Pre-Installation Guide

- HP Patara Laser System (Model PA-200-QMG)

MAY 2017
CEO-UMAN-0060 A

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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, Cutting Edge Optronics 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 Optronics**
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	O	O	O	O	O	O
第二组	电线/ 连接插头	X	O	X	X	X	X
第三组	安装组件	O	O	O	X	O	O
第四组	开关组件	O	O	O	X	X	X
第五组	电路板/ 开关组件	X	O	O	O	X	X
第六组	阵列前端次模组	O	O	O	O	O	O
第七组	接触板	X	O	O	O	X	X
第八组	热交换组件	O	O	O	O	O	O
第九组	16 进制硬件	O	O	X	O	O	O
第十组	焊锡	X	O	X	O	O	O
第十一组	电线/ 连接插头	X	O	O	O	X	X
第十二组	基部/ 端帽	X	O	O	X	O	O
第十三组	硬件/ 装配	O	O	O	X	O	O
第十四组	时计组件	X	O	O	X	X	X
第十五组	包装物料	O	O	O	O	O	O

O：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

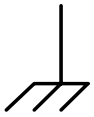
The following conventions appear in this manual:

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

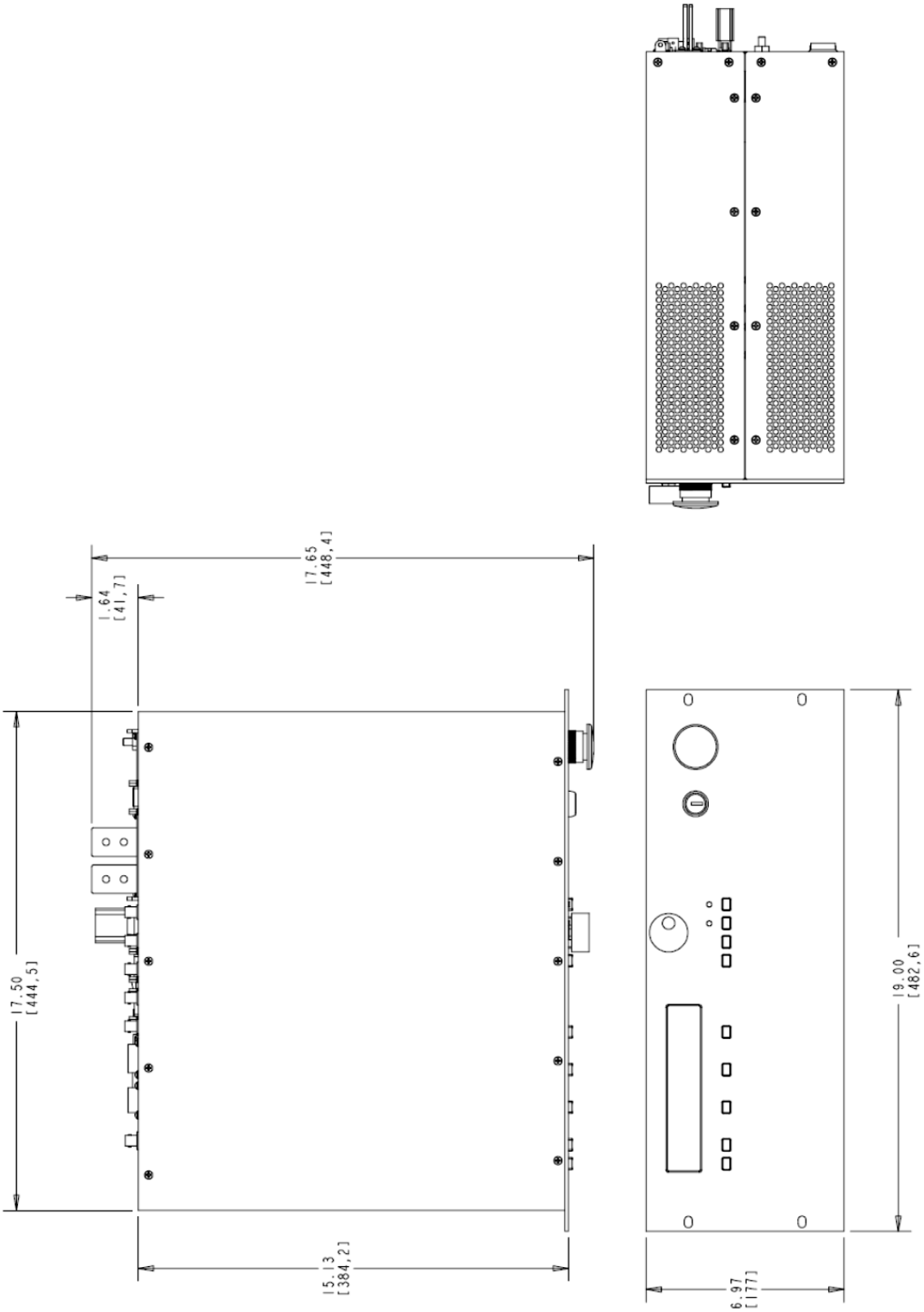

Figure 1-1 Dimensions of eDrive Nitro for Patara Laser

