

Opt Lasers GRAV

PLH3D-15W Engraving Laser Head - User's Manual



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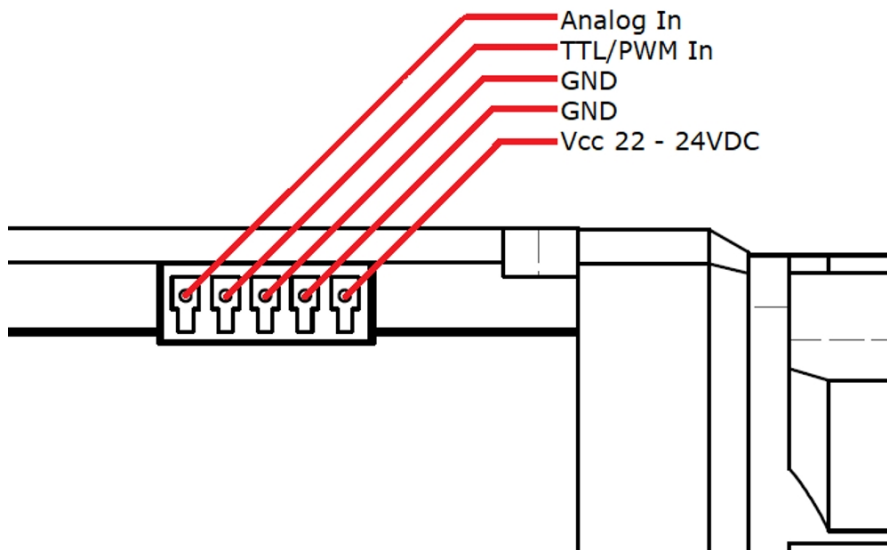
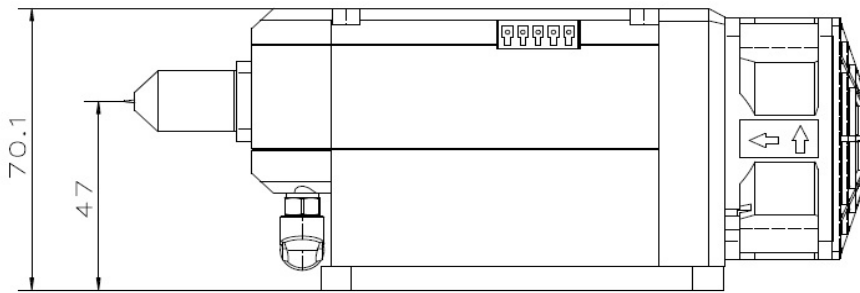
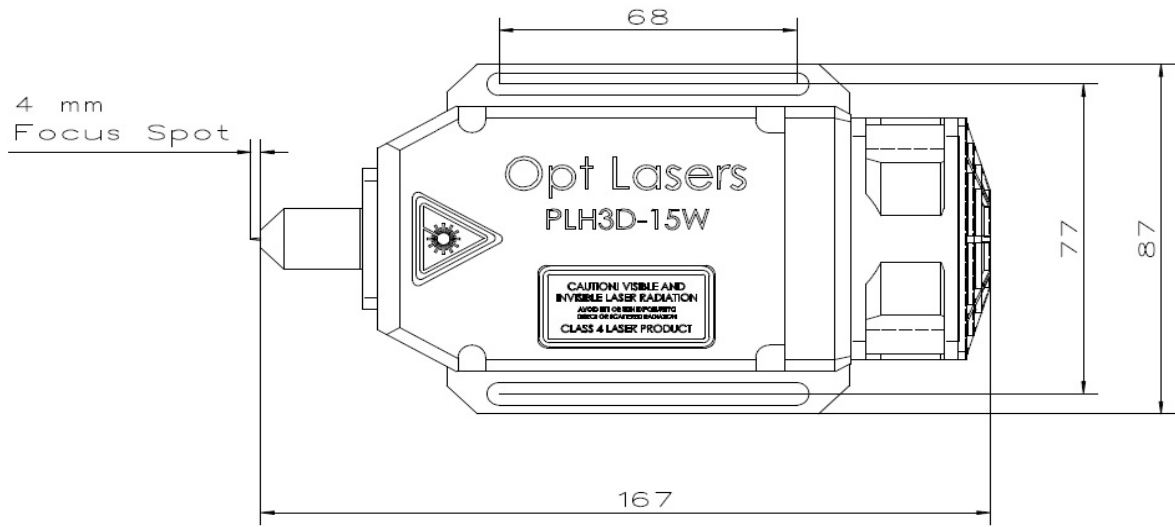
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Technical Specifications

