



SOLE SOURCE CERTIFICATE AND POSTING NOTICE

A sole source procurement is when you make a request to purchase product(s) and/or service(s) without competition when competition is otherwise required. This means that product/service is unique and that the supplier is the only supplier that can provide the product or service. In accordance with the authority granted under applicable Florida law and UCF Regulation 7.130, the following documentation is submitted in support of this request.

The purchase requisition can be entered into UCF Financials at any point during the process set forth herein; however, doing so does not ensure approval of the sole source.

The completed sole source must be approved in the following order. **Please be sure to obtain all required signatures before submitting the form to Procurement Services.**

- PI/Researcher/Director/Chair
- President/Vice President/Dean
- Procurement Specialist
- Procurement Services Associate Director
- Assistant Vice President for Tax, Payables & Procurement, who will review and provide a recommendation to approve or disapprove the sole source to:
- Chief Financial Officer, who will either directly approve or disapprove the sole source, or forward it to the Provost and Executive Vice President for goods/services related to academia for input prior to making the final decision.

Contingent upon the approval of all the officers/individuals listed, the sole source shall be posted on the UCF Procurement Services website for seventy-two (72) business hours. Upon expiration of said posting period, Procurement Services will process a purchase order upon receipt of the requisition.

Once the completed sole source is received, Procurement Services reviews the documentation provided and determines whether the sole source is valid or if there are additional suppliers that may be able to provide the requested product or service. The sole source review and approval process varies based on the nature of the product/service being requested and the information provided in the requestor's justification, among other factors, so please keep this in mind when submitting the form.

The usual bidding process shall be conducted if sole source approval is not granted.

PART I: DEPARTMENT AND SUPPLIER INFORMATION

Department Name: CREOL Contact & Phone: Steve Vallee 3-5138
Purchase Request No.: 2746 Product/Service Cost: \$372,904.00

Company Name: IPG Photonics Email: jpoon@ipgphotonics.com
Contact Person: Johnny Poon Title: Sales Manager, Scientific
Product and/or Service: Lasers
Telephone: 650-279-2995 Facsimile: _____
Address: 50 Old Webster Road City: Oxford
State and Zip: MA 01540

PART II: SOLE SOURCE JUSTIFICATION (see pages 4-5)

Only justifications submitted on this form and in the below format will be reviewed for approval. All of the below listed points MUST be fully answered on the following pages and any additional attached pages as needed. Failure to submit justification as outlined in the format below will result in the form being returned without review.

1. Describe the product(s) and/or service(s) and anticipated use thereof in layman's language.
2. State in detail why only this and no other product(s)/service(s) will satisfy the department's requirements.
3. State why the product(s) and/or service(s) are available from only one source and how that determination was made. Explain the research conducted to support this claim.
4. Provide an explanation to support the belief that the price is fair and reasonable.

PART III: SOLE SOURCE CERTIFICATIONS

- A. In my professional opinion, this is the only product or service that can reasonably meet my requirement(s)/specification(s), and this is the only supplier who can provide the product or service. I further certify that the information contained herein is true and correct to the best of my knowledge and belief and would withstand any audit or supplier protest.
- B. I, the undersigned, certify that I and/or the user do not have a financial interest in the above named supplier or contractor, and that I am unaware of any conflict of interest related to this purchase.

Robert F.

Signature Crabbs

Digitally signed by Robert F.
Crabbs
Date: 2022.07.26 13:07:10
-04'00'

Printed Name and Title (PI/Researcher/Director/Chair)

Date

I, the undersigned, hereby concur with the above justification and authorize the acquisition of the above product(s) and/or service(s) on a sole source basis.

David J Hagan

Digitally signed by David J Hagan
Date: 2022.08.04 12:54:07 -04'00'

Signature

Printed Name and Title (President/Vice President/Dean)
(Delegations not allowed; emails from absent approvers are acceptable)

Date

I, the undersigned, hereby concur with the above justification and support a sole source approval for the above product(s) and/or service(s).

See below email for approval

<u>Signature</u>	<u>Printed Name and Title (Procurement Specialist)</u>	<u>Date</u>
------------------	--	-------------

I, the undersigned, hereby concur with the above justification and support the acquisition of the above product(s) and/or service(s) on a sole source basis.

