Model EQ-9-HP
LDLS™
Laser-Driven Light Source

Operation Manual

Revision 4 June 2023

Part Number DOC-8240

ENERGETIQ

A HAMAMATSU Company

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Chapter 1

GENERAL INFORMATION

Safety

WARNING

This unit emits ultraviolet (UV) radiation that is harmful to humans. Avoid exposure to the direct or reflected output beam. Make certain that the appropriate output beam shields and optics are in place prior to energizing the unit. All interlocks must be satisfied prior to operation; failure to do so may lead to hazardous conditions.

CAUTION

The EQ-9-HP emits dangerous levels of UV radiation. Even short exposures to skin or eyes may cause burns. Ensure that only authorized personnel are in the vicinity of source during operation. Personnel in vicinity of operating source should wear protective eyewear, clothing, and gloves. Lighted UV warning lights and signs posted on doors to lab areas may help prevent accidental exposure.

WARNING

The EQ-9-HP utilizes an internal Class 4 IR laser capable of causing severe injury to eyes or skin. Do not open or attempt to service this unit. Contact Energetiq regarding any problems with the unit.

WARNING

When working near the emitted light, always wear protective devices (conforming to ISO 4007/4849/4850/4854/4855 or equivalent regulations). The lamp installed in this housing emits intense ultraviolet rays, which are harmful to the eyes and skin. Looking directly into the emitted light or allowing the light to fall on the skin will damage eyesight or cause skin burns.

This label indicates hazardous UV radiation.

WARNING

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The power supply must be properly grounded by the outlet to prevent electrical shocks.

Securely plug in the power supply connector to avoid looseness or play. Loose connections may result in faulty operation.

Indication of the symbols

The following symbols can found on this equipment.

~	Alternating current

General Precautions

The output beam from the EQ-9-HP should be blocked when not in use with an electronic shutter or other appropriate beam blocking device. Due to the possibility of generating ozone with some models of EQ-9-HP when ambient oxygen is exposed to short wavelength light, the beam should always be enclosed in an appropriate beam pipe, tube, or enclosed space. We suggest purging any beam transport space with dry nitrogen gas.

The EQ-9-HP source must also be cabled correctly and connected to a 12VDC power source with a protective earth ground prior to operation.

Refer to the Installation section of this manual in Chapter 3 for details of the facilities connections.

There are no user-serviceable parts inside the EQ-9-HP. For any problems encountered during operation, please contact Energetiq Technology for assistance. **If there is a component failure, do not attempt to open the Power Supply Controller or Lamp House enclosure of the EQ-9-HP.**

The EQ-9-HP utilizes a quartz lamp containing a high-pressure gas fill. Explosion of the lamp and possible injury from flying fragments can occur if the lamp is mishandled.

Do not open the enclosure of either the Lamp House or the Power Supply Controller. Dangerous invisible infrared laser beams and hazardous voltages exist inside the Lamphouse. Opening the chassis both voids the warranty and exposes the user to dangerous radiation and hazardous voltages.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Information

The EQ-9-HP uses a patented* laser drive system to excite a plasma that radiates in the UV as well as the visible bands. A class 4 laser is located in the Lamphouse enclosure. The optical configuration of the Lamp House ensures that the direct laser beam cannot exit the unit. The EQ-9-HP laser product is designated as Class 1 during all normal operation.

The parameters of the non-accessible internal laser are given below in Table 1.

Wavelength	974 nm
Emission Type	CW
Laser Power for classification	<8 mW via 7mm measurement aperture
Beam Diameter	~25 mm at aperture
Divergence	>100 mRad
Transverse Beam Mode	Diffuse

Table 1: Embedded Laser Parameters

No regular maintenance is required for the EQ-9-HP. Any service to the system must be performed only by factory authorized and trained technicians. To avoid injury, under no circumstances should the user open or modify the Lamp House or Power Supply Controller enclosure.

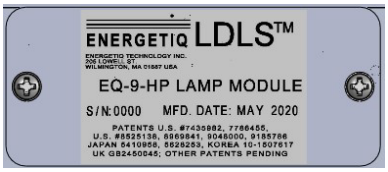
The unit must not be operated if the covers are removed or it is defective in any way. Contact Energetiq if any problems with the equipment are suspected.

* For a list of patents that cover Energetiq products, visit www.energetiq.com/patents.

The following safety labels appear on the product. Figure 1 shows the location of each label on the EQ-9-HP system.

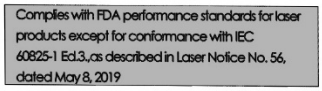
UV Hazard warning label – indicates hazardous levels of UV light are present.

UV Hazard warning label – indicates hazardous levels of UV light are present.



Manufacturer's identification label – gives the manufacturer's name, the model number, serial number, and date of manufacture of the equipment.

Explanatory label – states the classification of the laser product. Class 1 is the lowest hazard level classification.



Certification label – states that the equipment has been tested and verified to meet the standards indicated.

Non-interlocked housing label – notifies of a potential hazard when covers are removed.

