

Tunable Light Source Setup User Manual

V2.2.0

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1. Shipping and Unpacking

1.1 Unpacking

The instrument is packaged in such a way as to minimize damage during transport. If the package is damaged or if after unpacking any signs of damage become apparent, a claim should be filed with the carrier immediately.

If the instrument must be returned, contact Sciencetech Inc. for approval prior to shipping. A full description of the reason for return should be included.

Inspect the exterior of your system for any noticeable defects. If any are present, contact Sciencetech Inc. immediately.

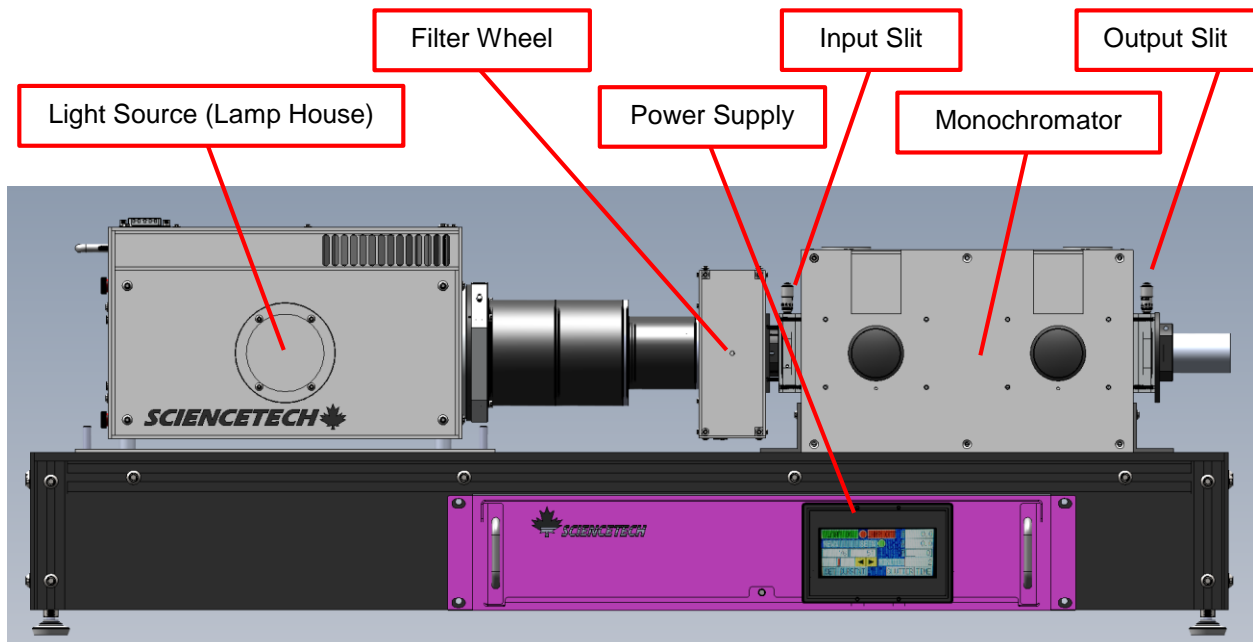
The lamp is uninstalled before shipment. Before the lamp installation identify what type of lamp will be used.

1.2 Included Components

The packing box should contain the following components:

- Tunable Light Source
- Power Supply Cable
- Requested Lamp
- Communication Cables

To prevent damage during shipment the arc lamps are shipped in a separate box and must be installed before operating the unit. Your system may not be pictured exactly as below.



2. Lamp Handling and Warning

WARNING:

Before servicing the lamp housing, be sure to disconnect the electrical connections and completely drain the cooling system (if water cooled). Make certain the lamp is at room temperature. Remember to wear eye and face protection when working around arc lamps. Follow the manufacturer's general information sheets for handling and operating the bulb.

2.1 Arc Lamps

Lamps purchased directly from other manufacturers may not meet our specifications for operation and may cause permanent damage to the housing and to the reflector. Use of such lamps will void the warranty.

WARNING:

Arc lamps can be used for a MAXIMUM of 1000 hours. Exceeding 1000 hours can cause damage to the quartz bulb and may result in explosion of the lamp.

The gases inside arc lamps are under extreme pressure, especially during operation (from 10 atmospheres for large lamps, up to 30 atmospheres for small lamps). Therefore the lamp housing must be closed at all times during operation. Furthermore, precautions must be taken to ensure protection from ultra-violet radiation emissions. Special storage cases are provided to eliminate possible hazards during shipping and handling. **Safety goggles and soft cotton gloves should be worn when removing and installing lamps. Never touch the quartz envelope with bare hands; such handling may lead to the deterioration and premature failure.** If accidentally handled, clean the lamp surface with an alcohol swab to remove any residue.

WARNING:

Never look directly at an operating lamp; severe eye injury will result. Wear UV protective lenses, such as welder's goggles, when working on or around lamps.

2.2 Mechanical Handling

A short arc high-pressure xenon lamp is used. The arc lamps are extremely robust. They must withstand the mechanical stresses exerted by their heavy electrodes – especially the anode, which can weigh up to 400g – and the high internal pressure of up to 30 bar (even more in low-wattage lamps). However, they are still made of glass and need to be handled accordingly; they must be protected against shock, impact and excessive force. Certain precautions must be observed when handling them.

Arc lamps are supplied in a safety cover. This protects users from possible spontaneous or induced bursting of the lamp. There is enough energy stored in the lamp bulb to send quartz splinters flying several meters across a room.

When the lamp is installed, its safety cover must not be removed until after it has been fitted in the lamp housing and shortly before the housing is closed. Wear protective goggles or complete face protection covering the arteries and veins of your neck, such as a transparent plastic mask. If the design of the lamp housing does not permit the lamp to be fitted together with its safety cover, it should be wrapped in strong lint-free cloth.

In some types of lamps the safety cover acts a tool for screwing the lamp into its holder at the cathode end. **Under no circumstances must force be exerted on the bulb during installation. For example, screwing in the cathode base by holding and turning the lamp at its anode base is grossly negligent.**

The lamp may only be clamped in position at one end in order to allow for expansion and distortion of the housing. Small (short) lamps can be left free and unsupported at the other end. Larger lamps must have a soft, flexible support, which calls for a mechanical solution. It should support the lamp but allow unrestricted expansion, including expansion perpendicular to the lamp axis. Lamps may only be stored if suspended freely from their bases in their (open) safety covers. Leaving them to roll around unprotected on a desk or shelf can result in microcracks in the surface of the quartz glass, causing lamps to burst later on.

If the lamp is inadvertently operated inside its safety cover the sleeve will melt within a few seconds and the lamp will be unusable.

When removing lamps the reverse procedure must be followed: first put the safety cover on the lamp, then remove the lamp.

Similar precautions must be observed for connecting arc lamps electrically as for handling them mechanically. All electrical connections must fulfill the criteria for high-current connections. Connecting components must be clean and offer the maximum contact area. In cases of doubt, it is better to recondition or preferably replace the contacts rather than risk lamp failure due to corroded and overheated contacts. In most cases good electrical contact is synonymous with good thermal contact to dissipate the heat produced by the lamp.

Care must be taken to ensure that the lamp is connected with correct polarity; the positive pole of the rectifier must be connected to the base marked (+), the negative pole to the base marked (-). Incorrect polarity results in total lamp failure within a few seconds; the cathode fuses over immediately as a result of being overloaded while acting as the anode.

Arc lamps must only be held by their base. Damage to the glass may cause the lamp to break during later operation.

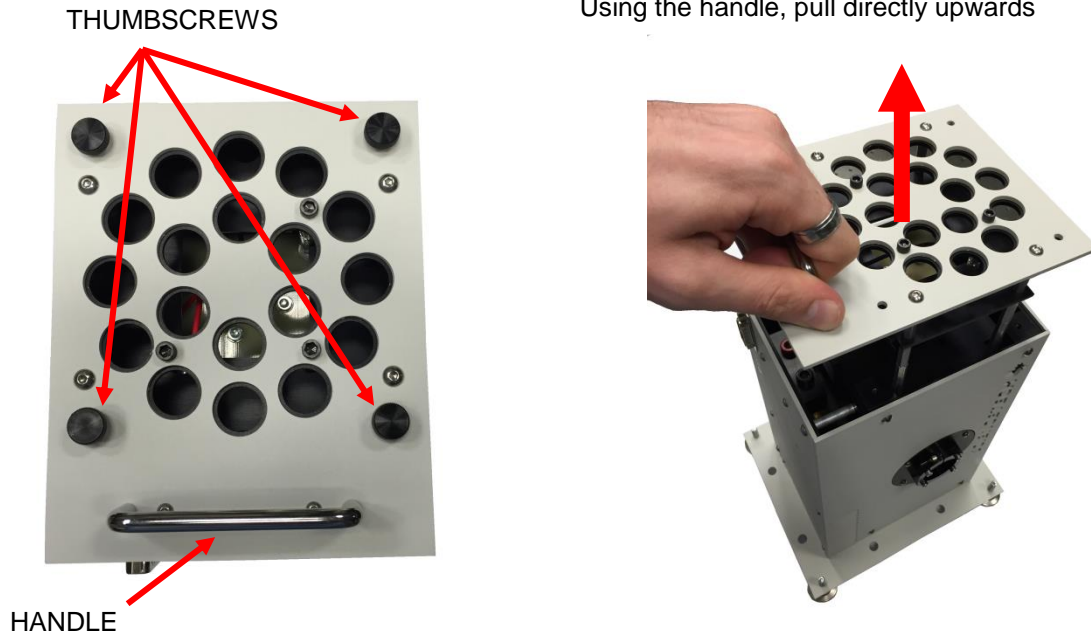
If the quartz bulb or the shafts should ever be inadvertently touched with bare fingers (which should never happen because unprotected lamps should only ever be handled with soft cotton gloves), the fingerprints must be removed immediately. A lint-free alcohol-moistened cloth is best for this, after which the lamp should be rubbed dry, taking care not to scratch the quartz glass surface. If fingerprints are not removed they burn into the quartz glass surface where they act as a seed for ever-expanding recrystallization of the glass. This causes the glass to lose its strength and increases the risk of bursting.

