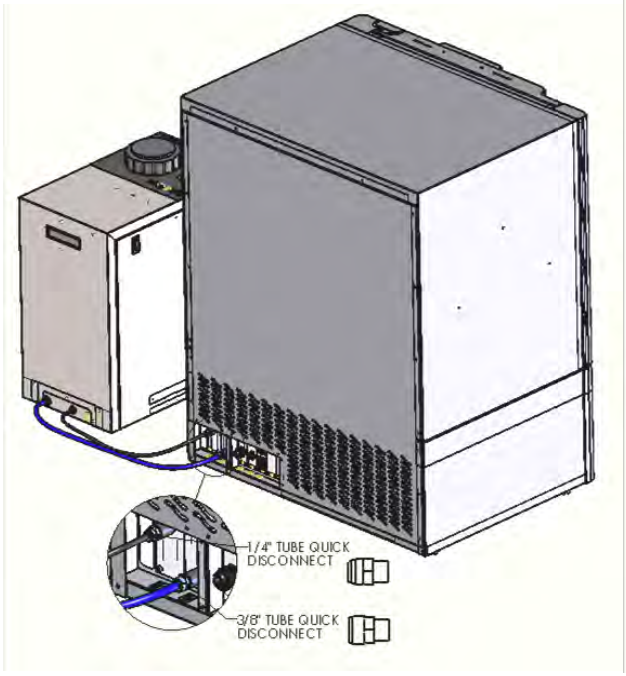
The chamber requires *distilled* or *deionized* water with resistivity between 0.05 & 1 Mega Ohmn-cm and pH above 6.5. Using water outside this range will void the warranty. Typical water usage is 0.4 gallons/day (1.5 liters/day) with a maximum of 3.2 gallons/day (12 liters/day).

| | |
|---|---|
| 6545-1, 6545-2 | Connect to 1/4FPT fittings on back of unit with 1/4MPT fitting. |
| 6545-3 | Connect to 1/4BSPP male (British Standard Pipe Parallel, also known as ISO parallel) on back of unit with a 1/4BSPP female fitting. |

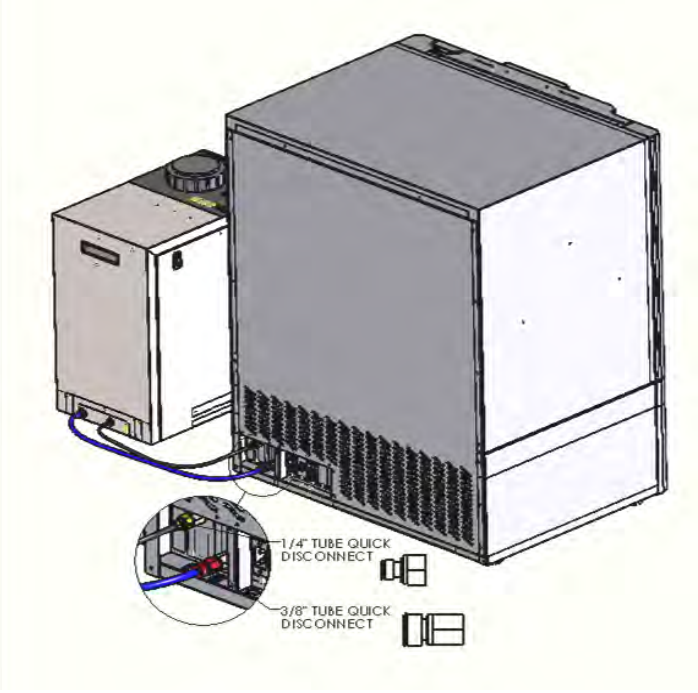


**Condensate Recirculating System: CRSY102 (optional)**

The Condensate Recirculating System can be used in conjunction with CARON's 6540 series chambers as a water delivery system. This system is typically used in facilities where a drain or in-house source of distilled or deionized water is not available. The system provides continuous, clean, filtered water to the chamber's humidity injection system, collects and recycles the condensate that forms in the base of the chamber. Refer to instructions with the CRSY102 for connection details.




6545-1-2 CRSY102 CONNECTION FITTINGS




6545-3 CRSY102 CONNECTION FITTINGS

**Ethernet (service only)**

For service or diagnostic purposes, the chamber can be monitored and controlled via the 10x base Ethernet link provided. If service support is needed contact CARON for details.

**Chart Recorder (optional)**

The circular chart recorder (REC203 and REC204) monitors and records UVA light intensity, VIS light intensity, temperature and humidity (optional). The mounting brackets can be used to mount the recorder on a wall. Connect the chart recorder signal and power cables into the back of the chamber. Electrical ratings for the power outlet receptacle are:

| | |
|---|---|
| 115V, 60Hz | (models 6540-1, 6545-1) |
| 208/230V, 60Hz | (models 6540-2, 6545-2) |
| 230V, 50Hz | (models 6540-3, 6545-3) |

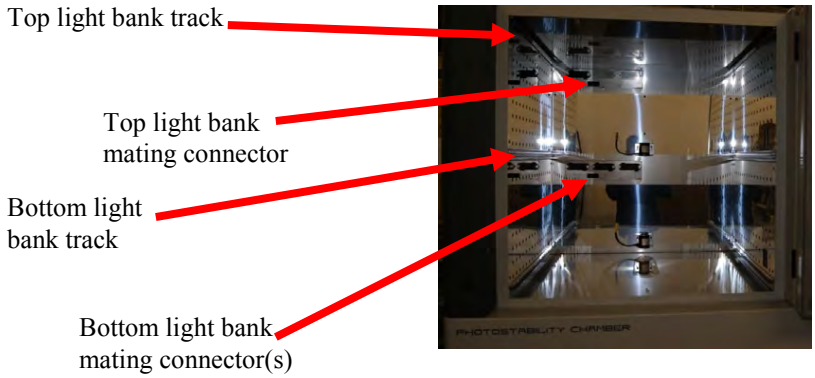
Chart recorder signal plug

Chart recorder power plug

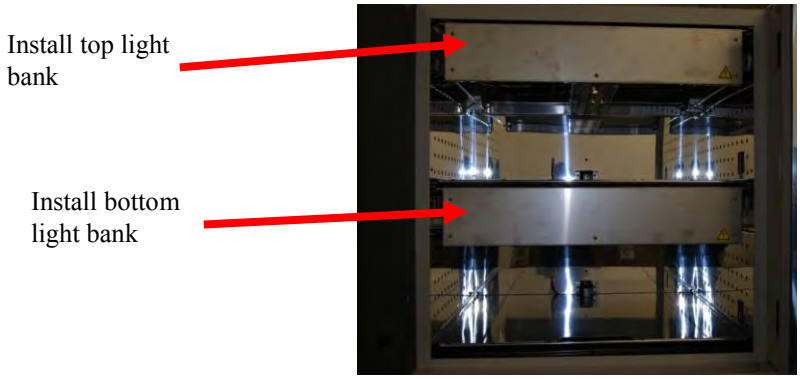
Install recorder on left side of cabinet

**Install Lamps and Lamp Banks (Chamber must be off while installing light banks!!)**

1. Locate the top lamp bank with 6 lamp holders (the bottom bank will have 10 or 14 lamp holders).
2. Turn the top lamp bank upside down and insert 'black' lamps into light bank by installing bi-pin lamps into lamp holders and rotate a ¼ turn.
3. Locate the top lamp bank track.

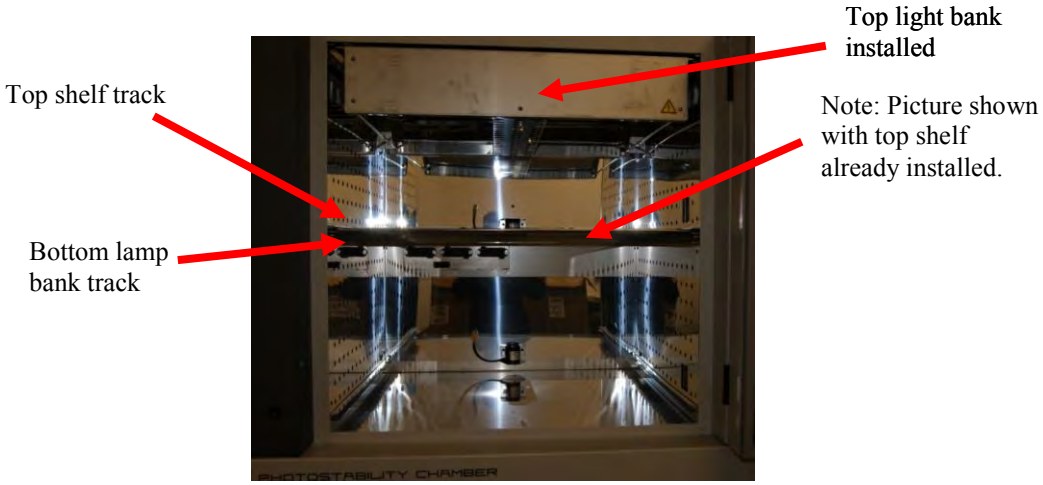



4. With the black connector going in first, slide the top light bank into the chamber.



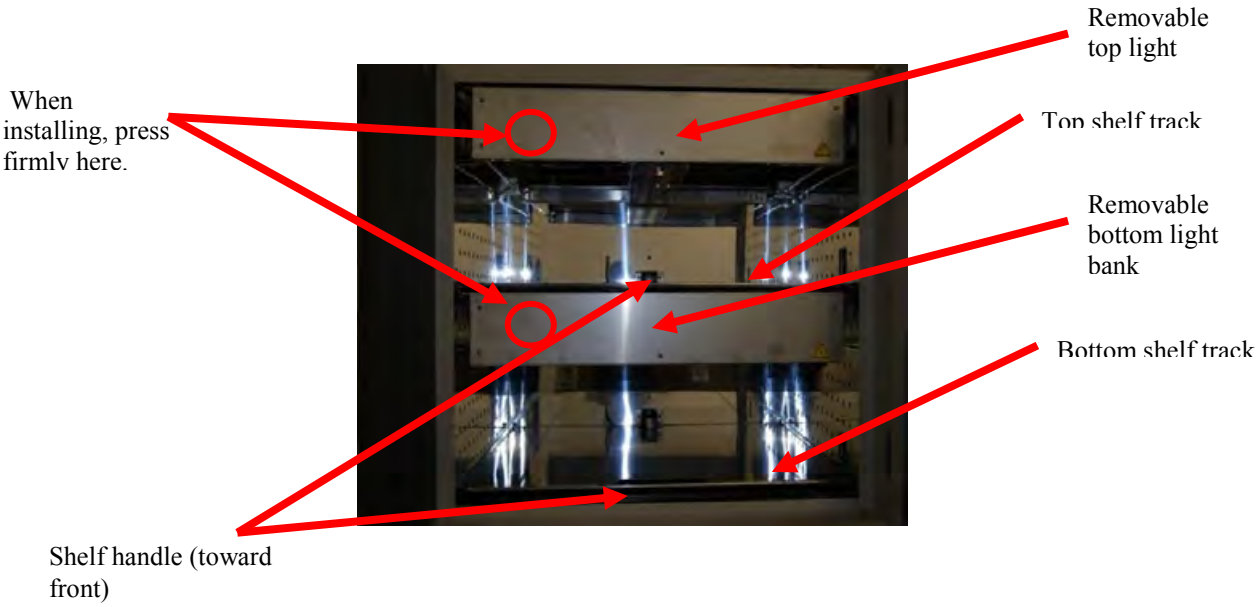

5. Press light bank firmly into place to seat rear connector.
6. Locate the bottom lamp bank with 10 (models 6540-1 or 6545-1) or 14 (models 6540-2, 6540-3, 6545-2 or 6545-3) lamp holders.
7. Insert 'white' lamps into light bank
   - 6540-1/6545-1: Press one end of lamp into 'plunger' lamp holder. Press the other lamp end into 'fixed' lamp holder. Repeat for other 9 lamps.
   - 6540-2, -3/6545-2, -3: Install bi-pin lamp into lamp holders and rotate a ¼ turn. Repeat for other 13 lamps.

8. Locate the bottom lamp bank track.



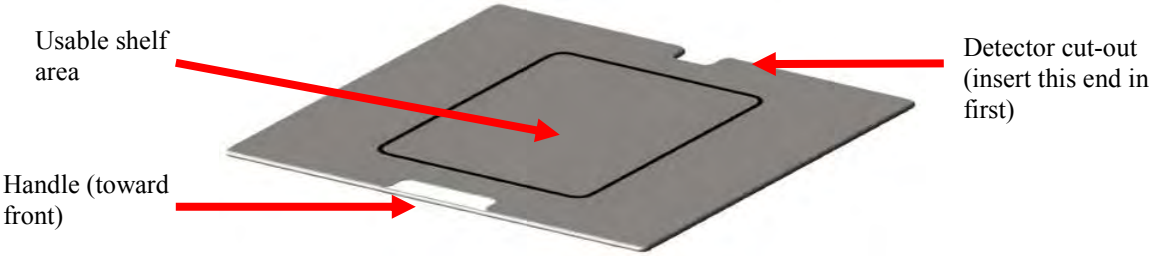

9. Install the bottom light bank and press firmly into place to seat rear connector.

Note: If one lamp is not installed properly or burned out, it will affect the performance of other lamps.




**Install Shelves**

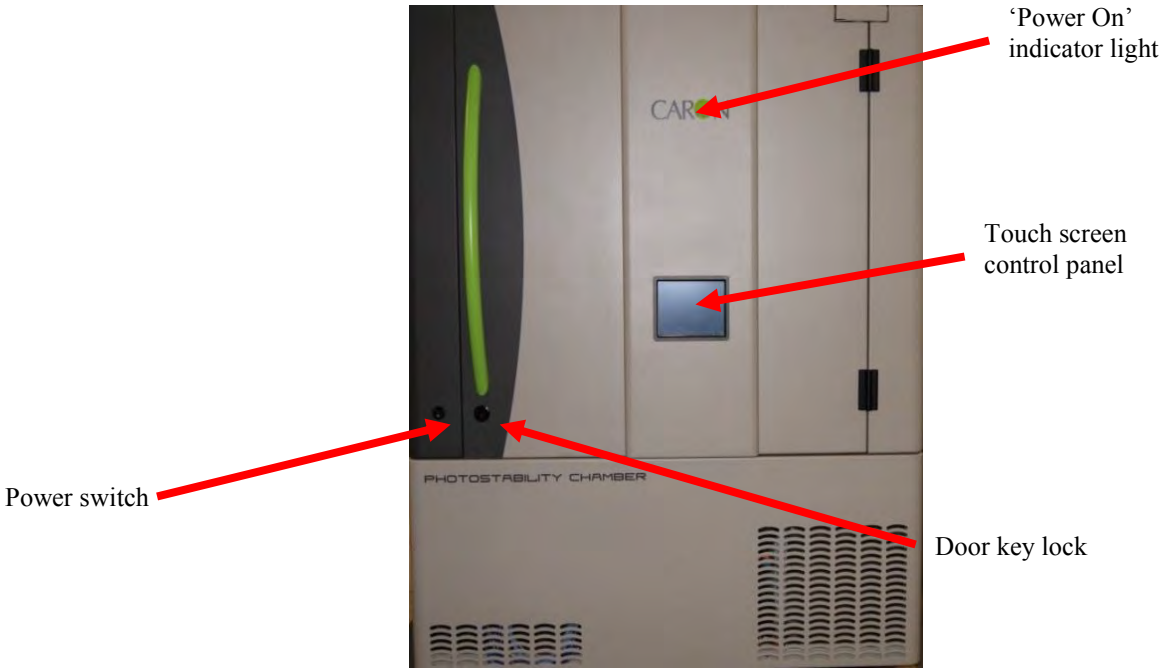
Insert both shelves into the shelf tracks (see picture above). Orient the shelf handle toward the front. Maximum shelf load is 22lbs (10kg) per shelf.



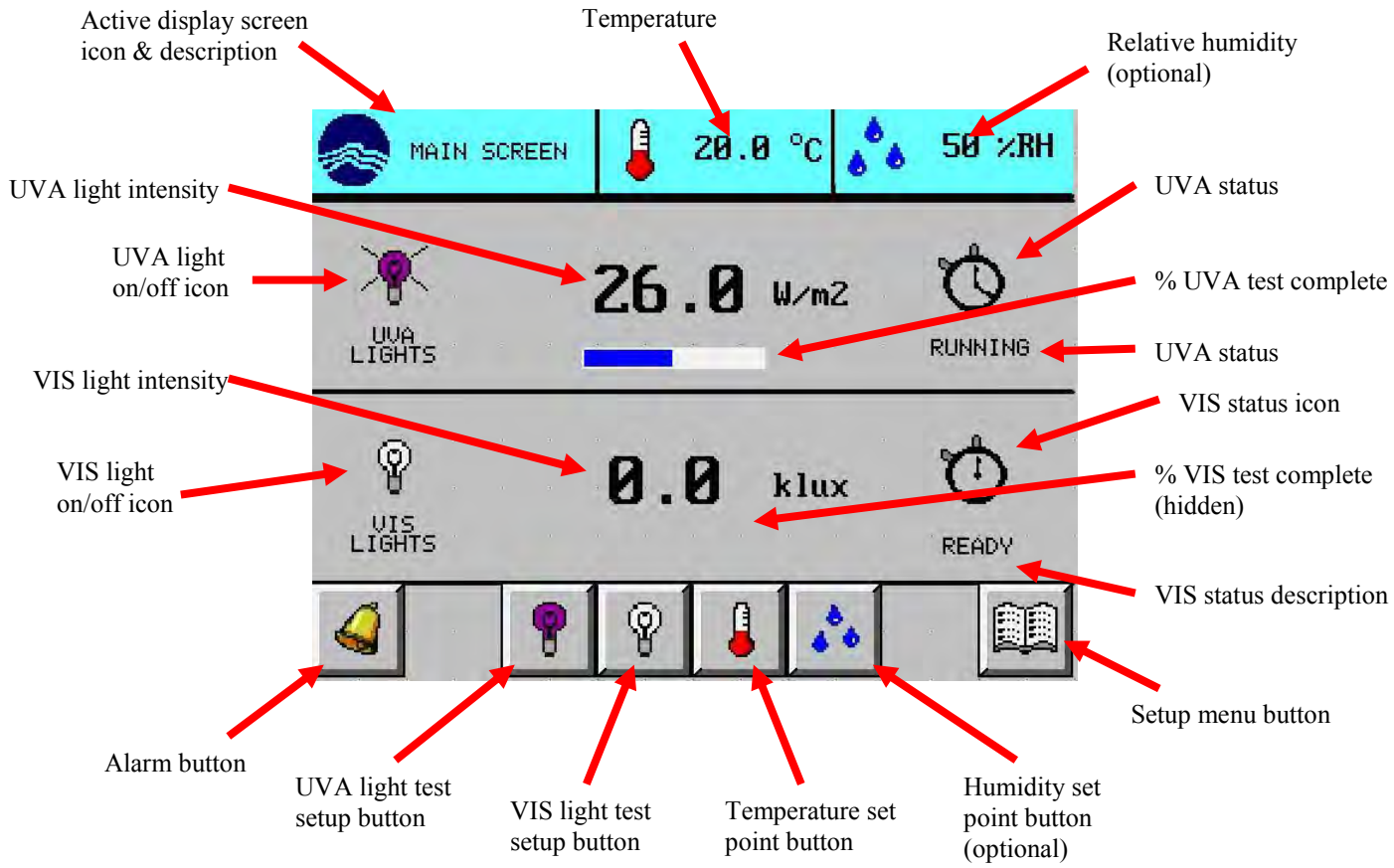
# OPERATION

**Start Up**

Turn on unit by pressing the power switch. The 'power on' indicator light and display screen will illuminate.



