Weathering
Instrumentation Products

Ci3000+
Ci4000
Ci5000

Weather-Ometer®

ATLAS®
MATERIAL TESTING SOLUTIONS

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1.0 INTRODUCTION

This manual provides instructions for the troubleshooting, calibration, maintenance and repair or replacement of all applicable systems and components of the Ci3000+, Ci4000 and Ci5000 Weather-Ometers. These procedures should be performed only by a qualified service technician. Specifications may be subject to change without notification.

Observe Precautions

Before conducting any procedures, read the warnings and precautions in Section 2.0. Doing so will help ensure your safety and minimize the potential for damage to the instrument. Beforehand, always read the procedure that you will be conducting to become familiar with the steps involved, tools required and safety precautions.

Topics Covered

This manual covers the following topics:

- Troubleshooting
  - Power-up Malfunctions
  - Xenon Lamp & Power Circuit Malfunctions
  - Humidification Malfunctions
  - Chamber Overtemperature Malfunctions
  - CS-6 Lamp Cooling System Malfunctions
  - Blower System Malfunctions
  - Temperature Control Malfunctions
  - Specimen Rack Drive Malfunctions
  - Water Spray Malfunctions
  - Water Resistivity Monitor Malfunctions
  - Optional Chart Recorder Malfunctions
  - Data Panel Malfunctions
  - PLC (Programmable Logic Controller) Malfunctions
  - Optional Data Acquisition System Malfunctions
  - Reference Material Test Malfunctions (SRM)

- Calibration
  - Black Sensor (BPT and BST)
  - Chamber (dry bulb) Sensor
  - Relative Humidity
  - Lamp Wattage
  - Lamp Irradiance
  - Air valve (Damper)
  - Rack Speed Control
  - Resistivity Monitor
  - Lamp & Rack Alignment

- Maintenance
  - Lamp Water Fitting Gasket
  - Lamp Outer Filter Cleaning
  - Light Rod End Cleaning
  - Lamp Burner Socket Inspection
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  - Demineralizer Cartridge Replacement
  - Flow Switch Filter Screen Cleaning
  - Lamp Water Reservoir Cleaning
  - Light Monitor Filter Replacement
  - Inlet Air Filter Cleaning
  - Humidifier Water Filter Cleaning
  - Humidifier - Inspection, Cleaning & Adjustment
  - Air Regulator Oil Trap Cleaning
  - Lamp, Rack & Light Rod Alignment

- Component Replacement
  - Relay Replacement
  - Sensor Replacement
  - Electric Motor Replacement
  - Solenoid Valve Replacement
  - Controller and Transmitter Replacement
  - Ignitor Replacement
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  - CS-6 Cooling Coil & Level Switches
  - Air Heater Replacement
  - Collector Ring Replacement
  - Rack Bearing Replacement
  - Chart Recorder Replacement
  - Data Panel and Software Downloading

- Appendix
  - A – PLC and Data Panel Software Configuration
  - B – Optional Yokogawa Chart Recorder Manual
  - C – Component Parts Lists

The Troubleshooting section is designed not only to help you pinpoint and verify malfunctions, but to provide a basic explanation of operating principles of the various instrument subsystems. Electrical block diagrams, while simplified, include accurate component wiring designations.

Additional Questions

If you have questions or encounter problems that are not addressed in this manual, please contact Atlas Service at (773) 327-4520, or send a fax to (773) 327-5787, Chicago, Illinois U.S.A.

5.0 TROUBLESHOOTING PROCEDURES

5.2 Xenon Lamp and Irradiance Control Malfunctions

5.2.1 Description

Irradiance is provided by the xenon lamp system which is comprised of the xenon lamp and power supply components that include the booster transformer T1, igniter L3, main reactor L1, auxiliary reactor L2 and wattage regulator AR1.

The Ci3000+ has a 4500 watt xenon lamp capable of operating from 1700 to 4500 watts. The 6500 watt xenon lamp in the Ci4000 is capable of operating within the range of 2500 to 7400 watts. The 12,000 watt lamp in the Ci5000 operates within the range of 4000 to 14000 watts.

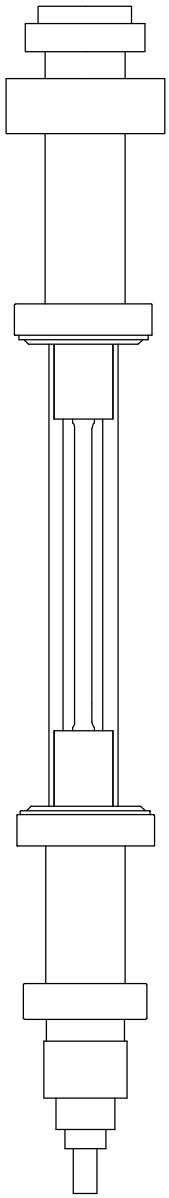
The xenon lamp receives its high-voltage ignition pulse from the igniter, which drops out of the circuit after the lamp is operating steadily. The instrument is designed to provide three ignition attempts before an ignition failure message is displayed on Data Panel MAIN page 1.

At minimum wattage, the lamp receives its power from the main reactor only. At higher wattage levels, the auxiliary reactor and wattage regulator (in series with the main reactor) contribute additional power and provide precision wattage control.

Irradiance control is provided by the light monitor which continuously monitors lamp output and provides a voltage signal to the PLC. The PLC then increases or decreases lamp wattage to maintain a stable irradiance level. Lamp wattage is continuously monitored by the wattage transducer A1 which provides a voltage signal to the PLC.

Lamp cooling is provided by the CS-6 lamp cooling system which pumps filtered D.I. water through the xenon lamp. Heat is extracted from the cooling water by a tap water coil in the CS-6 reservoir tank. In locations where tap water is expensive or its temperature is too high, an optional LiquiAir unit or a refrigeration unit may be present to provide cooling of the lamp water.

Lamp malfunctions can result from numerous causes. Ignition of the lamp can be prevented by a damaged or disconnected lamp, a CS-6 malfunction, such as low or lost water flow, or by the malfunction of a lamp circuit component. Low lamp irradiance output is often the result of burner or lamp filter aging, or expired interference filters in the light monitor. This section focuses on troubleshooting of the lamp assembly, lamp circuit components and the light monitor. For CS-6 troubleshooting, refer to Section 5.5.