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 ±10%	15A	50/60 Hz	T 15A 250V
240V ±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).

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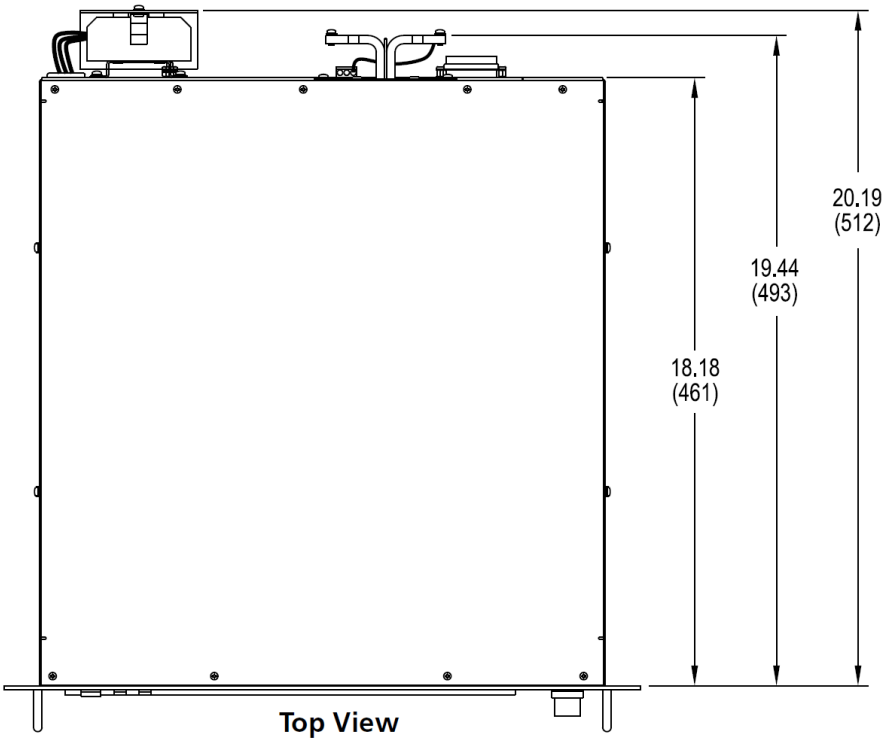
Chapter 2: DC Power Supply Dimensions, Power Requirement and Mounting

This chapter provides the following information:

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

DC Power Supply Dimensions



Input Connections
Compression lug terminals
#6 AWG max wire size

Chassis Ground Connection
#10-32 threaded stud

Output Connections
5V to 80V
Copper bus bars, nickel plated
Holes in bus bar 0.312 (7.92)
150V to 600V
Terminal block with #8-32 screws

Dimensions in inches (millimeters)

Figure 2-1 Dimensions of DC Power Supply

Input Power

Before you can use the DLM–E system 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 an input connector cover which you need to remove to make the input power connections.