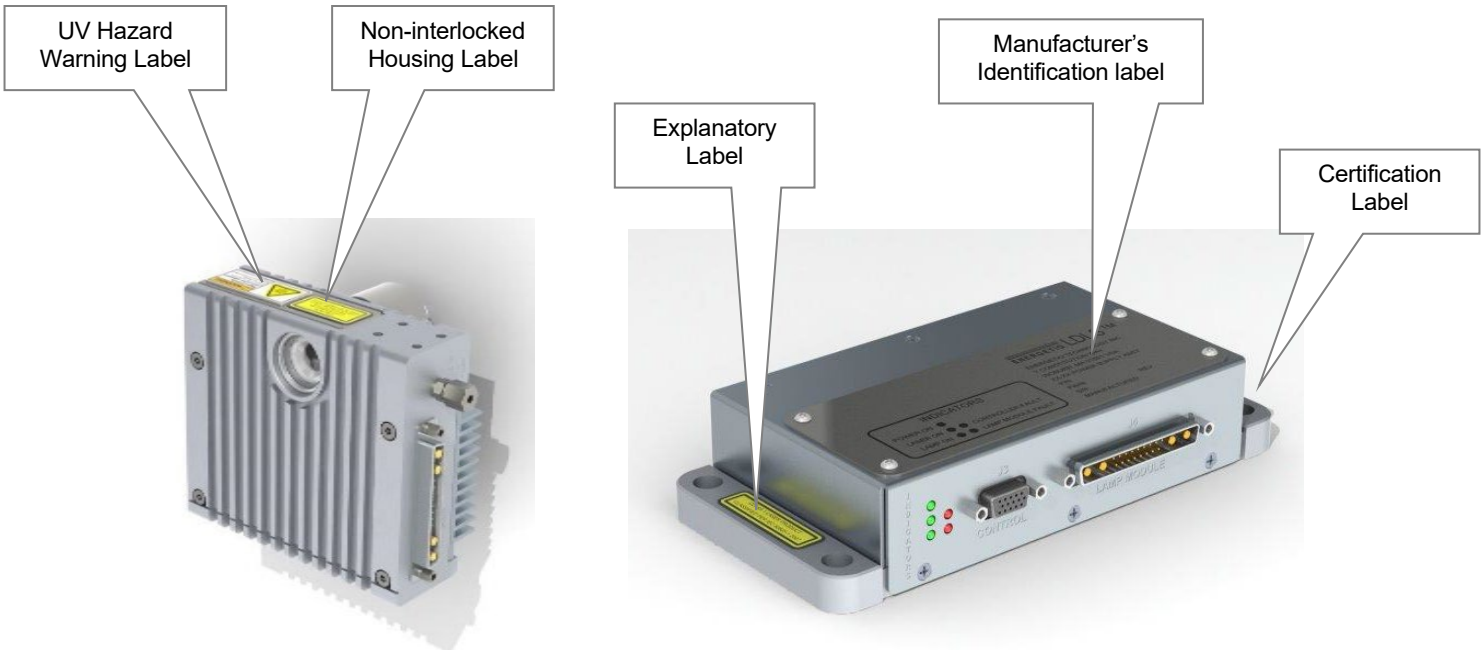


Figure 1: Safety Label Locations

Safety Interlocks

The EQ-9-HP is equipped with interlocks to prevent operation of the device when any of the following conditions are present:

1. An external interlock is open

External Interlock

External interlock pins are provided for the customer's use (see Chapter 3 for connection details). Any suitable normally-open contact or solid-state switch can operate the interlock circuit.

The interlock circuit must be connected to enable the operation of the unit. Should the interlock connection open during operation or standby, the source is immediately disabled, and all light output from the aperture ceases.

Chapter 2

DESCRIPTION

General

The EQ-9-HP is a broad-band lamp system for use in a wide variety of applications. The lamp produces high brightness, broad-band light from DUV wavelengths through visible and beyond. The output is very stable, and has a long lifetime before any service is required. A simple control interface ensures ease of use.

Some of the advantages of the EQ-9-HP include:

- Very high brightness across complete spectrum
  - 170nm through visible and beyond
- Eliminates need for multiple lamps (replaces D2/Tungsten/Xenon Arc)
  - Simplified optical system
- Excellent spatial stability
  - Repeatable measurements
- Superior short and long term power stability
  - Repeatable measurements
- Electrodeless operation for long life
  - Reduced consumable costs
  - Minimal recalibration of instrument

The EQ-9-HP system consists of a Power Supply Controller unit, Lamp House unit, and interconnecting cable. Connection to DC power is required for operation. Connection to nitrogen purge gas is optional, but recommended in some cases. See Chapter 3 for connection details.

Specifications

Physical Specifications

Dimensions (H x W x D)

- Lamp House: 109x 120 x 43 mm
- Power Supply Controller: 38 x 197 x 93mm

Weight

- Lamp House: 0.91 kg (2 lb)
- Power Supply Controller: 0.68 kg (1.5 lb)

Utility Requirements

- Electrical: 12VDC, 140W
- Cooling: Fan (30 CFM forced air cooling)
- Purge gas (optional): clean dry nitrogen, filtered (5um 20 psig (0.14 MPa) supply pressure)

Remote Interface

Digital Inputs

- Type: Optocoupler LED
- Logic: Active High
- Input voltage: 5VDC
- Input current: 8mA

Digital Outputs

- Type: Open collector to ground (digital common)
- Logic: Active Low
- Voltage: 30VDC max.
- Sink current: 30mA max.

User Power

- Voltage: 5VDC, referenced to digital common
- Current: 50mA maximum

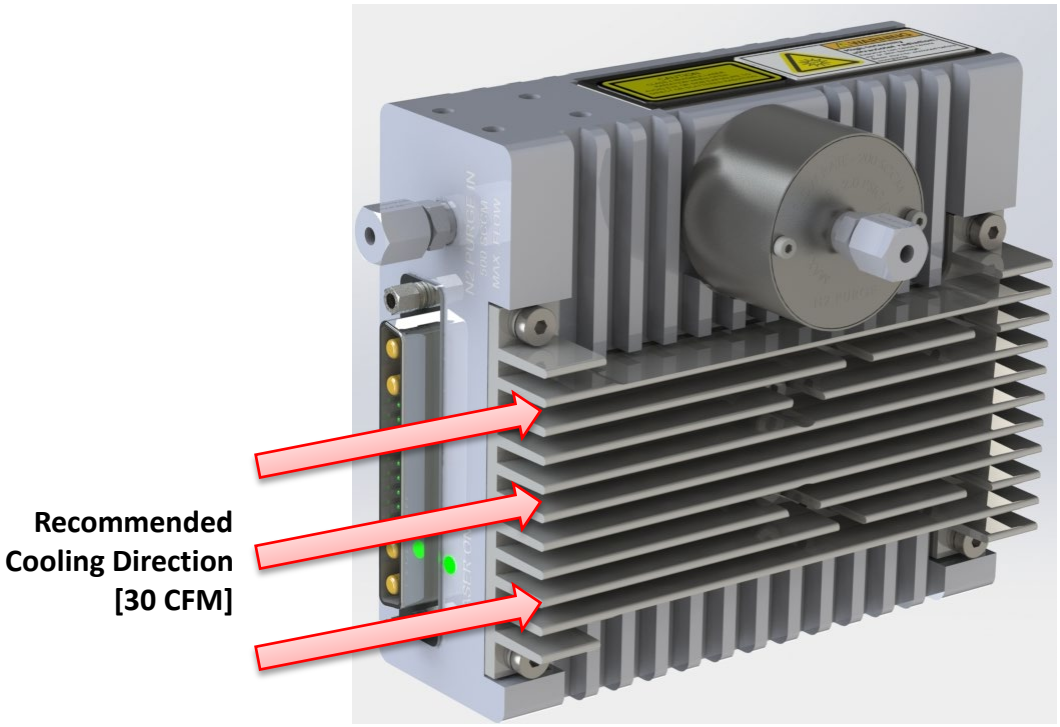


Figure 2: Recommended Cooling Configuration

Environmental Requirements

Operating

- Ambient temperature: 15–30°C (with 30 CFM forced air cooling)
- Relative Humidity: non-condensing, 80% max. for temperatures up to 31°C, decreasing linearly to 50% max. at 40°C.
- Pollution Degree 2 (normally only non-conductive pollution; occasional, temporary condensation possible)
- Installation Category II
- Indoor use only

Transport

- Temperature: -5–95°C
- Relative Humidity: non-condensing, 95% max.

System Description

As shown in Figure the EQ-9-HP system consists of a Power Supply Controller unit, Lamp House, Controller to Lamp house interconnect cable (not shown). Power and I/O interface connections (also not shown) are either provided by the user or by Energetiq upon request.

The following sections provide descriptions of the system components and controls, and give an overview of their functions. Refer to the "Installation" section of this manual (Chapter 3) for more detailed information.