See below email for approval

<u>Signature</u>	<u>Printed Name and Title (Procurement Services Associate Director)</u>	<u>Date</u>
------------------	---	-------------

I, the undersigned, hereby concur with the above justification and authorize the acquisition of the above product(s) and/or service(s) on a sole source basis.

See below email for approval

<u>Signature</u>	<u>Printed Name and Title (Asst. Vice President for Tax, Payables & Procurement)</u>	<u>Date</u>
------------------	--	-------------

I, the undersigned, hereby concur with the above justification and authorize the acquisition of the above product(s) and/or service(s) on a sole source basis.

See below email for approval

<u>Signature</u>	<u>Printed Name and Title (Chief Financial Officer)</u>	<u>Date</u>
------------------	---	-------------

POSTING NOTICE

<u>10/10/22 1:00pm EST</u>	<u>10/13/22 1:00pm EST</u>	<u>2304</u>	<u>Trinh Nguyen</u>
Date/Time Posted	Posting End Date	UCF Control No.	Procurement Specialist

SOLE SOURCE JUSTIFICATION

Please answer the questions below and attach additional documentation if needed.

1. Describe the product(s) and/or service(s) and anticipated use thereof in layman's language.

The requested items are lasers we use to make measurements of optical transmission in the atmosphere. Our program makes measurements of atmospheric parameters, to determine their effect on laser weapons and laser communication devices. These lasers will provide us with additional wavelengths and higher power levels expand our capabilities for our High Energy Laser weapon support programs.

2. State in detail why only this and no other product(s)/service(s) will satisfy the department's requirements.

These lasers will expand our capabilities in measuring beam propagation in the atmosphere. We have not been able to find companies that make comparable lasers, in the wavelength choices and high power levels that we need. It is our understanding that IPG Lasers holds patents on some of the critical components of these laser units, thus making it impossible for others to build similar units.

SOLE SOURCE JUSTIFICATION

3. State why the product(s) and/or service(s) are available from only one source and how that determination was made. Explain the research conducted to support this claim.

The lasers requested are only available from IPG Laser. They do not sell through third party vendors or distributors. No one else is able to provide these items.

4. Provide an explanation to support the belief that the price is fair and reasonable.

The prices, as quoted, are from IPG Laser. Since they are the only source for this device, the price is as stated. There is no way to get comparison prices.

From: [Gerald Hector](#)
To: [Joel Levenson](#)
Cc: [Brian Sargent](#); [Trinh Nguyen](#)
Subject: RE: RQ-UCF-00002746 - IPG Photonics Sole Source
Date: Friday, October 7, 2022 4:10:41 PM
Attachments: [image003.png](#)

Joel:

I approve of this sole source considering it appears this is the only vendor who supplies these lasers.

Regards,

Gerald L. Hector, CPA
Senior Vice President
Administration and Finance
University of Central Florida
4635 Andromeda Loop N
MH384
Orlando, FL 32816
Tel: (407) 823-1063
Email: gerald.hector@ucf.edu



From: Joel Levenson <Joel.Levenson@ucf.edu>
Sent: Wednesday, October 5, 2022 12:17 PM
To: Gerald Hector <Gerald.Hector@ucf.edu>
Cc: Brian Sargent <Brian.Sargent@ucf.edu>; Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Gerald,

I support this sole source as well. Research into the specifications of the laser match what the team was able to find from other governmental spending. There isn't another provider to meet the specifications needed.

Please reply all and indicate your approval, or let us know if you have any further questions.

From: Brian Sargent <Brian.Sargent@ucf.edu>
Sent: Wednesday, October 5, 2022 11:52 AM
To: Joel Levenson <Joel.Levenson@ucf.edu>
Cc: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Joel,

I support this sole source to IPG Photonics for three (3) fiber lasers. CREOL researched other laser manufacturer's and confirmed that only the lasers from IPG have the required output power levels needed for the research.

Additionally, a search was done in GovSpend of purchases made by other government agencies and IPG was listed as a

sole source for one of the lasers at 532 nm with a 500 watt output power level. There was no information on the other two.

Please approve/disapprove.

Regards,

Brian

From: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Sent: Wednesday, October 5, 2022 11:25 AM
To: Brian Sargent <Brian.Sargent@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Brian,

I have reviewed the attached sole source and can support it with the following reasons. Can you please also review to see if you agree or not.

