

Pre-Installation Guide

- HP Patara Laser System (Model PA-100-QMG)



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Safety Information

Product End-of-Life Handling



NG CEO is committed to protecting the environment. In accordance with the Waste Electrical and Electronic Equipment directive (WEEE) and Restriction of Hazardous Substances in the European Union (RoHS EU) directives, NG CEO accepts the return of our products for disposal. When you are ready to reclaim the instrument, you must properly transfer it according to local regulations concerning WEEE equipment. Contact NG CEO or your local distributor for shipping instructions. Please package the products as directed for a return for repair.

ROC ROHS Declaration

In accordance with the Clause 6.2 of Marking for Control of Pollution Caused by Electronic Information Products (SJ/T11364:2006) for Measures for the Administration on Pollution Control of Electronic Information Products No. 39, Order of the Ministry of Information Industry of the Peoples Republic of China, NG CEO includes the following translation about our laser modules.

中华人民共和国，电子讯息产品管理办法：自我声明							
生产商		Northrop Grumman Cutting Edge Optonics					
生产商地址		20 Pointe West Blvd St. Charles, MO 63301 USA					
产品名称 / 编号		Mirus Series Laser Systems Models: MI-xxx-xxxx-xxxx and AMI-xxx-xxxx-xxxx					
有毒有害物质或元素标认表							
部件编号	部件名称	有毒有害物质或元素					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
第一组	外壳	○	○	○	○	○	○
第二组	电线/ 连接插头	X	○	X	X	X	X
第三组	安装组件	○	○	○	X	○	○
第四组	开关组件	○	○	○	X	X	X
第五组	电路板/ 开关组件	X	○	○	○	X	X
第六组	阵列前端次模组	○	○	○	○	○	○
第七组	接触板	X	○	○	○	X	X
第八组	热交换组件	○	○	○	○	○	○
第九组	16 进制硬件	○	○	X	○	○	○
第十组	焊锡	X	○	X	○	○	○
第十一组	电线/ 连接插头	X	○	○	○	X	X
第十二组	基部/ 端帽	X	○	○	X	○	○
第十三组	硬件/ 装配	○	○	○	X	○	○
第十四组	時計组件	X	○	○	X	X	X
第十五组	包装物料	○	○	○	○	○	○
○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 规定的限量要求以下							
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 规定的限量要求							

Conventions

The following conventions appear in this manual:



This icon denotes a caution or a warning, which advise you of precautions to take to avoid injury, data loss, or a system crash.

Initial Capped

The first letter in uppercase refers to menu options, e.g., **Phase Delay**, **Pulse Width**.

CAPS

Front-panel buttons, knobs, and connectors appear in all uppercase letters, e.g., **MENU**, **CURRENT**.



The ► symbol separates a sequence of button pushes, e.g., **MENU ► CHANNEL SETUP ► PULSE WIDTH** means that you push the **MENU** button, then push the **CHANNEL SETUP** soft key, and then push the **PULSE WIDTH** soft key.

italic

Italic text denotes references to other resources that may be helpful to you or to bring attention to important information.



This icon denotes a note, which alerts you to important information.



Power Switch Position Symbols
I = On O = Off

The following conventions may appear on the product:

DANGER

An injury hazard immediately accessible as you read the marking.

WARNING

A hazard not immediately accessible as you read the marking.

CAUTION

A hazard to property including the product.



ESD: Handle Appropriately



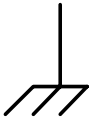
Laser Emission: Use caution.



Shock Hazard: Use caution.



Caution: Risk of danger. Refer to manual.



Chassis Ground

General Safety Summary

The Patara Laser System emits laser radiation that can permanently damage eyes and skin, ignite fires, and vaporize materials.

Do not attempt to operate the laser system before carefully reading the complete operation manual provided with the product. If you have any questions on the product that have not been discussed sufficiently in the manual, contact the manufacturer for complete instructions. Failure to heed this warning may result in the destruction or serious damage to the device, and will void the product warranty.

About This Guide

This document is to provide information necessary for smooth installation/integration of the Patara Laser System with the eDrive Nitro Laser Controller. The Guide consists of the following chapters:

- *Chapter 1: eDrive Dimensions, Power Requirement and Mounting* describes details of the eDrive Nitro
- *Chapter 2: DC Power Supply Dimensions, Power Requirement and Mounting* describes details of the DC Power Supply
- *Chapter 3: Laser Head Dimensions, Beam Height, and Mounting Requirements* describes details of the Patara laser head
- *Chapter 4: Closed Loop Chiller* provides information about plumbing the Patara Laser System.
- *Chapter 5: Hardware List, Equipment, Safety and Consumable Parts* provides information on laser operation considerations, and suggested supplies.