**Main Screen Display**
After initializing, the main screen (shown below) will display.




**Units**
The units displayed are as follows:

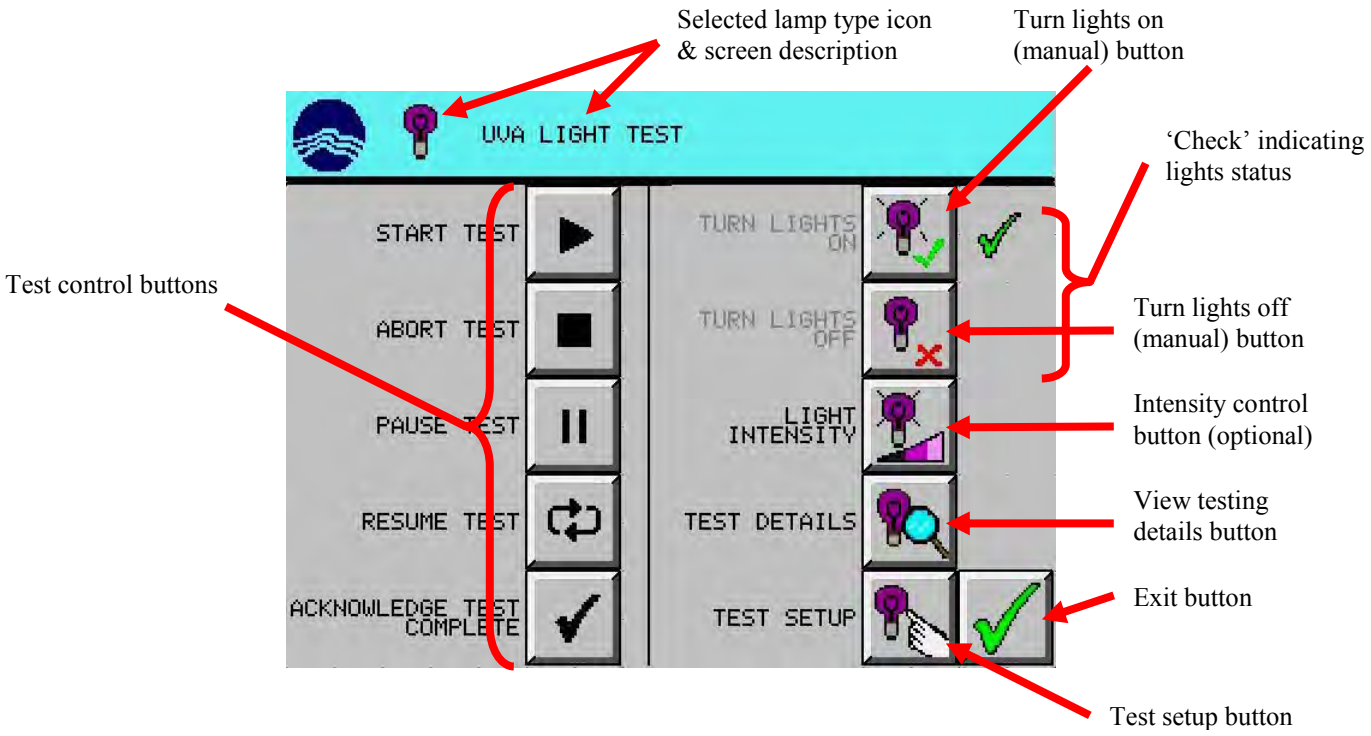
| | | |
|---|---|---|
| UVA light intensity | $W/m^2$ | |
| VIS light intensity | klux | |
| Temperature | ºC | |
| Relative humidity | %RH | (6545-1, 6545-2, 6545-3 only) |

For light exposure tests, corresponding units are:

| | |
|---|---|
| UVA light exposure (or dose) | $W\text{-}hr/m^2$ |
| VIS light exposure (or dose) | klux-hr |

The touch screen will go into screen saver mode (blank) after being un-touched for 30 minutes. To re-activate the touch screen (while the unit is still on), simply press anywhere on the screen and the screen will illuminate. The power indicating light (illuminated blue 'O' in CARON) indicates when the unit is on.

## Light Control




## Control Lights Manually

1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press  (TURN LIGHTS ON) button. Lights should come on.

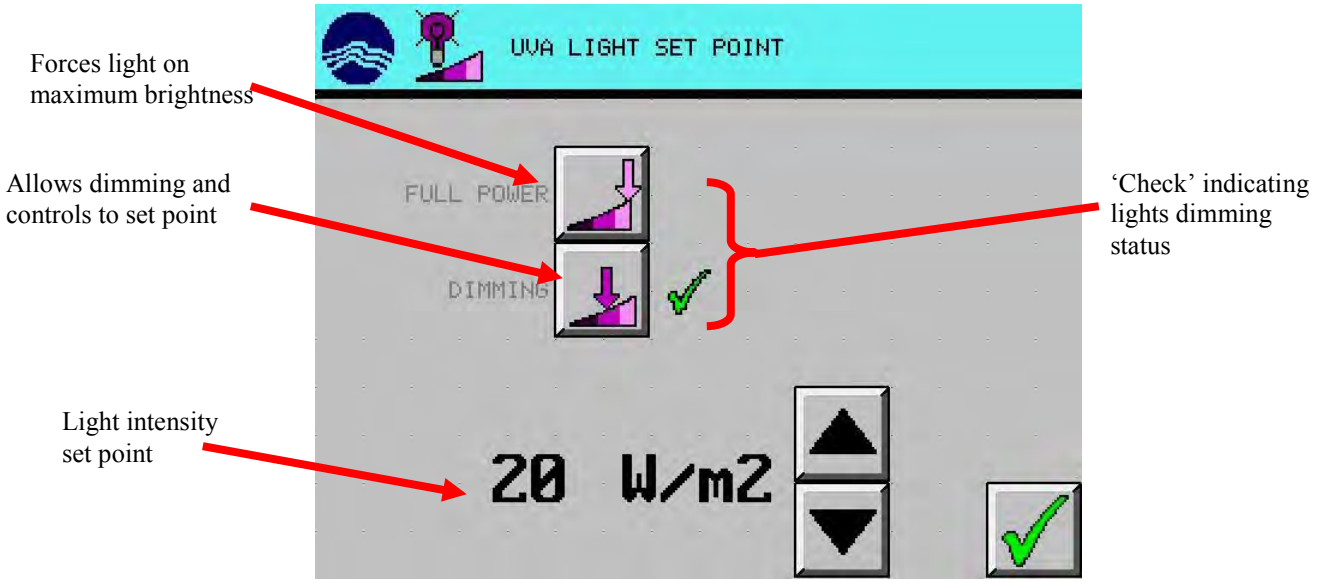
   Note: If the  (TURN LIGHTS ON) icon is *not* a button and the corresponding description is grey, then a test is running. The lights can't be controlled manually during a test.
3. Press  (EXIT) button.

To manually turn lights off, repeat the same procedure except in step #2, press  (TURN LIGHTS OFF).

**Light Dimming Control (6540-2, 6540-3, 6545-2, 6545-3)**

1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press  (LIGHT INTENSITY) button.
3. Press  (DIMMING) button. The light intensity set point will display a value.
4. Using  (UP) and  (DOWN) arrow buttons, set the desired light intensity.
5. Press  (EXIT) button

To turn lights on full power, repeat the same procedure except in step #3, press  (FULL POWER).



**Test Setup: Exposure Test**

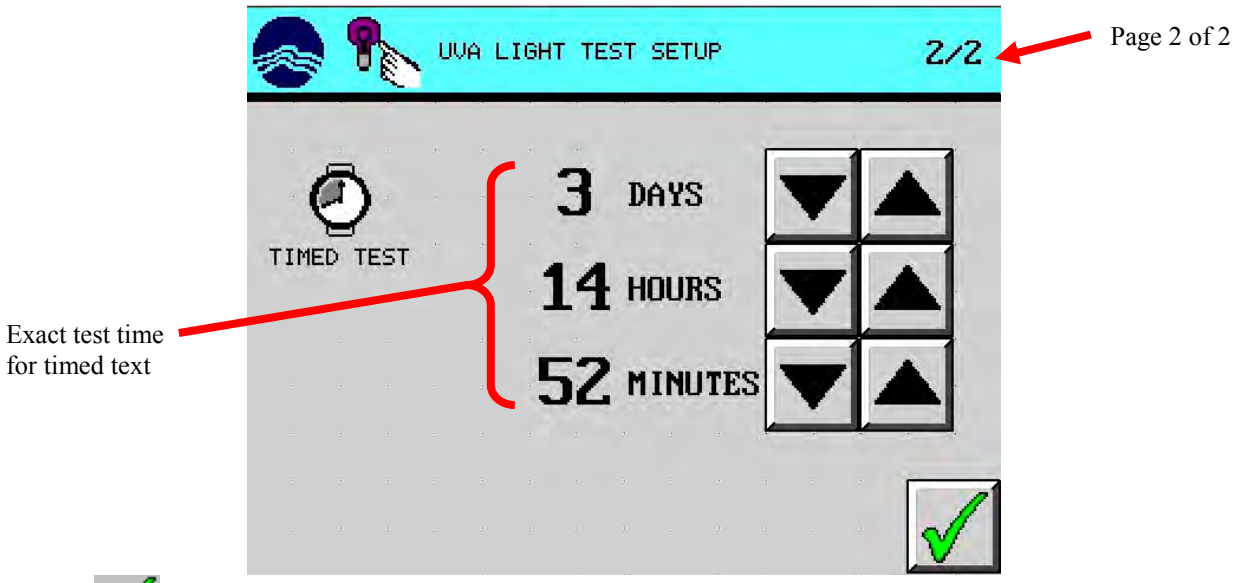
1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press  (TEST SETUP) button.
3. Choose  (EXPOSURE TEST).


4. Press  (NEXT) button.
5. Using  (UP),  (DOUBLE UP),  (DOWN), and  (DOUBLE DOWN) arrow buttons, set the desired test conditions.


6. Press  (EXIT) button

**Test Setup: Timed Test**

1. From the main screen, press desired light test setup (UVA) or (VIS) button. (UVA used in example)
2. Press (TEST SETUP) button.
3. Choose (TIMED TEST).
4. Press (NEXT) button.
5. Using (UP) and (DOWN) arrow buttons, set the desired test conditions.




6. Press (EXIT) button.

**Running a Test**

1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press desired testing change:

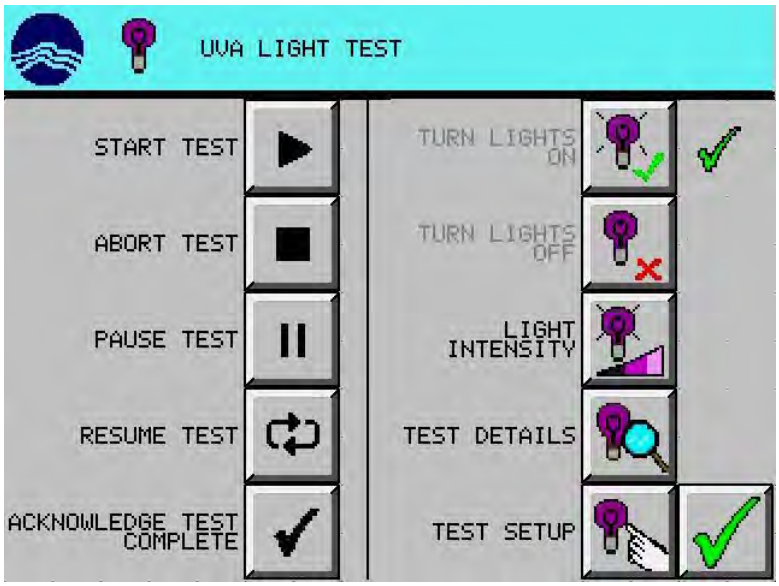
 (START) turns on corresponding lights and starts test

 (ABORT) turns off corresponding lights, cancels test, and clears test details (after warning)

 (PAUSE) turns off corresponding lights and maintains test progress

 (RESUME) turns on corresponding lights and continues test

 (ACKNOWLEDGE TEST COMPLETE) clears test details and returns to the READY mode




3. Press  (EXIT) button to return to the main screen.

**To Abort a Test**

1. Press  (UVA LIGHT TEST SETUP) button from the main screen.
2. Press the  (ABORT) button. The following warning screen appears:

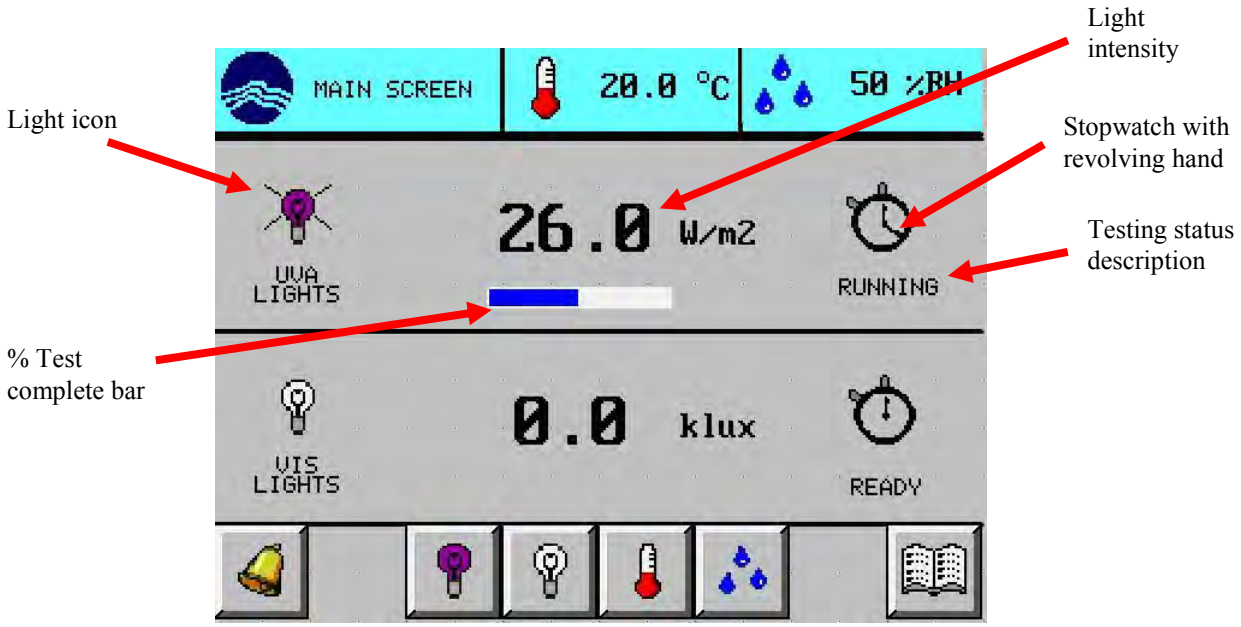

3. Press  (OK) button to abort test. Press  (CANCEL) to continue testing.
4. Press  (EXIT) button to return to the main screen.

**Test Status**

While a test is running, the main screen will indicate basic testing information. In this example, the UVA lights are running a test. The VIS lights are not.

Test running

- The status icon is a stopwatch with a revolving hand
- The testing status description displays “RUNNING”
- The % test complete bar shows the percent of testing that has been completed
- The light icon shows lights are on (rays coming from lamp)
- The light intensity is greater than zero

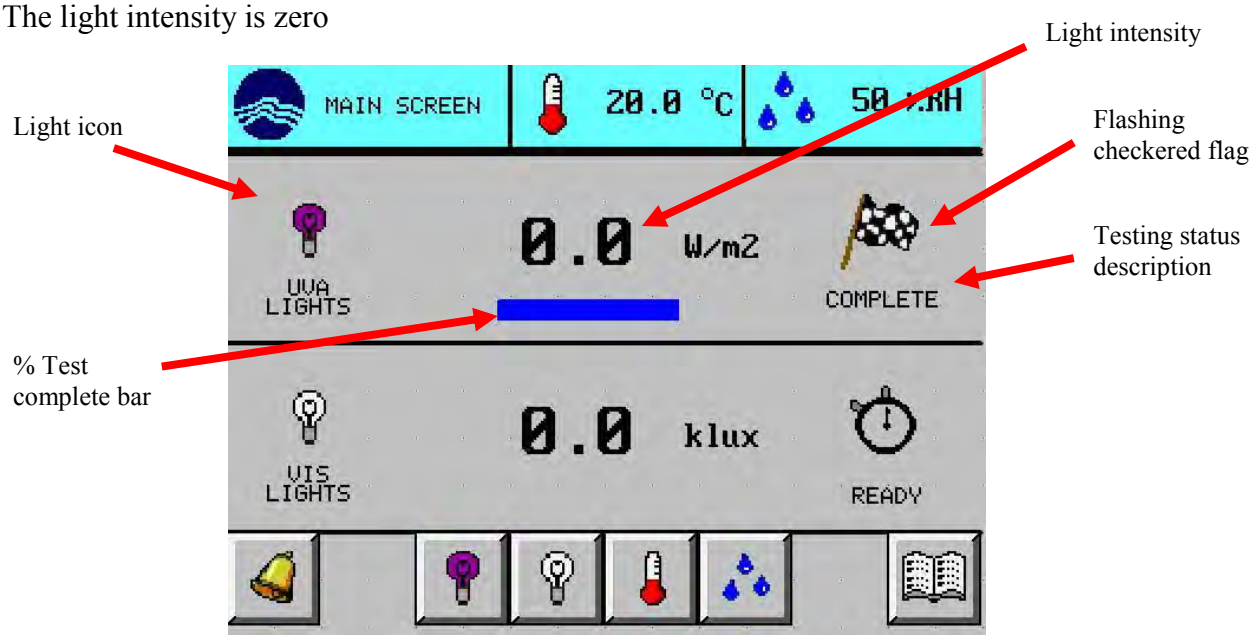



Test paused

- The status icon stopwatch flashes; the revolving hand stops
- The testing status description displays “PAUSED”
- The % test complete bar shows the percent of testing that has been completed
- The light icon shows lights are off (no lamp rays)
- The light intensity is zero

Test complete

- The status icon is a flashing checkered flag
- The testing status description displays “COMPLETE”
- The % test complete bar shows 100% completion
- The light icon shows lights are off (no lamp rays)
- The light intensity is zero

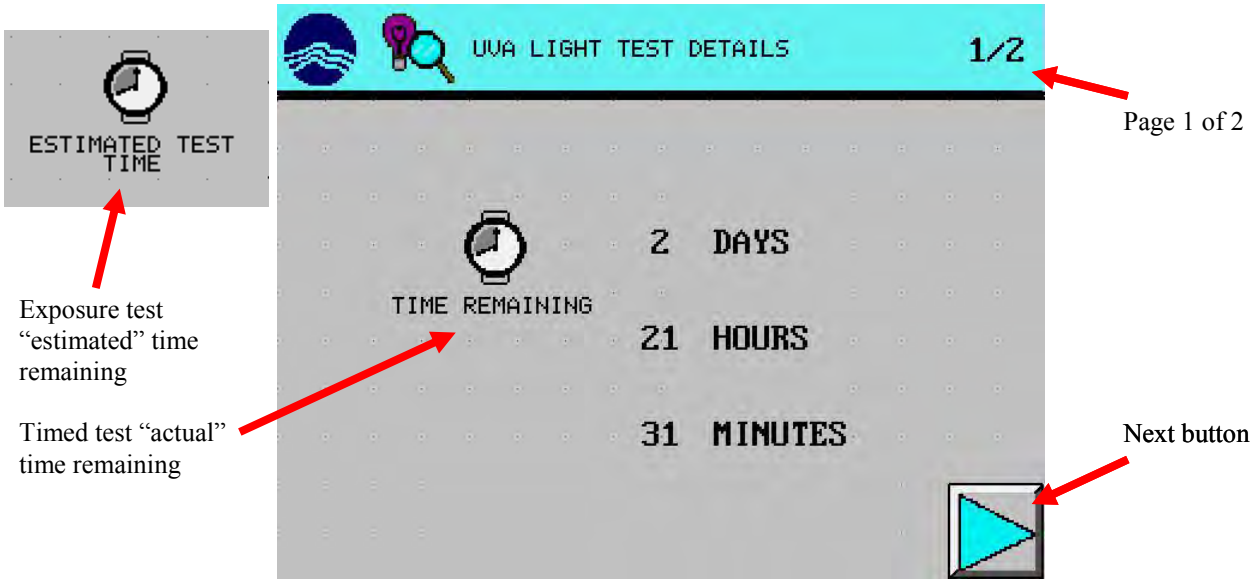



Note: As soon as a test is completed, the buzzer will sound for 3 seconds.