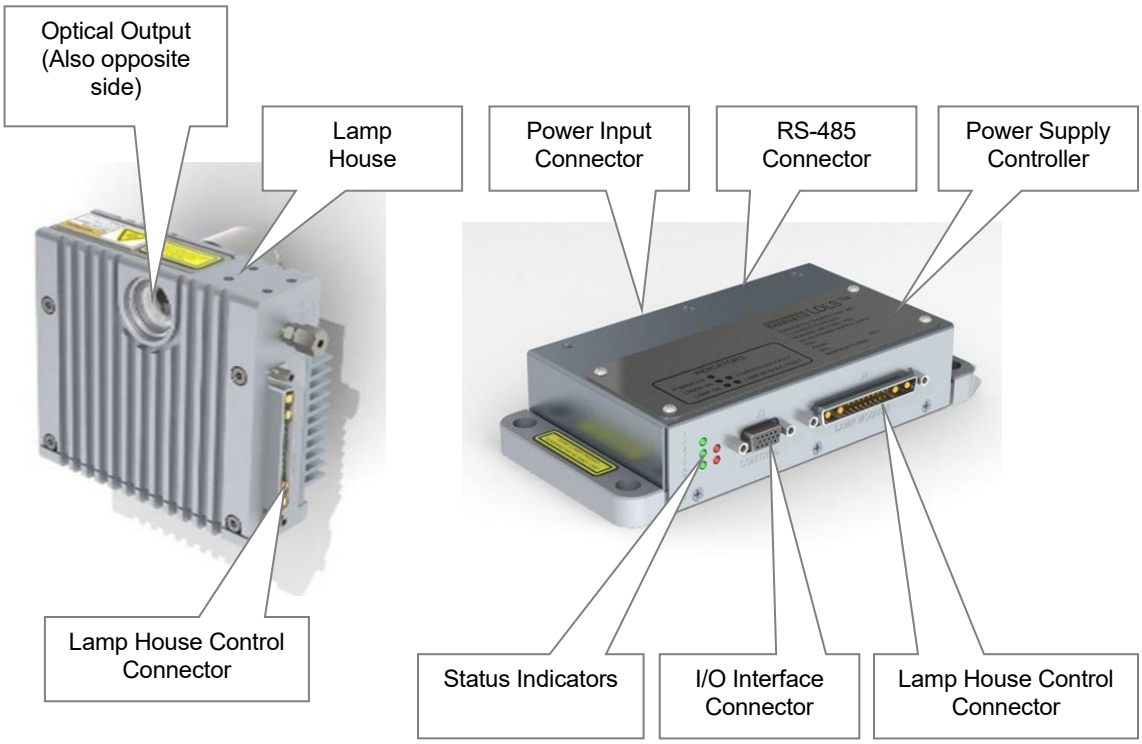


Figure 3: EQ-9-HP Lamp System

Power Supply Controller

The Power Supply Controller contains:

- Laser power supply
- Thermo-electric cooler control system for laser
- Control electronics
- Status indicator LEDs
- Interface connectors

External features (refer to Figure 3):

Status Indicator LEDs

These five LEDs indicate the system status. The function of these indicators is shown below in Table **2**.

LED Label	**Meaning (when lit)**
POWER ON	DC power is connected to the EQ-9-HP Power Supply Controller
LAMP ON	UV Light is on
LASER ON	Laser power is ON and laser light is being produced within the Lamp House
CONTROLLER FAULT	One of the following has occurred in the Power Supply Controller: 1. External interlock open 2. Controller internal temperature too high 3. Laser power not reaching setpoint 4. Laser Temperature Fault
LAMP MODULE FAULT	One of the following has occurred in the Lamp House module: 1. Control Cable not connected properly 2. Lamphouse internal termperature too high 3. Ignition Failure

Table 2: Status Indicator LED Functions

Input/Output (I/O) Connector

Provides access to control and status signals. See Chapter 3 for pin assignments and functions.

This is the only operator interface to the EQ-9-HP – there are no local controls. Energetiq offers the EQ-99-RC Remote Control Module which connects to the Input/Output connector of the EQ-9-HP or EQ-99 and provides a means of local control. Contact Energetiq for additional information.

Power Input Connector

This is a jack screw secured input connector for 12 VDC power. The EQ-9-HP can be powered directly from a customer provided 12VDC power supply. See Chapter 3 for detailed information.

Lamp House Control Connector (21-pin mixed D-sub)

Provides various power and control signals to/from the Lamp House module. No other connector or cable may be used with the EQ-9-HP other than the one supplied.

Lamp House

The Lamp House assembly contains:

- Lamp
- Igniter
- Laser
- Thermoelectric cooler
- IR pumping optics
- Output windows
- Laser ON indicator
- Interface connectors

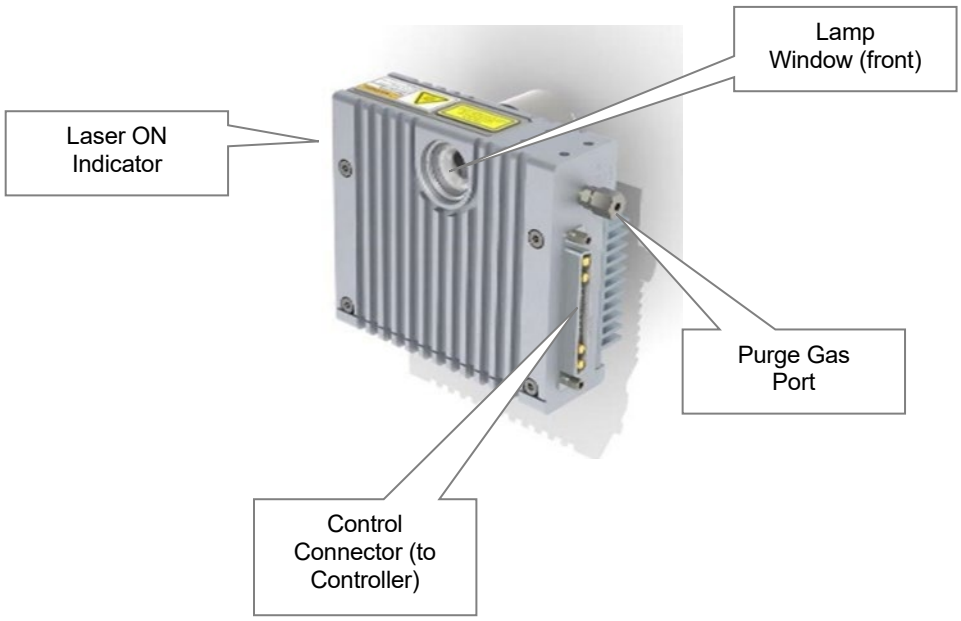


Figure 4: Lamp House Assembly

External features (refer to Figure 4):

Lamp Windows

The lamp windows at the optical output provide protection from the high pressure bulb inside the Lamp House. An internally-threaded SM1 adapter is provided for easy connection of optical hardware.

