

Cool Photons Operating Manual

Version 1.0.1



April 20, 2022

Contents

1	Introduction	2
2	Specifications	3
3	Operation	4
	3.1 Laser Diode Insertion and Replacement	4
	3.2 Setup and Operation	6
4	Drawings and Dimensions	7
5	Packaging and Handling	8
	Support	8



1 Introduction

Advanced Photonic Sciences' Cool Photons unit provides means of easy operation of high-power visible laser diodes. The compact system is equipped with integrated water-cooling as well as diode temperature monitoring.

The Cool Photons unit is a universal cooling, mounting and collimating system, designed to house various 9mm laser diodes. Operation remains consistent regardless of your chosen diode, however, certain parameters are diode specific, and the laser diode datasheet should **always** be referred to before operation. Product Specifications are shown in [Section 2](#).

This product is assembled before shipping, however, is designed to be disassembled for diode replacement. Instructions for this action, accompanied with graphics, are shown in [Section 3.1](#).

The system includes quick-disconnect hose fittings for easy use with the your thermoelectric water chiller and an integrated 9-pin connector available for power supply and monitoring. Set-up and operation of your system is described in [Section 3.2](#).

The multi-part system allows the user to mount their diode either vertically or horizontally on a standard optical table with 1" hole spacing. Dimensions of this product are shown in [Section 4](#).

Not Included: Thermoelectric Water Chiller, Power Supply, Solder

Please read this document before attempting to operate this system.

2 Specifications

Discipline	Parameter	Value	
Mechanical	Width	3.50 in.	
	Length	7.00 in.	
	Height	4.00 in.	
	Hose Outer Diameter (OD)	0.25 in.	
	Hose Hardness	95A	
	Hose Fitting NPT	1/8	
	Water Temperature	Diode Specific	
Electrical	Max Operating Current	Diode Specific	
	Operating Voltage	Diode Specific	
	9 pins (Suggested)	Pin 1	Anode (+)
		Pin 5	Cathode (-)
		Pin 6	Thermistor
Pin 9		Thermistor	
Optical	Beam Height (w/ Vertical Mount)	2.600 in.	

*Note: Diode Specific parameters should be found in your Laser Diode datasheet.

3 Operation

This section explains the insertion and replacement of laser diodes as well as system setup and operation. An exploded view of the system is shown in Figure 1. Components will be referenced by the numbers shown.