Vendor: IPG Photonics
Product: Lasers
Total Amount: \$372,904.00
Dept: CREOL

Requirement: The Department wants to purchase three customized fiber lasers with the below requirements to make measurements of optical transmission in the atmospheric parameters to determine their effect on laser weapons and laser communication devices. The requirements are:

- A CW (Central Wavelength) laser at 532 nm with a 500-watt output power level.
- A CW laser at 1550 nm with a 1000-watt output power level.
- A CW laser at 975 nm with a 400-watt output power level.

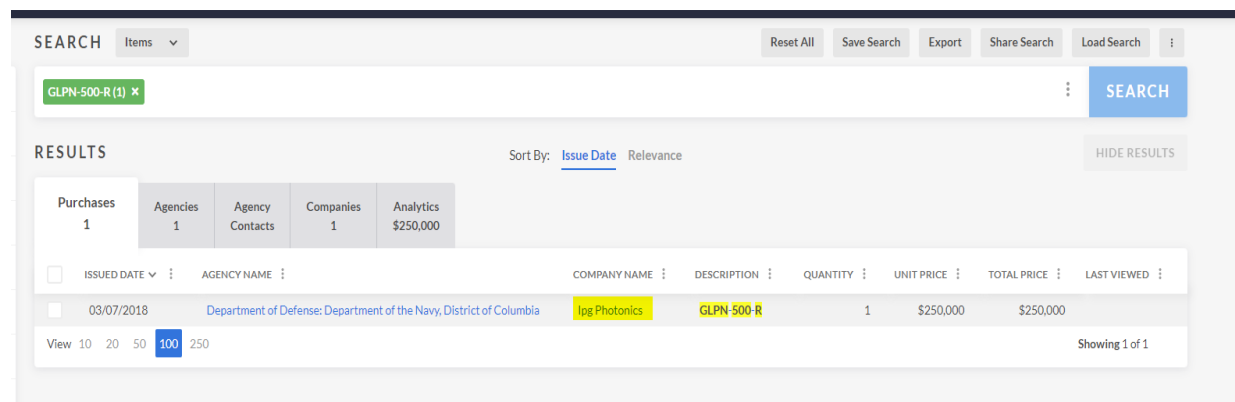
Research Conducted: The PI noted that the only supplier that can provide the lasers with the above required span wavelengths and power output level is IPG Photonics. The below suppliers were researched on but none of them can meet the needed output power level. The PI provided a statement that he received from IPG confirming that they are the sole source for these three specific laser products with span wavelengths from 530nm, 970nm through to 1550nm at power levels up to 1kW that are not available from other laser suppliers, anywhere in the world (see below email).

- **Keopsys/Lumibird Laser:** Have a laser with 532 nm output, but max power is only around 1 watt
- **Bektel laser:** Have a CW laser with 1550 nm output, but max power is about 5 watts
- **RPMC Laser:** Have a CW laser with 975 nm output, but max power is only around 1.5 watt
- **Coherent Laser:** Have high power laser systems for manufacturing processes, not relevant for our work

Price is fair and reasonable: It was noted that since IPG is the only source for these lasers, there isn't another source to get comparable pricing. However, IPG did give UCF a 5% discount from the list price for each laser which is deemed fair and reasonable.

GovSpend: In GovSpend the CW (Central Wavelength) laser at 532 nm with a 500 watt output power level (Item#: GLPN-

500-R in attached quote) came up as a sole source laser from IPG Photonics. There were no results from the search for the other two lasers.



SEARCH Items

Reset All Save Search Export Share Search Load Search

GLPN-500-R (1) x SEARCH

RESULTS Sort By: Issue Date Relevance HIDE RESULTS

Purchases 1 Agencies 1 Agency Contacts Companies 1 Analytics \$250,000

ISSUED DATE	AGENCY NAME	COMPANY NAME	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE	LAST VIEWED
03/07/2018	Department of Defense: Department of the Navy, District of Columbia	Ipig Photonics	GLPN 500-R	1	\$250,000	\$250,000	