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

Table 2-1 DC Power Supply Recommended Fuse Ratings

Output Power	Nominal Input Voltage	Input Option	Input Range (47–63 Hz)	Input Current Maximum	AC Input Terminals
4 kW	208 VAC Three–Phase	Std	180–264 VAC L–L	15A RMS	L1–L2–L3 (F1–F2–F3)
4 kW	380/400/415 VAC Three–Phase	M1	345–455 VAC L–L	8.5A RMS	L1–L2–L3 (F1–F2–F3)
4 kW	480 VAC Three–Phase	M2	432–528 VAC L–L	6.5A RMS	L1–L2–L3 (F1–F2–F3)

Rack Mounting

The supply is designed to fit in a standard 19" equipment rack. Use adjustable support angles such as Hammond RASA22WH2, or a support bar such as Hammond RASB19WH2. Bolt holes in the chassis sides are provided for rack mount slides such as the ZERO #C300S18 slides.

Be sure to provide adequate support for the rear of the unit while not obstructing the exhaust outlets at the rear of the unit.

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

Clearance

The DLM–E system supply is fan–cooled, so it requires unobstructed space on the front ventilation inlets and space at the rear 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, the derate would be 2% per °C.

Storage Temperature Range: –40 to +85° C

Weight

The total weight of DC power supply for Patara laser is approximately 40 pounds (18.2kgs).

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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).