65000W Xenon Lamp

5.2 Xenon Lamp and Irradiance Control Malfunctions

5.2.1 Description (cont.)

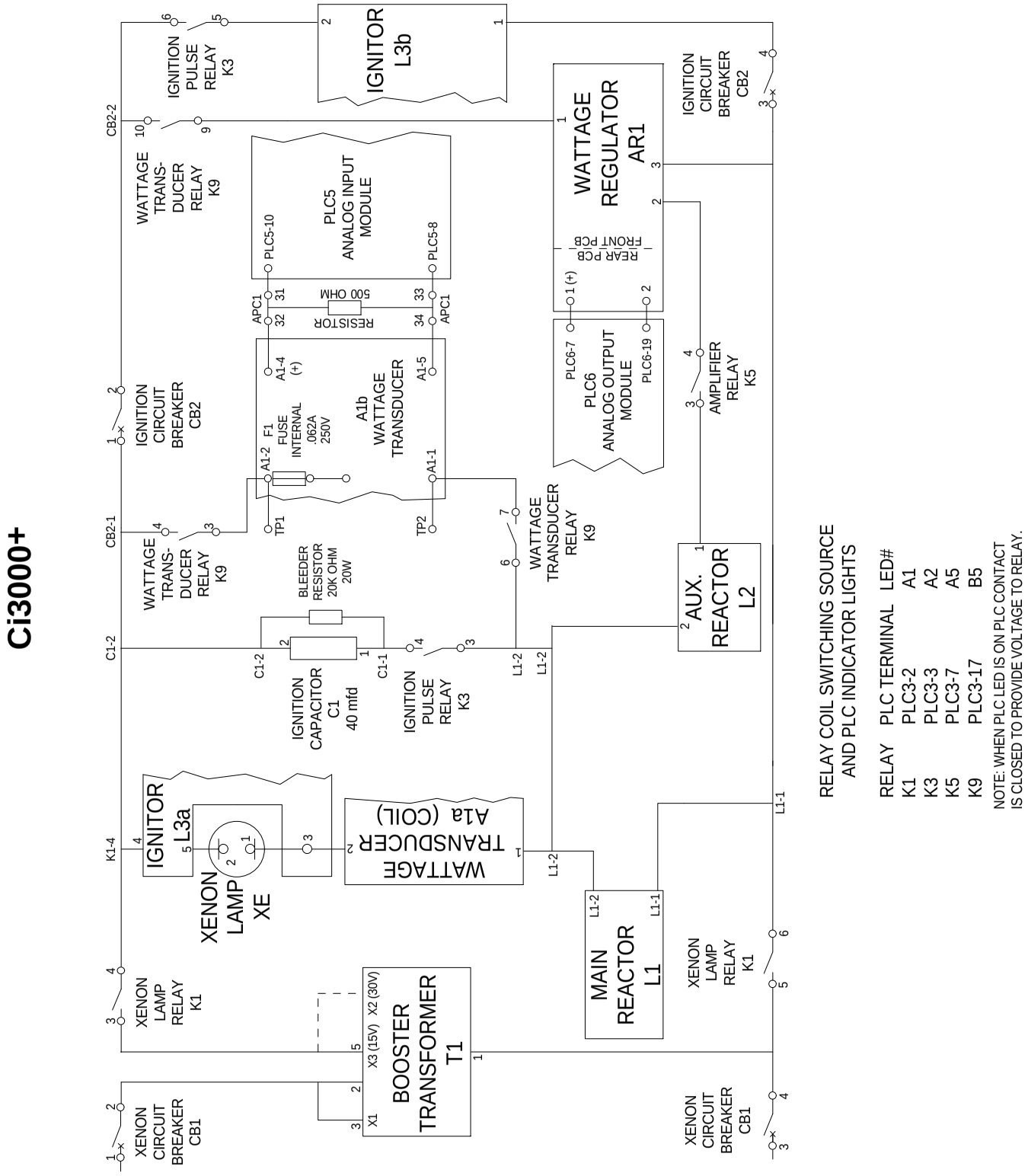


Figure 5.2 – 1 Ci3000+ Xenon Lamp Circuit

5.2 Xenon Lamp and Irradiance Control Malfunctions

5.2.1 Description (cont.)

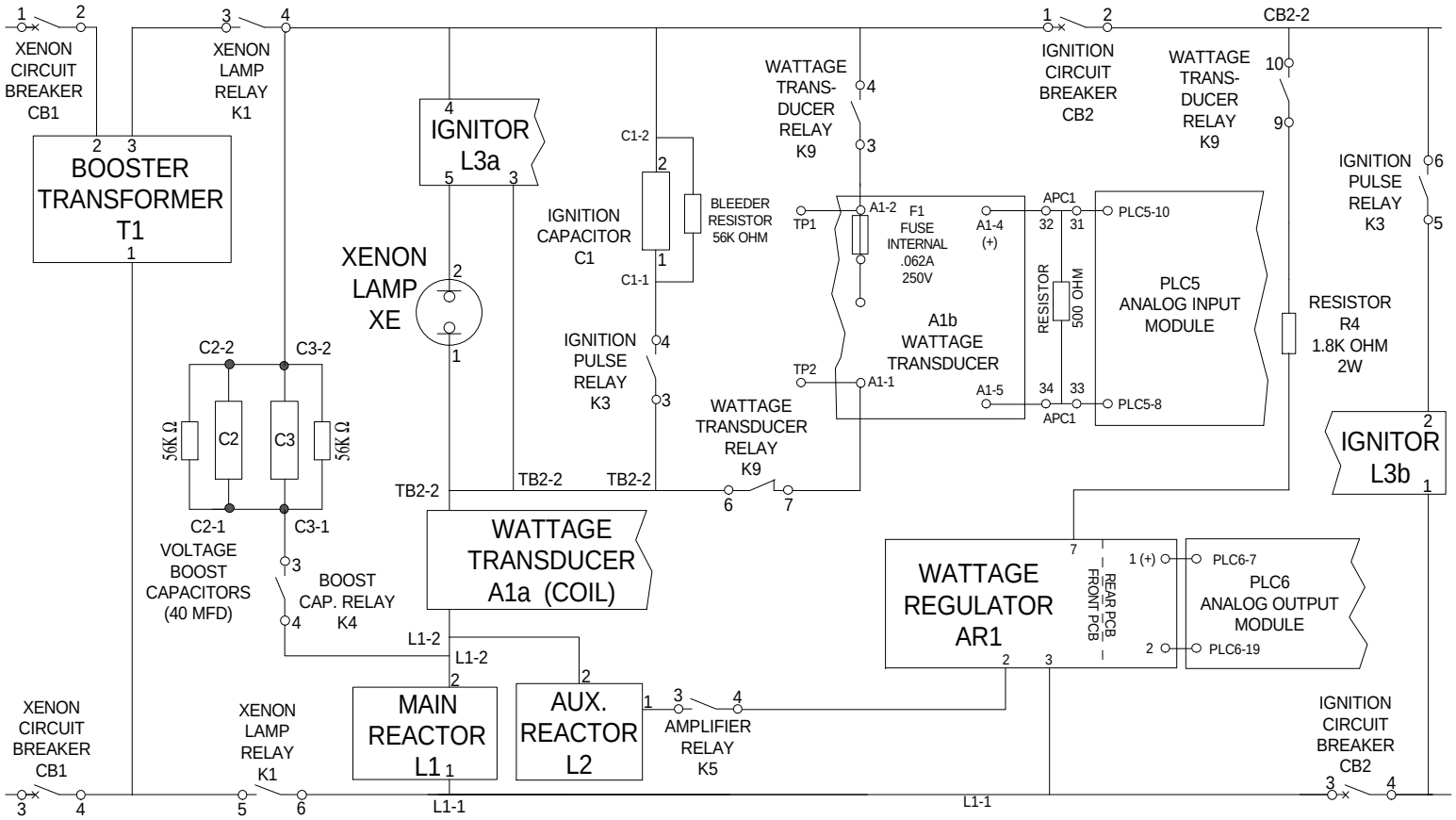


Figure 5.2 – 2 Ci4000 Xenon Lamp Circuit

RELAY COIL SWITCHING SOURCE
AND PLC INDICATOR LIGHTS

RELAY	PLC TERMINAL	LED#
K1	PLC3-2	A1
K3	PLC3-3	A2
K5	PLC3-7	A5
K9	PLC3-17	B5

NOTE: WHEN PLC LED IS ON PLC CONTACT
IS CLOSED TO PROVIDE VOLTAGE TO RELAY.