Nitrogen Purge Inlet

This is the inlet fitting for nitrogen purge gas. Purge gas is optional but is recommended for best performance when a deep UV bulb is provided. With no purge, ozone will form from atmospheric oxygen and attenuate the light output in the 220 – 280nm band. In addition, atmospheric oxygen and water vapor will attenuate the output below 200nm. Bulbs chosen for some OEM applications do not produce ozone and the purge fitting can be omitted.

There is no return fitting for the purge nitrogen. The purge flow normally escapes within the Lamp House enclosure, and then to atmosphere.

Laser On Indicator

This LED is illuminated when the laser is ON.

Control Connector (21-pin mixed D-sub)

Provides various power and control signals to/from the Power Supply Controller. No other connector or cable may be used with the EQ-9-HP other than the one supplied.

Chapter 3

INSTALLATION

Unpacking

Upon arrival, start by inspecting all parts of the system for completeness and any damage incurred in shipping. The EQ-9-HP shipping box should contain:

1) EQ-9-HP Power Supply Controller unit
1) EQ-9-HP Lamp House unit
1) Black interconnecting cable from Lamp House to Power Supply Controller (21-pin mixed D-sub).

OPTIONAL
1) EQ-99-RC Remote Control Module with interlock connector
1) I/O cable with 15 pin D- connector at each end
1) DC power supply with custom connector

If any part is missing or appears damaged, contact Energetiq immediately. Do not attempt to substitute any parts. There are no user-serviceable parts inside the EQ-9-HP Lamp House or Power Supply Controller unit.

Connections

Installation of the EQ-9-HP consists of connecting electrical and optional gas supplies, and connecting the Lamp House module to the user's equipment.

Electrical Power

The EQ-9-HP requires 12VDC at 11.7A minimum (140W rating). Power consumption is approximately 100W during normal operation. Some OEM versions have higher current requirements.

Power can be provided via a customer provided 12VDC power supply. The connector on the EQ-9-HP is a jack screw secured connector. This protects from accidental removal of power if the power cable is pulled. Connect to a 12VDC source as follows:

Connector	FCI DA3W3SA00LF
Pin A1	+12VDC
Pin A2	-12VDC return
Pin A3	Safety Ground

Purge Gas

Purge gas is optional but is recommended for best performance. With no purge, ozone will form from atmospheric oxygen and attenuate the light output in the 220 – 280nm band. In addition, atmospheric oxygen and water vapor will attenuate the output below 200nm. Some OEM units for near-UV and visible applications are equipped with bulbs which do not produce ozone and the purge fitting may not be present.

If required, connect a source of nitrogen purge gas to the port on the Lamp House. The fitting is a push-to-connect type, sized for 1/8" tubing.

Clean and dry nitrogen from either a Dewar or research-grade N_2 bottle is recommended. Do not use any other purge gas. Grade 6 or better gas purity is recommended to maintain cleanliness of the optics, and gas should be filtered to <5um. Supply pressure should be 20 psig (0.14 MPa). With a 20 psig inlet pressure, the EQ-9-HP will consume approximately 1 slm of flow.

There is no return fitting for the purge nitrogen. The purge flow normally escapes within the Lamp House enclosure, and then to atmosphere.

Optical Interface

The lamp windows accommodate light output of 0.56 NA. A pair of pins and four M4 threaded holes are available on the bottom of the EQ-9-HP for mounting. Four M4 threaded holes are also available on the top surface of the Lamp House. An internally-threaded SM1 adapter is provided for connection of optical hardware. See Figure 5 below for mechanical layout of the Lamp House.