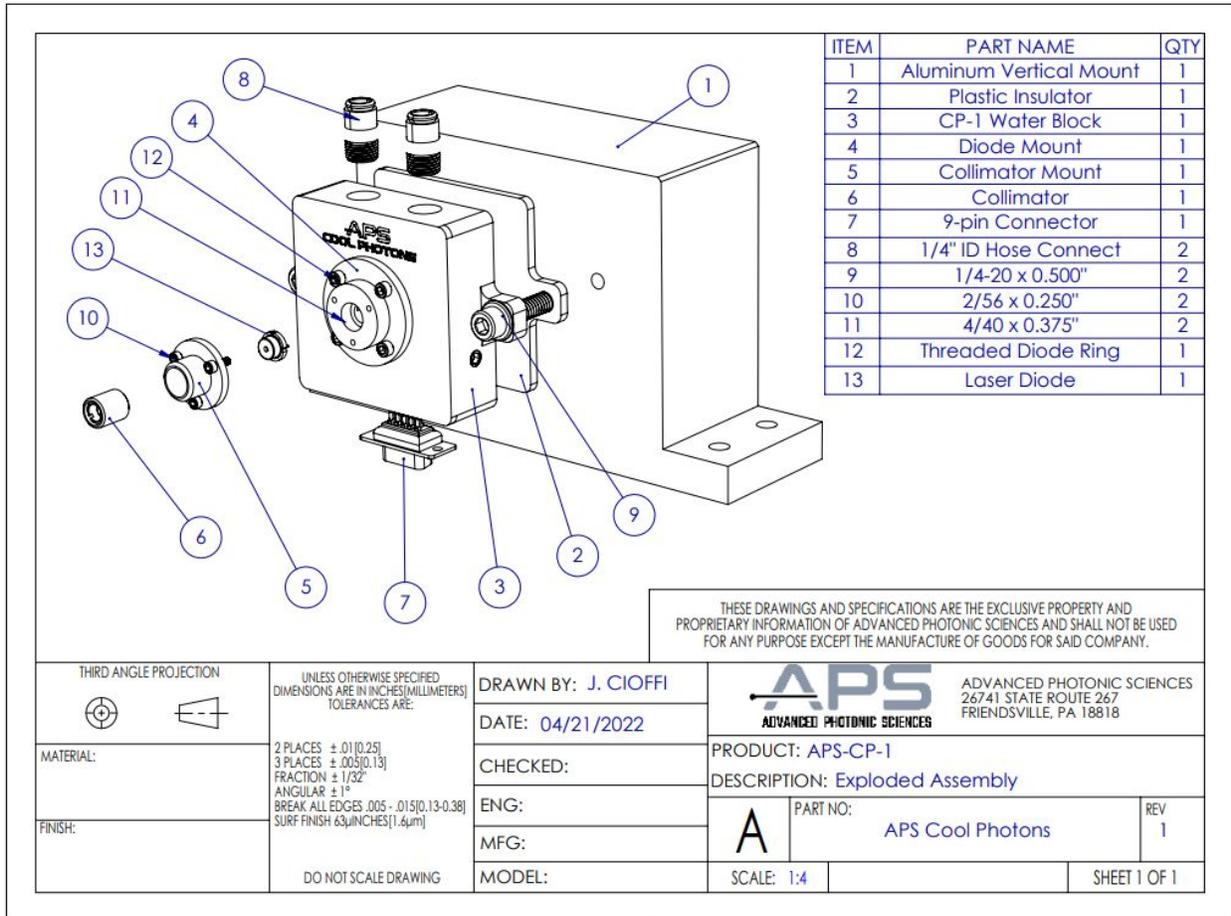


Figure 1. Cool Photons Exploded Assembly

3.1 Laser Diode Insertion & Replacement

The Cool Photons system is designed to house various diodes, which are housed in the Diode Mount (4). Laser diodes can be removed and replaced by the user by following these steps.

The chosen diode should be prepared prior to insertion. About 3 inches of wire needs to be connected to both diode leads. Colors are recommended to keep note of polarity. Heat shrink wrap is recommended around solder connections for protection from shorting.

Once the laser diode is prepared with wire, insert the wire through the center of the Diode Mount (4), as shown in Figure 2.

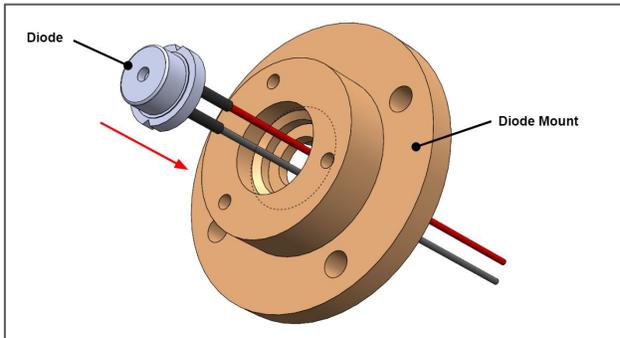


Figure 2. Diode Insertion

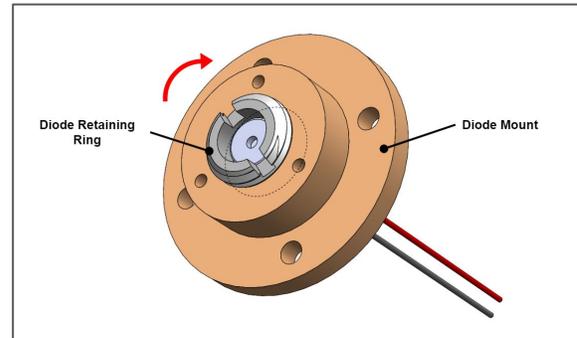


Figure 3. Diode Retaining Ring

Then, insert the Diode Retaining Ring (12) and hand tighten until the diode is secure, as shown in Figure 3. This ensures appropriate heat removal.