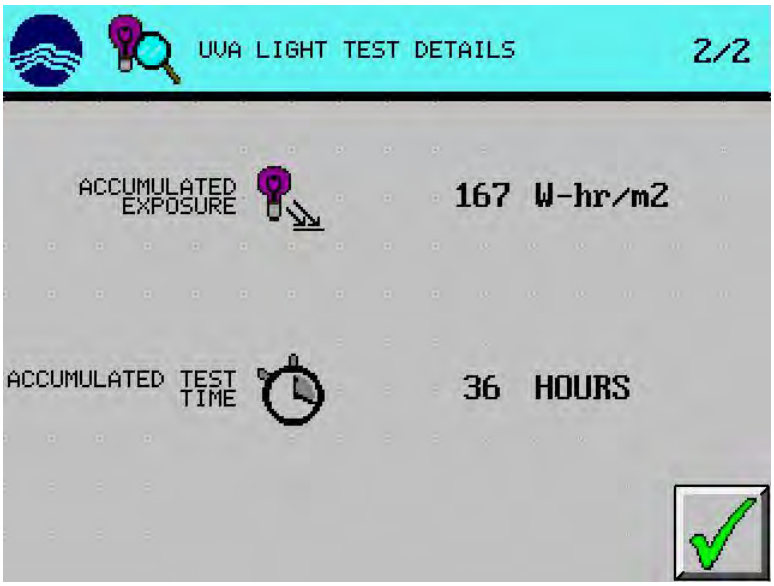
**Test Details**

The following steps are how to view the testing progress and details during a test or before a completed test is acknowledged.

1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press  (TEST DETAILS) button. The time remaining will be displayed.
   - If an exposure test is running, the time remaining is *estimated* based on current light intensity levels
   - If a timed test is running, the time remaining is *actual*




3. Press the  (NEXT) button. The accumulated exposure and accumulated test time will be displayed.

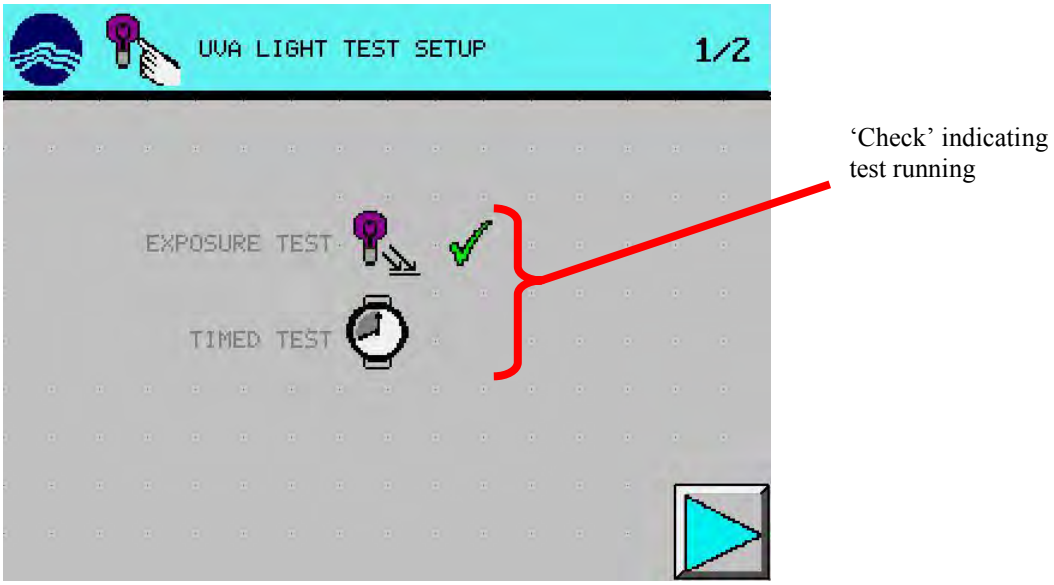



4. Press  (EXIT) button twice to return to the main screen.

**Reviewing Test Setup**

The following steps are how to view the test setup during a test or before a completed test is acknowledged. Once a test is running, the test setup can be viewed but not changed.

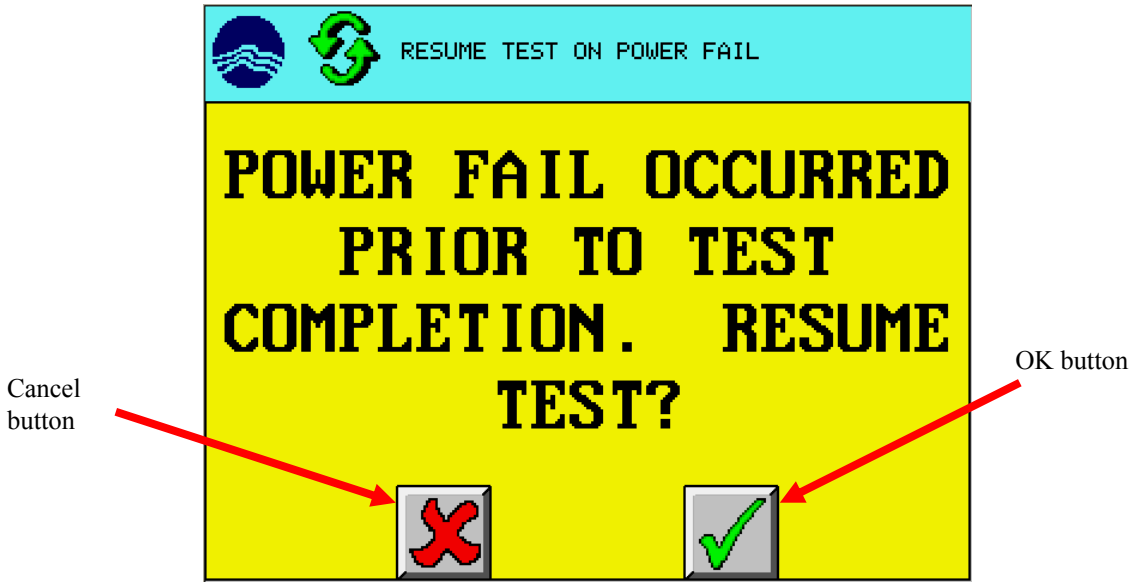
1. From the main screen, press desired light test setup  (UVA) or  (VIS) button. (UVA used in example)
2. Press  (TEST SETUP) button. The exposure test and timed test text is gray and corresponding buttons are suppressed. In this example, an exposure test is running.




3. Press the  (NEXT) button. The exposure level for the total test will be displayed. If a timed test is running, the total test time will be displayed.

**Power Failure**

The chamber continually maintains the progress of a test in non-volatile memory. In the event of a power failure or turning the unit off during a test, this information is preserved. Upon restoring power, the operator is alerted that the power failure occurring before the test was completed and can resume the test (see below). A test is considered complete when it has been acknowledged.

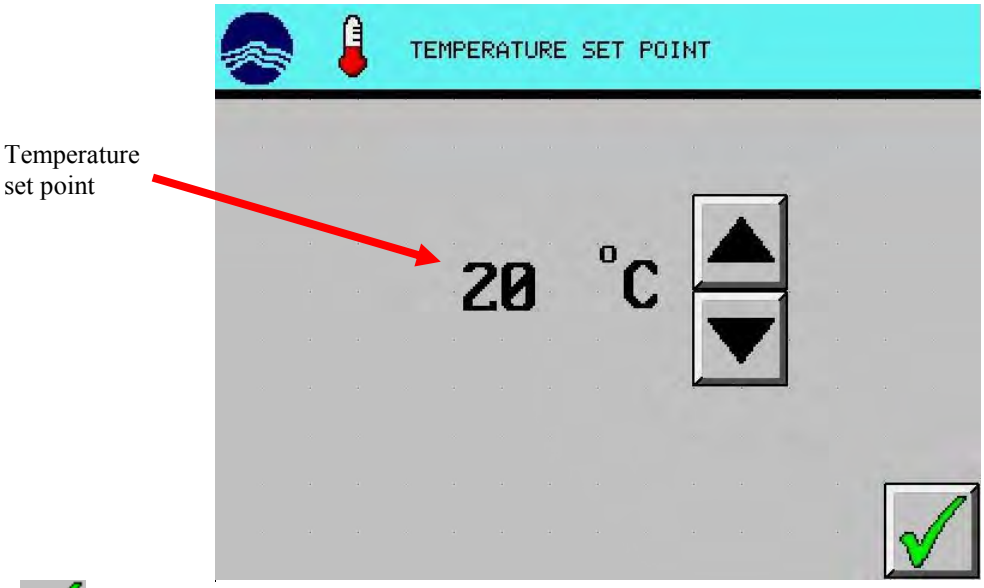



Pressing the OK button immediately resumes the test. If the operator wants to resume the test but at a later time, the test can manually be paused (see Running a Test).

Pressing the Cancel button aborts the test and returns to the main screen.

**Set Temperature Set Point**

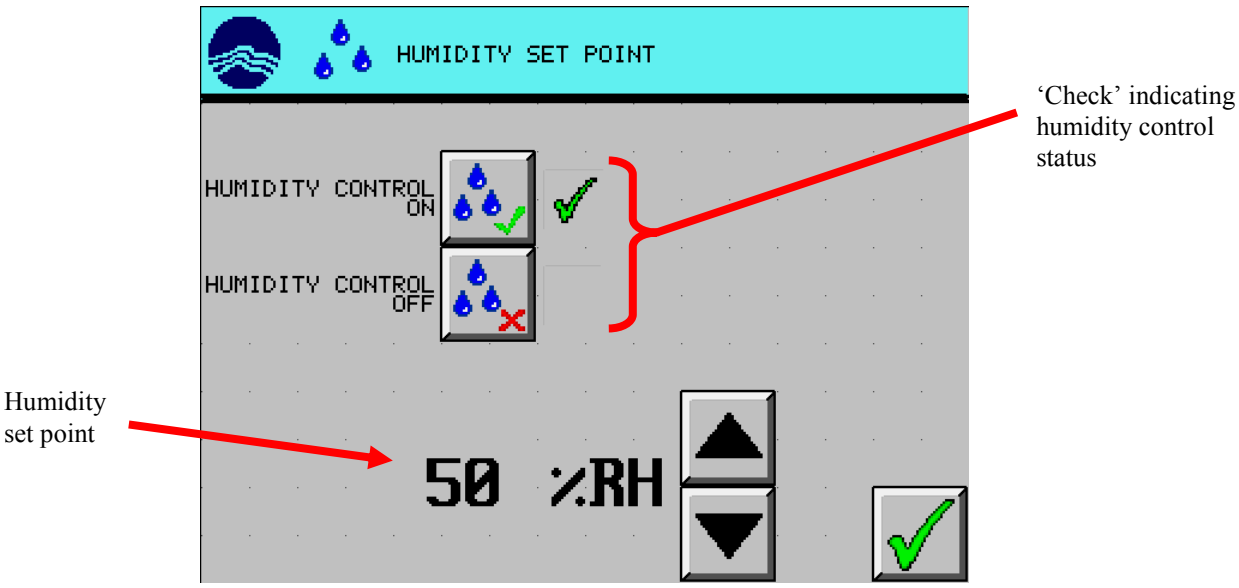
1. Press  (TEMPERATURE SET POINT) button from main screen
2. Use the  (UP) and  (DOWN) arrow buttons to set the desired temperature in degrees C




3. Press  (EXIT) button to return to the main screen.

**Set Humidity Set Point (6545-1, 6545-2, 6545-3 only)**
For chambers that have humidity control, the humidity level inside the chamber can be set via the humidity set point. To monitor and control the humidity level, humidity control must be turned 'on'.

1. Press  (HUMIDITY SET POINT) button from main screen
2. Press the  (HUMIDITY CONTROL ON) button (if not already 'checked')
3. Use the  (UP) and  (DOWN) arrow buttons to set the desired % relative humidity
4. Press  (EXIT) button to return to the main screen.

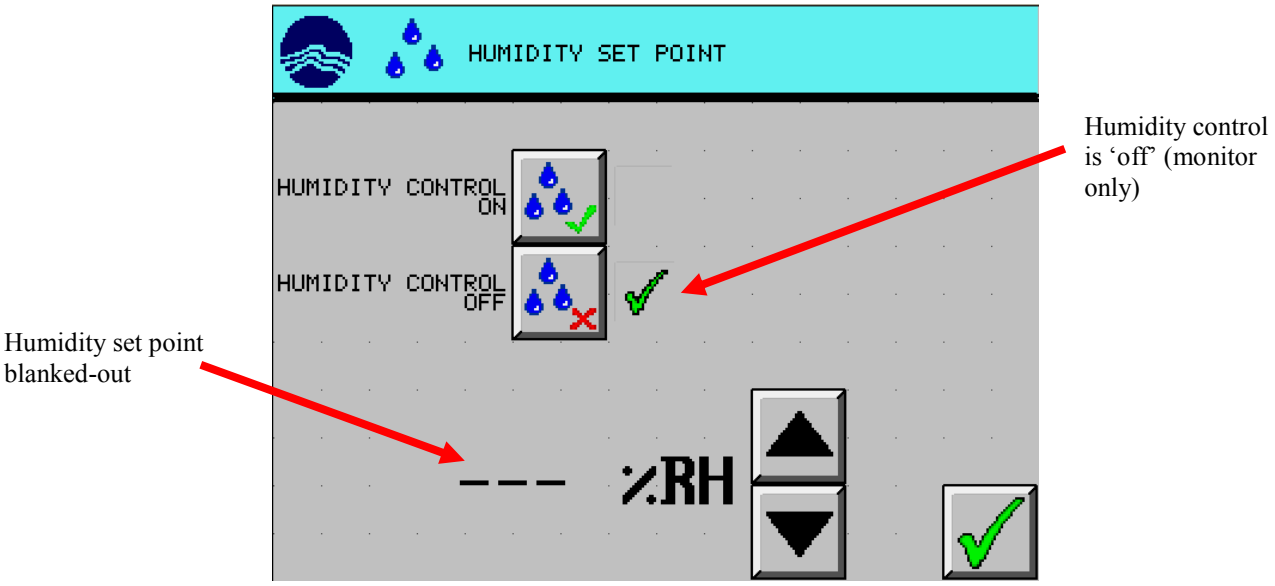



Due to the interaction between temperature and relative humidity, it maybe necessary to let the chamber reach the temperature set point with the lights on and humidity control off. Then, turn the humidity control on with the desired humidity set point. Let the chamber stabilize in the test configuration before the test is started.

For complete humidity range attainable, check appropriate specifications.

To monitor the humidity level only, the humidity control can be turned off. This should be done when humidity control is not needed or when there is not an appropriate water supply. This will also avoid nuisance alarms.

1. Press  (HUMIDITY SET POINT) button from main screen
2. Press the  (HUMIDITY CONTROL OFF) button
3. Press  (EXIT) button to return to the main screen.



**Alarms**

There are high and low process alarms that can be set for UVA light, VIS light, temperature and humidity (optional). Alarms automatically reset when the alarm condition is satisfied. Alarms may be silenced (buzzer turns off) while the alarm condition continues. Process alarms are absolute, independent of the corresponding set point. See maintenance section for recommended lamp hours.