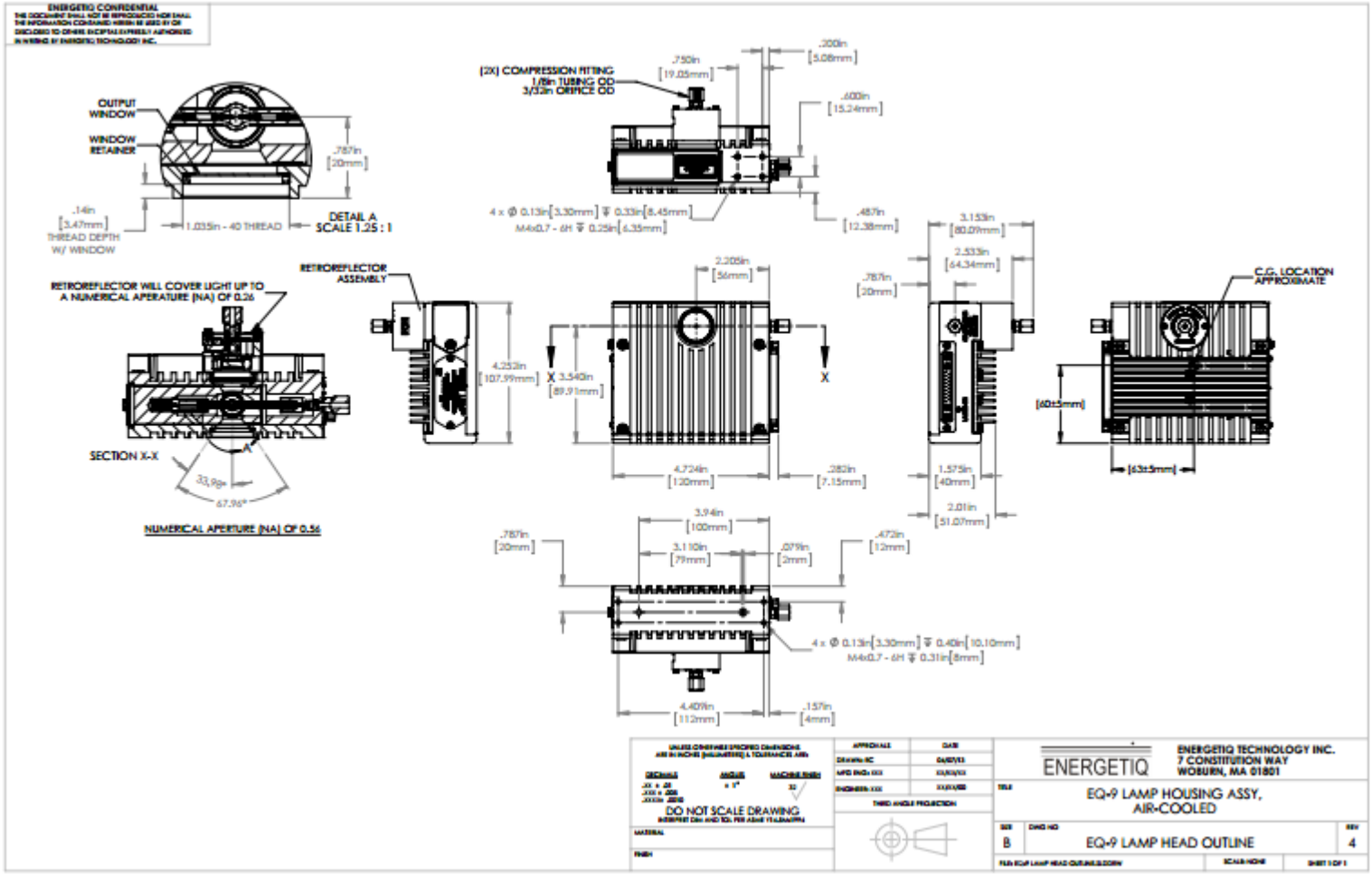

ENERGETIQ CONFIDENTIAL
OUTPUT WINDOW
WINDOW RETAINER
.787in [20mm]
.14in [3.47mm] THREAD DEPTH W/ WINDOW
1.035in - 40 THREAD
DETAIL A SCALE 1.25 : 1
(2X) COMPRESSION FITTING 1/8in TUBING OD 3/32in ORIFICE OD
.750in [19.05mm]
.200in [5.08mm]
.600in [15.24mm]
4 x Ø 0.13in[3.30mm] ↧ 0.33in[8.45mm] M4x0.7 - 6H ↧ 0.25in[6.35mm]
.487in [12.38mm]
RETROREFLECTOR WILL COVER LIGHT UP TO A NUMERICAL APERATURE (NA) OF 0.26
RETROREFLECTOR ASSEMBLY
4.252in [107.99mm]
2.205in [56mm]
3.540in [89.91mm]
X
X
3.153in [80.09mm]
2.533in [64.34mm]
.787in [20mm]
C.G. LOCATION APPROXIMATE
[60±5mm]
[63±5mm]
SECTION X-X
A
33.98°
67.96°
NUMERICAL APERTURE (NA) OF 0.56
4.724in [120mm]
.282in [7.15mm]
1.575in [40mm]
2.01in [51.07mm]
3.94in [100mm]
.787in [20mm]
3.110in [79mm]
.079in [2mm]
.472in [12mm]
4 x Ø 0.13in[3.30mm] ↧ 0.40in[10.10mm] M4x0.7 - 6H ↧ 0.31in[8mm]
4.409in [112mm]
.157in [4mm]
DO Nnot SCALE DRAWING
THIRD ANGLE PROJECTION
ENERGETIQ
ENERGETIQ TECHNOLOGY INC.
7 CONSTITUTION WAY
WOBURN, MA 01801
EQ-9 LAMP HOUSING ASSY, AIR-COOLED
B
EQ-9 LAMP HEAD OUTLINE
4