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Chapter 1: eDrive Dimensions, Power Requirement and Mounting

This chapter provides the following information:

- eDrive Dimensions
- Input Power
- Rack Mounting
- Clearance
- Weight

eDrive Dimensions

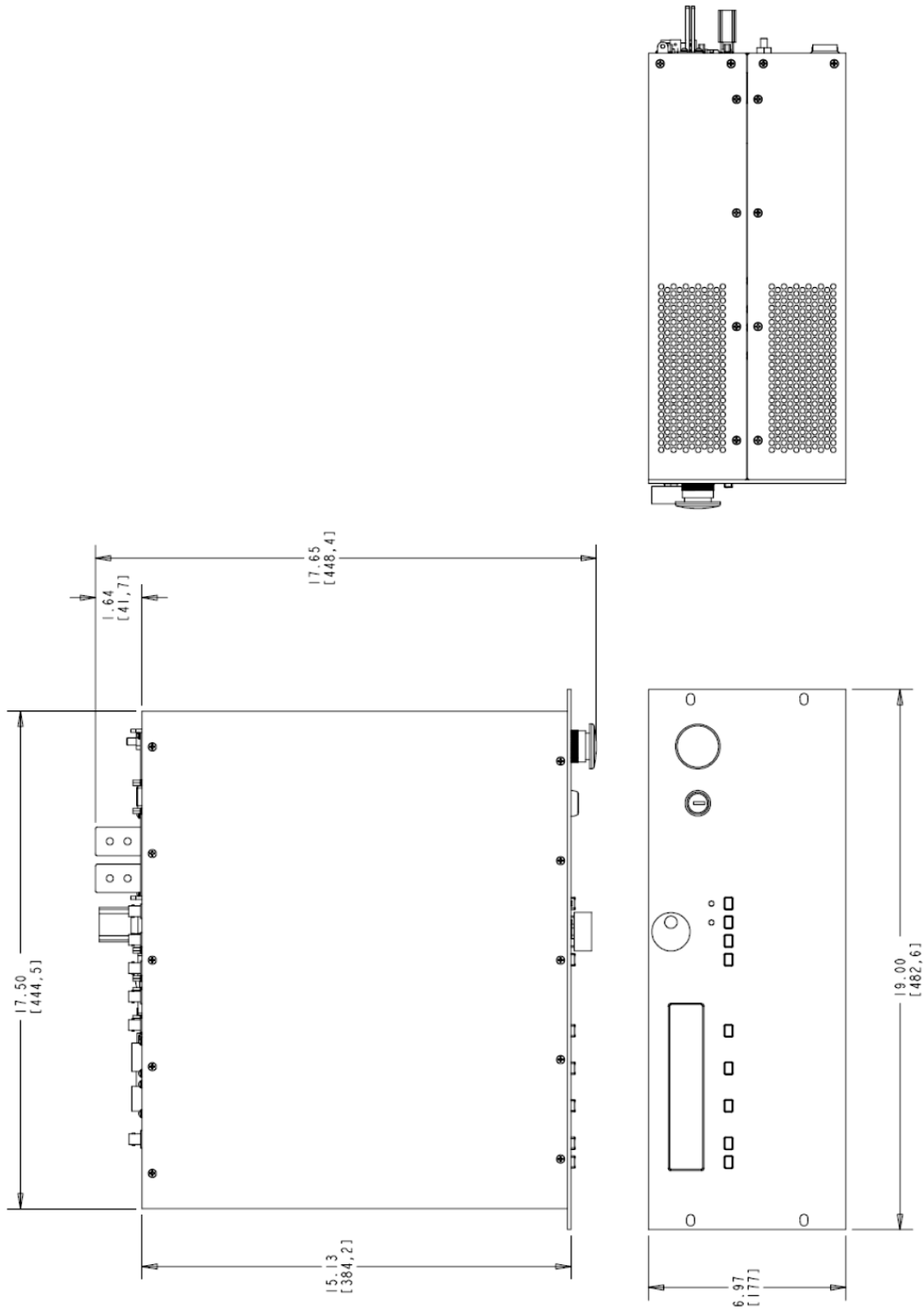


Figure 1-1 Dimensions of eDrive Nitro for Patara Laser

Input Power

Use only power cords suitable for your driver. Use a power source that delivers power in the range of 90 to 250 VAC-RMS, 47 to 63 Hz. Power switching is done automatically; there are no configuration switches to set for high or low power ranging. Table 1-1 lists the recommended fuse selection for each voltage range.