The user set alarms are:

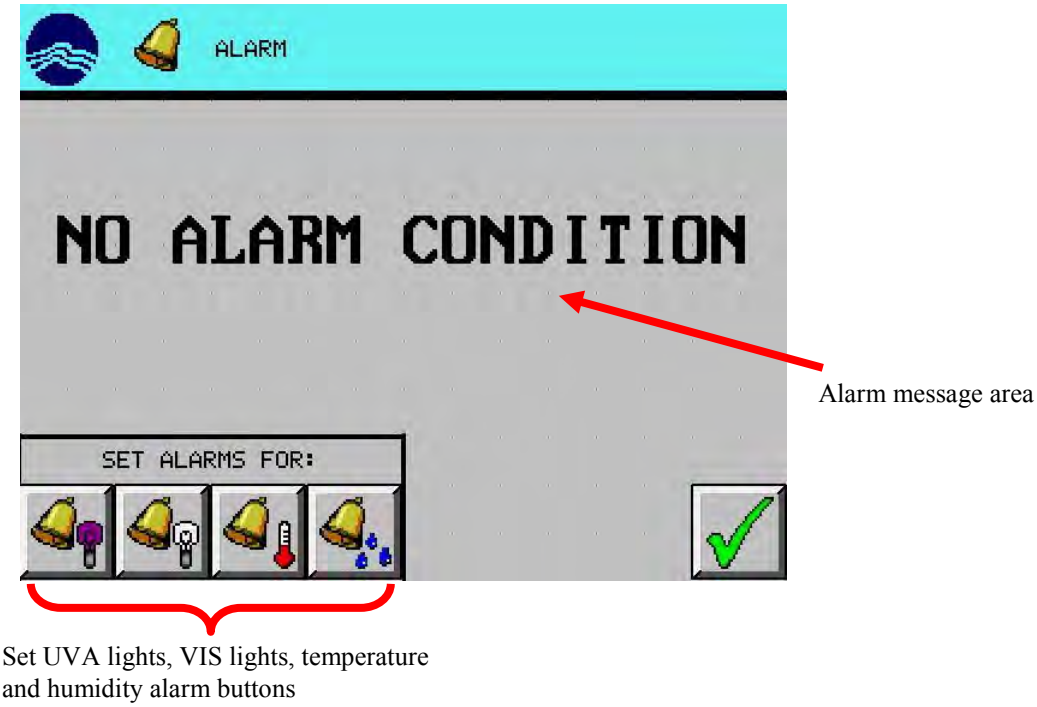
- Maximum UVA lamp hours
- UVA lights dim (minimum UVA light intensity)
- Maximum VIS lamp hours
- VIS lights dim (minimum VIS light intensity)
- High temperature
- Low temperature
- High humidity
- Low humidity

If the unit detects an error, it may alert the operator to additional alarms such as:

- Lamps too hot on top bank*
- Lamps too hot on bottom bank*
- Top light bank not installed properly
- Bottom light bank not installed properly
- Humidity water not draining properly (humidity only)
- Humidity water not filling properly (humidity only)

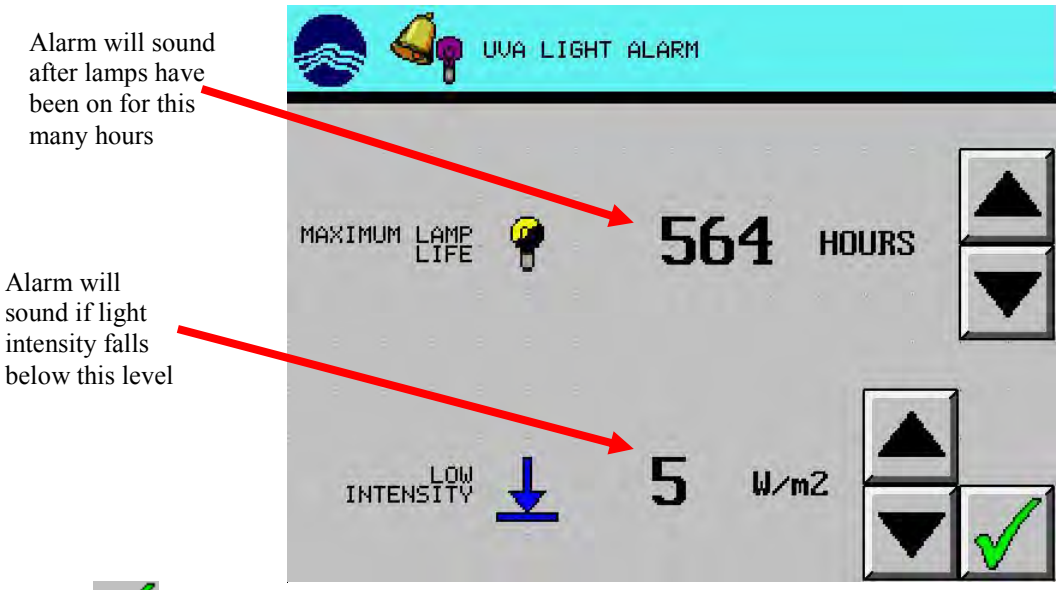
* This alarm requires manual resetting (acknowledge alarm).

To access the alarm screen, press the  (ALARM) button from the main.



**Set Light Alarms**

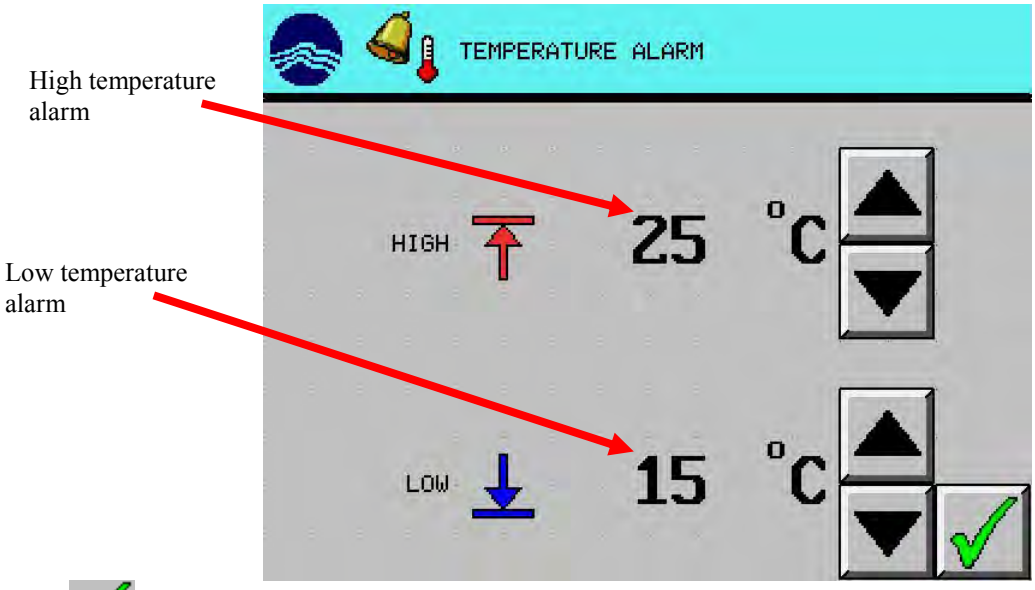
1. Press the  (UVA ALARM) button from the alarm screen.
2. Use the  (UP) and  (DOWN) arrow buttons to set the maximum lamp life hours.
3. Use the  (UP) and  (DOWN) arrow buttons to set the low intensity alarm.




4. Press  (EXIT) button to return to the alarm screen.
5. Repeat steps 1-4 for the VIS light by pressing the  (VIS ALARM) button.

**Set Temperature and Humidity (Optional) Alarms**

1. Press the  (TEMPERATURE ALARM) button from the alarm screen.
2. Use the  (UP) and  (DOWN) arrow buttons to set the high and low temperature alarms.



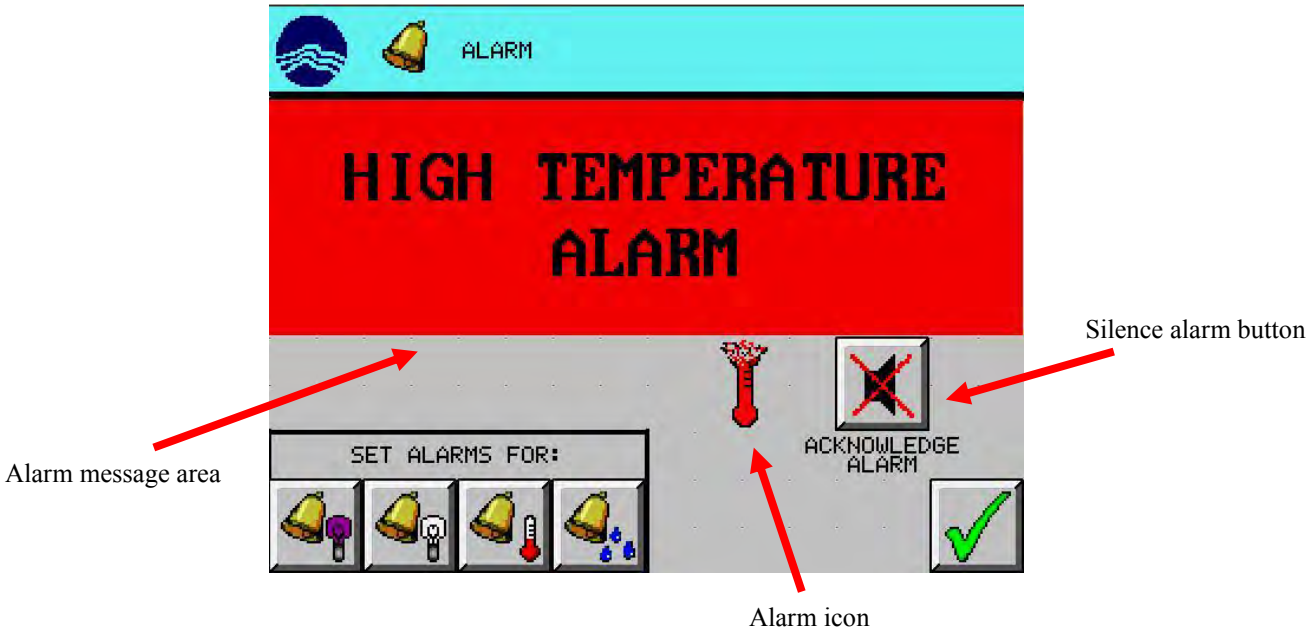

3. Press  (EXIT) button to return to the alarm screen.
4. Repeat steps 1-3 for humidity by pressing the  (HUMIDITY ALARM) button (optional).
5. Press  (EXIT) button to return to the main screen.

**Clear Alarms**

When an alarm occurs:

- The alarm button on the main screen turns red
- The audible buzzer pulses

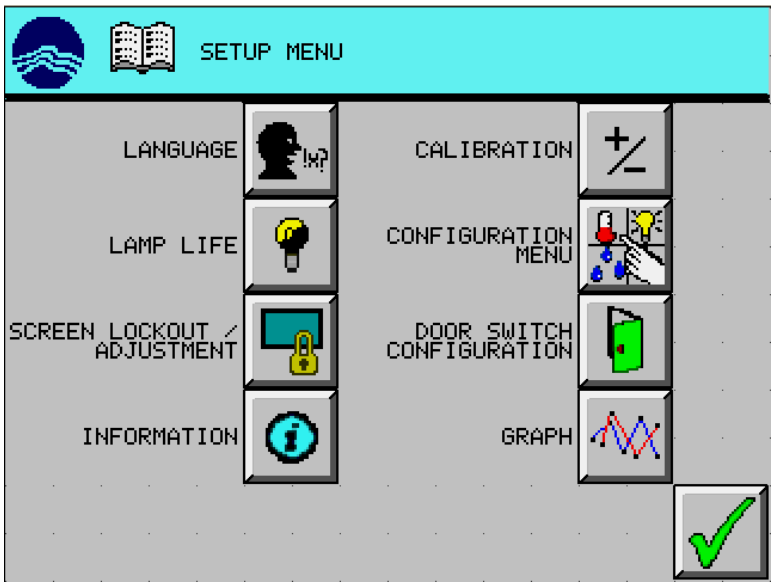

1. Press  (ALARM) button from the main screen. The alarm description will appear with a red background in the alarm message area. The example shown is a high temperature alarm.




2. Press  (SILENCE ALARM) button to acknowledge the alarm. Alarm should clear and buzzer stop.
3. Press  (EXIT) button to return to the main screen.

**Setup Menu**

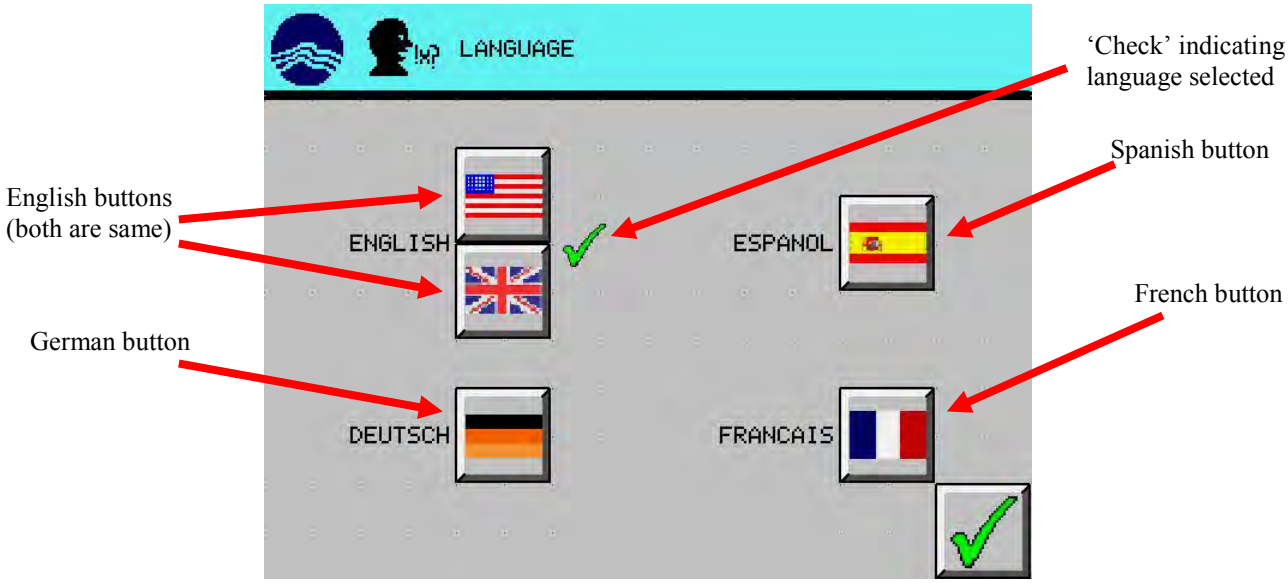
Press the  (SETUP MENU) button from the main screen and the setup menu appears.




**Language**

The language button allows the user to change the active language displayed on the screen.

1. From the Setup Menu, press  (LANGUAGE) button.
2. Select desired language, and press  (EXIT) button to return to the setup menu screen. In this example, English is selected.

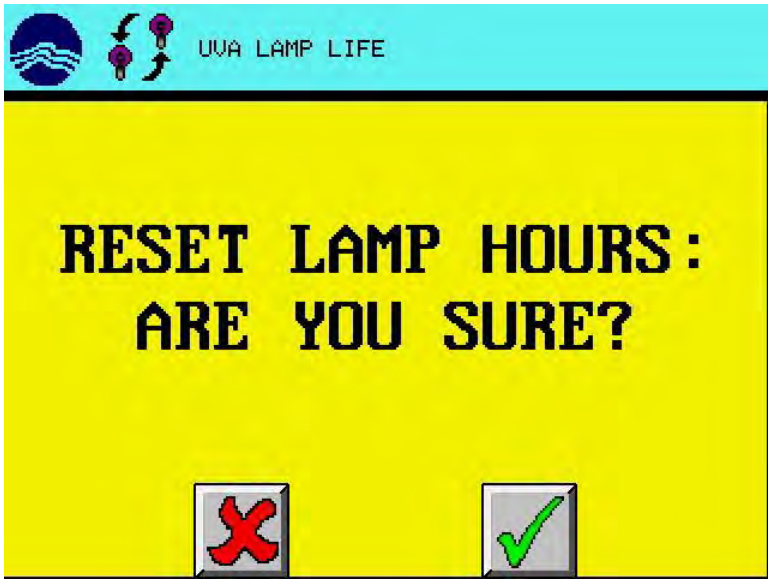


**Lamp Life**

The unit keeps track of how long each lamp bank is on (in hours). When lamps are replaced, the accumulated lamp hours should be reset to 0.

From the Setup Menu, press the  (LAMP LIFE) button. Accumulated lamp life for both UVA and VIS lamps will display.


1. To reset the lamp hours, press the  (RESET UVA LAMP HOURS) button.
2. Press  (OK) button to reset lamp hours. Press  (CANCEL) to abort and not reset lamp hours.



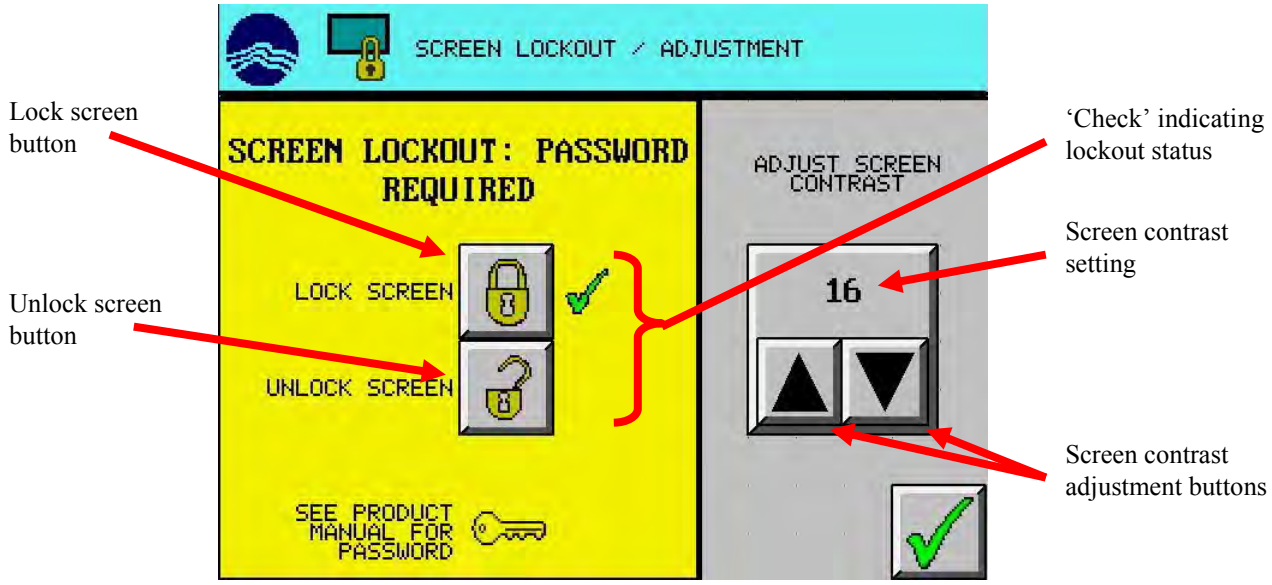

3. Repeat steps 1-2 for UVA lamps.
4. Press  (EXIT) button to return to the setup menu screen.

**Screen Lock-out / Adjustment**

To avoid unauthorized programming or other changes, the entire touch screen can be 'locked-out'. When the screen is locked out, only the main screen will display. If a button is pressed while the screen is 'locked-out', the Lockout screen appears. The lockout code is factory set and can't be changed.

The screen contrast is also adjusted on the same screen. The contrast can be set between 0 and 32. The default value is 16. A lower value is brighter.

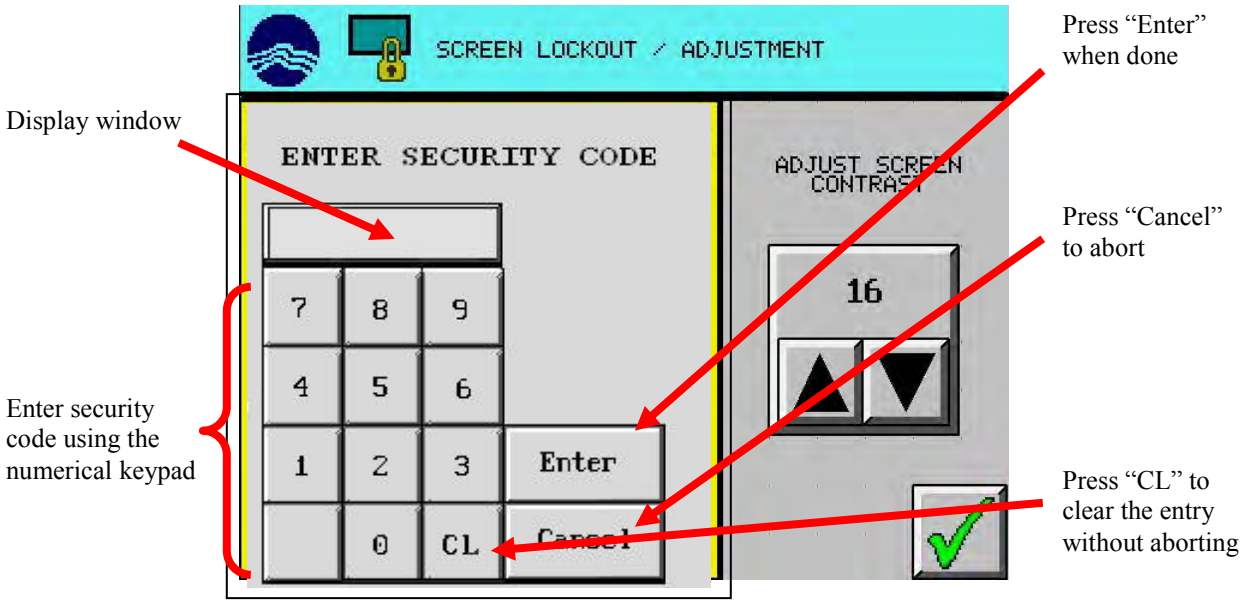
From the Setup Menu, press the  (SCREEN LOCKOUT) button.