3. Arc Lamp Installation

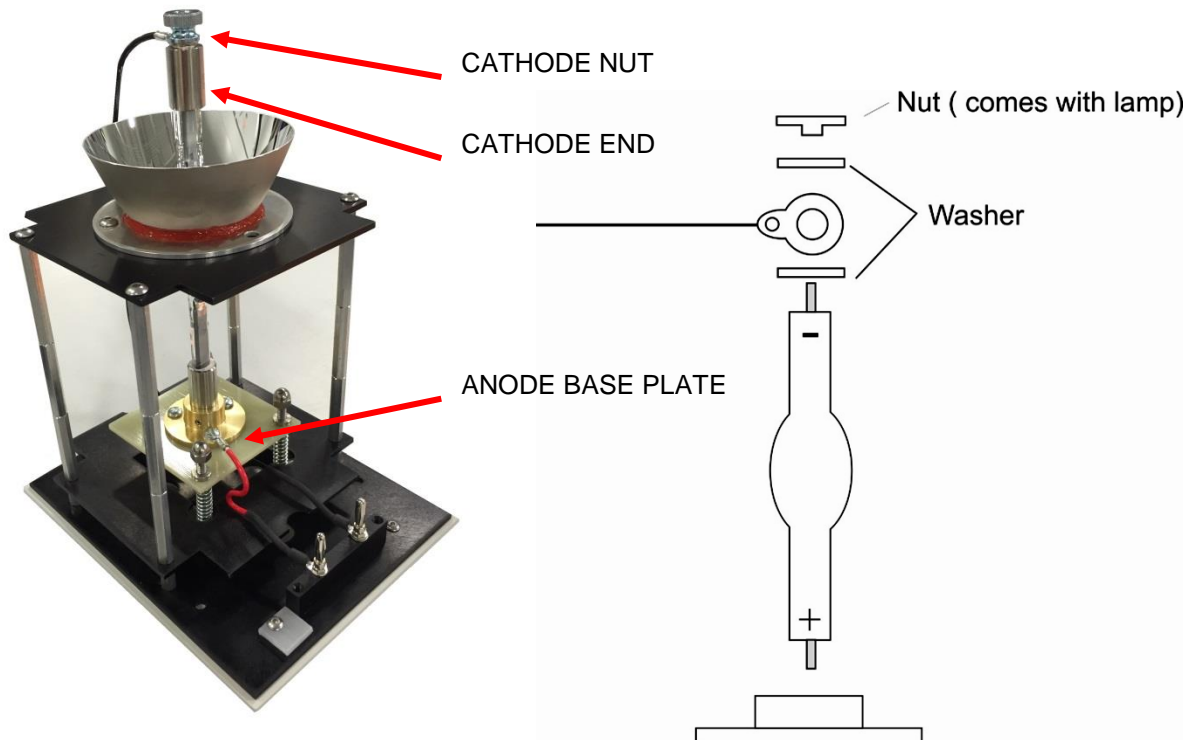
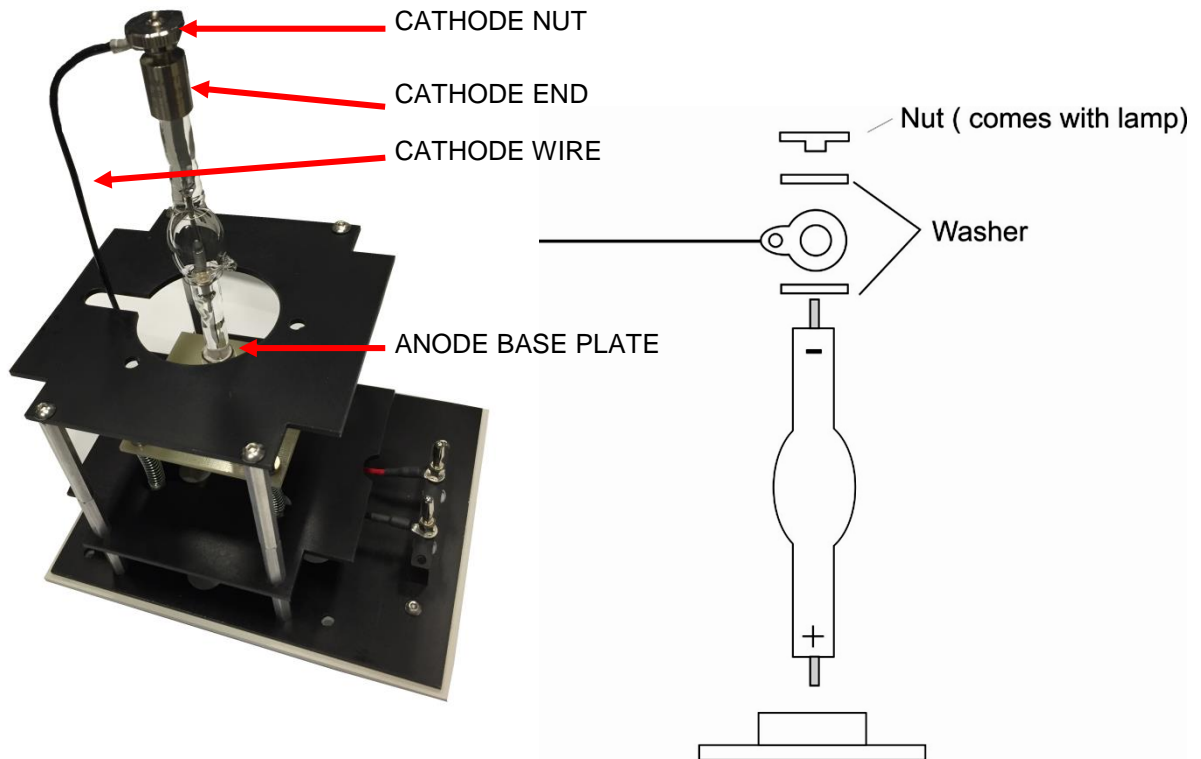
3.1 TLS-55/72-X300 Lamp Installation

The following procedure can be used to install the XENON ARC LAMP into the housing:

1. Remove the four thumbscrews on the TOP of the lamp housing.



2. Very carefully pull the top off of the lamp housing. The top of the lamp house should be pulled directly upwards. There is a puzzle piece shape attached to the lamp house top plate and must be pulled directly upwards or it will not fit through the exit opening. The lamp may be positioned extremely close to lenses inside the lamp house.
3. Refer to Section #4 for proper handling of the bulb.
4. Install the lamp by screwing the anode (+) into the brass base. Hold the lamp by the anode base as you screw the lamp into place.
5. Attached the cathode wire (black wire with round washer/lug) to the cathode end of the lamp. Secure the cathode wire lug to the lamp cathode with the included nut (washers not included or needed on all models).



6. Screw the nut tight with your hand. Support the lamp cathode against the turn so that no stress is transferred to the glass.
7. Ensure PROPER POLARITY of the lamp (i.e. RED to ANODE and BLACK to CATHODE).
8. CAREFULLY replace the top panel of the lamp housing. **As you insert the lamp tilt it towards the rear reflector slightly so that you can clear the internal lenses without**

scratching the lamp.

9. For a new lamp installation you may need to align the lamp. Use the following alignment procedure. **NOTE: If your system is being shipped from Sciencetech with a lamp then you will not need to align the lamp, it has been done for you at the Sciencetech factory.**

3.2 TLS-72/55-X300 Lamp Alignment

!STOP!

If you have just received an TLS from Sciencetech your system is already aligned. The lamp position has been aligned for you at the Sciencetech factory. If you are replacing an old lamp you may need to align the new one, follow the procedure below if required. Once again, all systems are factory aligned at Sciencetech.

Place the LH lamp housing on a flat surface before aligning the bulb and reflector.

3.2.1 LH-S Lamp House Alignment

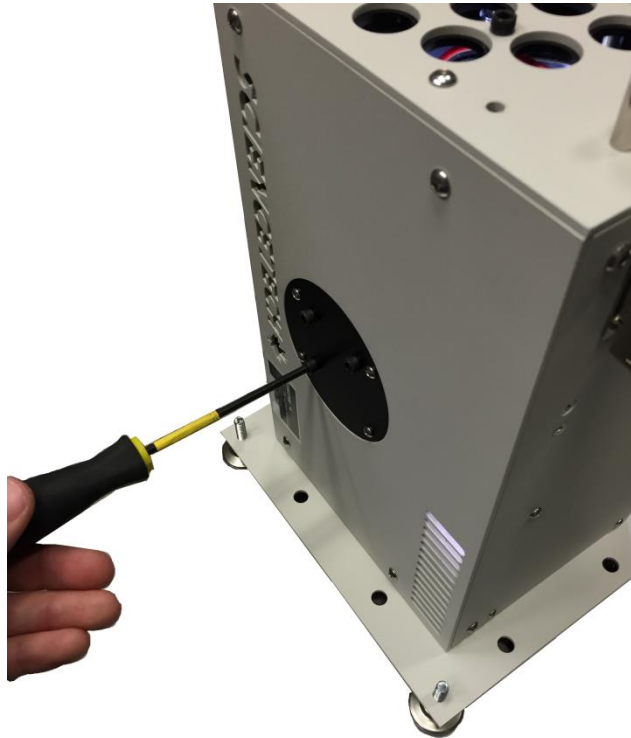
Align the bulb using the 3 bulb alignment screws (9/64" Allen Driver) on the back (top) of the lamp housing. When turning the adjustment screws make only progressive ½ turns on each of the screw. This will keep all screws properly aligned and will avoid swaying the lamp from side to side, which could damage the lamp or jam the adjustment mechanism.



Adjusting each of the three bulb alignment screws by equal amounts in the same direction will raise or lower the lamp in the housing. Adjusting each screw individually will adjust the lamp tilt across the output port and towards the output port depending on the screw adjusted.

Adjust the bulb so that the lamp center point (between electrodes), when viewed from the exit port of the lamp housing, is in the center of the window both horizontally and vertically.

Align the reflector using the 3 reflector alignment screws on the side of the lamp housing (9/64" Allen Driver). When turning the adjustment screws make only progressive $\frac{1}{2}$ turns on each of the screws at a time before adjusting the other screws in a like manner. This will keep all screws properly aligned and will avoid jamming the adjustment mechanism.



Adjust the reflector so that the reflection of the lamp center is aligned with the actual lamp center (between electrodes) when viewed from the exit port of the lamp housing. Also ensure that the arc size matches that of the reflection in the elliptical reflector. If the arc size reflection is larger than the actual arc size then the mirror is too close to the bulb. If the arc size reflection is smaller than the actual arc size then the mirror is too far from the bulb.

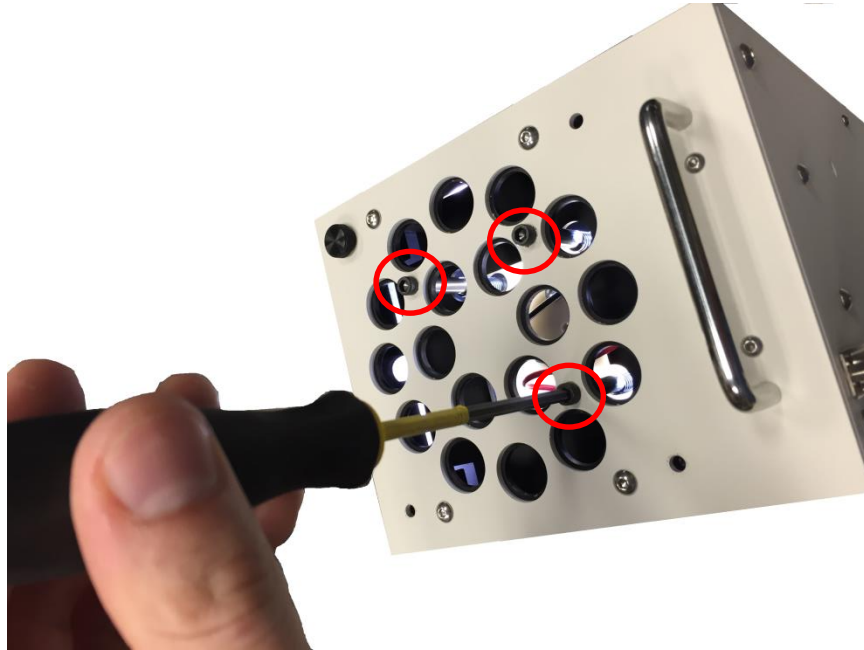
3.2.2 LH-E Lamp House Alignment

WARNING:

UV eye protection such as UV sunglasses must be worn when adjusting the lamp focus. Do not place hands or combustible material in the focus of the light beam.