As shown in Figure 4, feed the diode wires and the thermistor wires through the center hole of the Water Block (3) and connect to the 9-pin connector following the pin-out chart in [Section 2](#).

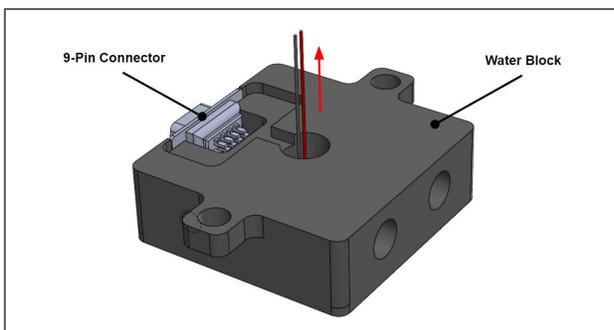


Figure 4. Wire Connections

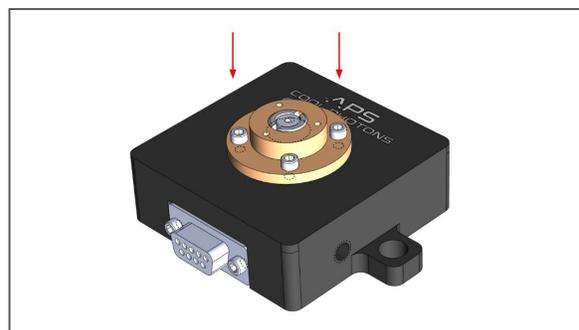


Figure 5. Diode Mount

Finally, mount the Diode Mount (4) to the Water Block (3) via the four provided #2-56 bolts. Mount the Water Block to either the Vertical Mount or an optical table, ensuring the Plastic Insulator is in place.

3.2 System Setup & Operation

The user should first mount the unit in their desired location and position. The black CP-1 Water Block can be removed from the Aluminum Mount to mount flat on a surface. Both orientations are mounted via 1/4-20 bolts.

Water hoses should then be connected to the quick-disconnect hose fittings by pushing on the blue ring, inserting the hose, and releasing. Ensure the hose is above the required Durometer rating of 95A. The flow direction is negligible. Lightly tug on hose connections to ensure security. It is recommended that water is sent through the system to ensure there are no leaks before moving onto the next step.

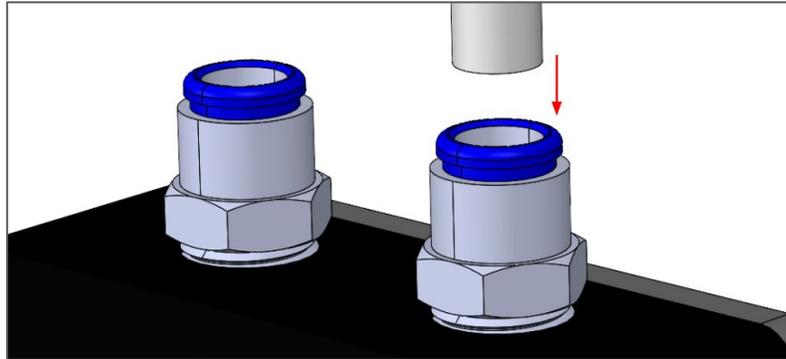
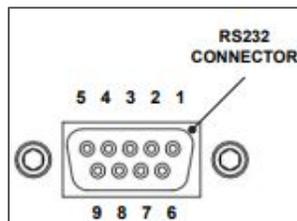


Figure 6. Hose Connections

Once water flow is tested, the power supply should be connected using the pins denoted in [Section 2](#).