Figure 5: Lamp House mechanical layout

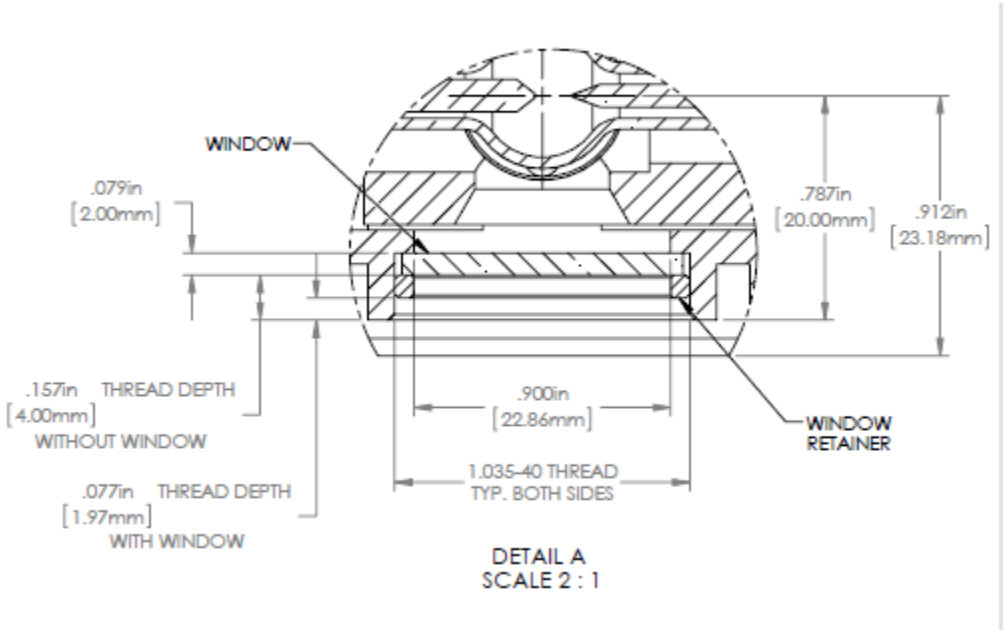


Figure 6: Lamp House Output Window Detail A

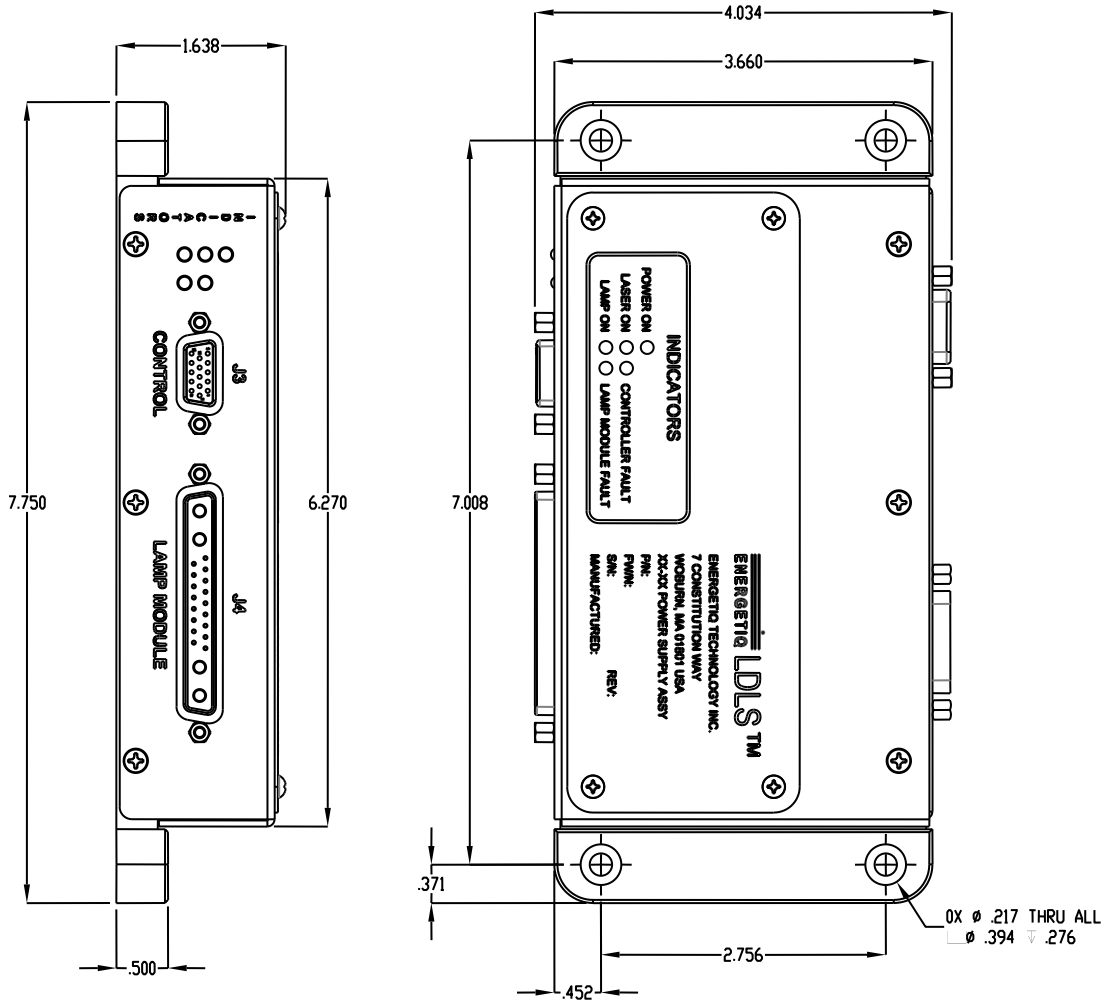


Figure 7: Power Supply Controller mechanical layout

Signal Connections

The EQ-9-HP is controlled through the remote I/O connector.

Table 3 gives the pin assignments and functions for this interface. Connect to the user's control system using a suitable cable. Mating connector is a standard high-density 15-pin d-sub male (for example, Amp part no. 748364-1 with contacts 1658670-2).

Optionally, connect a model EQ-99-RC remote control module to the I/O connector using the supplied cable

User I/O can be powered either by the EQ-9-HP internal isolated power supply, or an external supply.

Figure 8 shows connection schematics for both configurations.

Description	Pin #	Details
Commands (Inputs)		
LAMP OPERATE	12	OPERATE REQUEST, apply +5V (referenced to digital common) to initiate start cycle
EXTERNAL INTERLOCK	13	EXTERNAL INTERLOCK, apply +5V (referenced to digital common) to close interlock and allow operation
Status Indicators (Outputs)		
LAMP ON	1	Pulled to digital common when ON
LASER ON	2	Pulled to digital common when ON
LAMP MODULE FAULT	3	Pulled to digital common when OK, float on FAULT
CONTROLLER FAULT	4	Pulled to digital common when OK, float on FAULT
ISOLATED +5V SUPPLY	5	50mA maximum, referenced to digital common
DIGITAL COMMON	6,7,8,9	Galvanically isolated from system
RESERVED	10, 11	Do not connect
RESERVED	14,15	Do not connect

Table 3: I/O Connector Pin Assignment

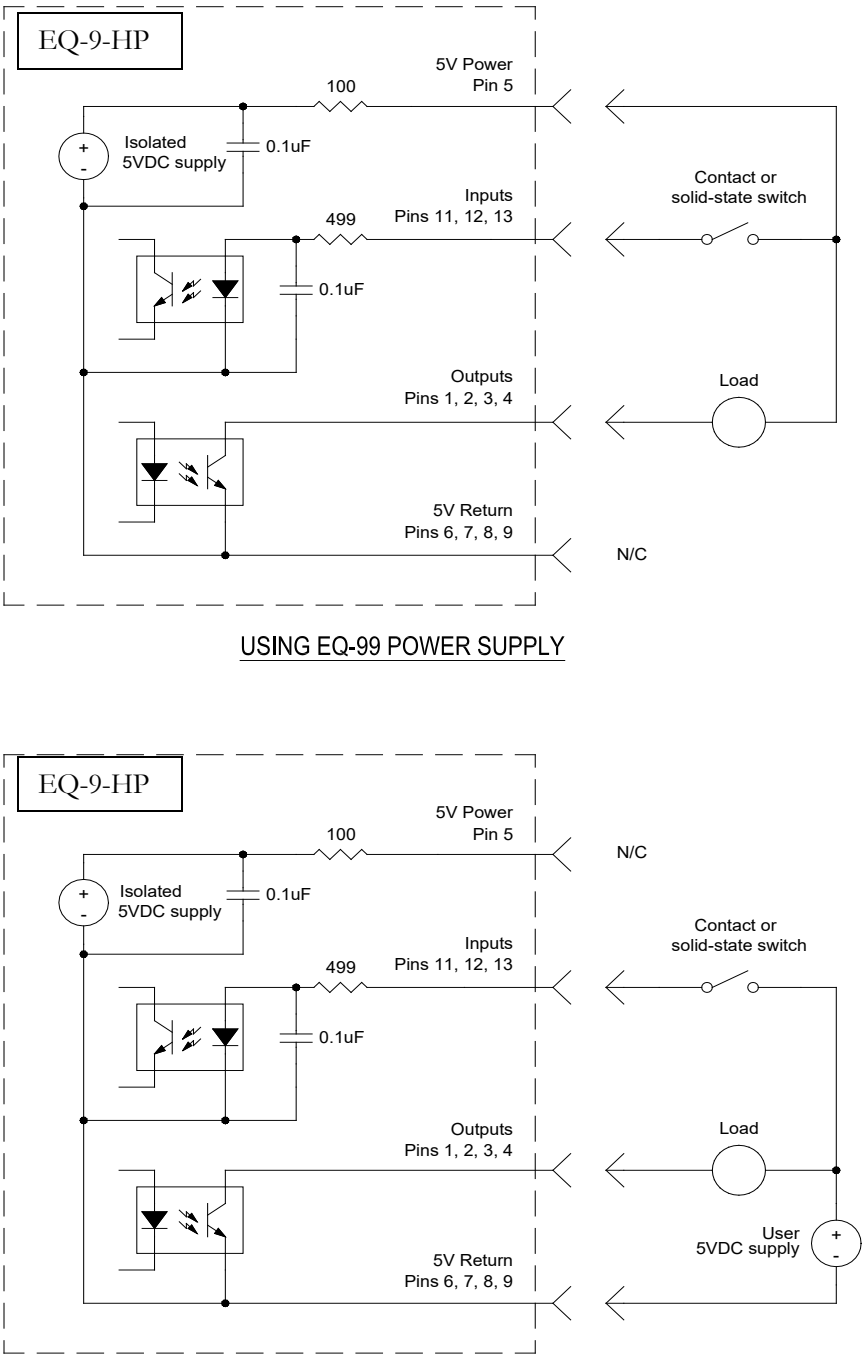


Figure 8: Remote Interface Schematic

RS-485 Serial Interface

General

This specification defines the commands and functions available for customer use via the EQ-9-HP RS-485 port.

The interface is derived from the EQ-400 customer interface, with some changes to the system status readback.

The RS-485 port will continue to support Logwatch as usual.

Hardware

Hardware configuration is as follows: Half-duplex (2-wire) RS-485, standard 9-pin male d-sub connector, 120 ohm termination across the data lines.

Pin connections are as follows:

Description	**Pin #**	**Details**
DATA – (A)	7	Connect to host DATA -
DATA + (B)	2	Connect to host DATA +
GROUND	5, 9	Galvanically isolated from system
RESERVED	1, 3, 4, 6, 8	Do not connect

Port settings are: 9600 bps, 8 data bits, 1 stop bit, no parity, no handshaking.