Place a power meter at the exit of the monochromator and set the monochromator to 0 nm on any grating and ensure the lamp is on. Make **small** adjustment of the 3 alignment screws on the rear of the lamp house with a 9/64" Allen driver. While observing the power recorded by the power meter (or any light measuring device) exiting the monochromator, make small adjustments to maximize the power exiting the monochromator until a maximum is achieved. It may take a small adjustment on all 3 screws to raise or lower the power.

If no power meter or light measuring device is available, using a screen at the target location and observing the optical power by eye can be done.

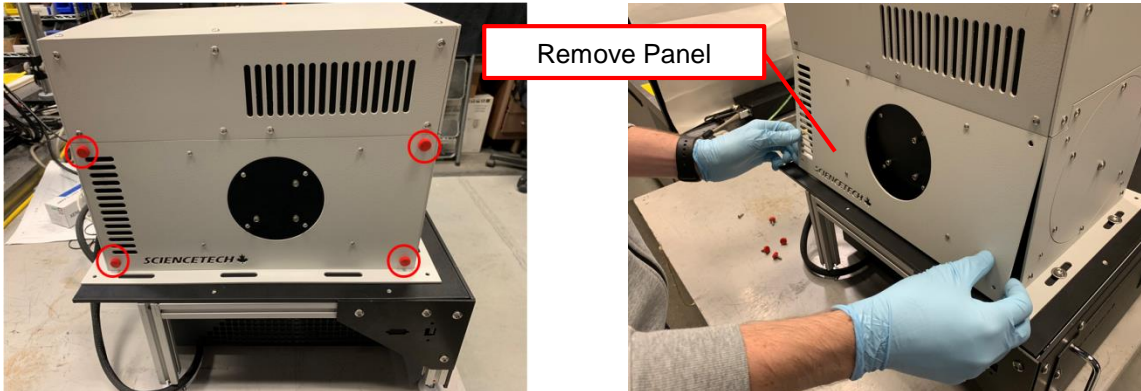


WARNING:

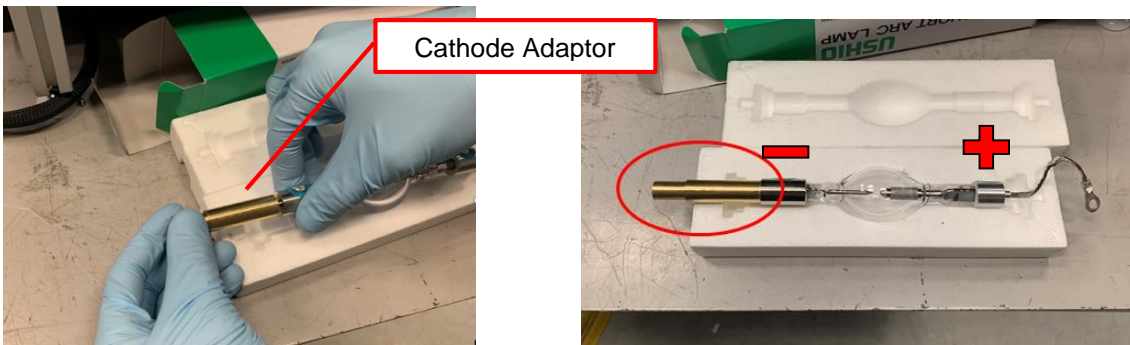
Make only progressive ¼ turn adjustments on each of the screws at a time. Larger turns will place excessive stress on the lamp and the lamp could explode as a result. Be sure to turn all three screws the same amount in the same direction.

3.3 XLH-S-500X Lamp Installation

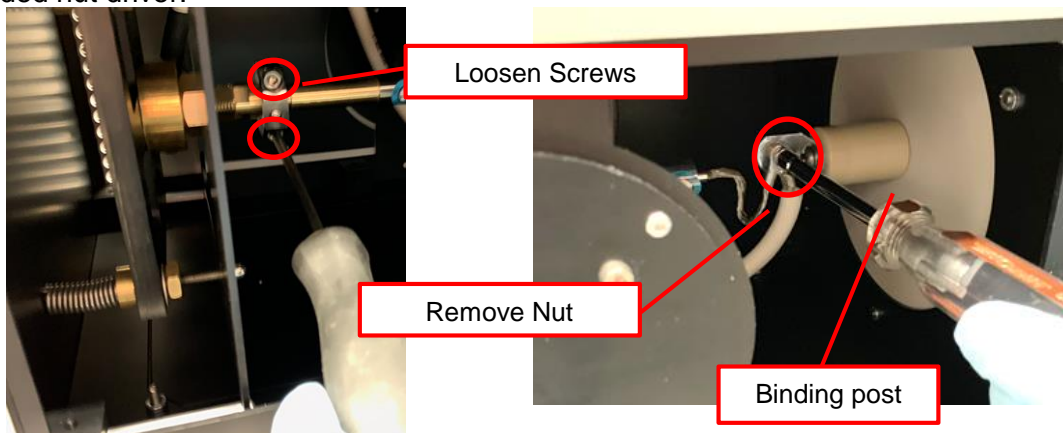
1. Ensure the power supply is off and the 9W5 lamp house power cable is unplugged (not pictured).
2. Remove the 4 RED thumbscrews on the side of the lamp house as shown below left.
3. Remove the side panel, lifting upwards and pulling it out (see figure below right). Using a driver may be required to lift the bottom of the panel off the lamp house.



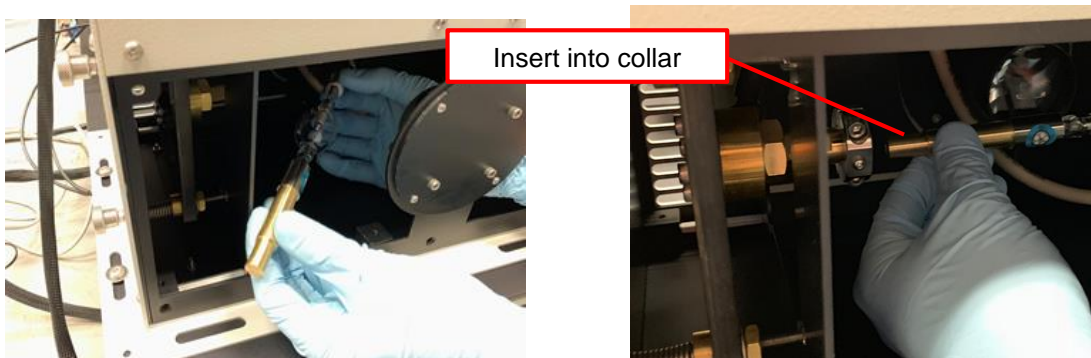
4. Refer to Section 2 for the 500W bulb handling precautions. Gripping the metal collar at the cathode end of the lamp, carefully screw on the brass cathode adaptor (figures below).



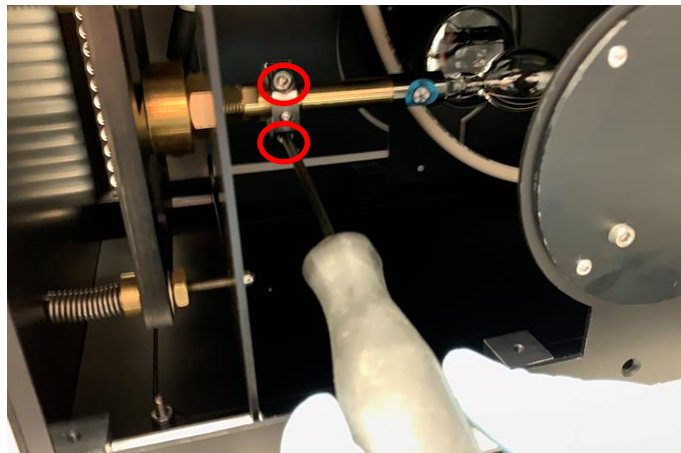
5. Loosen the collar with a 5/32 Allen key and remove the nut on the binding post with the provided nut driver.



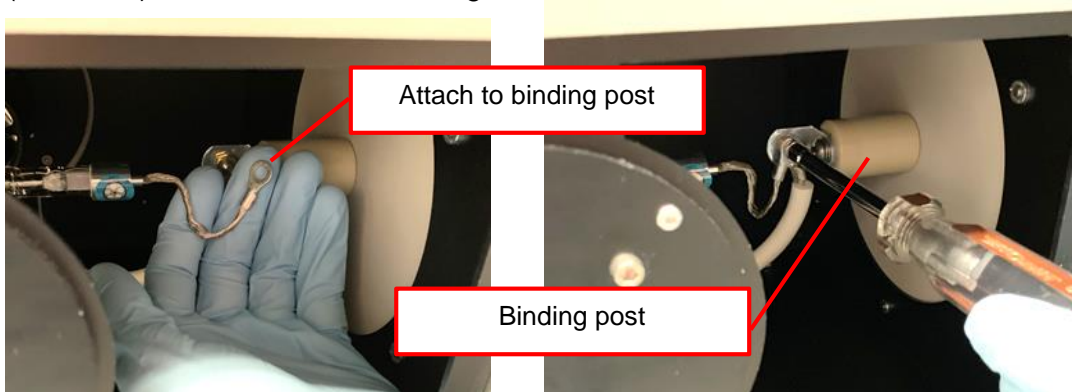
6. Insert the bulb as shown below (at left). Then, insert it into the cathode mount of the lamp house (below at right).



7. Carefully tighten the screws on the collar with a 5/32 hex driver, shown below.



8. Position the anode wire eyelet onto the binding post at the anode standoff in the lamp house (below left). Screw on the nut and tighten it with an 11/32 hex nut driver (below right).



9. Install the side panel as shown in step 1.
10. Bulb removal is the reverse of installation.

3.3.1 XLH Lamp Alignment

!STOP!

If you have just received an TLS from Sciencetech your system is already aligned. The lamp position has been aligned for you at the Sciencetech factory. If you are replacing an old lamp you may need to align the new one, follow the procedure below if required. Once again, all systems are factory aligned at Sciencetech.

If your lamp house contains an elliptical reflector, alignment is completed by adjusting the three metal thumbscrews on the rear of the lamp house.



Place a power meter at the exit of the monochromator and set the monochromator to 0 nm on any grating and ensure the lamp is on. Make **small** adjustment of the 3 alignment screws on the rear of the lamp house. While observing the power recorded by the power meter (or any light measuring device) exiting the monochromator, make small adjustments to maximize the power exiting the monochromator until a maximum is achieved. It may take a small adjustment on all 3 screws to raise or lower the power.

If no power meter or light measuring device is available, using a screen at the target location and observing the optical power by eye can be done.