Table 1-1 eDrive Recommended Fuse Ratings

AC Input		Frequency	Fuse Ratings (F1, F2)
120V \pm 10%	15A	50/60 Hz	T 15A 250V
240V \pm 10%	8A	50/60 Hz	T 8A 250V

Fuse Dimensions: 0.25 x 1.25 inches

Rack Mounting

When installing the eDrive Nitro into an EIA-310D-compliant rack, always install rack mounting screws into the two bottom holes of the front panel flanges first and then install screws into the top holes. This will help to minimize any potential damage that might occur to the eDrive front panel if the driver were to shift during installation.

For the eDrive Nitro, it is recommended that two people install the unit into a rack. Supporting rails should be used. Lift the driver into place and then fasten the front panel flanges into place.



WARNING. Using the eDrive Nitro without mounting rails can result in serious damage to the driver or personal injury.

Clearance

Adequate clearance should be allowed on the front, sides, and rear of the eDrive for access to connections and components. The front and rear vents of the eDrive must be a minimum of 24 inches (61 cm) away from walls or vertical surfaces so air flow is not restricted.

Weight

The total weight of eDrive Nitro for Patara laser is approximately 52 pounds (23.6kgs).

Chapter 2: DC Power Supply Dimensions, Power Requirement and Mounting

This chapter provides the following information:

- DC Power Supply Dimensions
- Input Power
- Rack Mounting
- Clearance
- Weight

DC Power Supply Dimensions

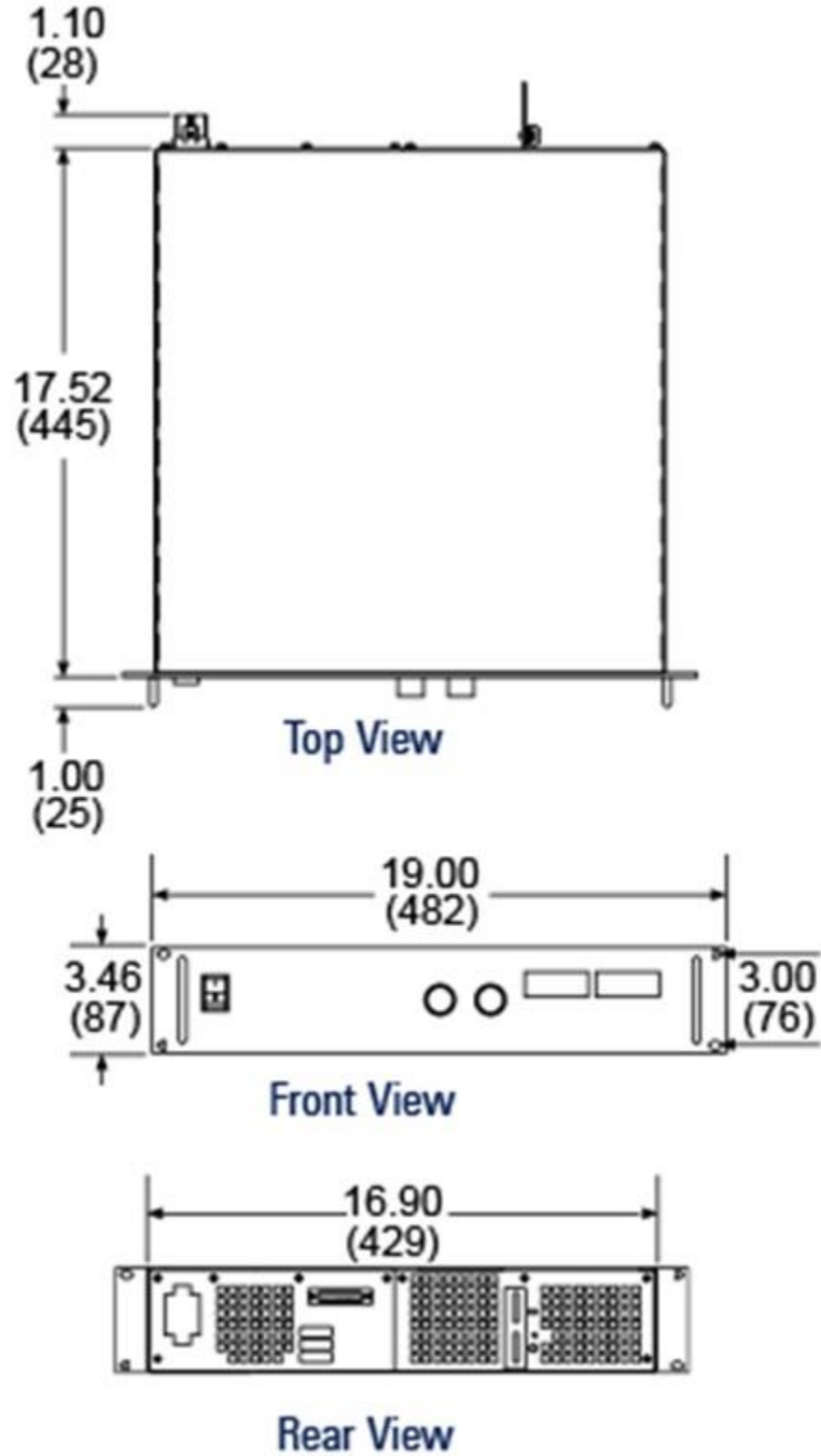


Figure 2-1 Dimensions of DC Power Supply

Input Power

Before you can use the DCS 60-50E power supply, you must determine your AC input power requirements and connect an appropriate cable or line cord to the input connector. The power supply is shipped with a kit of connector and strain relief parts which will need to be assembled.

Due to variety of AC outlets, customer should prepare the proper power plug for the power supply.

Table 2-1 Input Voltage, Current, and Frequency

AC Input Voltage Range	Maximum Input Current	Frequency
200-250 Vac Single Phase	20 A rms	47-63 Hz
190-250 Vac Three Phase	14 A rms	47-63 Hz



CAUTION! The maximum output power must be limited to 2500 Watts when the power supply is used with a single phase input to avoid tripping the power supply's input circuit breaker

Rack Mounting

The supply is designed to fit in a standard 19" equipment rack. Bolt holes in the chassis sides are provided for rack mount slides such as the ZERO #C300S18 slides. When installing the unit in a rack, be sure to provide adequate support for the rear of the unit while not obstructing the ventilation on the top, sides, and rear of all units.



CAUTION! Rack mounting bolts must not extend more than 3/16" into the side of the power supply.

Clearance

The DCS-E system supply is fan-cooled, so it requires unobstructed space on the top ventilation inlets and space at the rear and sides for the ventilation exhaust. The following temperature ranges apply for the best results when operating or storing the unit.

Operating ambient temperature should be within 0 to 50° C with no derating. From 50 to 70° C, derate output 2% per °C.

Storage Temperature Range: -55 to +85° C

Weight

The total weight of DCS-E power supply is approximately 35 pounds (16kgs).

Chapter 3: Laser Head Dimensions, Beam Height, and Mounting Requirements

This chapter provides the following information:

- Laser Head Dimensions
- Beam Height
- Mounting Requirement
- Weight
- Optional Air-Cooled Power Meter Head/Beam Dump

Laser head dimensions

The detailed dimensions of the Patara laser are shown in Figure 2-1 and 2-2. The laser head has dimensions of 34.2 inch (L) x 10 inch (W) x 6.73 inch (H).