Laser power adjustment

Laser current in the EQ-9-HP is set by specifying a setpoint in amps. This is set at the factory (over the RS-232 programming port) during unit test. This is defined as full-scale laser power. Default value is 6.5 amps.

The customer will have the ability to adjust the actual operating power between 80% and 100% of full scale, in 0.5% increments.

Command set

A command consists of a single ASCII character, case-sensitive. If a valid command is successfully received, the EQ-400 responds with a string of ASCII characters.

Commands are as follows:

Command character	**Function**	**Reply from EQ-9-HP**
U	Increases the present laser power setpoint by 0.5% of full scale	Power = XXX.X %
D	Decreases the present laser power setpoint by 0.5% of full scale	Power = XXX.X %
Q	Queries the value of the present laser power setpoint (in % of full scale)	Power = XXX.X %
F	Resets laser power setpoint to factory default value	Power = XXX.X %
B	Saves present settings to flash memory. This command should be issued after the settings are at their desired values. If not, changes will be lost if power to the EQ-400 is interrupted.	Calibration data copied to FLASH Memory
H	Query bulb operating hours	Bulb time = XXXX.X hrs
Z	Zero bulb operating hours	Send 'z' within 10 sec. to confirm.
z	Confirm zeroing of bulb hours	Bulb hours zeroed & flash saved
L	Query laser operating hours	Laser time = XXXX.X hrs
T	Query lamphead temperature	LH temp = XX.X degC
S	Query system status. Returns a 16-bit decimal number representing the present system status. See below for bit mapping.	00000 to 65535
?	Displays a help menu listing the available commands	EQ9-HP firmware vXXX build date mm/dd/yy (c) Energetiq Technology, Inc. U/D Inc/Dec laser pwr (by 0.5% full scale) Q Query laser pwr setpoint F Reset laser pwr to default B Burn settings to flash memory H Query bulb operating hrs Z Zero bulb operating hrs z (confirm above within 10 sec) L Query laser operating hrs T Query lamphead temp S Query system status ? This menu

System status word

Bit #	Definition
0 (LSB)	Fault status: 1 = one or more faults present, 0 = no faults
1	Laser status: 1 = on, 0 = off
2	Lamp status: 1 = on, 0 = off
3	Laser temperature: 1 = overtemperature, 0 = OK
4	Reserved – always 0
5	Reserved – always 0
6	Lamphead temperature: 1 = overtemperature, 0 = OK
7	Reserved – always 0
8	Lamphead interlock: 1 = open, 0 = OK
9	External interlock: 1 = open, 0 = OK
10	Reserved – always 0
11	Laser photodiode signal: 1 = low, 0 = OK
12	Lamp photodiode signal: 1 = low, 0 = OK
13	Ignition status: 1 = failed to ignite, 0 = OK
14	Reserved – always 0
15	Reserved – always 0

Installation Procedure

1. Mount the Controller Unit rigidly to a suitable metal part of the equipment structure using the four mounting holes and suitable hardware. The surface chosen to mount the Controller Unit should be near ambient temperature, preferably 20°C to 30°C and capable of dissipating 25W of heat. See Figure 7 for dimensional and mounting details.
2. Connect the Lamp House unit output to the user equipment. The beam should always be either directly coupled to a fiber optic cable, or enclosed in an appropriate beam pipe, tube, or enclosed space and purged with nitrogen. Operating the source without any output target or beam transport is not recommended, and may lead to unsafe operating conditions. Consult Energetiq for applications information and suggested configurations.

   The Lamp House should be mounted in the orientation shown in Figure 4, with the output windows on the side and the bulb oriented horizontally. The lamp has been factory aligned in this position. Mounting the lamp in a different orientation will cause the plasma position inside the bulb to shift slightly and may cause performance problems.

   Setup the Lamp House unit with appropriate ultraviolet safety measures and laser light safety measures in place. It is recommended that any enclosure or aperture-blocking hardware utilize switches wired to the EQ-9-HP external interlock circuit.
3. Connect the black 21-pin mixed D-sub interconnect cable from the Controller Unit to the Lamp House.
4. If required, connect nitrogen purge gas to the Lamp House. Refer to "Facilities Requirements" above.
5. Connect user's control system to the I/O interface connector as shown in Table 3 and Figure 8.
6. Alternately, if using the EQ-99-RC Remote Control Module, place it on a clean rigid surface. Install the supplied 15-pin cable from the Power Supply Controller to the EQ-99-RC.
7. Connect 12VDC input power source to the Controller Unit.

The system is now ready to operate.

Chapter 4

OPERATION

Starting

Once the lamp is set up properly, verify that all personnel that will be in contact with the lamp system are aware of the potential hazards involved. It is the responsibility of the user to verify that the lamp is being used safely.

This example assumes the use of the EQ-99-RC Remote Control Module to provide local control. If using a custom control system, substitute the appropriate digital input and output lines from Table 3 for the switches and LEDs described below.

1. With the EQ-99-RC Remote Control Module connected properly, review the status LEDs on the Power Supply Controller. The POWER ON LED should be lit, and neither the CONTROLLER FAULT nor LAMP MODULE FAULT LEDs should be lit.

2. Turn on the OPERATE Switch (place switch in UP position).

3. Within several seconds the LASER ON LED will light. Laser light is now present in the Lamp House.

4. In approximately 20-150 seconds the igniter will be turned on automatically and the plasma will ignite. The LAMP ON LED will be lit. The duration of the warm up time (20-150 seconds) will depend on the temperature and previous operating condition of the EQ-9-HP. The EQ-9-HP will automatically detect when the unit has reached the optimum conditions for ignition.

5. If a bulb fails to ignite, 150 seconds after the OPERATE switch was activated, the LASER ON LED will go out, the LAMP FAULT LED will be lit, and LAMP ON LED will remain off. This is very unusual. However, if this occurs, turn the OPERATE switch to the OFF position (down) and begin at Step 1 again. If this occurs multiple times, contact Energetiq service

Stopping

To turn the LAMP off, simply turn the OPERATE Switch to the OFF position. If the lamp will not be used for some time, the 12VDC supply can be turned off.

To minimize wear on the ignition components, it is best to avoid frequently starting and stopping the lamp. It is recommended to run the lamp continuously if long off-periods are not required.