4. QTH Lamp Installation

WARNING:

Wear gloves while handling a QTH lamp. If you are removing a lamp, ensure it has had ample time to cool down after operation before handling.

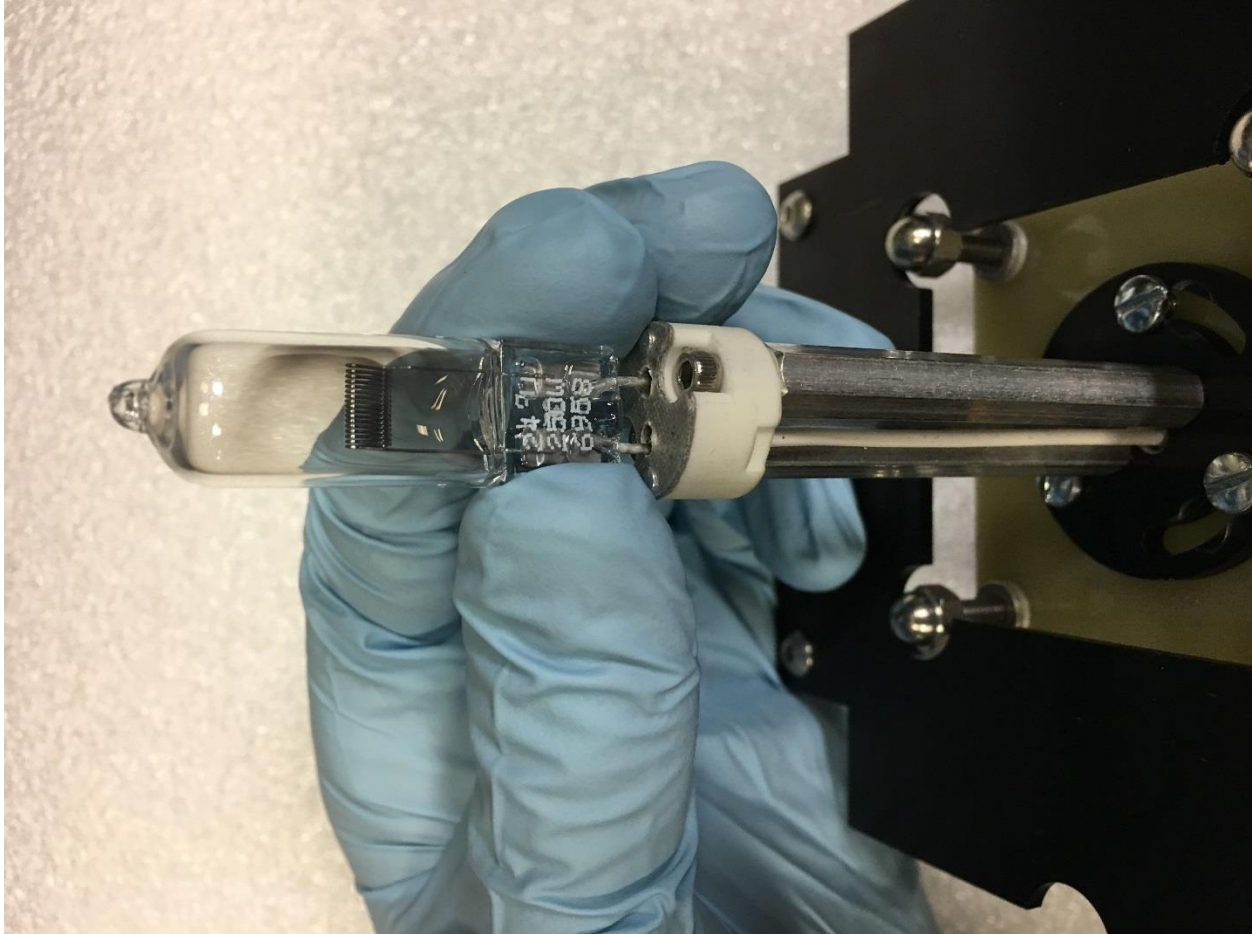
Remove the top (or back depending on model) of the lamp house by removing the four thumbscrews (red or black depending on model).



Using the handle, pull directly upwards



Remove the QTH lamp from its packaging and handle it by the base. Slide the two prongs on the bottom of the QTH lamp into the corresponding receptacles on the lamp house stage. Slide the two prongs in until the prongs bottom out. Only a small amount of force is required to install the QTH lamp. Excessive force will damage the QTH lamp.



Place the lamp base back into the lamp house and secure with the thumbscrews.

4.1 QTH LH-S Lamp Alignment

!STOP!

If you have just received an TLS from Sciencetech your system is already aligned. The lamp position has been aligned for you at the Sciencetech factory. If you are replacing an old lamp you may need to align the new one, follow the procedure below if required. Once again, all systems are factory aligned at Sciencetech.

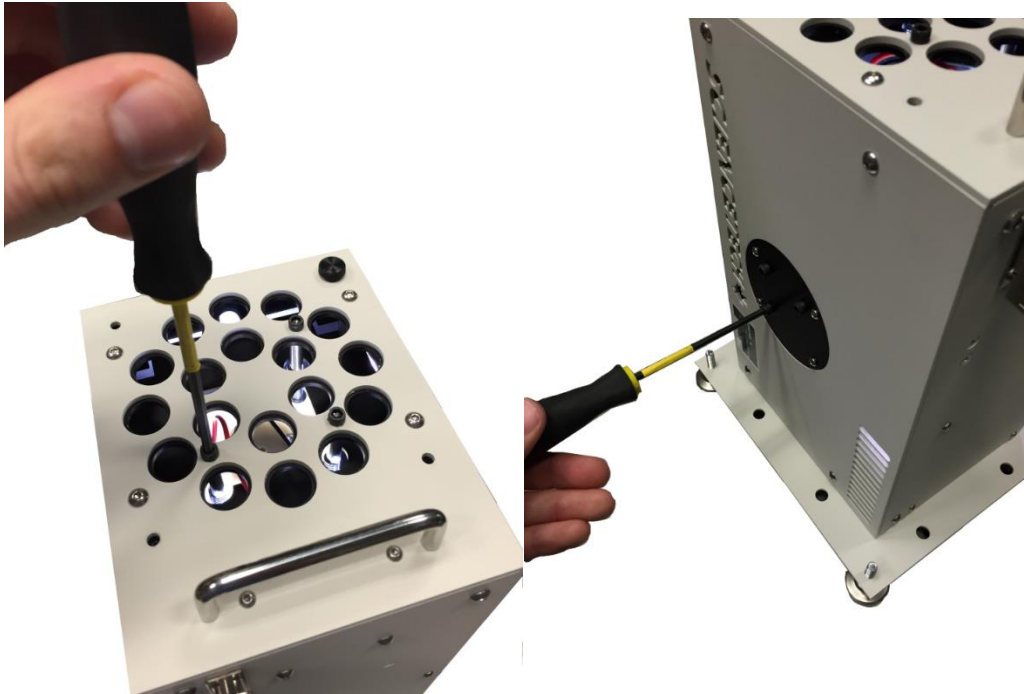
4.1.1 Alignment with the Lamp House Installed in the Optical Train

If the lamp house is already installed in the tunable light source, the alignment can be completed with the lamp house installed.

Place a power meter at the exit of the monochromator and set the monochromator to 0 nm on any grating and ensure the lamp is on. Make small adjustment of the 3 alignment screws on the rear of the lamp house with a 9/64" Allen driver and on the top. While observing the power recorded by the power meter (or any light measuring device) exiting the monochromator, make

small adjustments to maximize the power exiting the monochromator until a maximum is achieved. It may take a small adjustment on all 3 screws to raise or lower the power.

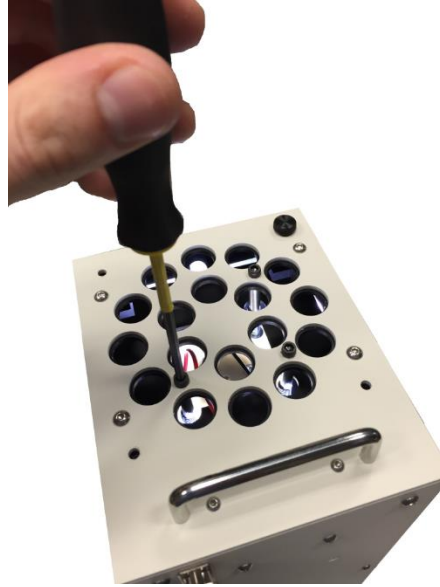
If no power meter or light measuring device is available, using a screen at the target location and observing the optical power by eye can be done.



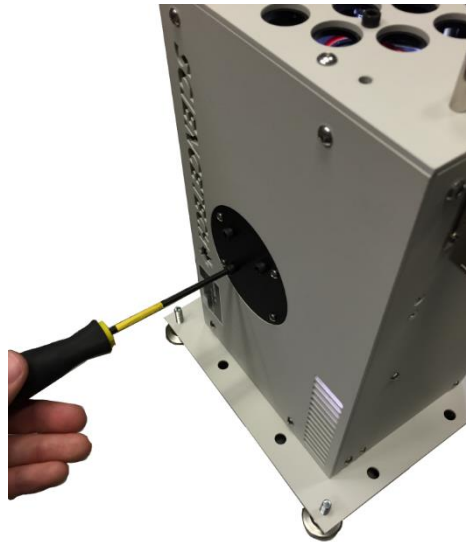
4.1.2 Alignment with the Lamp House Removed from the Optical Train

With a collimated beam exiting at the lamp house, place a target (black metal) at the image location of the QTH filament.