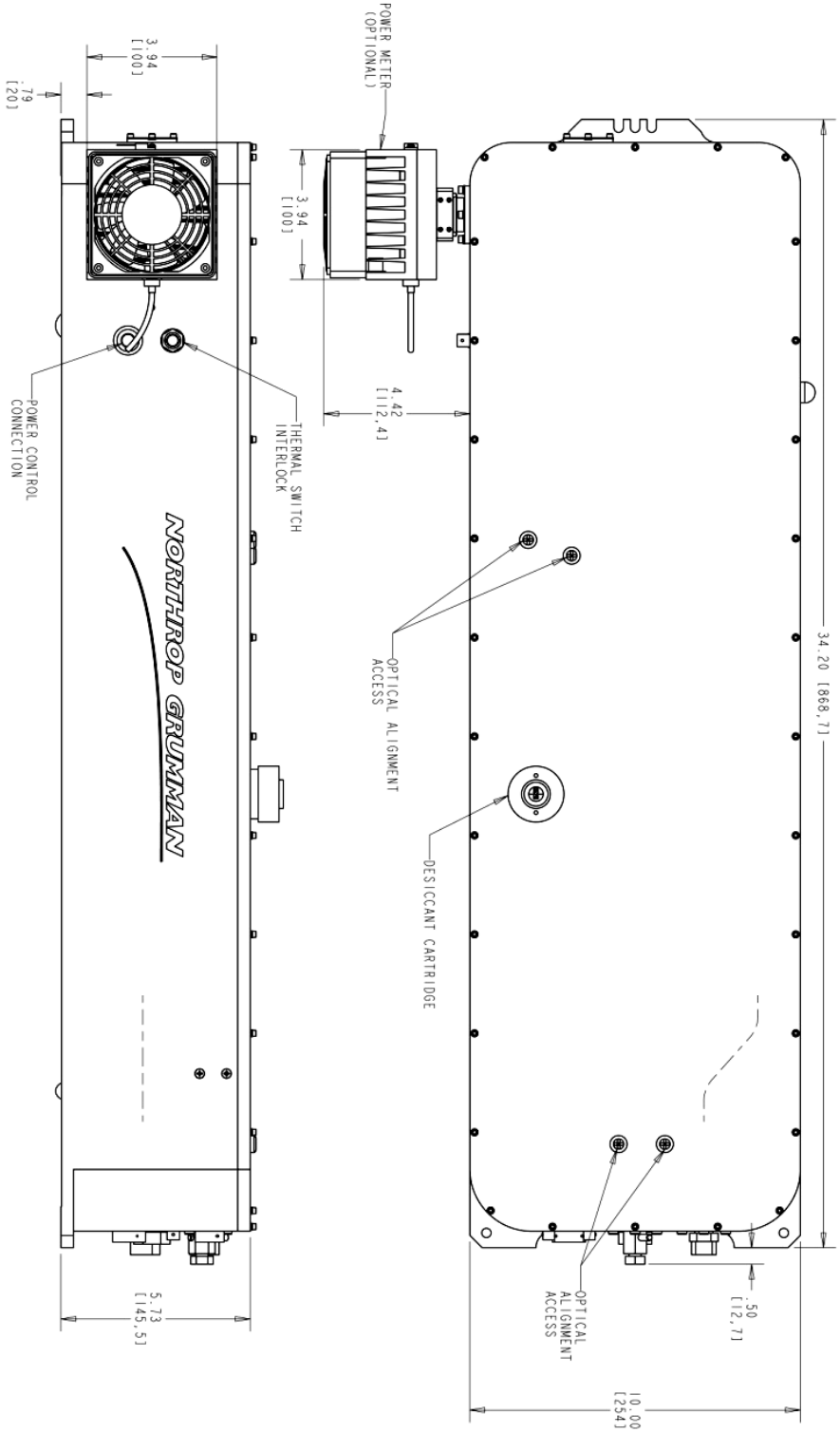

Figure 3-1 Patara Laser Head Dimensions, Sheet 1

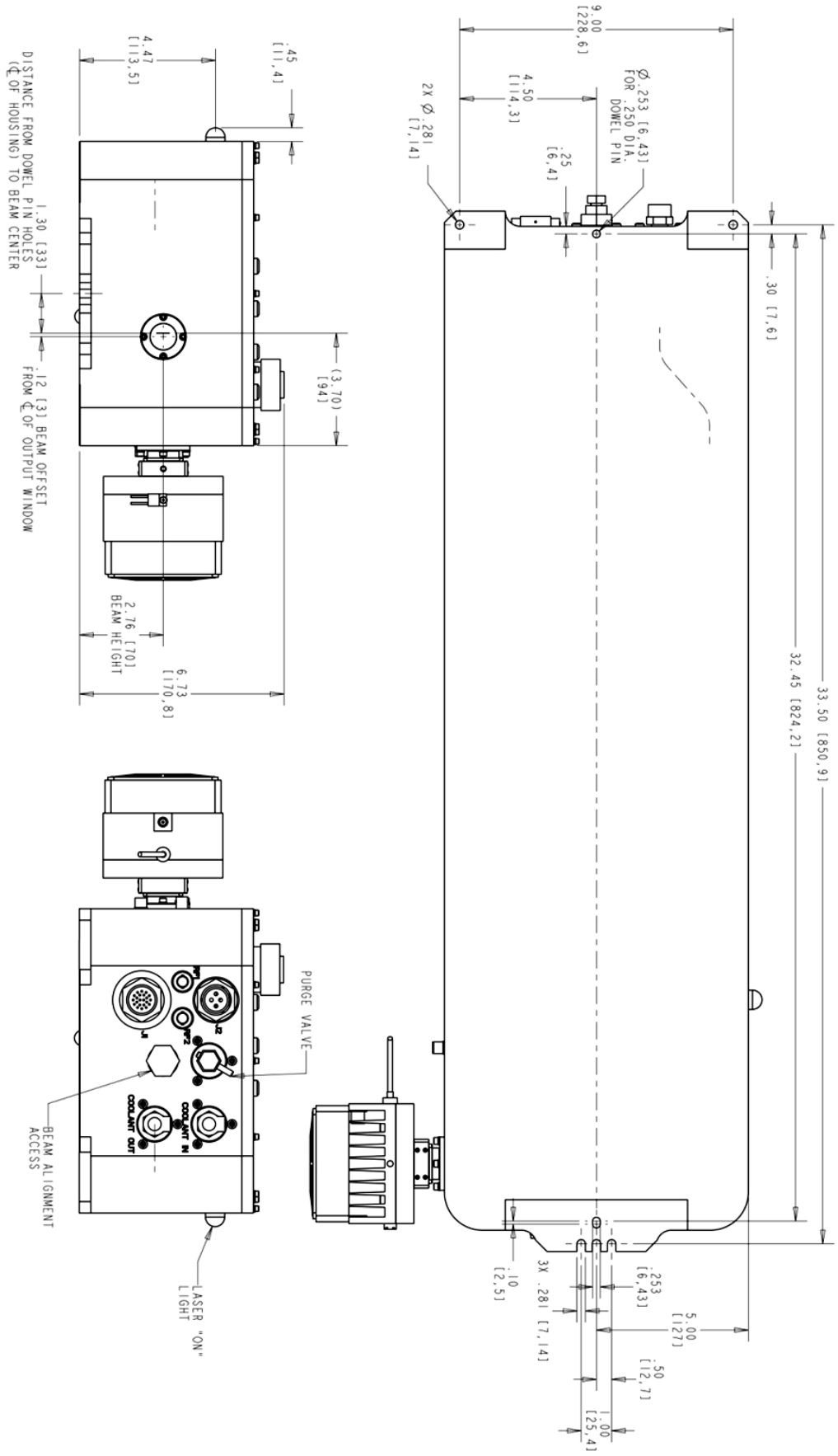

Figure 3-2 Patara Laser Head Dimensions, Sheet 2

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.

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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 3-1. 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.

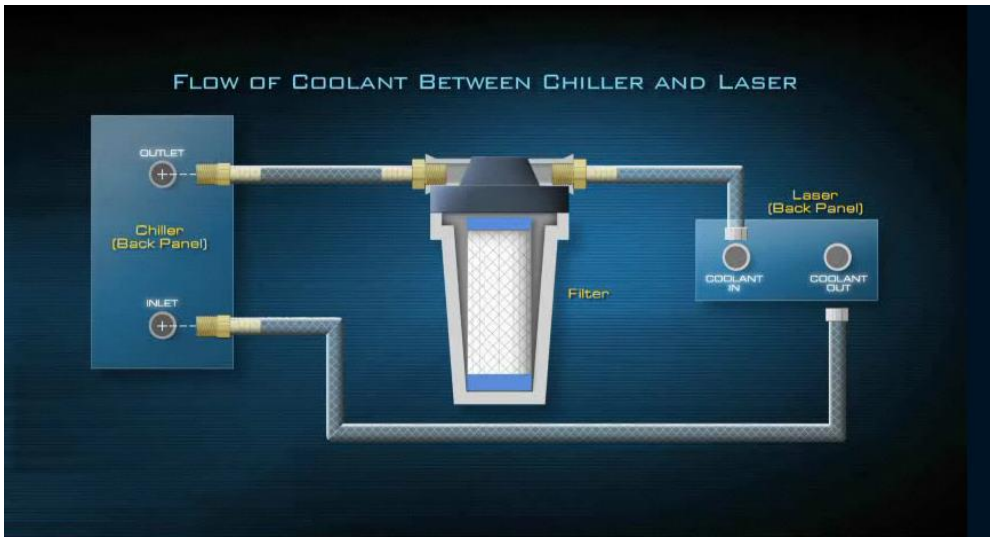

Figure 4-1 Water Hoses and Filter Connections

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 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 HP 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)
6852T66CE73E[1]	208-230V three phase	50 Hz	37.1A[2]	25 3/4 x 19 x 30 1/2 inch	340 Lbs (154kg)

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

[2]Amperage for 7500W heater option, additional heater options available

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

This chapter provides the following information:

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

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 Cutting Edge Optronics 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.

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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: 1DT57000;

Desiccant packet refill: DTMS-B-4-4-20G.

Replacement cartridges may be purchased from:

Drytech

54 WRIGHTSTOWN-COOKSTOWN RD.
P.O. BOX 128
COOKSTOWN, NJ 08511
Phone 609-758-1794
http://www.drytechinc.com/

Chiller Filter

The water 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

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

Optishield Plus ™ may be purchased from:

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

The Patara laser requires approximately 2 Gallons (4 Gallons if using the 50Hz chiller) of prepared coolant for the system including the hoses and filter.

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