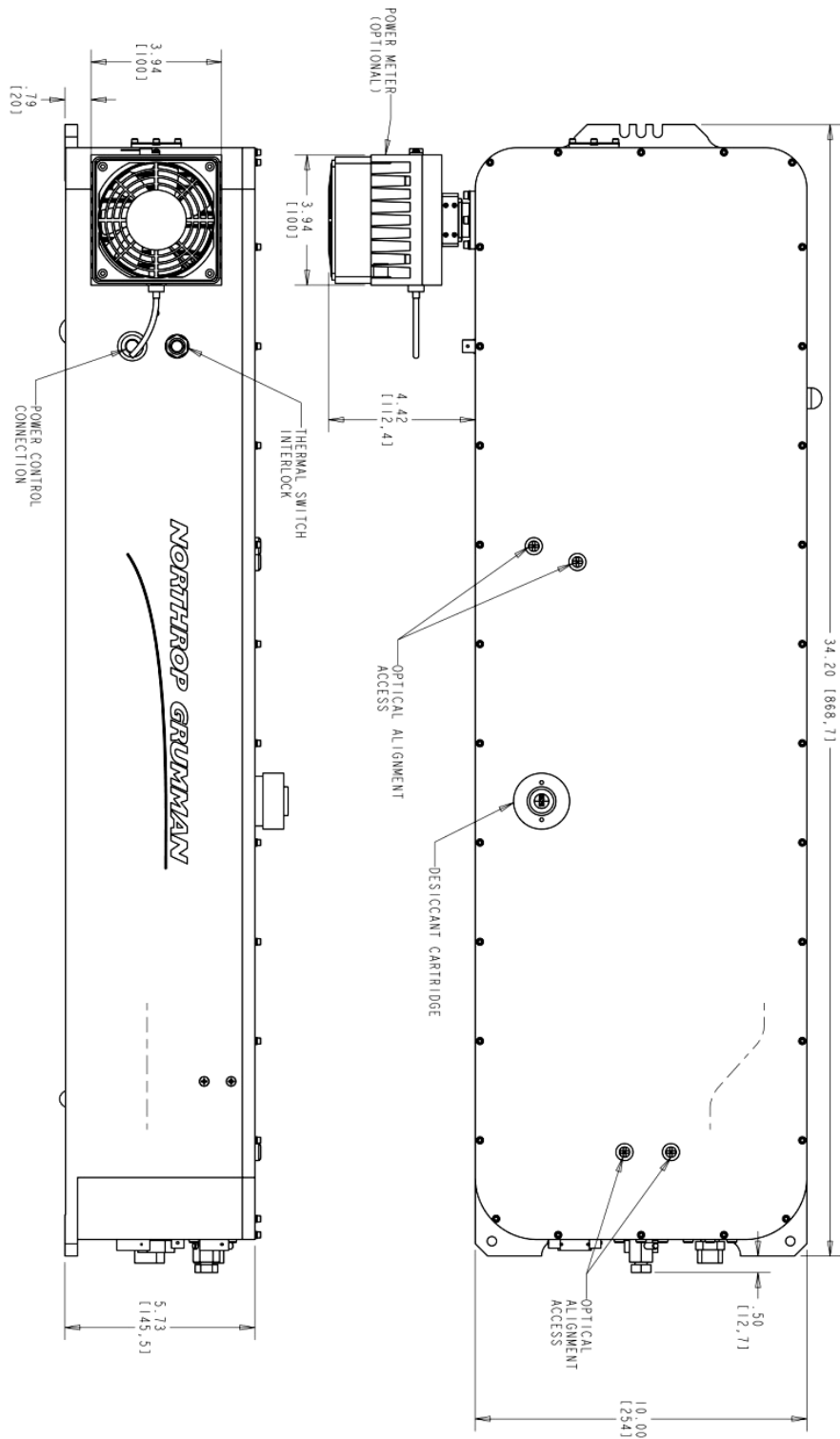


Figure 3-1 Patara Laser Head Dimensions, Sheet 1

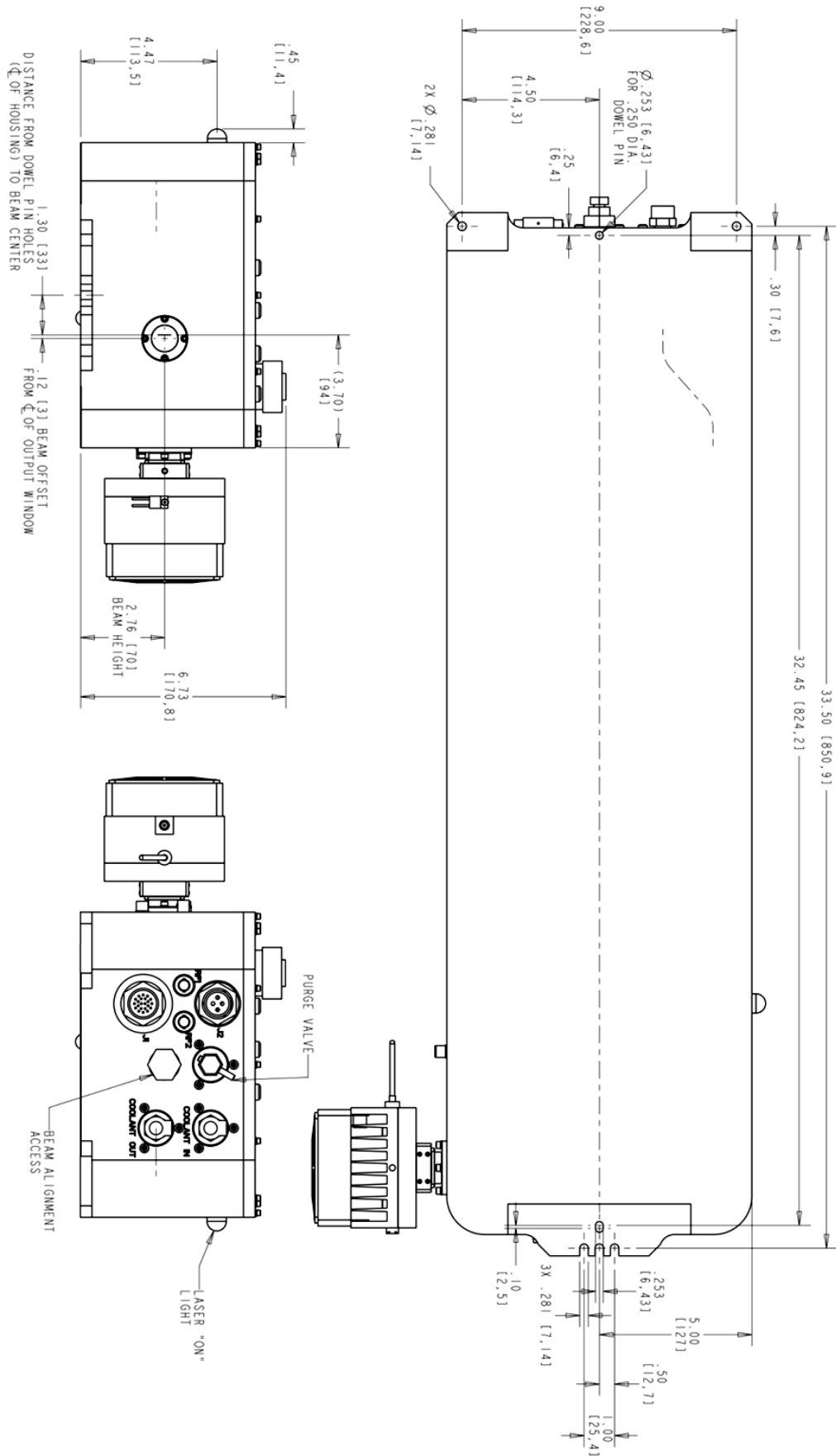


Figure 3-2 Patara Laser Head Dimensions, Sheet 2

Beam Height

The beam height of the HP Patara laser is 2.76 inches (70mm).

Mounting Requirement

The laser has to be mounted on a flat optical table or equivalent bench. There are three mounting holes that are 0.28 inches (7.1mm) in diameter. Two mounting holes are located at the back of the laser head and one at the front. There are holes designed for 0.25 inch dowel pins to confine the position of the laser head. These are on the center line of the laser head: see Figure 3-2.

Weight

The weight of the laser head is approximately 73 pounds (33.1kgs).

Optional Air-Cooled Power Meter Head/Beam Dump

Power attenuation option is available with the high power Patara laser. The output power through the output window can be adjusted continuously by rotating half wave plate inside the laser. In this way, the pulse width, pulse-to-pulse stability and beam quality are maintained.

The residual laser power is directed to the side window of the laser. An air-cooled power meter head collects the power and provides the information of laser power stability as well.

Chapter 4: Closed Loop Chiller

This chapter provides the following information:

- Chiller Plumbing
- Suggested Chiller Models

Chiller Plumbing

The required water hoses, filters, and fittings are included in the plumbing kit that was shipped with your laser. They should be connected as illustrated in Figure 4-1. The correct water flow path starts with the supply port of the chiller ► filter ► coolant in port of laser head ► laser head ► coolant out port of laser head ► return port of the chiller. Please be aware of the flow direction of the filter.



Figure 4-1 Water Hoses and Filter Connections

The filter may be attached to the back of the chiller, customer's equipment or a wall using the provided L-bracket.

Suggested Chiller Models

NG CEO has used Polyscience chillers for a long time. Other chillers with similar specifications may be used. The customer may decide to buy a chiller through NG CEO or purchase directly from the third party. When supplied by NG CEO, the following models are specified for use with the 100 Watt Patara laser.