5.2 Xenon Lamp and Irradiance Control Malfunctions

5.2.1 Description (cont.)

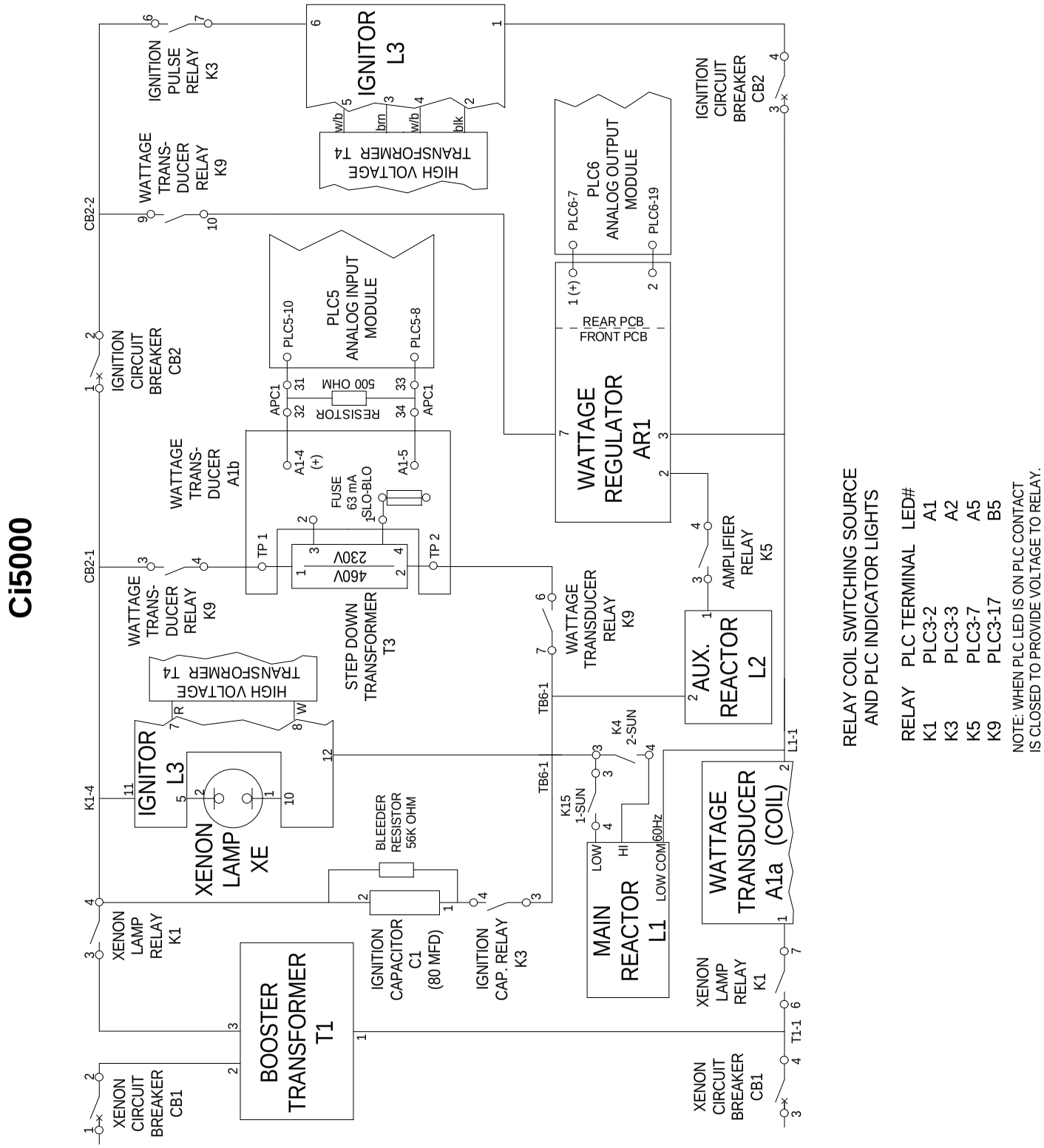
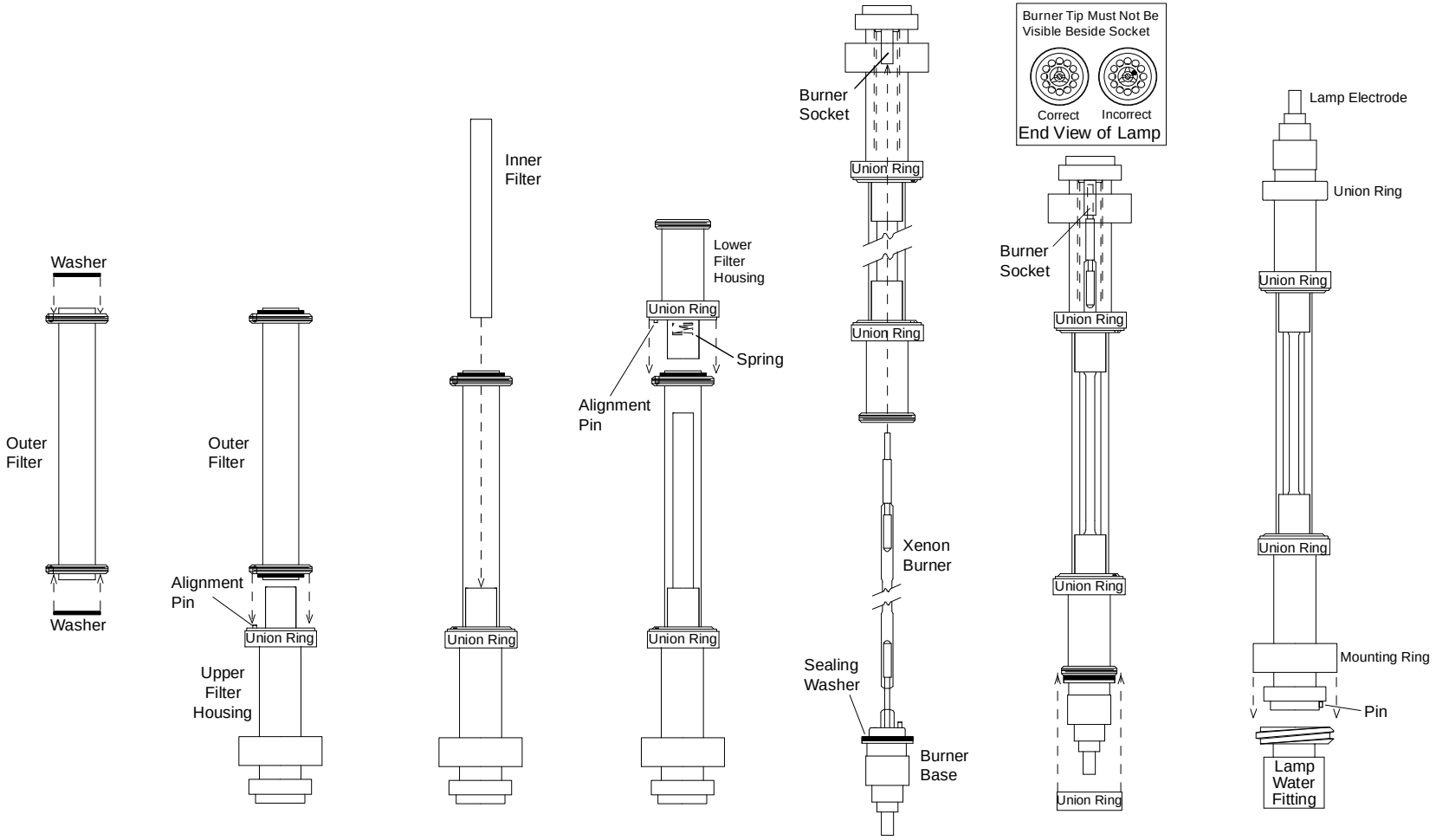


Figure 5.2 – 3 Ci5000 Xenon Lamp Circuit

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)



Install the two sealing washers onto the outer filter ends if none are in place.

Connect the upper filter housing to the outer filter. Be sure to match the alignment pin and hole. Gently hand tighten.

Hold the lamp sideways, and slowly slide the inner filter into the outer filter. Do NOT drop the inner filter in place or damage may occur.

Check that the spring inside the lower filter housing tube is in place. Connect the lower filter housing to the outer filter. Gently hand tighten the union ring.

Turn the lamp upside down. Check that the sealing washer is in place on the burner base. Slide the burner up into the burner socket. Look down through the lower filter housing to ensure that the burner tip is inside the burner socket.

Check that the burner tip is inside the socket as shown. Gently hand tighten the union ring.

Clean the outer filter with an optical cleaner or a 1:1 mixture of alcohol and acetone. Hold the lamp by the upper or lower filter housing only.

Check that there is a sealing washer inside the lamp water fitting. Connect the lamp and rotate it until the alignment pin falls into place. Gently hand tighten the mounting ring.