Item	Typical Value	Comments
Optical Power	15 W	$T_{\text{Ambient}} = 25^{\circ}\text{C}$
Center Wavelength	445 nm	
Working Distance	4 mm (0.157")	Distance from the tip of air nozzle
Beam Spot Width	180 μm (0.007")	
Dimensions	40 x 54 x 86.5 mm (1.6" x 1.7" x 3.4")	(L x W x H), with nozzle attached
Mounting Hole Pattern	77 x 68 mm (3" x 2.7")	M3 (#4-40) or M4 (#8-32) recommended
Weight	790 g (27.8 oz)	
PSU Voltage	22 - 24 VDC	
Power Consumption	<85 W	
Modulation Input 1	0 - 5 V	Analog / PWM / TTL
Modulation Input 2 ¹	0-3 V, 0-5 V, 0-10 V, 0-24 V	PWM / TTL
Max. Mod. Bandwidth	30 kHz	Recommended: 5 - 10 kHz
Operating Temperature	10°C to 45°C (50 - 113°F)	
Air Nozzle Hose Size Standard	4 mm (5/32")	
Max. Air Pressure	5 bar (72 PSI)	

¹"Laser Off" state is < 2 V. "Laser On" state is 3 – 24 V.

Dimensions and Pinout



Electrical Information

Important: PLH3D-15W-Series engraving laser head should be powered with a high-quality power supply without anything else connected. Please note: connecting the laser head to the same power supply unit as a stepper motor or any other high-impedance equipment is not recommended. Doing so may cause irreversible damage to laser diodes.

Important: Do not connect both Modulation Input #1 and Modulation Input #2 at the same time. Doing so may result in the malfunction of the laser head.

Modulation Functionality

Engraving Laser Head	Modulation Input 1	Modulation Input 2
PLH3D-15W Series	0 – 5 V Analog Signal 0 – 5 V TTL/PWM Signal	0 – 5 V TTL/PWM Signal 0 – 10 V TTL/PWM Signal 0 – 24 V TTL/PWM Signal

Modulation Input #1:

Modulation Input #1 accepts Analog, Pulse-Width Modulation (PWM) and Transistor-Transistor Logic (TTL) signals. The operating range of Modulation Input 1 is 0 – 5 V. If it is connected to a signal with a slightly higher voltage, e.g., 0 – 10 V, only the 0 – 5 V portion of the signal will affect the laser output power. The voltage connected to this input should never exceed 10 V.

Modulation Input #2:

Modulation Input #2 accepts PWM or TTL signals. Examples of compatible control signal ranges are: 0 – 5 V, 0 – 10 V and 0 – 24 V. For control via PWM, we recommend using a base frequency of 5,000 – 10,000 Hz. While frequencies such as 1,000 Hz can also work, higher frequencies typically produce better grayscale images. Duty cycle % will correspond to the optical output power %.

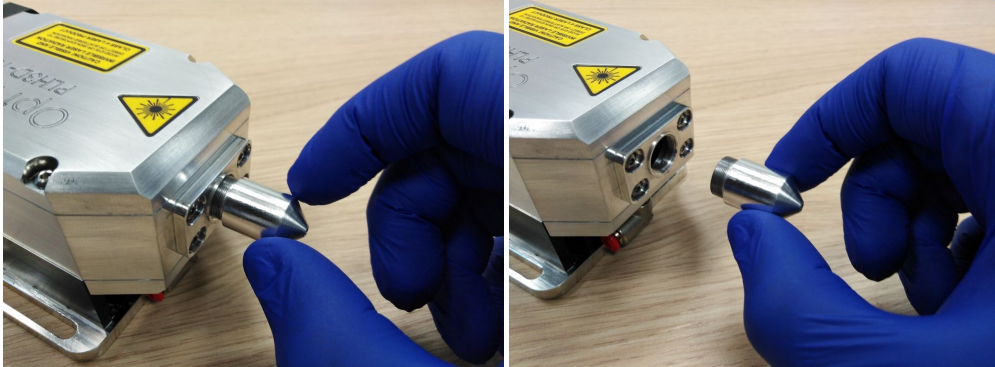
Specification of Modulation Input #2 are following:

Parameter	Test condition @ Ta = 25°C	Min. Voltage	Typ. Voltage	Max. Voltage	Units
High level input voltage	Vcc = 12 V Vcc = 24 V	2.5	-	-	V
Low level input voltage	Vcc = 12 V Vcc = 24 v	-	-	1.0	V

Maintenance

1. Nozzle Removal

For cutting materials thicker than 3.5 mm the air nozzle should be removed. To remove the air nozzle, unscrew it as shown in the images below.

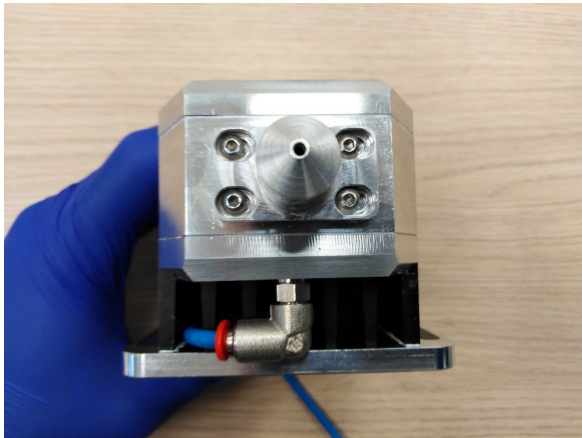
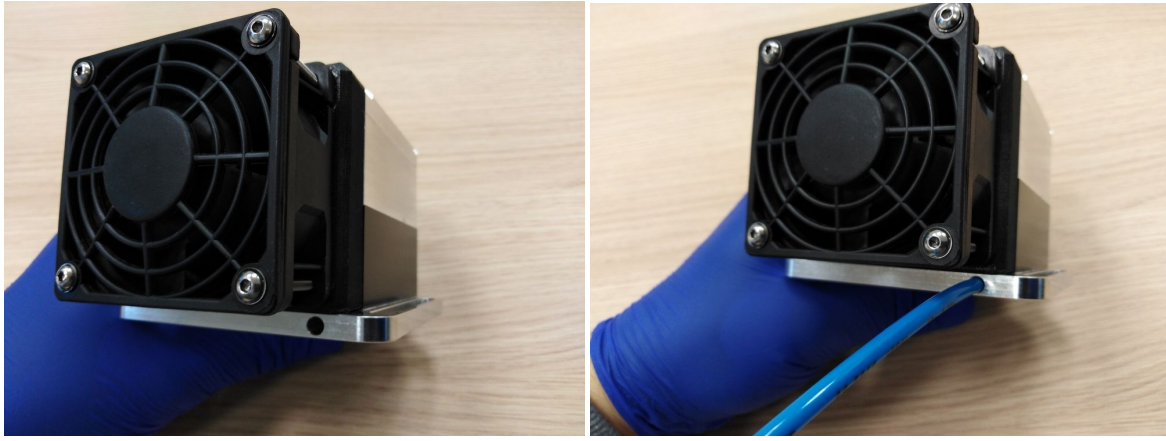


Important: Never unscrew or loosen the screws shown in the image below. The part that they are holding is factory aligned.



2. Air Nozzle Connection

High pressure nozzle can be connected via a 4 mm (5/32") hose. The hose is meant to be guided through the hole at the back of the laser head. It is important that you ensure the nozzle has got a fresh air supply.



3. Cleaning the Lens

We recommend regular inspections of the lens surface cleanliness before laser processing operations. The front surface of the lens is easy to clean in case it has become dirty during your recent engraving or cutting operations. The cleaning procedure can be carried out with Isopropyl Alcohol (IPA) and an optical wipe. You can watch an appropriate cleaning technique on our Youtube channel.