4 Drawings and Dimensions

4.1 Product Dimensions

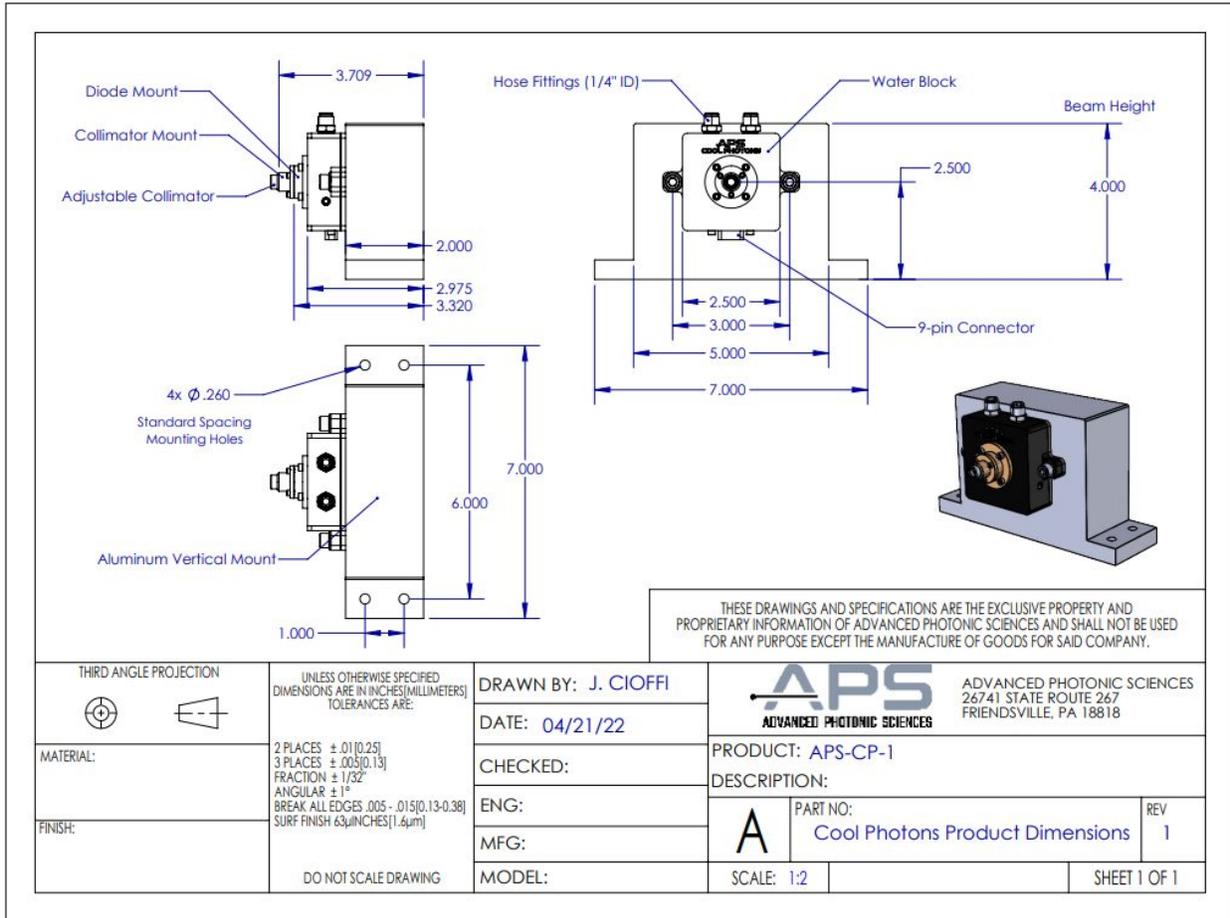


Figure 7: Cool Photons with Vertical Mount

Note: Water Block is designed to be removed and mounted flat on a surface if desired.

5 Packaging and Handling

This product is assembled before packaging and shipping.

Product Weight: Approx. 5 lbs

Support

Please contact Advanced Photonic Sciences for technical support.

www.apslasers.com



Advanced Photonic Sciences
26741 State Route 267
Friendsville, PA 18818
(570) 553-1120
info@apslasers.com