To adjust the screen contrast, use the  (UP) and  (DOWN) arrow buttons.

To Lockout the screen:

1. Press the  (LOCK SCREEN) button. The security code window appears.



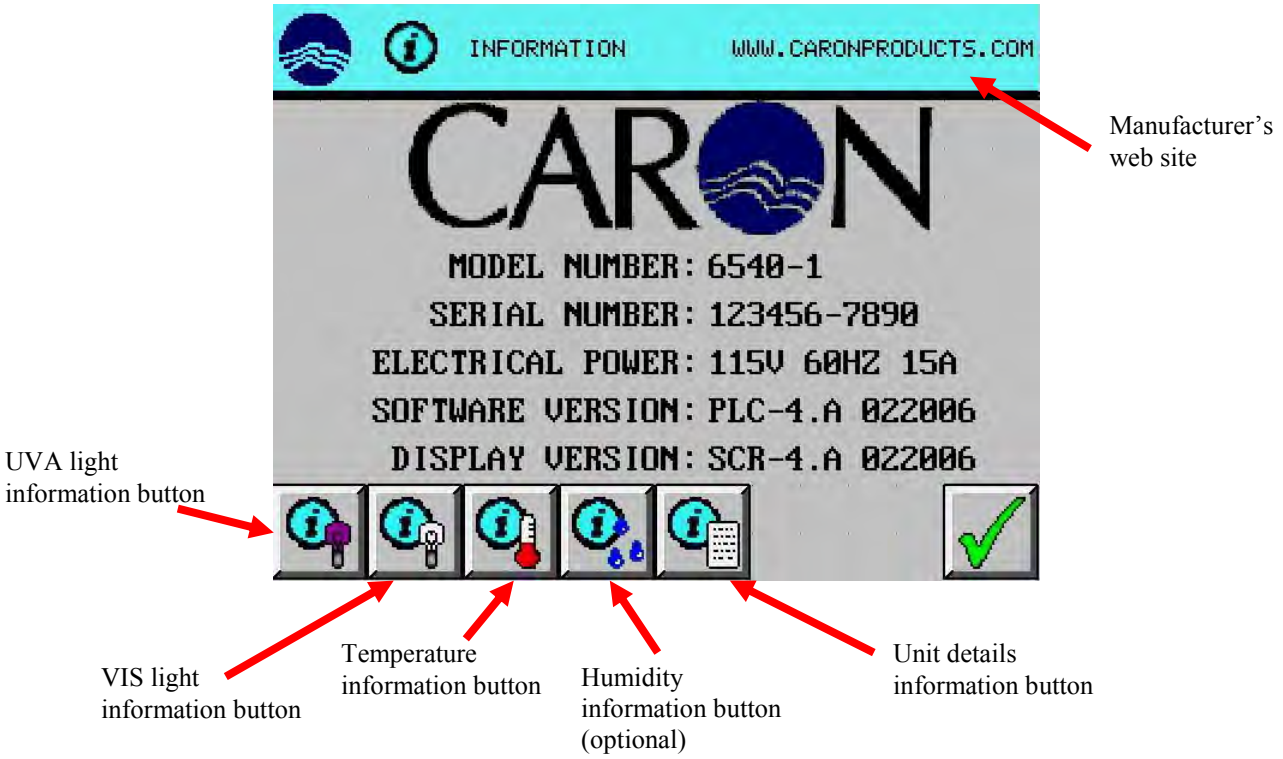
2. Enter the screen lockout security code ( 5  6  7  8 ) by pressing button ‘5’, button ‘6’, button ‘7’ and button ‘8’.  For each entry, a ‘*’ will appear in the display window.  If a mistake is made, pressing the ‘CL’ button will clear the display window and allow re-entry of the security code.  If an invalid code is entered, the display window clears.
3. Press ‘Enter’.  Note: the ‘Cancel’ button will close the security window and abort the lockout.
4. Press  (EXIT) button.  Since the unit is in lockout mode, this returns to the main screen.

To unlock the touch screen from the main menu:

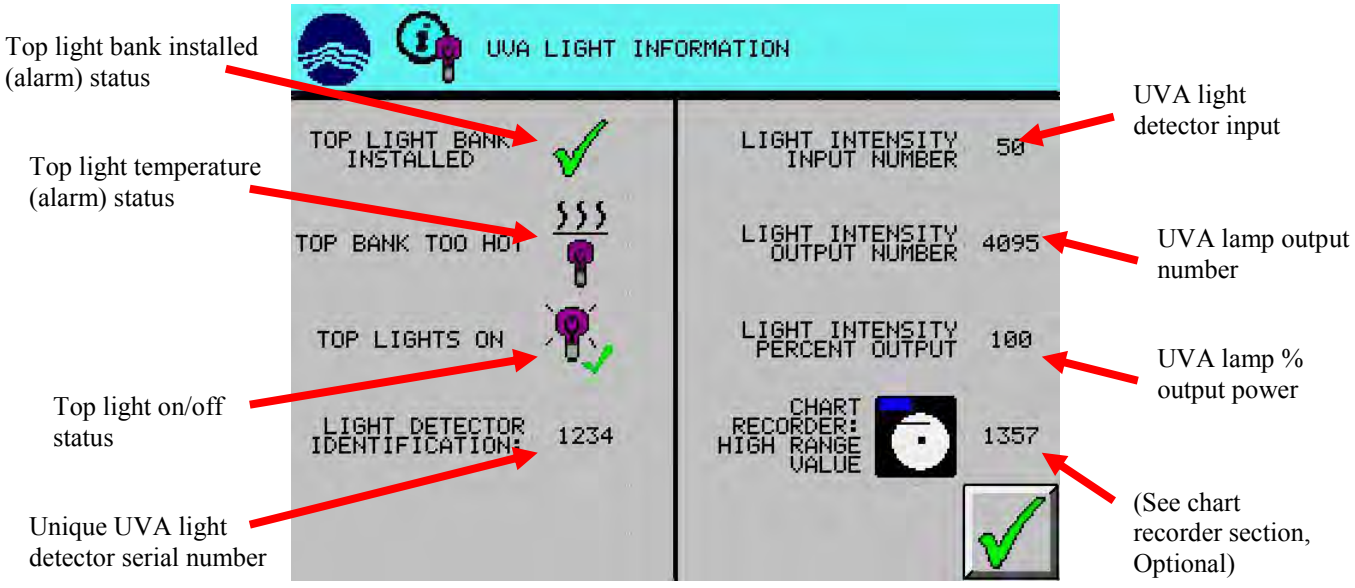
1. Press any button (such as the  (SETUP MENU) button).  This brings up the screen lockout screen.
2. Press the  (UNLOCK SCREEN) button.  The security code window appears.
3. Enter the screen lockout security code ( 5  6  7  8 ) by pressing button ‘5’, button ‘6’, button ‘7’ and button ‘8’.  For each entry, an ‘*’ will appear in the display window.  If a mistake is made, pressing the ‘CL’ button will clear the display window and allow re-entry of the security code.  If an invalid code is entered, the display window clears.
4. Press ‘Enter’.  Note: the ‘Cancel’ button will close the security window and abort the un-lock.
5. Press  (EXIT) button.  This returns to the menu setup.

**Information**

The information screens provide unit specific configuration information such as model number, serial number, electrical power. They also provide system details for diagnostic or troubleshooting purposes. No parameters or settings can be altered from the information screens.

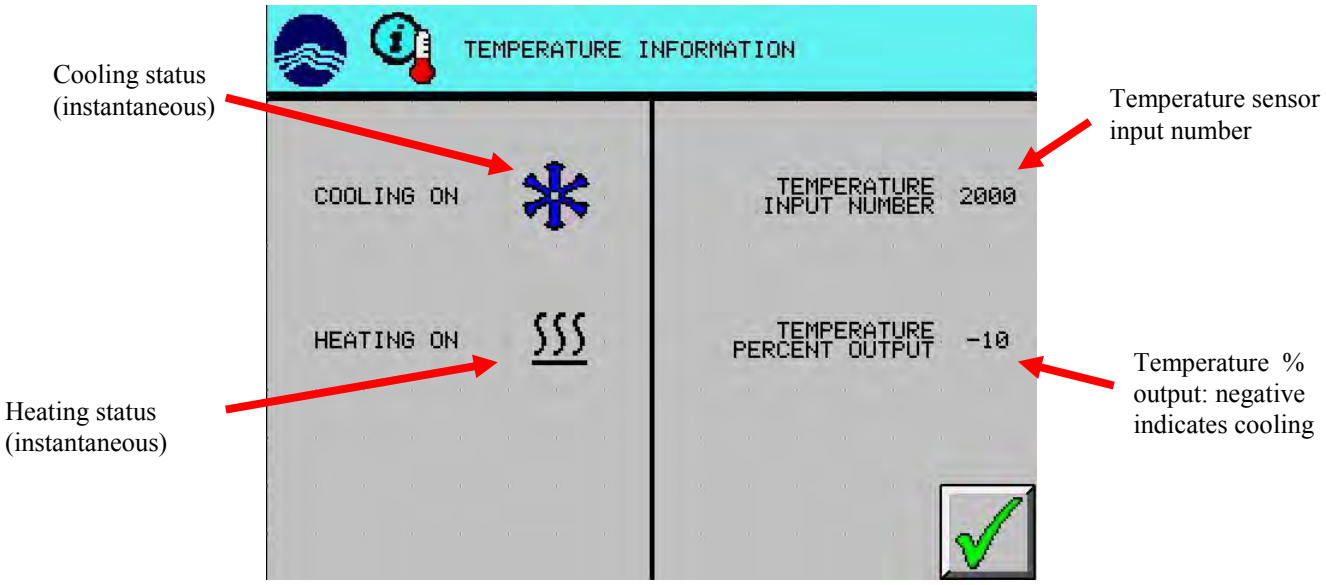



For UVA light information, press the  (UVA LIGHT INFORMATION) button.

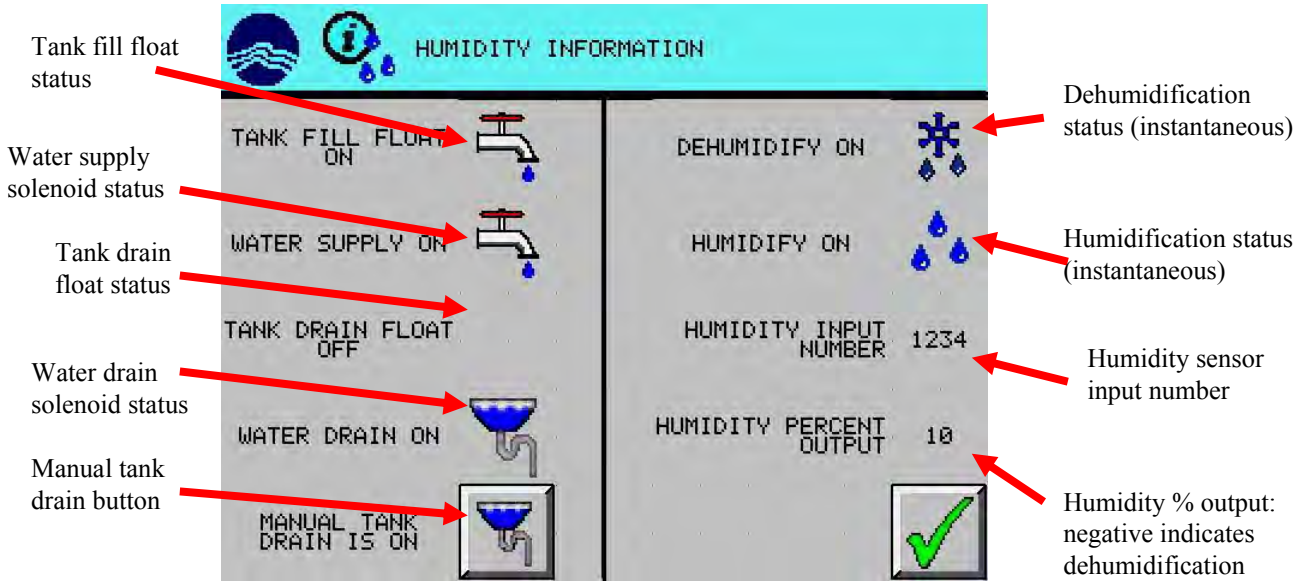



For VIS light information, press the  (VIS LIGHT INFORMATION) button from the main information screen. Screen layout is consistent with UVA information screen.

For temperature information, press  (TEMPERATURE INFORMATION) button from main screen.



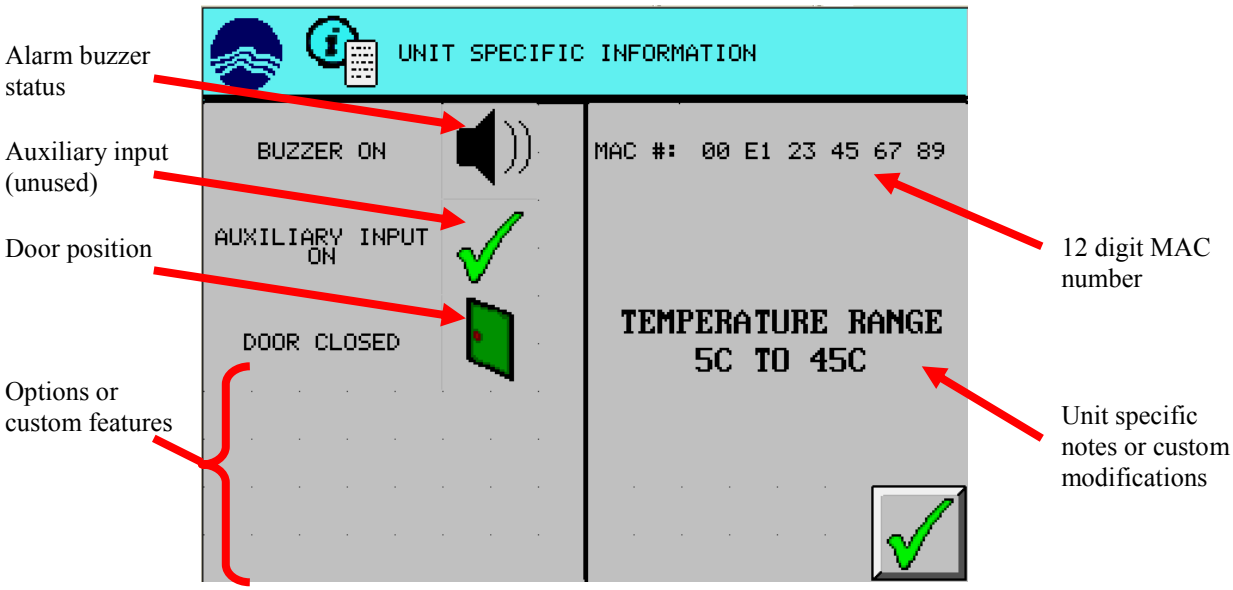

For humidity information, press  (HUMIDITY INFORMATION) button from main screen (optional).




To drain the internal water reservoir (used for humidification):

1. Turn off or remove the water supply to the chamber. If water level is low, alarm may sound.
2. Press the  (MANUAL TANK DRAIN) button. Water should flow out the water drain located in the chamber rear. It may take several minutes for it to drain completely.
3. Turn off the manual drain by pressing the  (MANUAL TANK DRAIN). If water supply to the chamber is still on, the internal water reservoir will re-fill. If not pressed, the manual drain will automatically shut-off after 15 minutes.

For additional unit specific information, press the  (UNIT SPECIFIC INFORMATION) button from the main screen. Any custom features or notes would be located here.

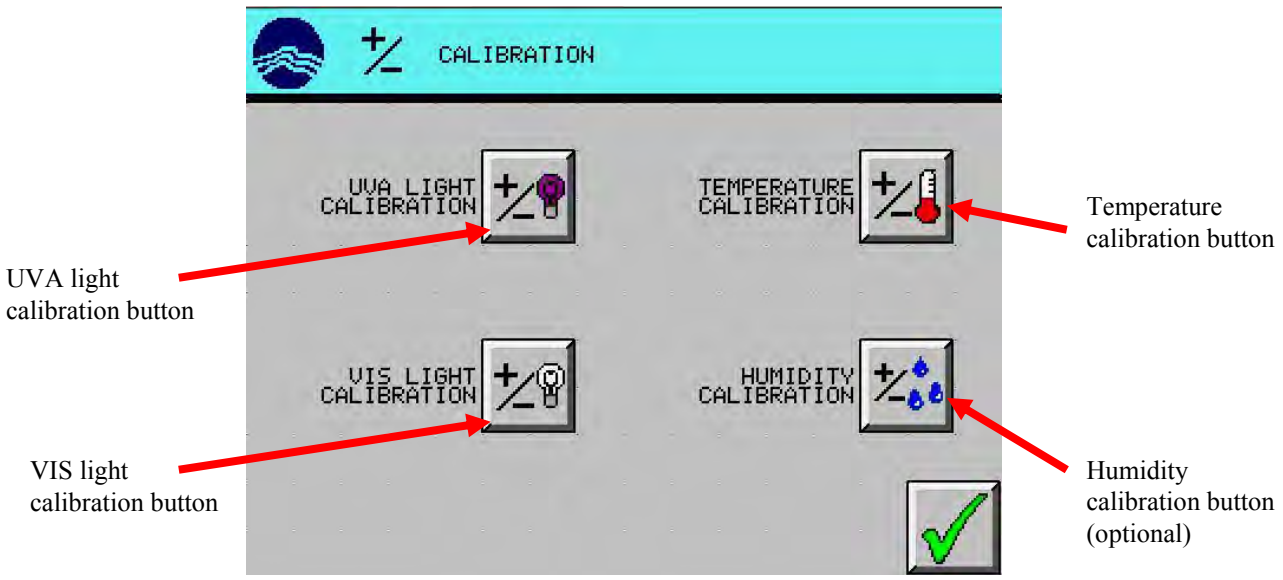



Press  (EXIT) button to return to the setup menu screen.