Figure 5.2–4 Xenon Lamp Assembly Guide

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

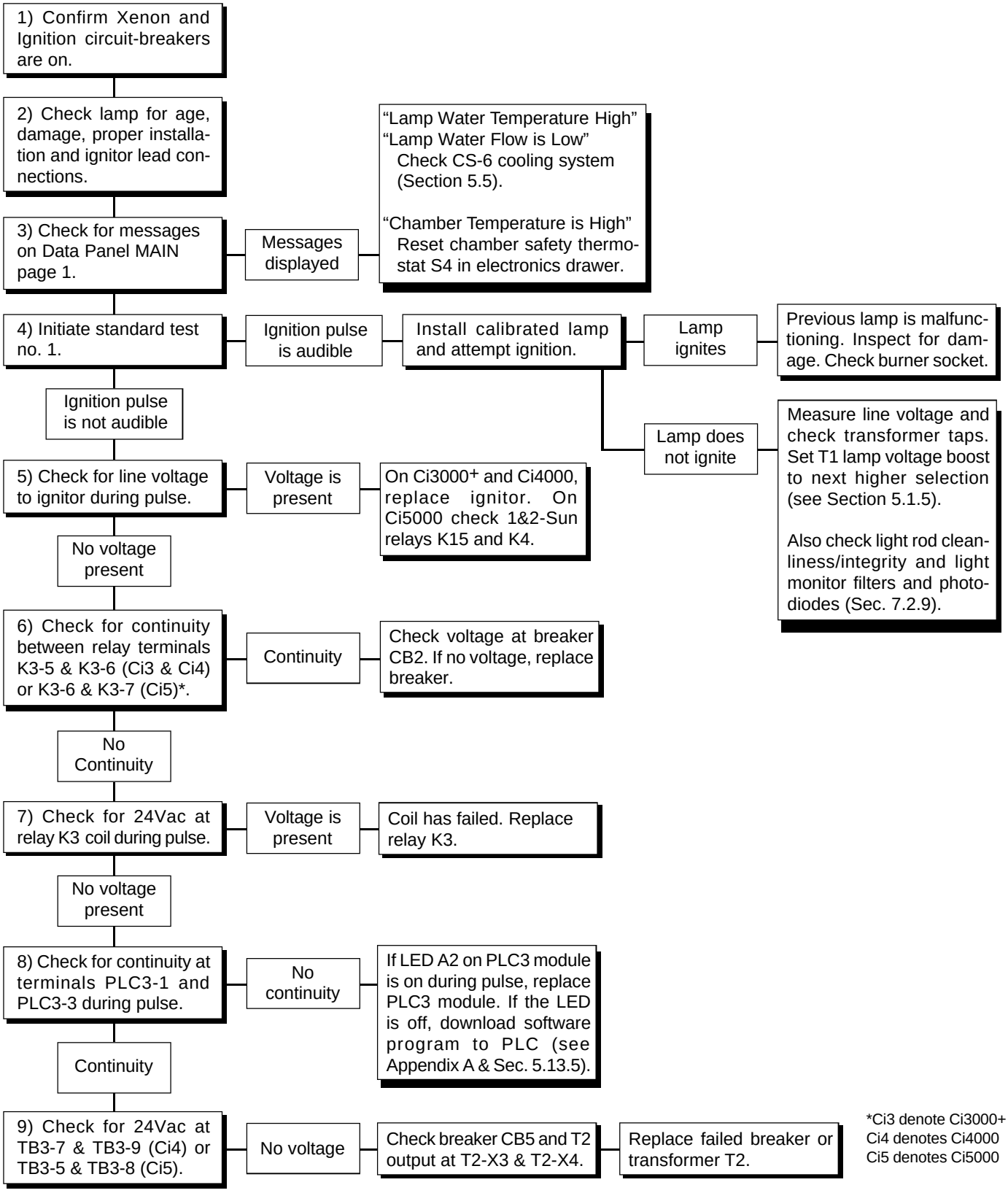
5.2.2 Troubleshooting Guide

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Lamp fails to ignite	Chamber door open or switch failure	Close door or check switch.
	Xenon lamp/ignition breakers off	Turn on circuit-breakers.
	Lamp assembled/installed incorrectly	Check lamp.
	Lamp ignitor lead off or loose	Check lead connections.
	Light rod dirty or damaged	Inspect/clean light rod.
	Light monitor malfunction	Check filters & photodiodes.
	Lamp burner socket damaged	Inspect/replace (Sec. 7.2.4).
	Low lamp starting voltage	Check/adjust taps on T1 and L1.
	CS-6 cooling water flow low	Check CS-6 (see Section 5.5)
	Ignitor malfunction	Conduct procedure in 5.2.6.
	Relay failure in lamp circuit	Conduct procedure in 5.2.6.
	PLC malfunction	Conduct procedure in 5.2.6.
Lamp output is high/low	Burner is near end of life	Replace xenon burner.
	Lamp filters expired	Replace lamp filters.
	Burner tip/socket damaged	Inspect/replace socket or burner.
	Incorrect irradiance calibration	Recalibrate (Section 6.9).
	Interference filters expired	Check/replace filters (Sec. 7.2.9).
	Light rod is misaligned	Align light rod (Secs. 7.2.14 & .15)
	Wattage regulator malfunction	Conduct procedure in 5.2.7.
Lamp will not operate above 1-Sun level (Ci5000 only)	1-Sun or 2-Sun relay failure	Perform procedure 5.2.8.
Lamp operating at excessive wattage	Burner is near end of life	Replace xenon burner.
	Lamp filters expired	Replace lamp filters.
	Burner tip/socket damaged	Inspect/replace socket or burner.
	Incorrect irradiance calibration	Recalibrate (Section 6.9).
	Interference filters expired	Check/replace filters (Sec. 7.2.9).
	Light rod is misaligned	Align per Section 7.2.14 or 7.2.15.
	Wattage regulator malfunction	Conduct procedure in 5.2.7.
No wattage display	Blown fuse F1 on A1 transducer	Check fuse.
	A1 wattage transducer board failure	Check board output w/ lamp on.

5.0 TROUBLESHOOTING PROCEDURES

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

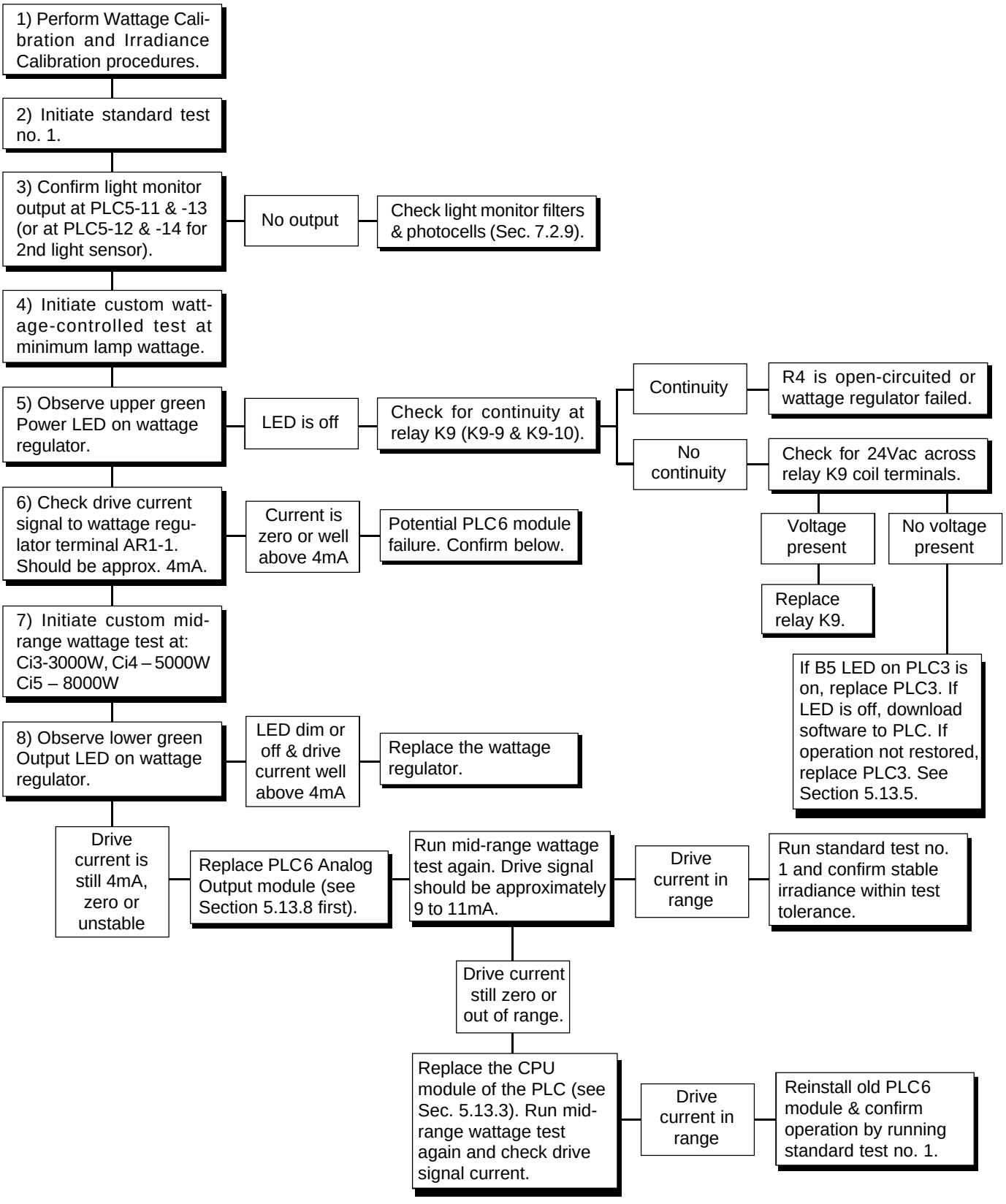
5.2.3 Troubleshooting Flow Chart - Lamp Ignition Failure