Align the image of the QTH filament so it is centered at the optical axis height and following a perpendicular path from the lamp house. The easiest way to complete this alignment, is to place a target with cross hairs at the image location where the cross-hairs are at the correct optical height and is along the perpendicular path from the lamp house centred on the collimating lens. Align the filament using the 3 bulb alignment screws (9/64" Allen Driver) on the top/side of the lamp housing. When turning the adjustment screws make only progressive $\frac{1}{2}$ turns on each of the screw. This will keep all screws properly aligned and will avoid swaying the lamp from side to side, which could damage the lamp or jam the adjustment mechanism. There may be two images at the target plane, one produced by the rear reflector and one produced from the filament. To determine which image is produced by the filament (and not the rear reflector) adjust one screw on the rear reflector, the image that stays stationary at the target plane is produced directly from the filament (and not the rear reflector)

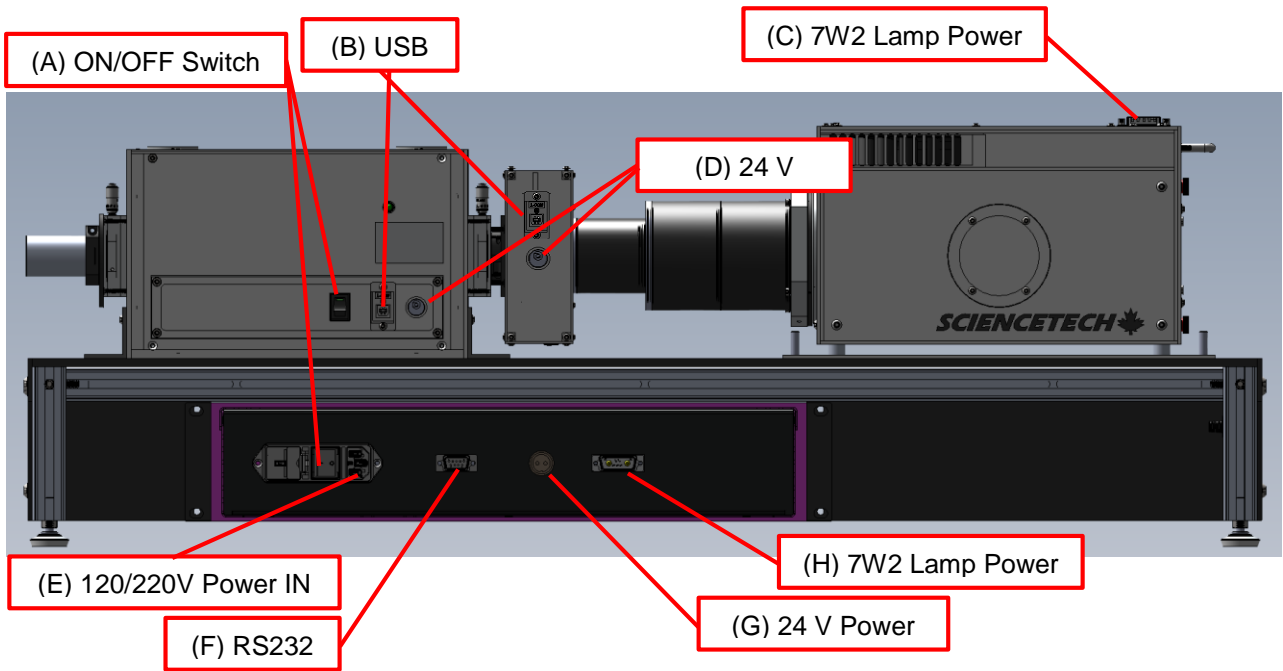
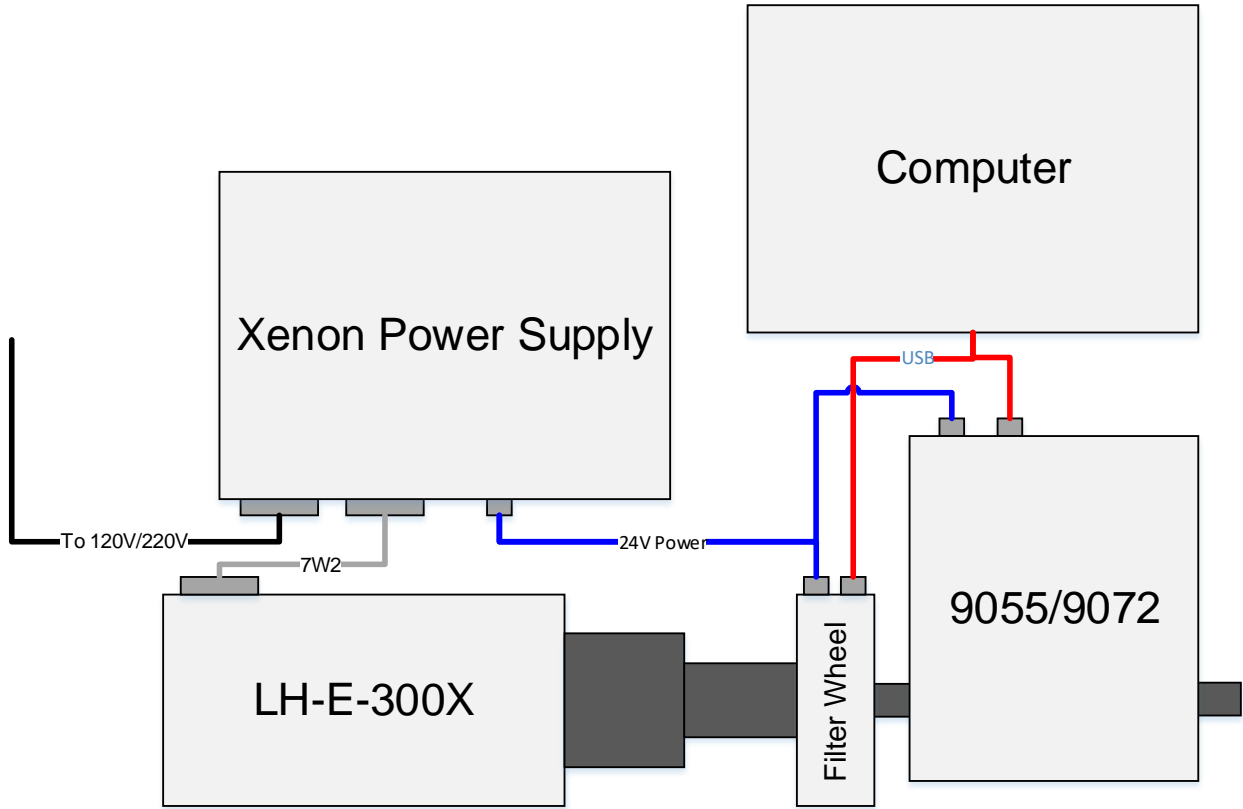


Once the filament is adjusted, adjust the rear-reflector with the 3 screws on the rear of the lamp house with a 9/64" Allen driver. Align the image of the filament produced by the rear reflector with the image from the filament.



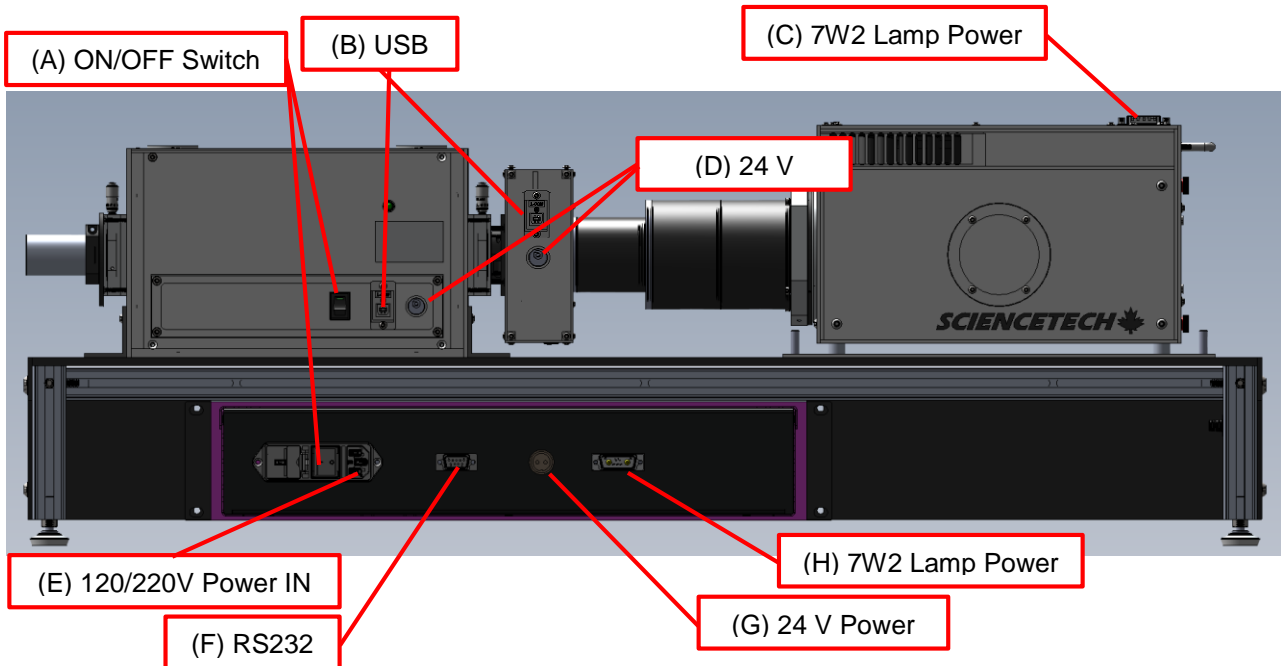
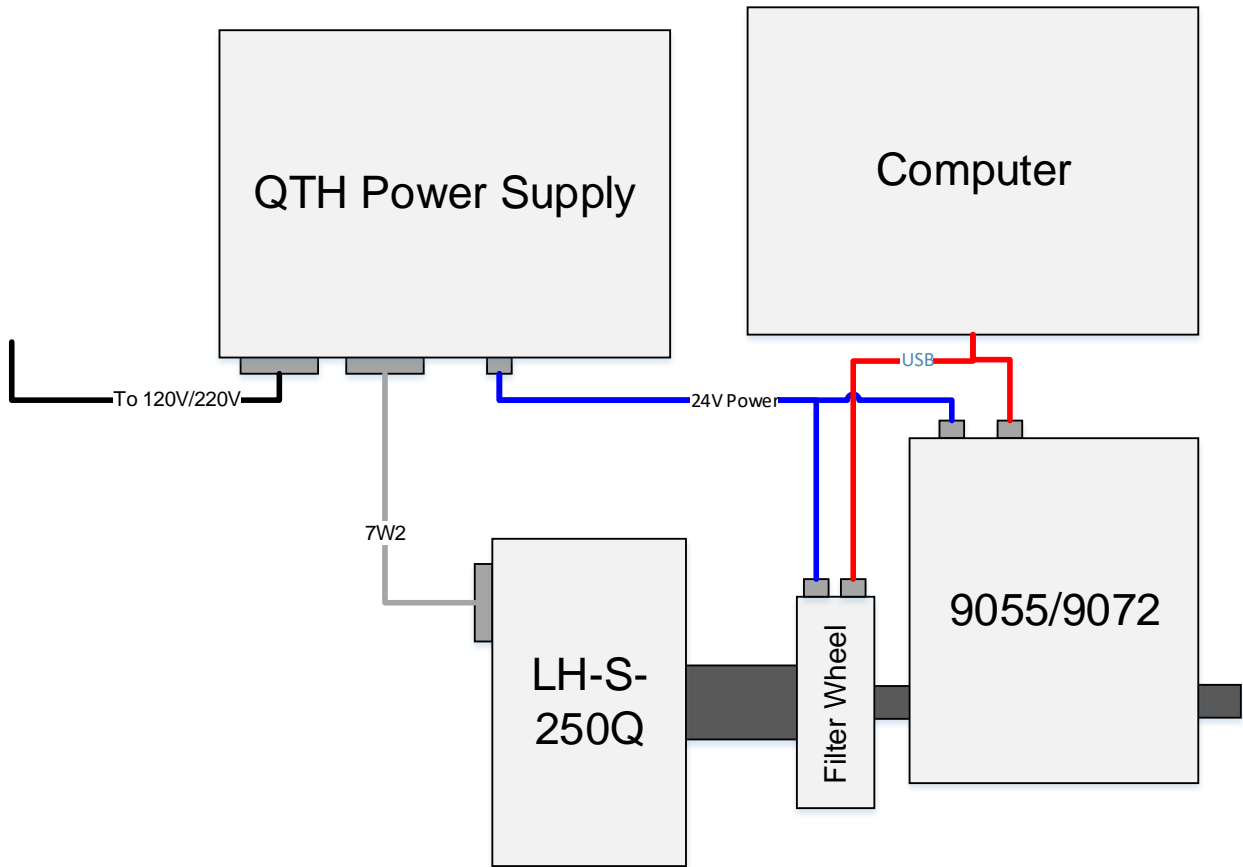
5. Hookup Diagram