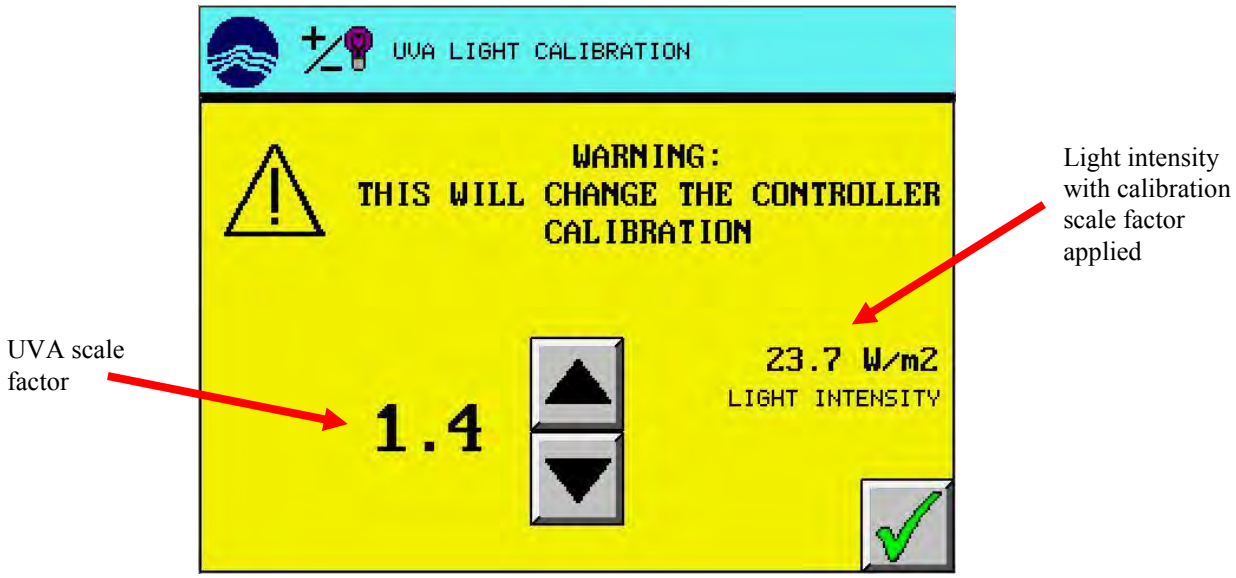
**Calibration**

The Calibration feature is used to adjust the light intensity, temperature and humidity (optional) against an independent calibrated measuring device. A linear scale factor is set for both UVA and VIS light intensity. An offset is set for temperature and humidity.

1. From the Setup Menu, press the (CALIBRATION) button.
2. Press the (UVA CALIBRATION) button.

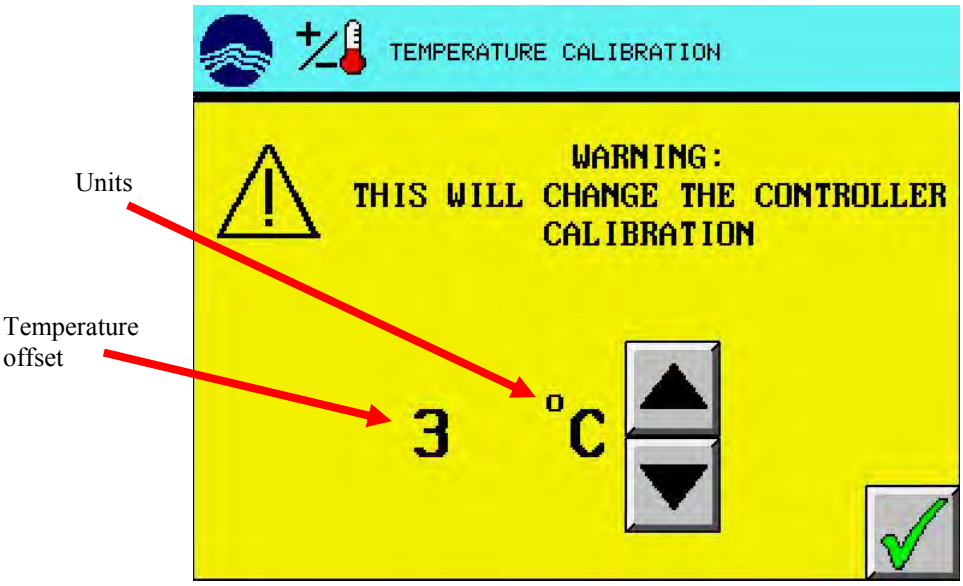



3. Use the (UP) and (DOWN) arrow buttons to adjust the calibration scale factor so the light intensity corresponds with an independent calibrated light sensor. The default scale factor is zero. To increase the intensity, increase the scale factor. Scale factors can be negative.




4. Press (EXIT) button to return to the calibration screen.

5. Repeat steps 2 thru 4 for  (VIS CALIBRATION).
6. Press the  (TEMPERATURE CALIBRATION).
7. Use the  (UP) and  (DOWN) arrow buttons to adjust the calibration offset so the temperature corresponds with an independent calibrated light sensor.

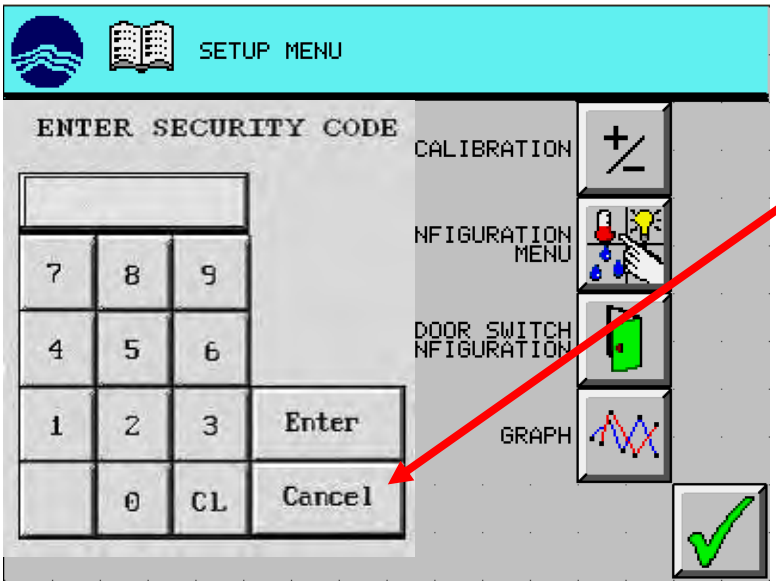



8. Press  (EXIT) button to return to the calibration screen.
9. Repeat steps 6 thru 8 for  (HUMIDITY CALIBRATION) (optional).
10. Press  (EXIT) button to return to the setup menu screen.

**Configuration Menu**

Factory default parameters and settings are stored in the configuration menu. Changing these parameters will significantly affect the unit's performance. If access to this menu is required, contact CARON for the security code. Unauthorized configuration changes void the warranty.

Press  (CONFIGURATION MENU) button. The security window appears.



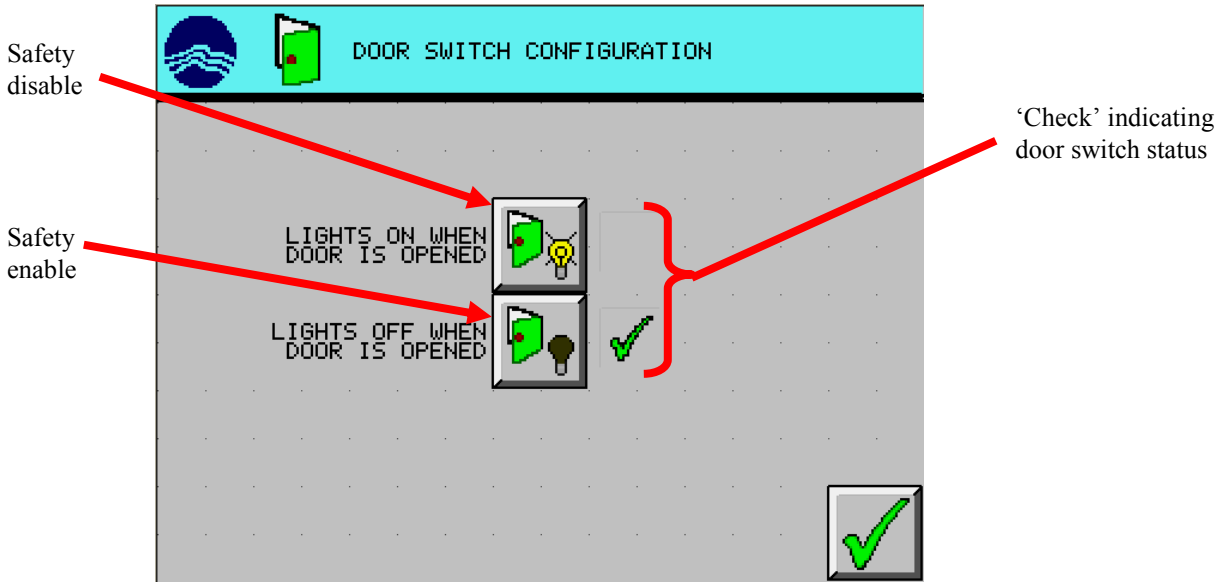

Press "Cancel" button will close the security window and abort the lockout.

**Door Switch Configuration**

The integral safety door switch allows the user to set the chamber so the lights automatically turn off whenever the door is open. This protects the operator from internal bright lights. For purposes such as chamber mapping, it may be beneficial to have the lights on while the door is open.

Warning: Whenever using the chamber with the door safety switch not activated (lights on when door is opened) the operator should always use eye protection.

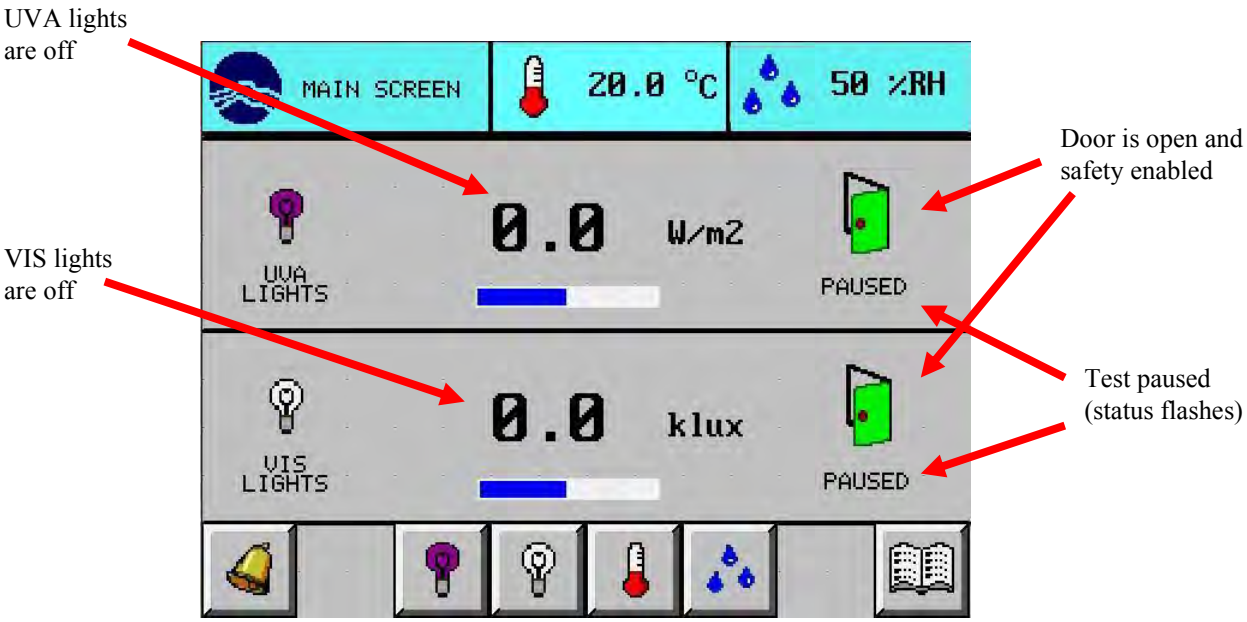
1. From the Setup Menu, press the  (DOOR SWITCH CONFIGURATION) button.
2. Press the  (LIGHTS OFF WHEN DOOR IS OPENED) button.




3. Press  (EXIT) button to return to the setup menu screen.

To disable the door switch safety, repeat the above steps except pressing the  (LIGHTS ON WHEN DOOR IS OPENED) button in step 2.

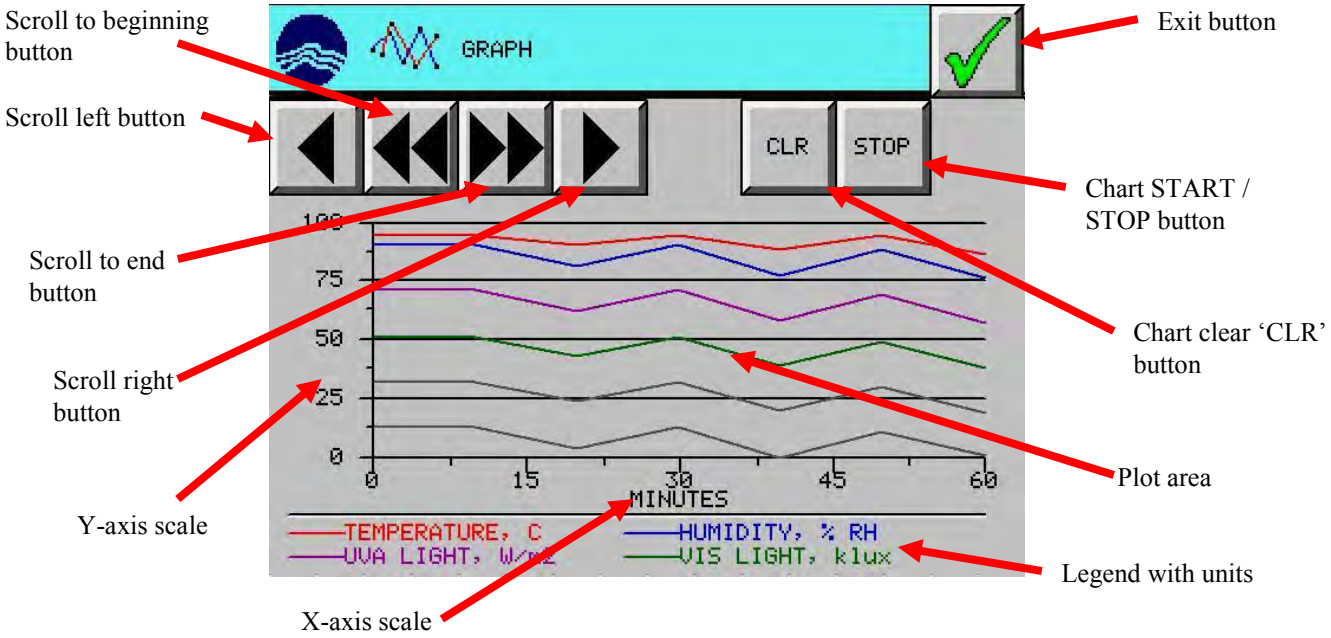
With the door switch safety enabled (lights off when door is opened), any door opening will shut the lights off. When a test is in process and the door is opened, the lights will shut off and the test is paused (see picture below). Closing the door will automatically turn the lights on and resume the test.



**Graph**

The touch screen control panel has a graph built into it. The graph records actual chamber conditions for UVA intensity, VIS intensity, temperature and humidity (optional). Data is plotted at 1 minute intervals for up to 7 days. One hour (60 minutes) can be viewed on the screen at one time. The graph automatically starts collecting data upon start-up and clears itself each time the unit is turned off. Graph data is for on-screen viewing purposes only and can't be exported or downloaded to other electronic devices.

From the Setup Menu, press the  (GRAPH) button.




- The START/STOP button starts and stops the chart recording. (It is collecting data upon startup)
- The CLR button clears the graph data and starts plotting a new graph.
- The scroll left button scrolls the graph back (left) by 30 minutes.
- The scroll right button scrolls the graph forward (right) by 30 minutes.
- The scroll to beginning button scrolls the graph to the graph beginning (0 minutes).
- The scroll to end button scrolls the graph to the end (current time frame).

Press  (EXIT) button to return to the setup menu screen.

**Extended Temperature Range down to 5ºC: EXT005 (optional)**

With this option, light testing (with lights on) can be performed down to 5ºC. For operation below 10ºC:

- Ambient temperature should not exceed 25ºC and ports must be closed.
- The chamber will use slightly more electrical power (current).
- Maximum light intensity will decrease and low intensity alarms should be adjusted accordingly.
- The humidity range is not specified below 10ºC.
- Depending upon ambient conditions, slight condensation may form on the exterior of the chamber.

# MAINTENANCE

WARNING: Before removing control panel, disconnect all power!

Electrical components (circuit breakers, fuses, relays, power supplies, etc.) are located on the electrical 'sled' or chassis. Access is through the front service panel. For additional service support, contact your local distributor or CARON service department at service@caronproducts.com. When contacting CARON, be sure to provide the following information from the information screen

- Model number
- Serial number
- Electrical power
- Software version
- Display version


**Routine Maintenance**

Routine chamber maintenance is necessary to keep the chamber working properly. The recommended chamber maintenance schedule is:

a) Replace lamps after 2000 hours of usage (*not* covered under warranty)
b) Vacuum or blow out condensing unit fins and PLC air vents every 500 hours (or more frequently if dusty environment).
c) Clean interior chamber stainless steel with a non-abrasive glass cleaner.
d) Drain internal water reservoir (6545-1, 6545-2, 6545-3) if chamber is going to be unused for 10 days. See Information Humidity section of operations manual.
e) Apply electrical dielectric grease to connector pins on rear of both light banks

**Brief Troubleshooting**

Touch screen is blank
To maximize the touch screen optics, the touch screen will go into screen saver mode after being un-touched for 30 minutes. To re-activate the touch screen (while the unit is still on), simply press anywhere on the screen and the screen will illuminate. The power indicating light (illuminated blue 'O' in CARON) indicates when the unit is on.

Chamber is alarming (see also alarm section of manual)

- At the alarm screen, what alarm is indicated?
- Was the alarm condition rectified?
- Was the acknowledge alarm button pressed?
- Has another alarm appeared in the alarm screen?
- A 'Lamps too hot' alarm can't be silenced until the lamps cool down to acceptable levels. To cool down the lamps, turn unit off and open the door for 1 hour. If problem persists, contact service personnel.
- A 'Lights dim' alarm can also be reset by having the lights on at an intensity above the alarm level for 1 minute.

Interior lights won't come 'on'

- Are lights turned 'on'?
- Is light test 'complete'?
- Are any alarms activated? Silenced alarms are reset when unit is turned off.
- Is door safety switch enabled?
- Is correct light bank inserted?
- Is light bank pushed in all the way?
- Are the lamps inserted correctly?
- Are *all* the lamps installed? If one lamp is not installed properly or burned out, it will affect the performance of other lamps.

Interior lights have lower intensity than expected

- Are *all* the lamps installed and on? If one lamp is not installed properly or burned out, it will affect the performance of other lamps.
- Are the lights dimmed?
- Is there a light calibration factor applied?
- Is something physically between the lamps and light detector?
- Do the lamps need replaced?

Unit won't reach temperature set point

- Has the unit stabilized for 1 hour?
- Is the temperature set point within the unit specification range?
- Is the ambient temperature between 20ºC-25ºC?
- If set point is above 25ºC, are the lights on?

- Is there a temperature calibration factor applied?
- Is there free air flow (no obstructions) next to all of the air vents on the front, right and back sides?