*Ci3 denote Ci3000+
Ci4 denotes Ci4000
Ci5 denotes Ci5000

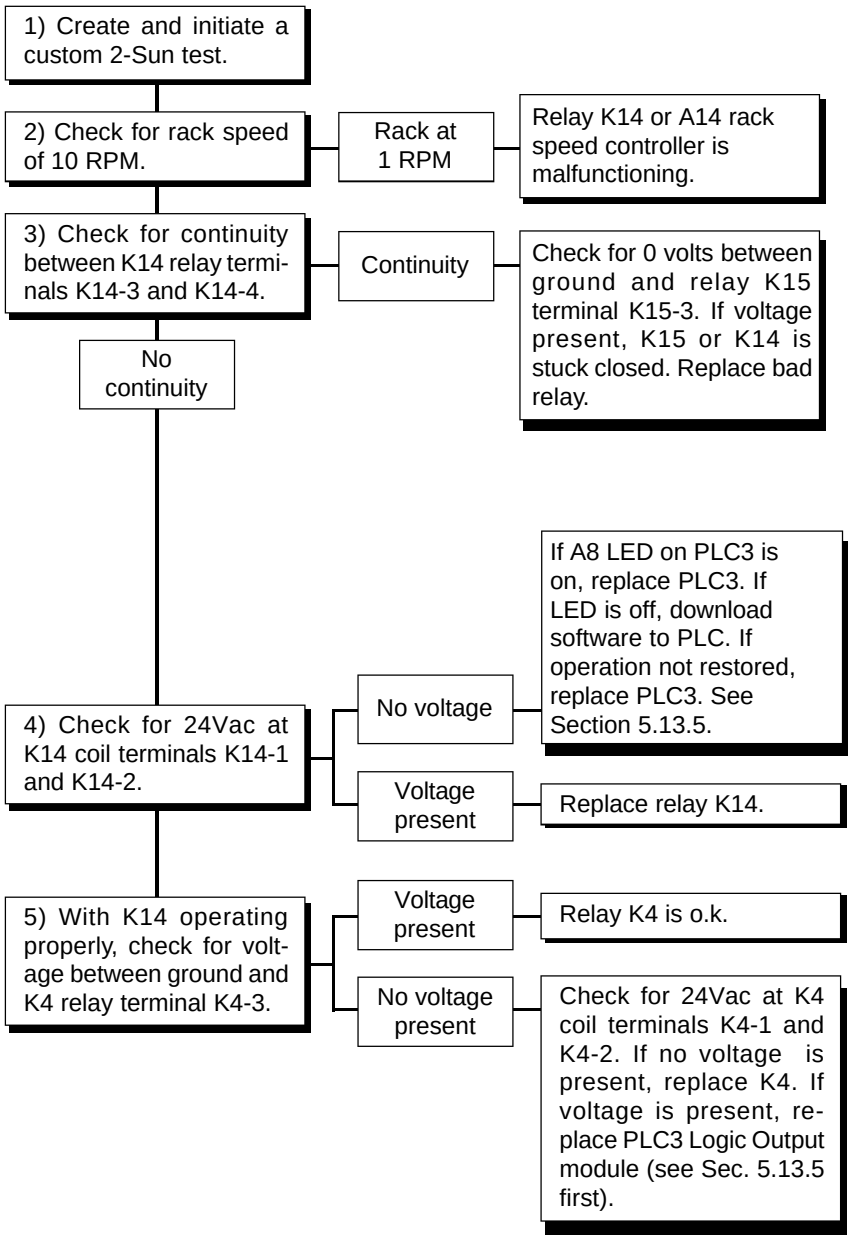
5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.4 Troubleshooting Flow Chart - Irradiance High or Low



5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.5 Troubleshooting Flow Chart - 2-Sun Irradiance Considerations (Ci5000 only)



5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.6 Troubleshooting Procedure – Lamp Ignition Failure (Ignitor)

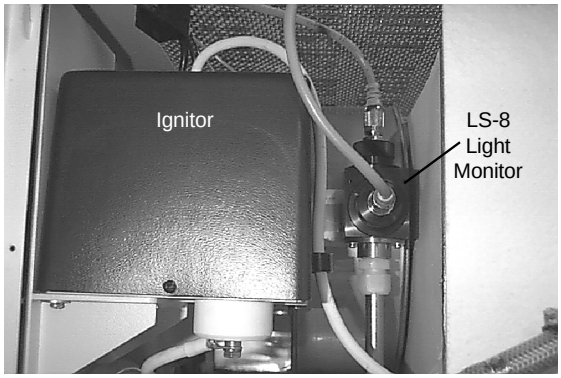


Figure 5.2 – 5 Ci3000+ Lamp Ignitor & LS-8

Figure 5.2 – 6 Ci4000 Xenon Lamp Ignitor

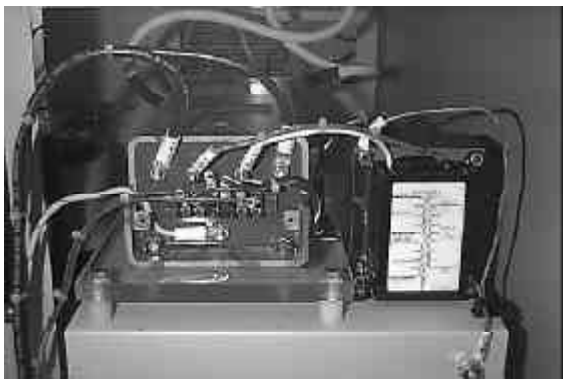


Figure 5.2 – 7 Ci5000 Xenon Lamp Ignitor

1) Ensure that the xenon lamp is properly installed and that the ignitor lead is firmly secured to the lamp electrode. Also ensure that the lamp lead connection to the ignitor terminal is secure and free of corrosion.

2) Confirm that the Xenon Lamp and Ignition circuit-breakers are turned on.

3) Check for messages on the Data Panel MAIN page 1 Messages display.

A) Check the CS-6 lamp cooling system (Sec. 5.5) if one of these messages appears:

Lamp Water Temperature High
Lamp Water Flow is Low

B) If the message “Chamber Temperature is High” is displayed, reset the chamber safety thermostat (S4) inside the electronics drawer. Press the red reset button on the thermostat.

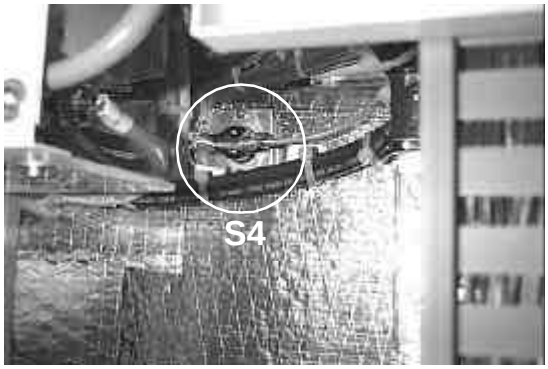


Figure 5.2 – 8 Chamber Overtemperature Thermostat

4) Initiate standard test no. 1 to attempt lamp ignition.

5) If the ignition start pulse is audible (up to 4 attempts), but the lamp will not ignite, the problem is either the lamp itself or low lamp-circuit voltage.

A) Install the calibrated reference lamp and initiate the test. If the lamp lights, then the previously installed xenon lamp is malfunctioning. Examine it for damage, burner tip and socket damage or corrosion. Check the burner age as recorded on the Xenon Burner Warranty Log card. The lamp may be at the end of its life (1200 hours or more).