5.1 TLS-72/55-X300



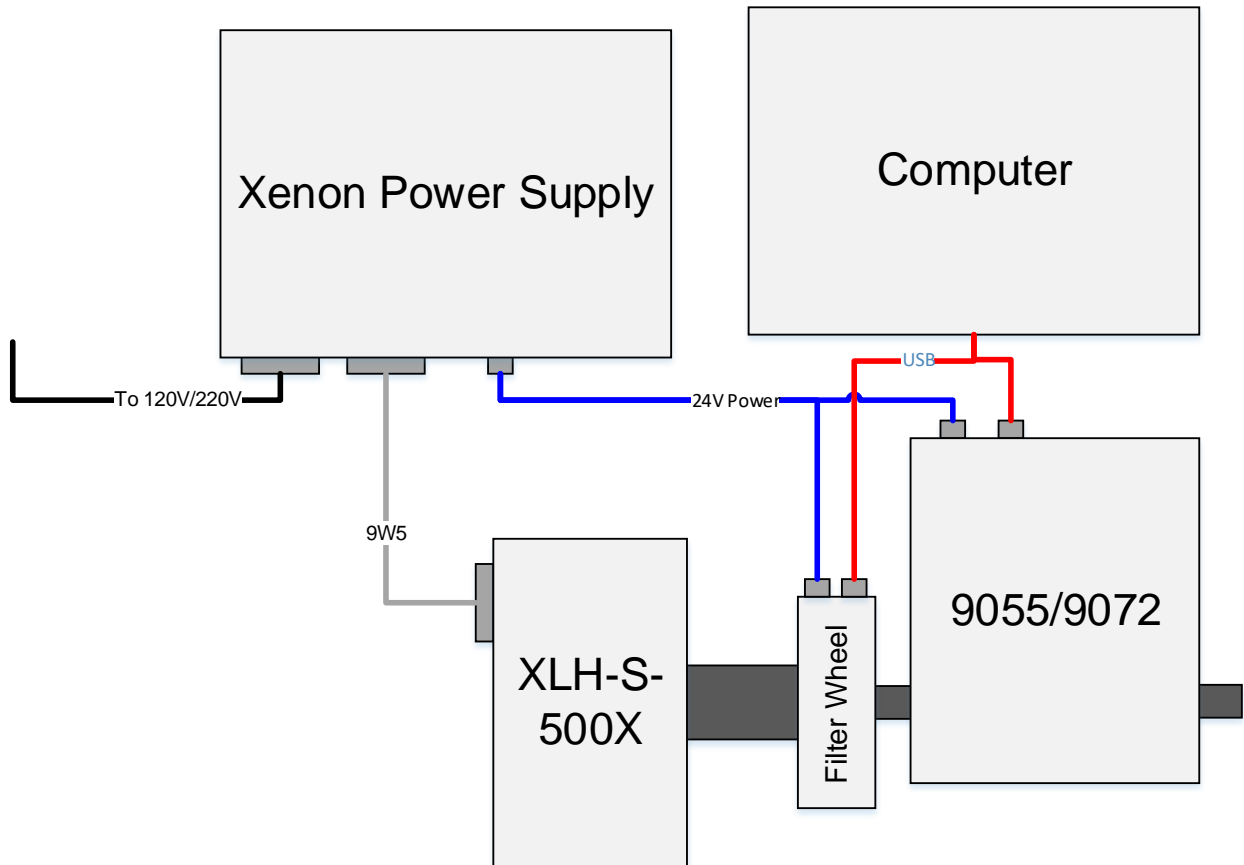
1. Connect the 6-pin power cable (G) from the rear of the power supply to the filter wheel and monochromator 24 V power receptacle (D).
2. Connect the USB A-B cables from the filter wheel and monochromator (B) to the computer to control the system.
3. Connect the RS232 connection on the rear of the power supply (F) to the computer to control the system with the provided RS232 to USB cable.
4. Connect the 7W2 connection on the rear of the power supply (H) to the LH-E-300X lamp house (C).
5. Ensure the power supply is off. Connect the provided line cord to the power supply (E) to a 120 or 220 V wall outlet (determine voltage of your system before connecting to a wall outlet).

5.2 TLS-72/55-Q250

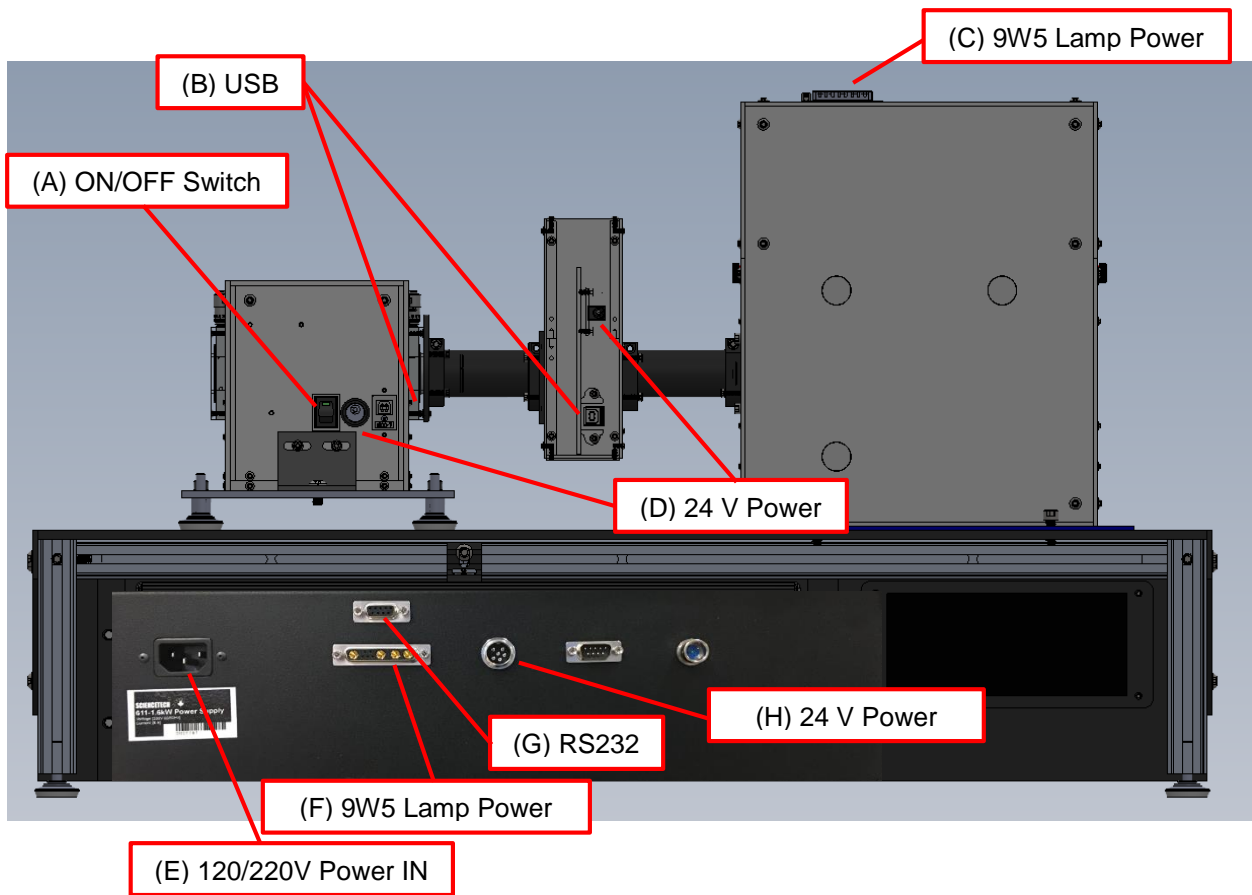


1. Connect the 6-pin power cable (G) from the rear of the power supply to the filter wheel and monochromator 24 V power receptacle (D).
2. Connect the USB A-B cables from the filter wheel and monochromator (B) to the computer to control the system.
3. Connect the RS232 connection on the rear of the power supply (F) to the computer to control the system with the provided RS232 to USB cable.
4. Connect the 7W2 connection on the rear of the power supply (H) to the LH-E-300X lamp house (C).
5. Ensure the power supply is off. Connect the provided line cord to the power supply (E) to a 120 or 220 V wall outlet (determine voltage of your system before connecting to a wall outlet).

5.3 TLS-72/55-X500



1. Connect the 6-pin power cable (H) from the rear of the power supply to the filter wheel and monochromator 24 V power receptacle (D).
2. Connect the USB A-B cables from the filter wheel and monochromator (B) to the computer to control the system.
3. Connect the RS232 connection on the rear of the power supply (G) to the computer to control the system with the provided RS232 to USB cable.
4. Connect the 9W5 connection on the rear of the power supply (F) to the XLH-S-500X lamp house (C).
5. Ensure the power supply is off. Connect the provided line cord to the power supply (E) to a 120 or 220 V wall outlet (determine voltage of your system before connecting to a wall outlet).