Unit reaches temperature set point but won't stabilize

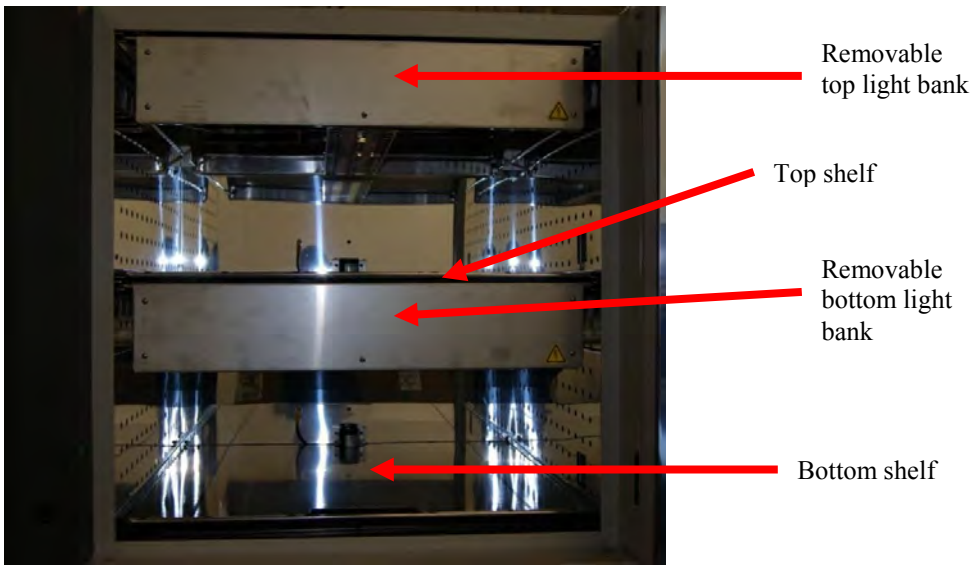
- Are both access ports closed?
- Has the door been open within 30 minutes?
- Have the lights cycled on or off within 30 minutes?
- If the chamber has humidity control, is it stable?

Unit won't reach humidity set point

- Are both access ports closed?
- Is the humidity set point within the unit specification range?
- Has the unit stabilized for 2 hours?
- Is the ambient temperature between 20ºC-25ºC?
- Is the drain draining? No kinks or up-hill traps in the line? Cycling power resets any silenced alarms. After turning the unit on, wait 1 minute to see if 'Water not draining properly' alarm activates.
- Is there a humidity calibration factor applied?
- Is there free air flow (no obstructions) next to all of the air vents on the front, right and back sides?
- Is there adequate water supply? Cycling power resets any silenced alarms. After turning the unit on, wait 1 minute to see if 'Water not filling properly' alarm activate

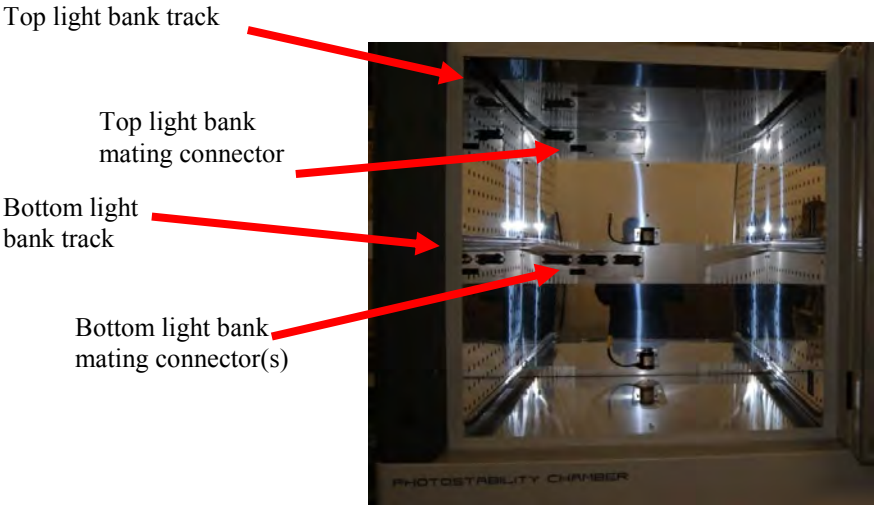
**Replace Lamps**

1. Remove top (or bottom) light bank from chamber by pulling on the removable light bank. There are no wires, connectors, screws or other fasteners to disconnect.

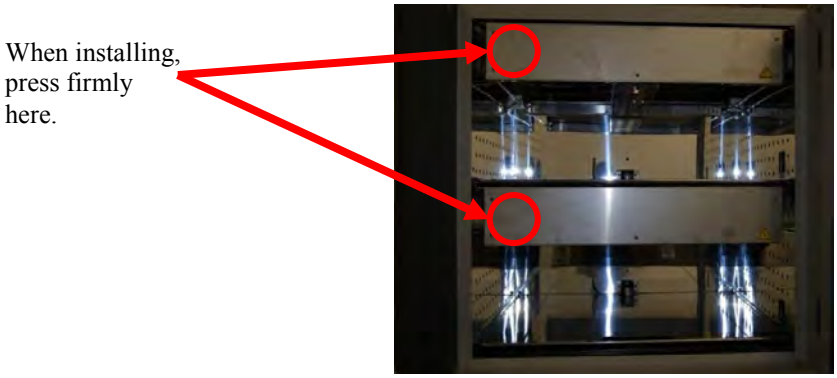



2. Remove old lamps and replace with new.
   - Rotate bi-pin lamps ¼ turn in lamp holders to remove/install.
   - For high output lamps, press one end of lamp into 'plunger' lamp holder. Press/release the other lamp end into 'fixed' lamp holder (6540-1 & 6545-1 only).

3. Install the light bank into track with connector end going in first.



4. Press firmly into place to seat rear connector.




Note: If one lamp is not installed properly or burned out, it will affect the performance of other lamps.

**Replacement lamps**

For models 6540-1 and 6545-1

| | |
|---|---|
| LGT-125 | Individual fluorescent UVA (black lights) 20W, 2 foot bi-pin lamps |
| LGT-126 | Individual fluorescent VIS (cool white) 35W, 2 foot high output lamps |
| LGHT503 | Set of (6) 20W black lamps (LGT-125) |
| LGHT504 | Set of (10) 35W white lamps (LGT-126) |

For models 6540-2, 6540-3, 6545-2 and 6545-3

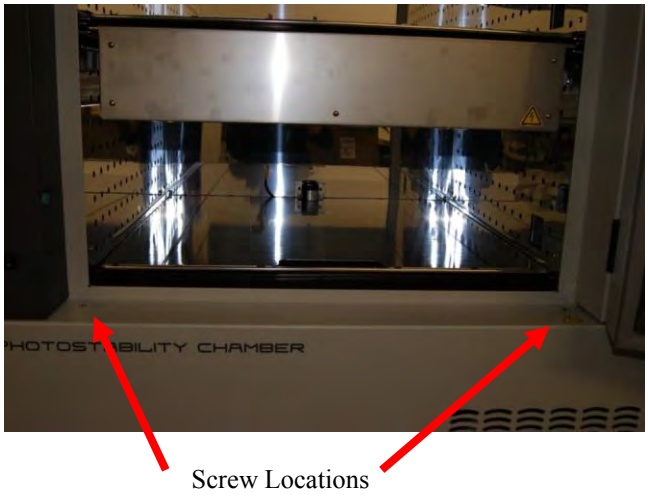
| | |
|---|---|
| LGT-138 | Fluorescent UVA (black lights) 18W, 2 foot bi-pin lamps |
| LGT-139 | Fluorescent VIS (cool white) 18W, 2 foot bi-pin lamps |
| LGHT505 | Set of (6) 18W black lamps (LGT-138) |
| LGHT506 | Set of (14) 18W white lamps (LGT-139) |

**Component Access**

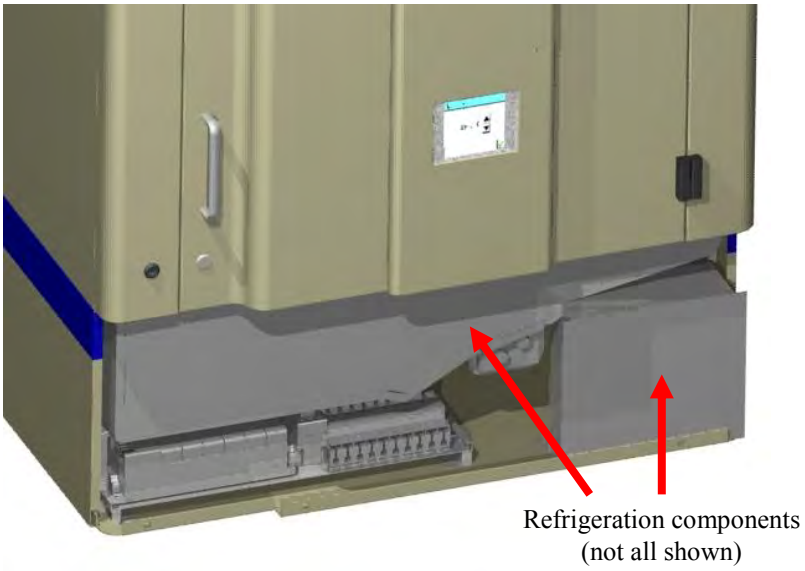
To clean condenser fins or access electrical and refrigeration components, the front cover must be removed.

1. Locate and remove two screws in the bottom base grill front.

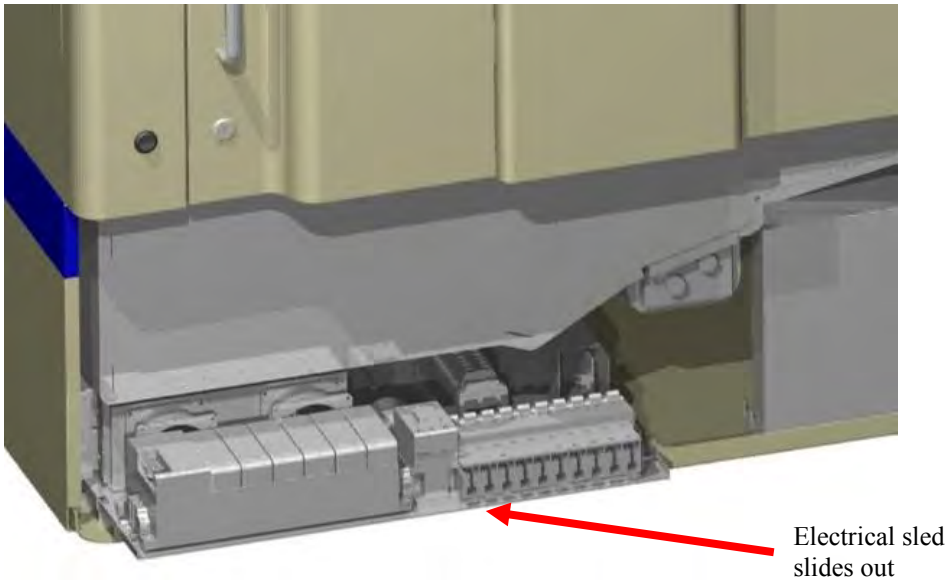

2. Open door, locate and remove two screws going down into bottom front cover.



3. Pull the bottom front cover straight off. Refrigeration components and electrical sled are exposed.




4. Carefully, slide out electrical sled (see below) to expose electrical components. Be sure to support sled weight if pulled more than half way out.



# Replacement parts

| Temperature Related | 115V,208-230V,60Hz |
|---|---|
| **Part Number** | **Description** |
| DRI-106 | Filter/Drier |
| ELE-105 | Charge Element |
| EXV-104 | Discharge Bypass Valve |
| EXV-108 | Expansion Valve Constant Pressure |
| EXV-122 | Expansion Valve Body |
| RTD-101 | RTD,100 Ohm Platinum |
| SOL-109 | Liquid Solenoid Valve Body |
| ORF-103 | Orifice, #0 |
| ORF-106 | Orifice, #2 |
| | |

| Temperature Related | 115V 60Hz |
|---|---|
| **Part Number** | **Description** |
| CND-121 | Compressor,1/4 HP,115V,60Hz |

| Temperature Related | 208-230V 60Hz |
|---|---|
| **Part Number** | **Description** |
| CND-129 | Compressor,1/3 HP,220V,60Hz |
| ELE-103 | Charge Element |

| Temperature Related | 230V 50Hz |
|---|---|
| **Part Number** | **Description** |
| CND-127 | Compressor,1/4 HP,50Hz |

| Humidity Related | 115V,208-230V 60-50Hz |
|---|---|
| **Part Number** | **Description** |
| FIL-101 | Filter, Water 250 Mesh |
| HUM-110 | Sensor, Humidity |
| HUM-113 | Ionic Silver Stick, Antibacterial |
| LEV-104 | Level Switch,Water |
| SOL-132 | Solenoid Valve Coil, Water |
| SOL-133 | Solenoid, Water |
| ULT-102 | Ultrasonic Nebulizer |

| Electrical Related | 115V,208-230V 60-50Hz |
|---|---|
| **Part Number** | **Description** |
| ALM-108 | Alarm,Audible |
| CBL-103 | Cable,Network RJ-45 |
| FAN-130 | Fan,Impeller 9" |
| FIL-501 | Filter,RFI |
| FIL-502 | Filter,EMI Suppression |
| PLC-102 | PLC,Windows CPU |
| PLC-104 | Cable,PLC |
| PLC-105 | PLC,Analog |
| PLC-107 | PLC,DC |
| PLC-111 | PLC,Screen |
| PLC-113 | PLC Base |
| PLC-115 | Ram,512K |
| PLT-118 | Led,Blue |
| POW-107 | Power Supply,+5V,-5V |
| POW-108 | Power Supply,24VDC |
| REL-147 | Relay,24VDC |
| REL-149 | Relay Module,12-24VDC |
| RES-605 | Resistor,1.33K Ohm |
| RES-608 | Resistor,249 Ohm |
| SUR-104 | Suppressor,Voltage |
| SWT-115 | Switch,Power |
| SWT-120 | Switch,Proximity |
| TRN-122 | Transformer,48V |

| Electrical Related | 115V,60Hz |
|---|---|
| **Part Number** | **Description** |
| CAP-111 | Capacitor,5 mF |
| FAN-113 | Fan,3" |
| FAN-130 | Fan,Impeller 9",115V |
| FUS-139 | Fuse,10A |
| FUS-140 | Fuse,15A |
| FUS-141 | Fuse,2.5A |
| FUS-143 | Fuse,5A |
| LGT-137 | Ballast,Light |
| PLC-113 | PLC Base,4 Slot |
| REL-148 | Contactor/Relay 110V |

| Electrical Related | 208-230V,60Hz |
|---|---|
| **Part Number** | **Description** |
| CAP-113 | Capacitor,1.5 mF |
| FAN-114 | Fan,3" |
| FAN-129 | Fan,Impeller,9", 220V |
| FUS-139 | Fuse,10A |
| FUS-140 | Fuse,15A |
| FUS-141 | Fuse,2.5A |
| FUS-143 | Fuse,5A |
| LGT-141 | Ballast,Dimmable,Light |
| PLC-101 | PLC Base,6 Slot |
| PLC-114 | PLC Analog |
| REL-140 | Contactor/Relay 220V |

| UV Light Bank | 115V,60Hz |
|---|---|
| **Part Number** | **Description** |
| LGT-125 | Lamp,UV, Black |
| LGT-205 | Detector,UV |
| RMT-111 | Thermostat,Light Bank |

| UV Light Bank | 208-230V,60-50Hz |
|---|---|
| **Part Number** | **Description** |
| LGT-138 | Lamp,UV, Black,220V |
| LGT-205 | Detector,UV |
| RMT-111 | Thermostat,Light Bank |

| VIS Light Bank | 115V,60Hz |
|---|---|
| **Part Number** | **Description** |
| LGT-126 | Lamp,VIS,Cool White,115V |
| LGT-204 | Detector,VIS |
| RMT-111 | Thermostat,Light Bank |

| VIS Light Bank | 208-230V,60-50Hz |
|---|---|
| **Part Number** | **Description** |
| LGT-139 | Lamp,VIS,Cool White,220V |
| LGT-204 | Detector,VIS |
| RMT-111 | Thermostat,Light Bank |

| Recorder Related | 115V,208-230V 60-50Hz |
|---|---|
| **Part Number** | **Description** |
| PPR-201 | Honeywell Thermal, 12” thermal chart paper |

# APPENDIX A – VALIDATION (REFERENCE ONLY)

**What is Validation/Qualification?**
Validation/Qualification is the act of providing documented evidence that the installed equipment or systems perform as specified during the design phase and meets the specifications of the manufacturer, the owner, and applicable regulations. Typically, one would Qualify equipment but Validate a process. Steps include Installation, Operation, and Performance Qualification. Validation/Qualification is more elaborate than Equipment Manufacturer's Installation in that it involves several additional steps farther performing system calibration, worst case and functionality testing. Calibration of individual components is recommended prior to validation.

**Recommended Equipment for Validation/Qualification**
Data acquisition system
Calibrated radiometer/photometer with calibrated UVA and VIS detectors
10 calibrated temperature sensors
2 calibrated humidity probes (if humidity control only)

**Recommended validation steps to include**
- Controller functionality testing
- System calibration of light controller (UVA and VIS light)
- Light uniformity mapping
- Chamber temperature mapping
- Chamber humidity mapping (reference only)
- Comprehensive final report

**Light Detector Calibration**
The UVA and VIS light detectors integrated into the chamber are high quality instruments specifically suited for the application. These features include:
- Detectors are calibrated to NIST traceable standards
- Detectors are planar, cosine-corrected and have a Teflon hemisphere
- UVA light detector calibrated to exact lamp's spectral power distribution
- VIS light detector spectral response closely follows CIE photopic action spectra & wide band width

For testing to a minimum exposure/dose level (such as ICH Q1B confirmatory testing), it may be useful to calibrate the light detector to correspond with the minimum intense shelf location (see calibration).

**Temperature and Humidity Calibration**
To isolate the disturbance of lamp radiation, temperature and humidity sensors are mounted out of direct lighting and measure air conditions entering the chamber. With the lights fully on, the chamber displayed temperature (and humidity) may be different than a sensor on the shelf because of the light radiation. Any temperature sensor in direct lighting should be wrapped in aluminum foil or similar material to measure air temperature. A calibration offset can be applied to equate to conditions anywhere within the chamber (see calibration).