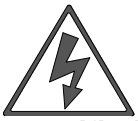
B) If the calibration lamp will not ignite, measure line voltage to the instrument and

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.6 Troubleshooting Procedure – Lamp Ignition Failure (Ignitor) (cont.)

check the transformer tap connections as described in Section 5.1.1. Set the T1 booster transformer lead T1-3 to the next higher lamp boost voltage terminal. Re-attempt lamp ignition. If the lamp still does not ignite, continue below.

Also check the light rod for cleanliness and damage. Confirm the LS-8 light sensor interference filters have not expired and that the photodiodes are functional (Sec. 7.2.9).



CAUTION: SHOCK HAZARD. Conduct step 6 below with meter leads clipped onto the specified terminals. DO NOT hold probes onto the terminals during lamp ignition or electric shock and injury may result.

Note: In the steps below you must shut the instrument off with the front panel power switch after each attempt at igniting the lamp. This will reset the lamp starting circuit.

6) Check voltage to the ignitor: Connect a voltmeter (with clip leads) to terminals L3-1 and L3-2. Attempt lamp ignition while watching the meter. The meter should indicate line voltage (230V or 480V) during the ignition pulse.

A) If line voltage is present during the ignition pulse, the ignitor has failed. Replace it (see Section 8.6).

B) If no voltage is present, continue below.

7) Check relay K3 operation: During an ignition attempt, check for continuity between the terminals of Ignition Pulse Relay K3. There should be continuity for 1 second during each ignition pulse between terminals:

Ci3/4000 - Terminals K3-5 and K3-6
Ci5000 - Terminals K3-6 and K3-7

A) If there is continuity across the K3 contacts during the ignition pulse, then there is a problem with the line voltage supply to the relay. Check wiring to the relay and voltage at the CB2 Ignition circuit-breaker terminals CB2-2 and CB3-4. There should be line voltage between each terminal and ground. If not, replace the circuit-breaker.

B) If the relay does not activate, its coil is bad or the PLC is not sending it an activation signal or the 24Vac supply to the PLC is bad.

B1) Check for 24Vac on the relay coil during the ignition pulse. If 24Vac is present, the coil is bad. Replace the relay (see Section 8.1).

B2) During the ignition pulse, check for continuity between terminals PLC3-1 and PLC3-3. If there is no continuity, and the A2 LED on PLC3 is on, replace the module (see Section 5.13.5 first). If A2 is off, download the PLC software program to the PLC.

B3) Check for continuous 24Vac across:

Ci3/4000 – TB3-7 and TB3-9
Ci5000 – TB3-5 and TB3-8

This is the 24Vac supply to the 24Vac control circuit. If 24Vac is not present, check circuit-breaker CB5 and the 24Vac output of the isolation transformer T2 at terminals T2-X3 and T2-X4. Replace the failed breaker or transformer.

5.2.7 Troubleshooting Procedure – Irradiance Low or High (Wattage Regulator)

To maintain an accurate and stable irradiance level during a test, the PLC receives a signal from the light monitor (at PLC5-11/-13 or PLC2-12/-14), compares it to the irradiance setpoint reference, and then alters its output (at PLC6-7/-19) to increase or decrease wattage regulator output.

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.7 Troubleshooting Procedure – Irradiance Low or High (Wattage Regulator) (cont.)

This drive signal is applied to terminals AR1-1 and AR1-2 of the wattage regulator AR1.

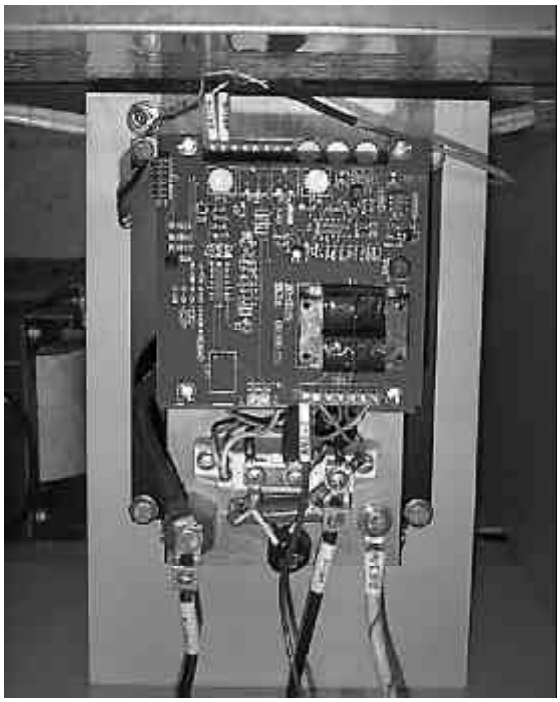


Figure 5.2 – 9 Xenon Lamp Wattage Regulator

Troubleshooting consists of first confirming light monitor operation and its output signal to the PLC. Then the instrument is operated at constant wattage and the PLC output signal to the wattage regulator is checked. If a stable drive signal is present, but lamp operation is erratic or out of wattage tolerance, it is likely that the wattage regulator is malfunctioning.

1) Perform the Wattage Calibration (Sec. 6.8) and then the Irradiance Calibration (Sec. 6.9) to eliminate calibration as a contributive factor.

2) Initiate standard test no. 1 SAE J-1885. Set it up so the lamp will operate for 30 minutes.

3) With the lamp operating, confirm that the voltage signal from the light monitor is present at the PLC terminals PLC5-11 and PLC5-13 (or at terminals PLC5-12 and PLC5-14 if the optional sensor is installed and is controlling irradiance).

A) If no voltage is present, there is a problem with the light sensor wiring, interference filter or the photocell. Check each of these before continuing (See Section 7.2.9).

B) If the signal is present, the light monitor is functioning properly.

4) Shut off all power to the instrument at the wall-mounted disconnect switch.

5) Disconnect the AR1-1 lead from the wattage regulator and connect an ammeter in series with

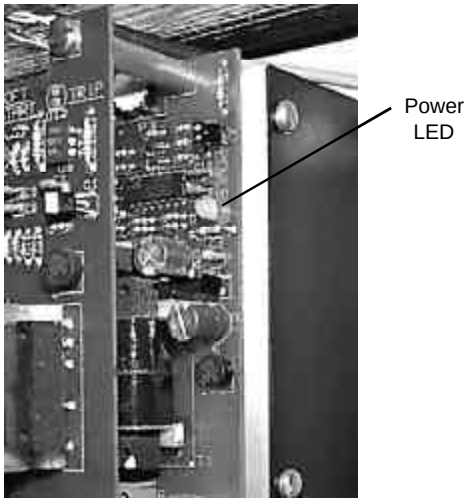


Figure 5.2 – 10 Wattage Regulator Power LED

the lead and terminal AR1-1. This will allow measurement of the 4-20mA drive signal from the PLC to the wattage regulator.

6) Apply power to the instrument. Initiate a custom test using wattage control rather than irradiance control. Set the wattage level to minimum for the lamp type in use (1700 watts for Ci3000+, 2500 watts for Ci4000, 4000 watts for Ci5000). Set the test duration to 30 minutes.

7) Observe the LED indicator lights on the wattage regulator. **With power on and the xenon lamp operating**, the upper green lamp should be on indicating that the regulator is receiving power.

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.7 Troubleshooting Procedure – Irradiance Low or High (Wattage Regulator) (cont.)

A) If the LED is off, check for continuity across terminals K9-9 and K9-10 of relay K9. If there is continuity, then resistor R4 (Ci4 only) is open-circuited or the wattage regulator has failed. Replace the regulator per Section 8.7.

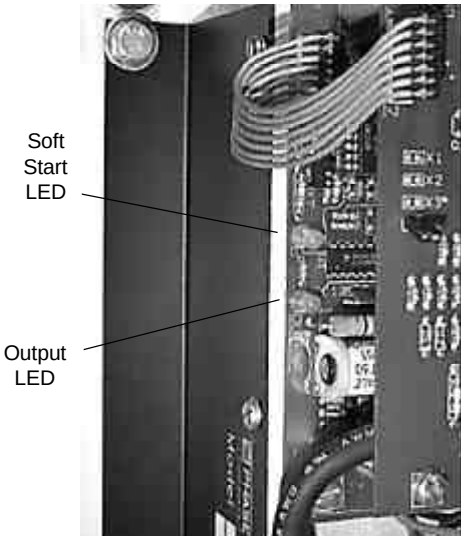


Figure 5.2 – 11 Wattage Regulator Output LED

B) Check for 24Vac volts across the K9 relay coil terminals K9-1 and K9-2.