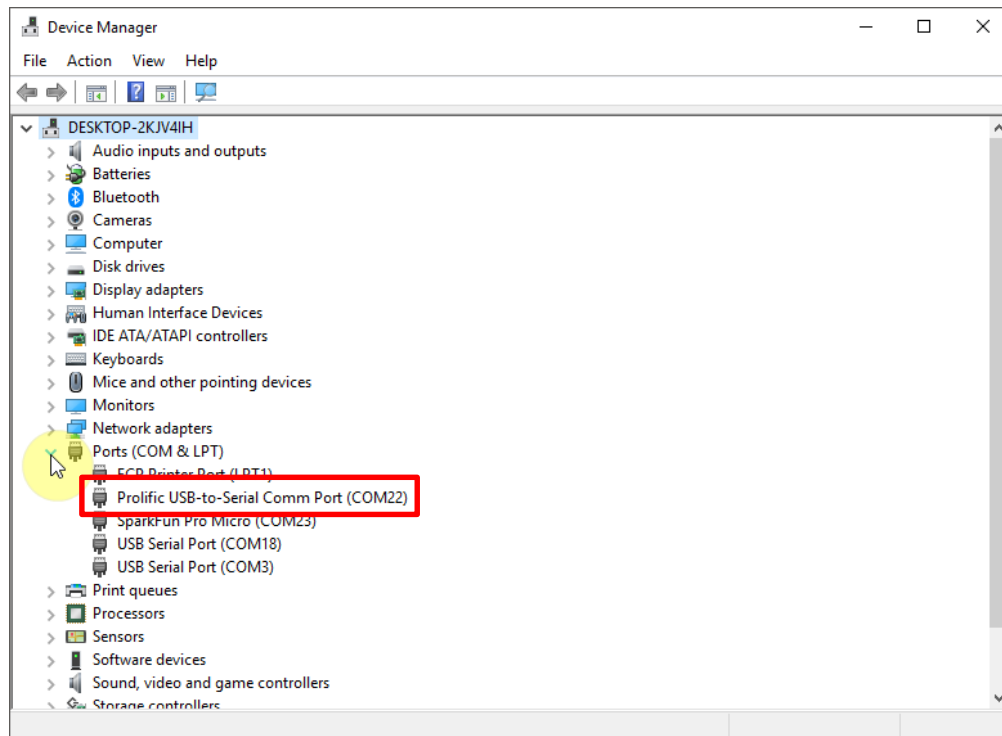


6. Software Installation

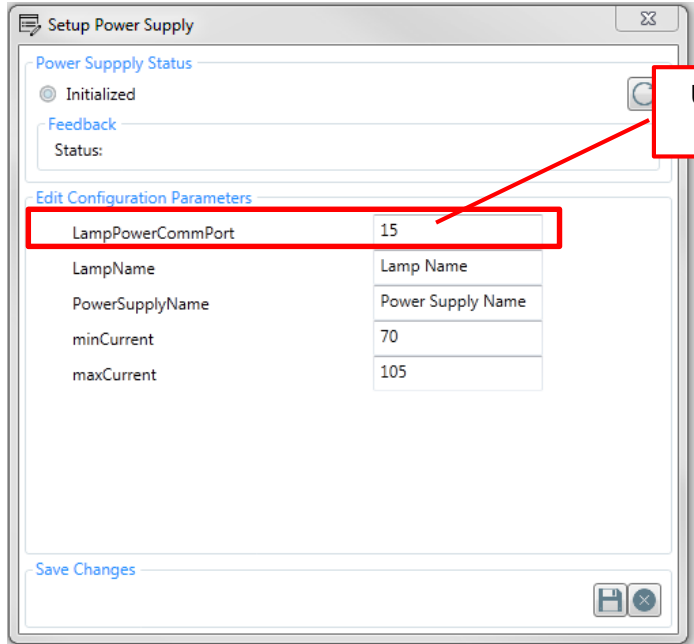
Please see the SciSpec User Manual for software installation. Ensure all proper drivers are installed for your system (see SciSpec User Manual).

To use the provided RS232 to USB cable, install the Prolific_PL2303 drivers (included on your USB). This will install the drivers for the supplied RS232 to USB cable for communicating with the power supply. Finish installing SciSpec before performing this step. Once installed and the power supply connected, the COM port number for the connection will need to be identified.

Sciencetech's 601, 602, and 611- series power supplies will have a COM port associated with the power supply. The first time the power supply is connected to a computer the COM port will need to be identified. To do this, open Windows Device Manager, open Ports (COM & LPT) and look for Prolific USB-to-Serial Comm Port (COM#).



Open the Power Supply Setup Window from the Configuration tab in SciSpec and enter the COM# found (only enter the number, not the letters COM). Once the COM port is set, you can initialize the power supply.

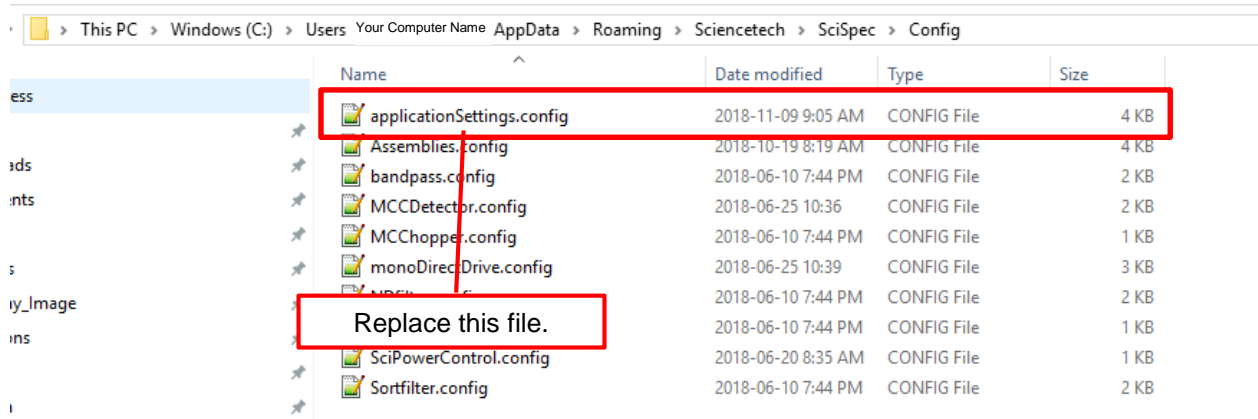


Update the COM Port number

6.1 SciSpec v9 Special Steps

If installing SciSpec v9 follow the following steps, for SciSpec v10 please skip the following steps.

Once the full installation is complete, replace the installed version of applicationSettings.config with the version in your supplied USB. The folder with the installed config files is accessible through the SciSpec user interface. Please read the included SciSpec user manual, Section 3.10, to navigate to the configuration file location to replace the applicationSettings.config file.



7. Power Supply Description and Operation

7.1 Configuration of 601 Series Power Supplies

611-/601-		
Specification		
Safety interlock for external lamp house		/SF
Programmable remote temperature monitor		/TM
Power connection for external lamp house cooling fans		/PF
Integrated shutter and exposure controller		/SH
RS232 computer control		/RS
WiFi computer control		/WF
Monitor output for monitoring power supply status		/OC
Auto Start lamp		/AS

Example: 601-300/SF/TM/RS is a 601 series power supply with wiring for a safety interlock, a remote temperature monitor and RS-232 computer control.

7.2 Description of Configurations

/SF Safety Interlock

The safety interlock is wired into the power supplies standard DB15 connector that connects to a Sciencetech lamp house. The interlock wiring can be connected to a mechanical safety interlock such as a magnetic switch or rocker switch on the lamp house. With the safety interlock option the power supply will turn off, extinguishing the lamp, if the interlock is opened. This helps ensure safety of the lamp house operator.

/TM Programmable Remote Temperature Monitor

The programmable remote temperature monitor option provides over temperature protection for the lamp house that the power supply is being used with. With this option an RTD or K-type Thermocouple is wired between the lamp house and power supply through the lamp house DB15 connector. A programmable temperature sensor with relay output is used to program a maximum lamp house temperature. This option ensures that if the cooling fans fail or the temperature inside the housing rises to a dangerous level the power supply will be shut off extinguishing and saving the lamp from catastrophic failure.

/PF Power Connection for Cooling Fans

This option provides a power pass through connection for the lamp house cooling fans. Without this option lamp house cooling fans must be plugged in to their own plug points and their operation is not monitored by the lamp house. With this option the lamp house cooling fans are plugged into the power supply. When the power supply is turned on the lamp house fans will also turn on automatically. With this option when the lamp is extinguished from the power supply control panel the power supply will run the fan for 10 minutes to cool the lamp house before turning off the cooling fans.

/SH Integrated Shutter and Exposure Controller

This option provides an onboard shutter and exposure controller built into the power supply. A 6-pin or 2-pin connector is provided on the back of the power supply to connect a Sciencetech solenoid driven shutter mechanism. With this option the power supply firmware provides an interface for programming shutter loops and exposure sequences.

/RS RS232 Computer Control

This option provides RS232 computer control of the power supply through a DB9 connector mounted on the rear panel of the power supply. With this option the power supply current output and lamp On/Off can be controlled from a remote terminal. Basic terminal software is provided with this option with instructions on how to operate the power supply remotely.

/WF WiFi Remote Operation

This option provides remote control of the power supply through a Wi-Fi connection. With this option the power supply current output and lamp On/Off can be controlled from a remote terminal.

/OC Monitor Output

This option provides a male 9-pin connector on the rear of the power supply for monitoring the status of the power supply. Parameters that can be monitored: Lamp current 0-10V, Lamp voltage 0-10V, Lamp On/Off 1-5V TTL.

/AS Auto Start Lamp

This option provides the capability to automatically start the lamp. This allows the user to set a time for the solar simulator to automatically ignite.

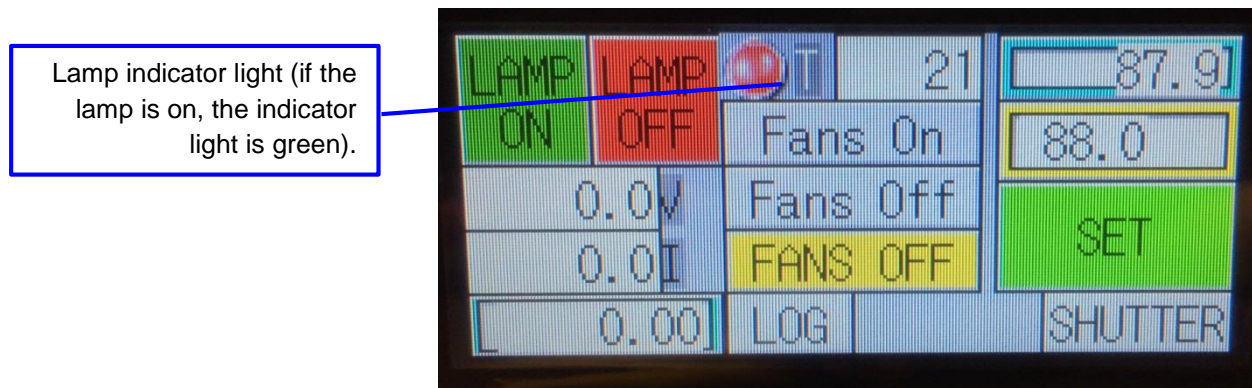
7.3 601-/611- Power Supply Start-up



With all electrical connections are made (see hookup diagram) and the arc lamp is installed turn the power supply on using the switch on back (601-) or front (611- series) panel.

You will hear the fans and power supply activate. If this does not happen ensure all connections are made correctly. If they did start press **OK** on the starting screen.

7.3.1 Understanding the Main Screen



7.3.2 Starting the Lamp

Ensure all connections have been made according to instructions in this manual. Press the Fans On button to turn on the fans on the lamp housing. Ensure the lamp housing fans have started. Running the lamp without turning on the lamp housing fans will result in overheating. The FANS ON/OFF should now display that the lamp housing fans are on.

You may now press the LAMP ON button to ignite the lamp. The power supply has a pre-set ignition voltage that will be less than the max current for your bulb. Click the box with the yellow border to enter a new power supply current % (% of max current). Adjusting the number displayed

does nothing until the green SET button is pressed. Once the new value is entered in the box with the yellow border, press the green SET button. To turn the lamp off simply press the LAMP OFF button. A Pop up window will warn that the fans will continue to operate for 1-5 minutes before shutting off.

7.3.3 Touchscreen Button Overview

LAMP ON – Turns on arc lamp

LAMP OFF – Turns off arc lamp

V – Displays present lamp voltage

I – Displays present lamp current

P – Displays present lamp power

SHUTTER – Brings up the shutter control screen

Fans On – Turns on lamp housing fans, always turn on the lamp housing fans before igniting a lamp

Fans Off – Turns off lamp housing fans, always let lamp housing fans run for a few minutes after turning off the lamp

FANS OFF – Displays the present state of the lamp housing fans

87.9 [BLUE BORDER BOX] – If the lamp is running, this box displays the present lamp current percentage. In the example below if the lamp were on, it would be operating at 87.9% of its maximum current.