# APPENDIX B –LIGHT INTENSITY CHARACTERISTICS (REFERENCE ONLY)

**Light intensity nomenclature**

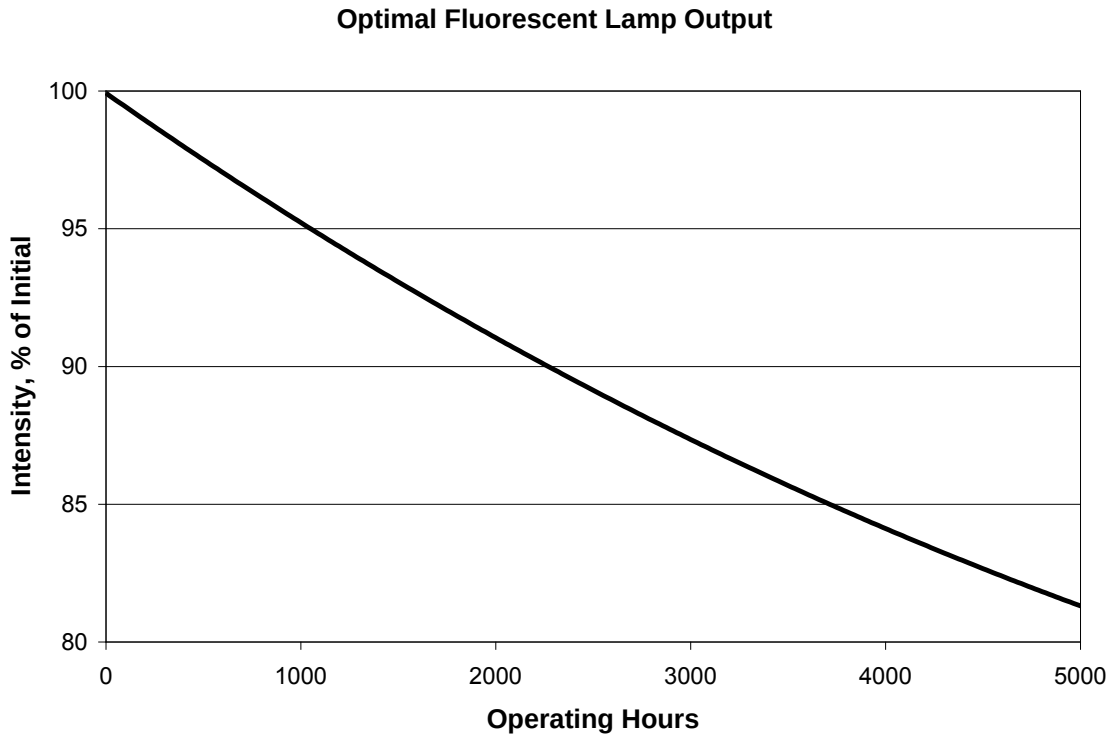
| | Near UV | Visual |
|---|---|---|
| Abbreviation | UVA | VIS |
| Lamp type | Black | Cool white |
| Wavelength | 320 – 400 nm | 400 – 800 nm |
| Intensity units | $W/m^2$ | lux (or klux) |
| Exposure (dose) units | $W\text{-}hr/m^2$ | lux-hr (or klux-hr) |
| ICH Q1B confirmatory requirement | 200 $W\text{-}hr/m^2$ | 1.2 million lux-hr<br>or 1200 klux-hr |

**Photopic (visual light) conversions**

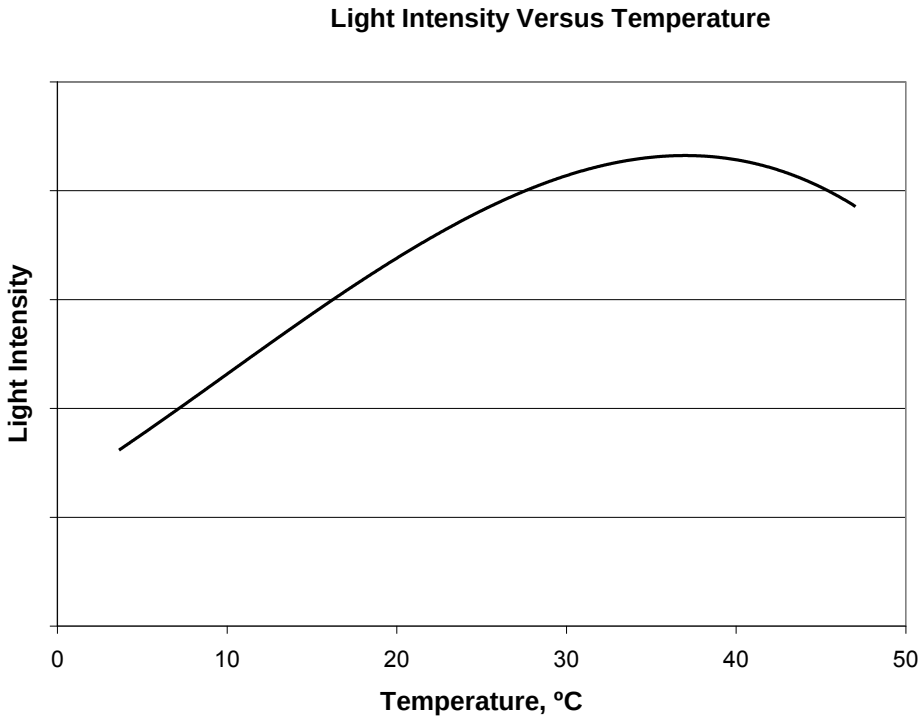
1 klux = 92.9 foot-candles (fc)
13.5 $\mu mol/m^2/s$ (for cool white fluorescent only)

**Light intensity and lamp age**

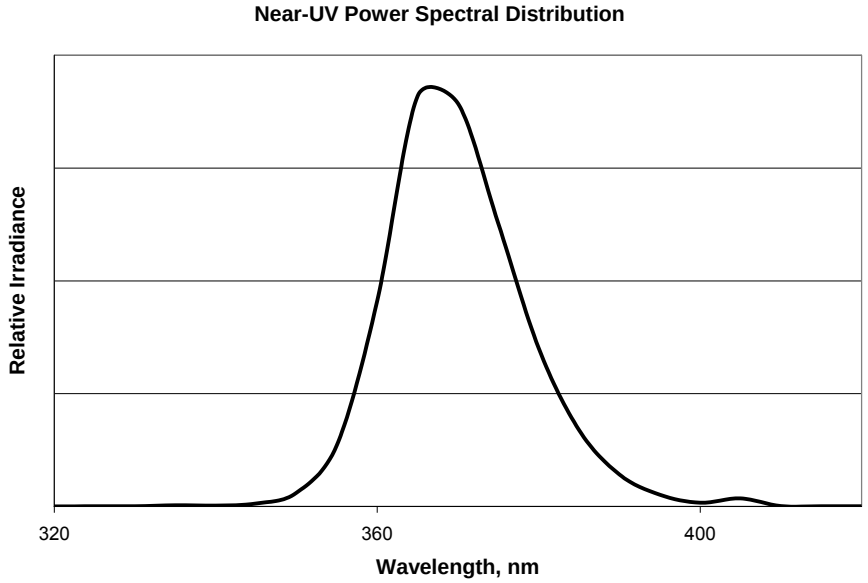
The life expectancy of a fluorescent lamp varies significantly by the operating condition in which it is used. Under ideal conditions, maximum light intensity decreases with lamp age as shown below. Other factors influencing lamp life includes chamber air temperatures (optimal at 25ºC), number of on/off cycles, and amount of light dimming applied. For optimal performance, CARON recommends lamp replacement every 2000 hours.



**Light intensity versus temperature**
The maximum light intensity attainable with the chamber is dependent upon air temperature, lamp age and lamp style. Below 35ºC, lower air temperatures constitute lower light intensity levels.

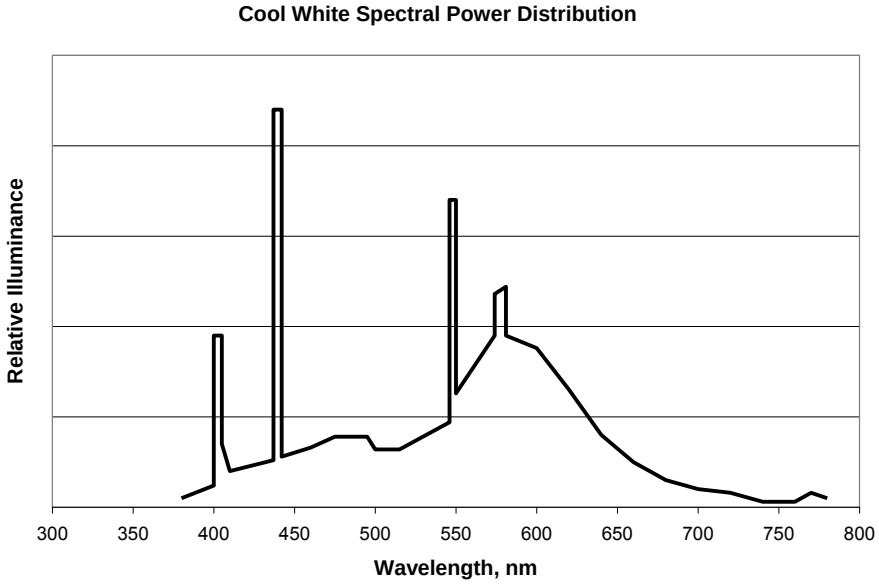



**UVA Spectral Power Distribution**
A lamp can be characterized by its spectral power distribution (typical output show below). Actual output may vary.



**Cool White Spectral Power Distribution**

A lamp output can be characterized by its spectral power distribution (typical output show below). Actual output may vary. The cool white lamps conform to ISO 10977.



# APPENDIX C – CHART RECORDER (REC-203, REC-204)

Recorder inputs are configured as listed below

| | 6540-1, -2, -3 | 6545-1, -2, -3 |
|---|---|---|
| Recorder P/N | REC-203 CE | REC-204 CE |
| # of inputs | 3 | 4 |
| Input #1 | Temperature | Temperature |
| Input #2 | Light meter 1 | Light meter 1 |
| Input #3 | Light meter 2 | Light meter 2 |
| Input #4 | | Humidity |

Recorder pens are the same for all recorders and are configured as listed below

| | |
|---|---|
| Pen 1 | Temperature |
| Pen 2 | Light meter 1 |
| Pen 3 | Light meter 2 |
| Pen 4 | Humidity |

Press the SETUP button to scroll through the group menus.
Press the FUNC button to scroll through a particular group.
Press the UP & DOWN arrow buttons to change the current parameter
Press the CHART button to temporarily put the chart on 'hold'. Pressing CHART again will resume.
Press the LOWR DISP button to scroll through the input variables.

To increment a numerical value, press & hold the UP arrow key. While holding the UP arrow key, press the DOWN arrow key to move cursor to the next digit location.

To decrement a numerical value, press & hold the DOWN arrow key. While holding the DOWN arrow key, press the UP arrow key to move cursor to the next digit location.

Factory default settings are as follows:

| Parameter | Analog Output Range | Corresponding Value |
|---|---|---|
| Temperature | 0 – 5 V | -176 to 208°C |
| UVA | 0 – 5 V | 0 to * |
| VIS | 0 – 5 V | 0 to * |
| Humidity | 0 – 5 V | 0 – 100 %rh |

*Value is unit specific, see figure on page 69

INPUT 1

| | | |
|---|---|---|
| INPUT 1 | ENABLE | Input 1 actuation |
| DECIMAL | XXX.X | Decimal point location |
| UNITS | DEG C | Temperature Units |
| IN1 TYPE | 0-5V | Input 1 actuation type |
| XMITTER1 | LINEAR | Input 1 transmitter characterization |
| IN1 HI | 208.0 | Input 1 high range value |
| IN1 LO | -176.0 | Input 1 low range value |
| BIAS 1 | 0.0 | Input 1 bias or offset |
| FILTER 1 | 0 | Input 1 filter |
| BURNOUT | UP | Burnout protection |

INPUT 2

| | | |
|---|---|---|
| INPUT 2 | ENABLE | Input 2 actuation |
| DECIMAL | XXX.X | Decimal point location |
| UNITS | XXXXX | Temperature units |
| ENGUNITS | W/M2 | Engineering units |
| IN2 TYPE | 0-5V | Input 2 actuation type |
| XMITTER2 | LINEAR | Input 2 transmitter characterization |
| IN2 HI | *see figure** | Input 2 high range value |
| IN2 LO | 0.0 | Input 2 low range value |
| BIAS 2 | 0.0 | Input 2 bias or offset |
| FILTER 2 | 0 | Input 2 filter |
| BURNOUT | UP | Burnout protection |

INPUT 3

| | | |
|---|---|---|
| INPUT 3 | ENABLE | Input 3 actuation |
| DECIMAL | XXX.X | Decimal point location |
| UNITS | XXXXX | Temperature units |
| ENGUNITS | KLUX | Engineering units |
| IN3 TYPE | 0-5V | Input 3 actuation type |
| XMITTER3 | LINEAR | Input 3 transmitter characterization |
| IN3 HI | *see figure*** | Input 3 high range value |
| IN3 LO | 0.0 | Input 3 low range value |
| BIAS 3 | 0.0 | Input 3 bias or offset |
| FILTER 3 | 0 | Input 3 filter |
| BURNOUT | UP | Burnout protection |

INPUT 4 *(6540-1, 6540-2, 6540-3)*

| | | |
|---|---|---|
| INPUT 4 | DISABL | Input 4 actuation |

INPUT 4 *(6545-1, 6545-2, 6545-3)*

| | | |
|---|---|---|
| INPUT 4 | ENABLE | Input 4 actuation |
| DECIMAL | XXXX | Decimal point location |
| UNITS | XXXXX | Temperature units |
| ENGUNITS | PERCT | Engineering units |
| IN4 TYPE | 0-5V | Input 4 actuation type |
| XMITTER4 | LINEAR | Input 4 transmitter characterization |
| IN4 HI | 100 | Input 4 high range value |
| IN4 LO | 0 | Input 4 low range value |
| BIAS 4 | 0 | Input 4 bias or offset |
| FILTER 4 | 0 | Input 4 filter |

| | | |
|---|---|---|
| BURNOUT | UP | Burnout protection |

PEN 1

| | | |
|---|---|---|
| PEN1 | ENABLE | Pen 1 record |
| PEN1IN | INPUT1 | Pen 1 input |
| CHART1HI | 50.0 | Chart 1 high range value |
| CHART1LO | 0.0 | Chart 1 low range value |
| MAJORDIV | 10 | Major chart division |
| MINORDIV | 10 | Minor chart division |
| RNG1TAG | TEMP | Range 1 tag name |

PEN 2

| | | |
|---|---|---|
| PEN2 | ENABLE | Pen 2 record |
| PEN2IN | INPUT2 | Pen 2 input |
| CHART2HI | 50.0 | Chart 2 high range value |
| CHART2LO | 0.0 | Chart 2 low range value |
| MAJORDIV | 10 | Major chart division |
| MINORDIV | 10 | Minor chart division |
| RNG2TAG | LGT1 | Range 2 tag name |

PEN 3

| | | |
|---|---|---|
| PEN3 | ENABLE | Pen 3 record |
| PEN3IN | INPUT3 | Pen 3 input |
| CHART3HI | 50.0 | Chart 3 high range value |
| CHART3LO | 0.0 | Chart 3 low range value |
| MAJORDIV | 10 | Major chart division |
| MINORDIV | 10 | Minor chart division |
| RNG3TAG | LGT2 | Range 3 tag name |

PEN 4 *(6540-1, 6540-2, 64540-3)*

| | | |
|---|---|---|
| PEN4 | DISABL | Pen 4 record |

PEN 4 *(6545-1, 6545-2, 6545-3)*

| | | |
|---|---|---|
| PEN4 | ENABLE | Pen 4 record |
| PEN4IN | INPUT4 | Pen 4 input |
| CHART4HI | 100.0 | Chart 4 high range value |
| CHART4LO | 0.0 | Chart 4 low range value |
| MAJORDIV | 10 | Major chart division |
| MINORDIV | 10 | Minor chart division |
| RNG4TAG | HUM | Range 4 tag name |

CHART {to change, recorder must be in HOLD mode; exit & press CHART if not in HOLD mode}

| | | |
|---|---|---|
| CHRTSPD | 24 HR | Chart speed selection |
| TIME DIV | 24 | Time division |
| MINORDIV | FOUR | Minor division |
| CONTINUE | YES | Continue chart rotation |
| CHARTNAM | CARON | Chart name |
| HEADER | YES | Header for chart |
| REM CHRT | NONE | Remote chart activity |

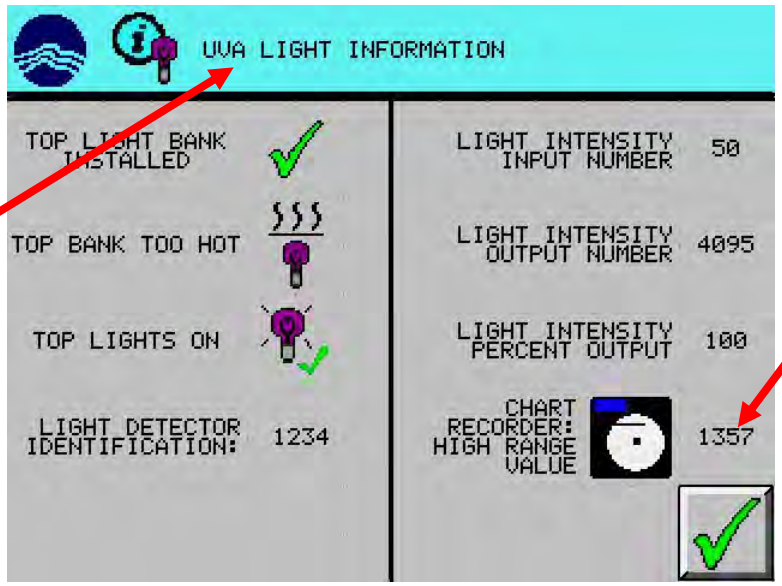
TIME

| | |
|---|---|
| MINUTES | {current minutes of day} |

| | |
|---|---|
| HOURS | {current hour of day, of 24} |
| DAY | {current day of month} |
| MONTH | {current month} |
| YEAR | {current year} |
| DAY | {current day name} |
| WAKE MIN | 00 |
| WAKE HR | 00 |
| WAKE DAY | 00 |
| WAKE MON | 01 |

*For IN2 HI, obtain the value from  (UVA LIGHT INFORMATION) screen shown below.

**For IN3 HI, obtain the value from  (VIS LIGHT INFORMATION) screen.




UVA light information screen

Input 2 high range value (IN2 HI) for UVA light intensity on chart recorder

**APPENDIX D – DECLARATION OF CONFORMITY**

# CE Compliant Product

## Declaration of Conformity CE 05

**Caron Products and Services, Inc.**
**27640 State Route 7**
**Marietta, OH 45750 USA**

---

Declares that the following product:

| | |
|---|---|
| Designation: | 6540 Series |
| Model Number: | 6540, 6545 (may have digits or numbers following) |
| Classification: | Electrical equipment intended for residential, commercial and lighting industrial environments |
| Rated Voltage: | 220-240 ~ (ac) (115 when noted) |
| Rated Frequency: | 50Hz (60Hz when noted) |
| Rated Power Consumption: | 10 amps (15 amp when noted) |

Meets the essential requirements of the following European Union Directive(s) using the relevant section(s) of the normalized standards and related documents shown:

## *89/336/EEC Electromagnetic Compatibility Directive*

| | |
|---|---|
| EN 61326:2002 | Laboratory Equipment, Immunity Measurement & Control requirements |
| EN 61000-4-2 | Electrostatic Discharge |
| EN 61000-4-3 | Radiated Susceptibility |
| EN 61000-4-4 | Electrical Fast Transient |
| EN 61000-4-5 | Lightning Surge |
| EN 61000-4-6 | Conducted Disturbances Induced by RF Fields |
| EN 61000-4-8 | Power Frequency Magnetic Field Immunity |
| EN 61000-4-11 | Voltage Variations, Dips and Interruptions |
| EN 61000-3-2:2000 | Harmonic Current Emissions |
| EN 61000-3-3:1995 +A1:2001 | Voltage Fluctuations and Flicker |
| EN 55011:1998 +A1:1999 +A2:2002 Class A, Group 1 | Radiated and conducted emissions |

## *73/23/EEC Low-Voltage Directive* ***as amended by 93/68/EEC CE Marking Directive***

| | |
|---|---|
| EN 61010-1:1994 +A2:07/95 | Safety requirements for electrical equipment for measurement, control, and laboratory use. |