B1) If voltage is present, and there is no continuity between terminals K9-9 and K9-10, replace relay K9 per Section 8.1.

B2) If voltage is not present, and the B5 LED on PLC3 is on, replace the PLC3 module (see Section 5.13.5). If B5 is off, download the software program to the PLC. If this fails to restore operation, replace PLC3.

8) Observe the ammeter on the AR1-1 terminal. It should display a reading of approximately 4mA.

A) If the ammeter reading is zero, or well above 4mA, there is potentially a problem with the PLC Analog Output PLC6 module. (This will be checked in a later step.)

9) Stop the wattage test and alter it to the mid-range operating wattage level shown below.

Ci3000+ – 3000 watts
Ci4000 – 5000 watts
Ci5000 – 8000 watts

10) Initiate the new test to ignite the lamp.

11) Observe the green LED indicator light on the lower circuit board of the wattage regulator. This is the output indicator and becomes brighter as output increases. It should be on brightly.

A) If the LED is very dim or off, and the ammeter reading is well above 4mA, there is a problem with the wattage regulator output. Replace the regulator (Section 8.7).

B) If the ammeter reading is zero, still at 4mA or is unstable, there is a problem with the PLC Analog Output PLC6 module or the PLC CPU (PID settings, corrupt PLC software or CPU failure).

B1) Replace the PLC6 module (see Sec. 5.13.8 first). Run the mid-range wattage test again. Check the level and stability of the ammeter reading. It should be very stable and approximately 5 to 10 mA.

B2) If replacement of the PLC6 module does not correct the problem, download the custom programs from the PLC to a laptop computer and replace the CPU module of the PLC (see Sections 5.13 and Appendix A). Upload the custom programs and the correct PLC operating software. Run the mid-range wattage test again and observe the ammeter reading for stability. If this corrects the problem, reinstall the old PLC6 module and confirm operation.

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.8 Troubleshooting Procedure – 2-Sun Irradiance Considerations

If the xenon lamp in the Ci5000 fails to operate at higher (2-Sun) irradiance levels, there may be a malfunction of the 1-Sun or 2-Sun relays, or the components driving them (Fig. 5.2–9). Additionally, if the error message “Test Irrad. Not Match with Filters” appears on the screen at the start of a test, it indicates that the irradiance level chosen is in the 2-Sun range and you must recalibrate the lamp for this irradiance level.

2-Sun irradiance levels are defined as follows:

0.70 W/m^2 or higher @ 340 nm filter
1.40 W/m^2 or higher @ 420 nm filter
75.0 W/m^2 or higher @ 300-400 nm filter

At 1-Sun irradiance levels, the rack rotates at 1 RPM. At 2-Sun levels it rotates at 10 RPM. Relay K14 switches the input to the rack speed controller. Conduct the procedure below to determine the cause of 2-Sun operation failure.

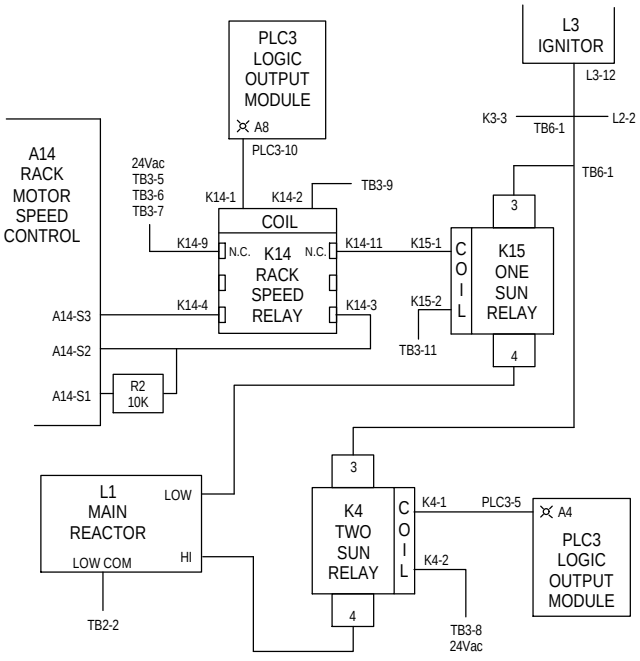


Figure 5.2 – 12 One and Two Sun Circuit Block Diagram

1) Program a custom, 2-sun irradiance test with the parameters shown below.

Test List (Data Panel page 6)
Select an unused Custom test. Press F6, the test number and Enter three times. Press F2.

Test Criteria (Data Panel page 7)

Total Segments	1
Duration Units	Time
Black Sensor	BPT
Black Temp. Active	Yes
Radiation@filter	**340** nm
Chamber Temp. Active	No

Segment (Data Panel page 8)

Segment Number	1
Light or Dark	Light
Time or Irradiance	30 min.
Irradiance	**1.50** W/m^2
Black Temp.	80 °C
Chamber (DB) Temp.	60 °C
Relative Humidity	0 %

Segment (cont.) (Data Panel page 9)
Set sprays to off.

Test List (Data Panel page 6)
Press F8. Press F5, the custom test number and Enter three times to load the new custom test.

Run/Stop Segment (Data Panel page 3)
Test Duration 0 hours 30 min

2) Press F4 on RUN/STOP page 3 to start the test.

CAUTION: SHOCK HAZARD
In the procedures below, you must check for voltages at live electrical terminals. Avoid contact with component terminals and wear insulated gloves to prevent electrical shock.

3) When the Ci5000 is running a test at 2-Sun irradiance level, the rack should be rotating at 10 RPM. Check rack speed. If it is rotating at 1 RPM, relay K14 or the rack speed control A14 is malfunctioning (see Section 5.8).

5.2 Xenon Lamp and Irradiance Control Malfunctions (cont.)

5.2.8 Troubleshooting Procedure – 2-Sun Irradiance Considerations (cont.)

In 2-Sun mode, PLC3 de-energizes (closes) the 2-Sun relay K4. It also energizes relay K14 causing the 1-Sun relay relay K15 to open. K14 also causes closure of contacts A14-S2 and A14-S3 of the A14 rack speed control board to provide 10 RPM rack rotation (see Fig. 5.2–9).

3) Check for continuity between terminals K14-3 and K14-4.

A) **If there is continuity**, relay K14 is likely operating properly. Check for voltage between ground and terminal K15-3 of relay K15. It should be 0 volts. If voltage is present, K15 is stuck closed or contacts K14-9 and K14-11 of relay K14 are stuck closed. Replace the malfunctioning relay (Sec. 8.1).

B) **If there is no continuity**, check for 24Vac at the K14 coil terminals K14-1 and K14-2. If voltage is present, replace K14. If no voltage is present, and the A8 indicator light on PLC3 is off, download the software program to the PLC. If indicator light A8 is on, replace the PLC3 Logic Output module (see Section 5.13.5 first).

4) With relay K14 operating properly, check for voltage between ground and terminal K4-3 of relay K4.

A) If voltage is present, K4 is o.k.

B) If voltage is not present, check for 24Vac at the K4 coil terminals K4-1 and K4-2. If voltage is present, the PLC3 Logic Output module is malfunctioning. Replace it (see Section 5.13.5 first). If voltage is not present, relay K4 is stuck open. Replace K4 (Sec. 8.1).

8.2 Sensor Replacement (cont.)

8.2.7 Light Monitor Photodiodes

The LS-8 Light Monitor, used on the Ci5000, Enhanced Ci4000and Ci3000+, includes one or two capsules that contain an interference filter and a photodiode. Light from the xenon lamp is transmitted to the photodiode via the quartz light rod. The photodiode produces a microampere (µA) output proportional to the light intensity it receives passing through the interference filter.

Older Ci4000 instruments have either a single light sensor in a sheetmetal enclosure or an optional dual band sensor in a machined aluminum housing.

In all three light monitors, the types of photodiodes used are the same, but their mountings differ.

Note: The photodiode used with a 340 or 420nm narrow-band interference filter is different than the one used with a 300-400nm wide-band filter. Do not mix them.