88.0 [YELLOW BORDER BOX] – To set a new current percentage for the lamp to operate at click this box. A popup window will appear and will allow you to type in a new value to operate the lamp at. Once complete, press enter on the popup window. The change will not take effect until the GREEN SET button is pressed.

SET – Press this button to apply the current percentage value in the YELLOW BOX to the arc lamp, this change will be reflected in the BLUE BOX that displays the current percentage the lamp is operating at. In this example the lamp would be set to 88.0% if the GREEN SET button is pressed.

LOG – Opens the log screen with lamp and power supply run time information.

T – Displays time since lamp turn on, on Main screen.

INDICATOR LIGHT – If the light is RED, the lamp is off, if the light is GREEN the lamp is on

7.3.4 Shutter Control (if Applicable)



From the main window select the shutter button at the bottom of the screen.

This window has 7 functions:

1. Allow to still stop the lamp if needed.
2. Manually open and close the shutter
3. Set a loop time or expose time.
4. Start a “1-shot” exposure. (Single open and close).
5. Start a continuous loop timer that opens and closes the shutter
6. Visually display if the shutter is open or closed
7. Access back to the Main Screen, or the Runtime screen.

To manually open and close the shutter use the top left button. To use the Loop or Expose function, select the larger box on the left to access a pop up window that allows a value of seconds to be entered as the “Open Value” repeat this step to the large box on the right to set the “Close Value”. Once time is set close the shutter.

Press the Expose button once and it will open the shutter for time entered in the “Open Value” window. Press the Loop button once to start a loop of and Open/Close stated timed by the two values. Press again to deactivate the loop.

Note: All time units are in seconds for shutter control.

7.3.5 Run Time Window

To access this window press the “RUN TIME” button on the bottom of either the main screen or shutter screen.

This window has 5 functions:

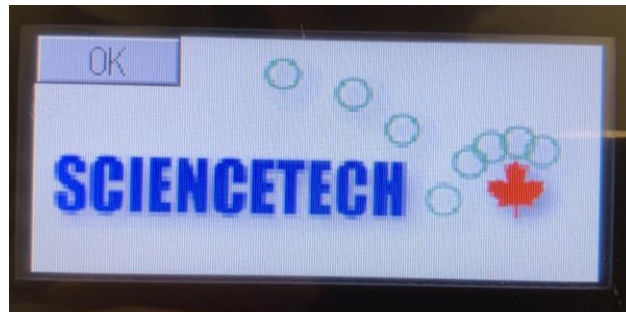
1. Stop the lamp if required.
2. Display the total amount of time the power supply has run lamps.
3. Display the time the current lamp has run.
4. Displays the total amount of lamp starts the power supply has performed.
5. Reset the lamp hours and minute when a new lamp is installed.
6. Allow access back to the main screen or shutter screen.

7.4 600- Series Power Supply Start-up

Once all connections have been verified and the appropriate lamp installed, simply press the GREEN button to turn on the lamp. To turn off the lamp, press the RED button.

7.5 602- Series Power Supply Start-up

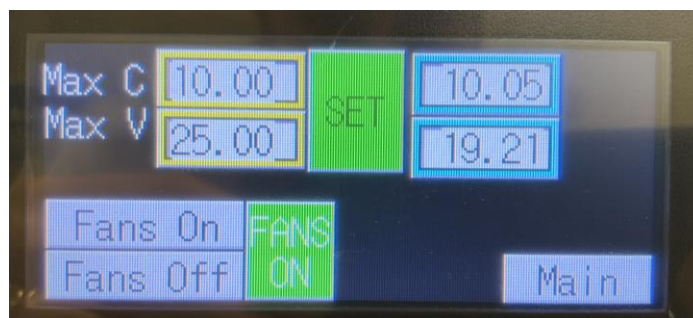
1. Press OK on the loading splash screen.



2. Press the SETUP button and set the Max C (maximum current) and Max V (maximum voltage). To do this, click the yellow border box next to the labels. When the lamp is turned on, the power supply will set the lamp up to the limit of each setting, depending on which setting is limiting the lamp, the power supply will work as constant current (current limited) or constant voltage (voltage limited). Be sure to not exceed the rated current and/or voltage for your lamp. Press the green SET button.



3. Turn the cooling system on (this will also turn on power to the monochromator and filter wheel) by pressing the Fans On button. The FANS ON indicator will turn green with all interlocks are met and the fan system is on. Press the Main button, to return to the main screen.



4. With the maximum current and voltage set to desired levels, and the cooling system operating, press the LAMP ON button. (To turn off the lamp, press LAMP OFF).



5. The current, voltage, and power the lamp is operating at will be displayed in the blue bordered boxes (on both the main screen and setup screen).

7.5.1 LOG Window

To access this window press the LOG button on the bottom of either the main screen or shutter screen. Use this screen to reset the logged lamp hours when changing a lamp.



This window has 5 functions:

7. Stop the lamp if required.
8. Display the total amount of time the power supply has run lamps.
9. Display the time the current lamp has run.
10. Displays the total amount of lamp starts the power supply has performed.
11. Reset the lamp hours and minute when a new lamp is installed.
12. Allow access back to the main screen or shutter screen.

7.6 RS232 Output

For more information on the RS232 communication see the Power Control User Manual.

Pin	Description
1	Data Carrier Detect
2	Received Data
3	Transmitted Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request to Send
8	Clear to Send
9	Ring Indicator

7.7 Notes on Voltage Selection

The power supply power entry module can be configured to accept 120VAC or 220VAC power input. Be sure to check that your power supply has been configured properly for your local line voltage before plugging in the power supply. Before re-configuring your supply, check the technical specifications of your power supply to ensure that the input voltage you want to configure is listed.

7.8 Notes on Fuses

The fuse drawer holds two fuses. Use 250V slow blow fuses only.

7.9 Notes on Cords

Depending on your location a power cord has been supplied for you*.

Part Number	Region	Style	Expected Line Voltage
040-9001	North America	Type B	110VAC
040-9002	China	Type I	230VAC
040-9003	India	Type M	230VAC
040-9004	Europe	CEE 7/7	230VAC
040-9005	North America	Nema 6-15P	230VAC

For regions not listed your cable type may not be available.

8. System Operation

1. Make sure the SciSpec software has been installed as per the supplied manual on the control computer. With the software closed, follow the cabling connections shown in Section 5 if not completed already. Starting with everything in a powered off state, ignite the lamp first. Set the power to 100% or the desired output level.
2. Next, turn on the monochromator via the switch at the back; the green LED on the switch will illuminate when power is present.
3. Set the desired slit widths on the monochromator by using the manual micrometer adjustment. For every 0.25 turns of the micrometer head from the closed position, the resolution increases by 0.5 nm FWHM (for a 1200 line/mm pitch grating). For example, see the Table below:

Turns of Slit Micrometer Head	Resolution (FWHM), nm With 1200l/mm Grating	Resolution (FWHM), nm With 600l/mm Grating
0.25 (0.13 mm width)	0.5 (9055), 0.9 (9072)	1 (9055), 1.8 (9072)
0.50 (0.25 mm width)	1 (9055), 1.8 (9072)	2 (9055), 3.5 (9072)
1.00 (0.5 mm width)	2 (9055), 3.5 (9072)	4 (9055), 7.0 (9072)
2.00 (1 mm width)	4 (9055), 7.0 (9072)	8 (9055), 14 (9072)
4.00 (2 mm width)	8 (9055), 14 (9072)	16 (9055), 28 (9072)
12.00 (6 mm width)	24 (9055), 42 (9072)	48 (9055), 84 (9072)

4. Start the SciSpec software. The monochromator should be at position 0 nm after initializing and white light should be present at the output. Refer to the SciSpec Software Manual for details of controlling the monochromator and filter wheel.

NOTE: The Fans for the lamp house (enabled through the touchscreen power supply) must be on for the monochromator and filter wheel to receive power.

9. Important Notice

All electrical instruments may be hazardous if not handled in accordance with proper instructions and common precautions. Sciencetech Inc. will not be responsible for any damage caused by such units if instructions herein are not followed and repairs are not attended to or performed by company-trained or licensed personnel. All instruments should be operated with proper grounds on power line and should not be opened or handled as to electrical or electrically operated components without being switched off and disconnected from power receptacle.

Sciencetech Inc. reserves the right to make adjustments or improvements in its product without notice and without obligation to subsequent purchasers and without being required to make corresponding changes or improvements in products theretofore manufactured and sold.

We have done our very best in the manufacture and packing of this material. The transportation carrier is now responsible for delivering it to you in its original good condition, since all purchases are FOB London.

If the shipment is NOT delivered in good order and in accordance with quantity shown on Bill of Lading or Packing Slip, have the shortage or damage noted by the Carrier on both the delivery receipt and the freight bill, or by special form provided by United Parcel or the Post Office.

The Interstate Commerce Commission has ruled that Transportation Companies will not honor any losses or shortage claims unless exceptions are noted on the freight bill at the time of delivery. It is the buyer's responsibility to make a complete inspection immediately upon receipt of purchased goods.

If you accept shipment from the Transportation Carrier short of what is enumerated on the Bill of Lading – or in damaged condition – without having proper notation made by the Carrier, you do so at your own risk.

If bundles or crates are in apparent good order, but on opening contents are found to be damaged, call Carrier for adjuster to view same and have the Transportation Company/United Parcel/Post Office mark the freight bill or packing slip relative to such concealed damage. Make your claim at once for the Transportation Company/United Parcel/Post Office has a limited time for presentation of claims.

We are willing to assist you in every possible manner in collecting claims for loss or damage on this shipment, but this willingness on our part does not make us responsible for filing or collecting claims or replacing materials. Claims for Loss or Damage on shipment may not be deducted from out invoice, nor pay of the invoice withheld awaiting adjustment of such claims, as we cannot guarantee safe delivery.

Important: Do not return goods without written authority.

Contact factory for return material authorization.

Returned goods will not be accepted by us from the Transportation Company/United Parcel/Post Office unless written authorization has been issued by Sciencetech Inc.

Return of special or non-stock items cannot be authorized. Credit for goods returned - under authorization - will depend on the value to us based on our selling price, less a fair charge to cover the expense of shipping - re-handling - transportation - refinishing, etc, providing material is received in good condition - transportation charges prepaid - credit rendered to be used against future purchases.

All equipment manufactured by Sciencetech Inc. has been subjected to extensive performance and quality control testing. In order to constantly improve our product, we ask your assistance. Upon installation of our equipment, please fill out the attached card and return to us.

By completing the card and returning it to Sciencetech, you will register your instrument in warranty and enable us to provide you with the best possible service.

10. Warranty and Assistance

All Sciencetech products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. Products sold or resold, but not manufactured by Sciencetech, carry the warranty, if any of the original manufacturer. We will repair or replace products that prove to be defective during the warranty period or employ our best efforts to effect repair or replacement of equipment sold, but not manufactured, by Sciencetech. No other warranty is expressed or implied.

We are not liable for consequential damages.

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