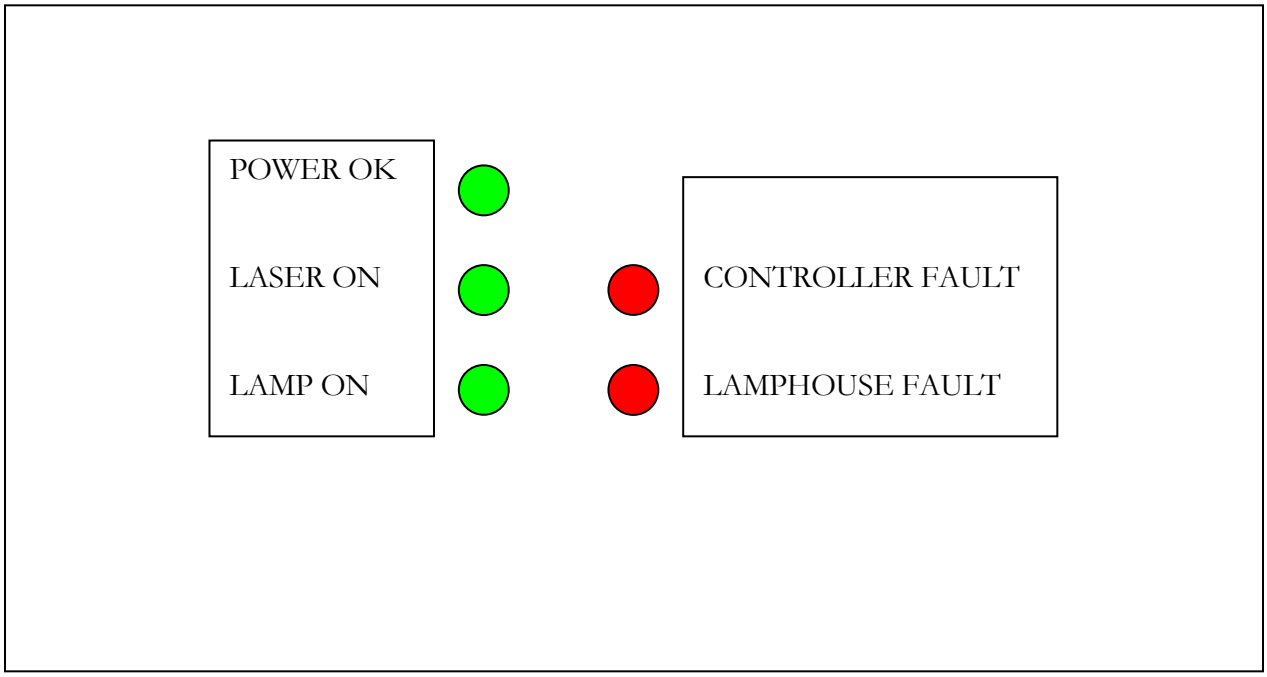
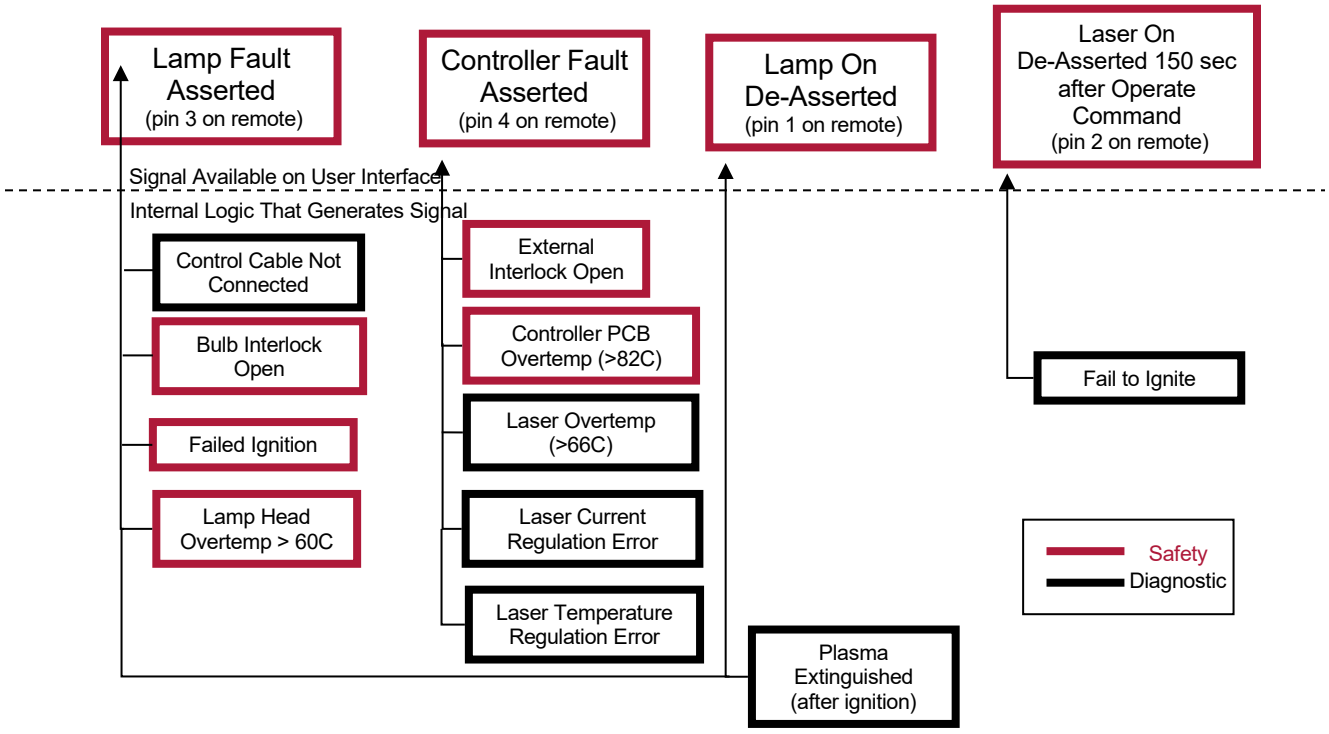


Figure 9. Identification of Indicator LED's on Control Unit

Fault Indicator Block Diagram



See below if any problems are encountered in operating the EQ-9-HP.

Condition:

Controller Fault and/or Lamp House Fault LED(s) are ON.

Action:

- Always begin operation of the source by verifying the interlocks.
- Confirm that the external interlock contact is closed (or that the black jumper plug is fully inserted into the back of the EQ-99-RC Remote Control Box)
- To reset or clear a Fault condition, actuate the "Operate" switch from the ON position to the OFF position. If a fault was generated while the "Operate" switch was in the OFF position, first actuate the switch to the ON position, then to the OFF position. The unit will not turn on if a fault condition exists.
- If all of the interlocks are OK and either the lamp or controller interlock faults will not clear, please contact the factory.

Condition:

Lamp fails to ignite after several tries.

Action:

Contact Energetiq.

Appendix A

REVISION CONTROL

Version Number	Modified By	Modifications Made	Date Modified
Rev. 2	M. Steinberg	Updated CE Mark, Page footer format, added Appendix A	January 2018
Rev. 3	L. Chan	Updated: • Declaration of Conformance to latest electrical safety standards • Laser safety labels to reflect latest standards date.	June 2022
Rev. 4	E. Burz	Compliance label updates. Updated Declaration of Conformity. Minor edits.	June 2023

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Energetiq laser-driven light source (LDLS®)) products are designed to be RoHS and REACH compliant and possess a CE marking. For a list of compliance documentation, including the Declaration of Conformity, visit www.energetiq.com/compliance.

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