Photodiode Part Numbers

	340nm	420 nm	300-400 nm
Older Ci4000	09-3515-00	09-3515-00	09-3493-00
Ci3+, Ci5 & Ci4000 Enhanced	09-3529-00*	09-3530-00*	09-3531-00*

*LS-8 capsule assembly including photodiode

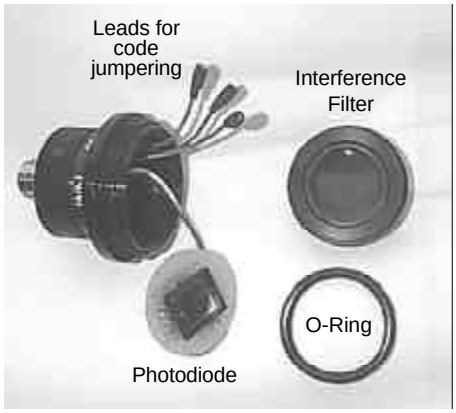
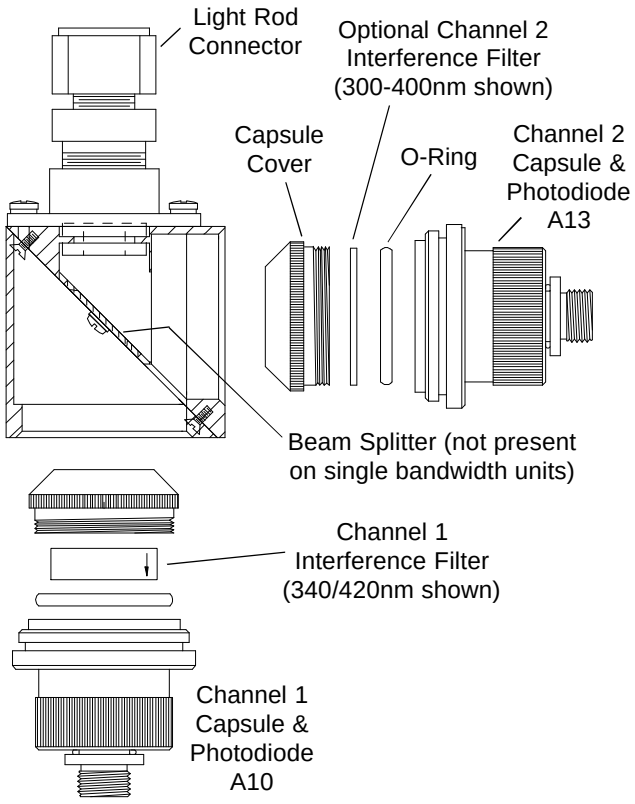
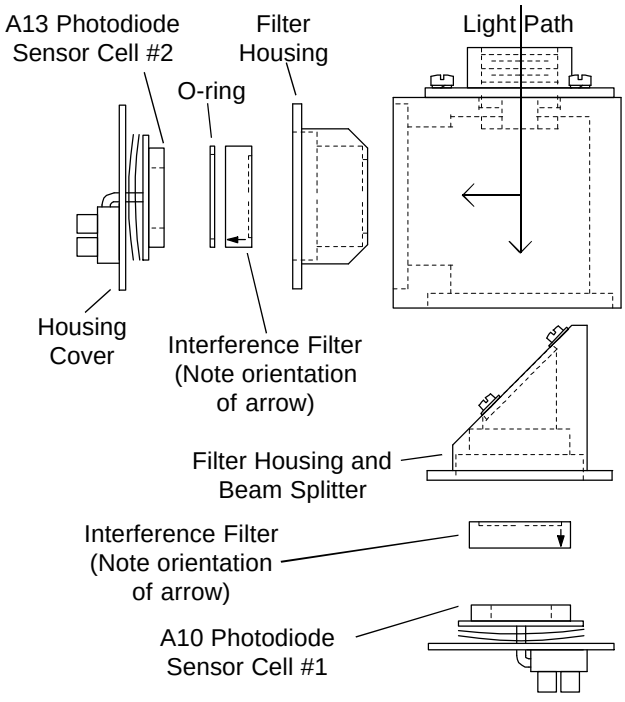


Figure 8.2 – 7 LS-8 Light Sensor Capsule Assembly



Ci3000+, Ci5000 & Enhanced Ci4000 Light Sensor



Older Ci4000 Dual Bandwidth Light Sensor

Figure 8.2 – 8 Dual Bandwidth Light Sensors

8.2 Sensor Replacement (cont.)

8.2.7 Light Monitor Photodiodes (cont.)

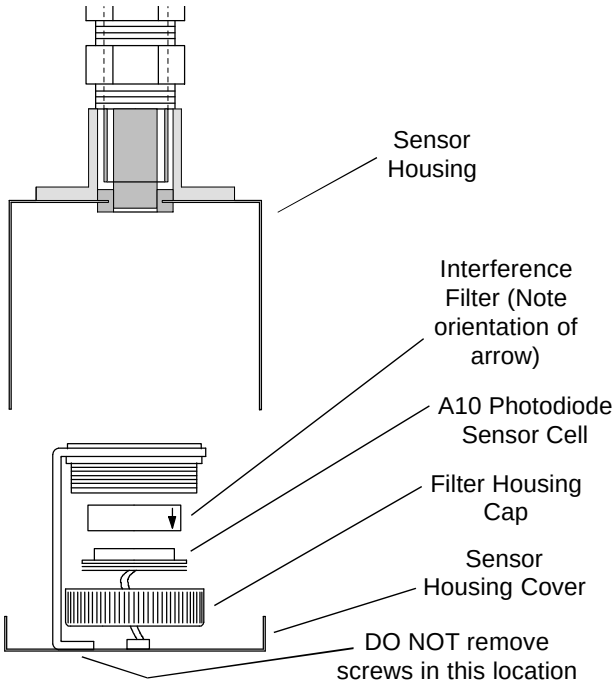


Figure 8.2 – 9 Older Ci4000 Single Bandwidth Light Sensor

Guidelines

1) The photodiode is fragile. Handle it with care and avoid touching its front window. If you do, clean it with alcohol or optical cleaner and a soft cloth. This applies to the interference filters as well.

2) Always ensure that the direction arrow on the 340 or 420nm filter is pointing toward the photodiode (direction of light travel) when assembling the light sensor. The 300-400nm filter may be installed either way.

3) DO NOT attempt to install a photodiode normally used with the 340/420nm filter in place of the one used with the 300-400nm filter, or vice versa. The spectral response of each is different and will result in erroneous readings.

8.2.8 Chamber Overtemperature Thermostat

This thermostat is accessed from inside the electronics drawer (but may be easier to replace by removing the right-side access panel).

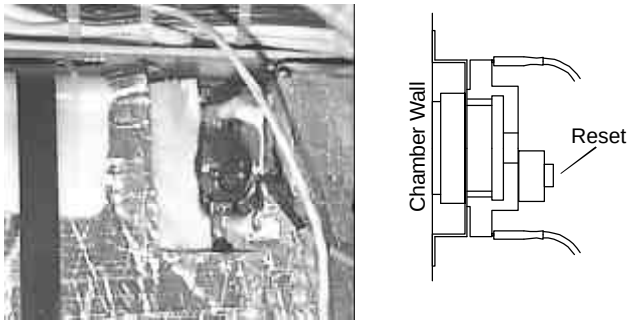


Figure 8.2 – 10 Chamber Overtemp. Thermostat S4

Guidelines

1) The face of the thermostat must be in contact with the exterior wall of the test chamber. Apply a small amount of silicon thermal grease to the face of the thermostat when mounting a new one. (Thermal grease is commonly used in the electronics industry when mounting transistors to heat sinks to improve thermal transfer.)

2) Apply sealant to the mounting screws. The screws extend into the test chamber and could allow leakage without sealant in place.

8.2.9 Chamber Overtemperature Sensor (Older Ci4000 only)

On some of the early Ci4000 instruments, a Chamber Overtemperature alarm was included beside the Lamp Cooling Water Controller in the top section. It has an RTD temperature sensor mounted in the test chamber.

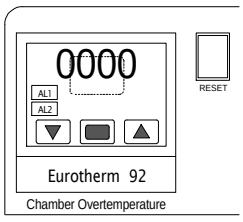


Figure 8.2–11 Chamber Overtemperature Alarm

Replace the three-wire sensor by disconnecting it from the back of the alarm. Remove the old sensor from the test chamber taking note of its insertion depth in its mounting. Install the new sensor.

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