Table 4-1 Polyscience Chiller Specifications

Model Number	Input Power	Frequency	Nominal Rated Amps	Dimensions	Weight
6162T41CE33D ¹	208-230V single phase	60 Hz	12.5A	22 5/8 x 14 1/2 x 27 5/8 inch	199 Lbs (90kg)
6152T41CE33E ¹	240V single phase	50 Hz	12.5A	22 5/8 x 14 1/2 x 27 5/8 inch	199 Lbs (90kg)

¹Chiller models are air-cooled and feature a stainless steel 1 HP pump and RS-232 communication

If a water cooled chiller is required, TERMOTTEK is an option.

Table 4-2 TERMOTTEK Chiller Specifications

Model Number	Input Power	Frequency	Nominal Rated Amps	Dimensions	Weight
P330-19371 WW-S	230 Vac +/- 10% single phase	50/60 Hz	< 16 A	22 9/13 x 19 x 21 inch	199 Lbs (90kg)

Chapter 5: Hardware List, Equipment, Safety and Consumable Parts

This chapter provides the following information:

- NG CEO Supplied Hardware
- Precautions for Safe Operation
- Suggested Supplies and Equipment

NG CEO Supplied Hardware (Standard)

1. Patara Laser head
2. eDrive
3. DC Power Supply
4. Laser signal cable and RF cable- Length 7 ft. (2.1 meters)
5. Diode power cable- Length 7 ft. (2.1 meters)
6. Hoses and filter for chiller (included in plumbing kit)- Length 8 ft (2.4 meters)
7. US power Cord for Chiller
8. US power Cords for eDrive and DC Power Supply
9. (International power cords can be arranged when the order is placed.)
10. Consumable parts for initial installation

Precautions for Safe Operation

- Avoid looking directly into the laser beam or at specular reflection, even with protective eye wear on.
- Wear laser safety eyewear that is optically dense at the wavelengths of operation (798-816 nm pump light, 1064 nm fundamental, 532 nm second harmonic).
- Provide a controlled access area for laser operation and limit access to those trained in laser safety principles.
- Post warning signs in prominent locations near the laser operation area.
- Use safety interlocks on all entryways. All NG CEO system control electronics are supplied with interlock inputs that can be used to preclude operation with an open safety door.
- Enclose beam paths wherever possible.
- Set up experiments so the laser beam is below eye level.
- Work in an area that is well lighted to avoid dilation of pupils.
- Set up a target for the beam.
- Set up shields to prevent reflected beams from escaping the laser operation area.
- View an infrared laser beam with a protected image converter at an oblique angle reflecting from a diffuse surface.
- Ensure that all electrical connections are made in a safe manner.
- Position equipment so that electrical connections are shielded from accidental touch.
- Do not smoke, eat, or drink in laser areas.

- Avoid leaving an operating laser unattended.

Suggested Supplies and Equipment

Three Phase AC Power Plug

Due to the variety of AC wall outlet, customer should prepare the three phase power plug per the requirements for DC power supply and chiller.

Desiccant Cartridge

The desiccant cartridge used in the Patara laser head is an industry standard part.

- Desiccant holder: 680340-2912
- Desiccant packet refill, 50 grams Mol Sieve: 643665
- 7/8" HEX X 1/2" DRIVE SOCKET tool: 980412

Replacement cartridges may be purchased from:

AGM Container Controls
3526 East Fort Lowell Road
Tucson, AZ 85716
sales@agmcontainer.com
1-800-995-5590 or 520-881-2130

Chiller Filter

The coolant filter used for the Patara laser head is 5 µm pleated polyester filter

The Hydronix pleated 5µm polyester filter, part number SPC-25-1005, is available at multiple online retailers.

Coolant

NG CEO recommends using a mix of 10% Optishield Plus TM and 90% distilled water.

Optishield Plus TM may be purchased from:

Opti Temp Inc.
231-946-2931
<http://www.optitemp.com/>

The Patara laser coolant system requires approximately 2 Gallons of prepared coolant when using a Polyscience chiller and 1.5 Gallons for the Termotek chiller.

Laser Power Meter

Power Capacity: Minimum of 250 W

To protect the power meter, a negative lens ($f=-100$ mm) with an anti-reflective (AR) coating at 532 nm should be installed in front of the power meter