View 10 20 50 100 250 Showing 1 of 1

Thanks,
Trinh

From: Robert Crabbs <Robert.Crabbs@ucf.edu>
Sent: Thursday, September 22, 2022 12:08 PM
To: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Cc: Steven Vallee <steve.v@creol.ucf.edu>
Subject: Re: RQ-UCF-00002746 - IPG Photonics Sole Source

Trinh:

As it turns out, I was given incorrect information regarding IPG Lasers. they do not have patents on these various lasers. However, the statement below, received from IPG describes why they are a sole source for the lasers we are trying to purchase:

IPG is US based public company (HQ in Oxford MA) that employees more than 2000 people in our US manufacturing centers located at several sites in MA as well as multiple other locations throughout the USA. As the largest fiber laser supplier in the world, the breadth of products available from IPG is unrivalled, with the highest power levels, best beam quality and widest range of operating wavelengths on the market.

The 3 specific laser products quotes here (GLPN, ELS and DLM), span wavelengths from 530nm, 970nm through to 1550nm at power levels (up to 1kW) not available from other laser suppliers, anywhere in the world.

Since manufacturing is located in USA customer concerns about global supply chains, local technical support and timely customer service are not a relevant when purchasing from IPG.

With industry leading warranty and aggressive pricing, enabled by the extremely high level of vertical integration, IPG are the first choice for fiber laser solutions to the 1000's of customers here in USA and overseas.

Bob Crabbs
Program Manager/PI
TISTEF Site, KSC
UCF/Center for Directed Energy
321-861-3083
Cell: 321-505-3114
<http://tistef.creol.ucf.edu>

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.

From: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Sent: Thursday, September 22, 2022 10:39 AM
To: Robert Crabbs <Robert.Crabbs@ucf.edu>
Cc: Steven Vallee <steve.v@creol.ucf.edu>
Subject: RE: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Robert,

Your sole source is for 3 different individual lasers lumped into one justification instead of doing 3 separate Sole Source for each laser as a stand alone on their own merit making it confusing to review and compare three different types of lasers. You did however, mentioned that all three lasers are patented? Do you have something stating this or a letter/email from the supplier documenting this to provide to help with the justification.

Thanks,
Trinh

From: Robert Crabbs <Robert.Crabbs@ucf.edu>
Sent: Wednesday, September 7, 2022 11:41 AM
To: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Cc: Steven Vallee <steve.v@creol.ucf.edu>
Subject: Re: RQ-UCF-00002746 - IPG Photonics Sole Source

Trinh:

Laser requirements

- We require a CW laser at 532 nm with a 500 watt output power level.
- We require a CW laser at 975 nm with a 400 watt output power level.
- We require a CW laser at 1550 nm with a 1000 watt output power level.

Keopsys/Lumibird Laser:

- Have a laser with 532 nm output, but max power is only around 1 watt

RPMC Laser:

- Have a CW laser with 975 nm output, but max power is only around 1.5 watt

Bektel laser:

- Have a CW laser with 1550 nm output, but max power is about 5 watts

Coherent Laser:

- Have high power laser systems for manufacturing processes, not relevant for our work

Bob Crabbs
Program Manager/PI
TISTEF Site, KSC
UCF/Center for Directed Energy
321-861-3083
Cell: 321-505-3114
<http://tistef.creol.ucf.edu>

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.

From: Trinh Nguyen <Trinh.Nguyen@ucf.edu>

Sent: Wednesday, September 7, 2022 11:12 AM
To: Robert Crabbs <Robert.Crabbs@ucf.edu>
Cc: Steven Vallee <steve.v@creol.ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Robert,

I'm still not understanding what are the required wavelengths and high-power levels are you comparing the below lasers to? Please provide the required specs.

RPMC laser - proper wavelength (975nm), very low power
Bektel - proper wavelength (1550nm), low power
Keopsys - proper wavelength (532nm), no high power available
Coherent - very high power, not the wavelengths we require

Thank you,

Trinh Nguyen
Knights Experience Team (kNEXT)
☎ 407.823.5889
Trinh.Nguyen@ucf.edu

ucf.edu | kNEXT.ucf.edu | [Workday Help](#)

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.

From: Steven Vallee <steve.v@creol.ucf.edu>
Sent: Tuesday, September 6, 2022 10:31 AM
To: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hello Trinh,

I just realized Bob did not reply all. His responses to your questions are below.

Thanks,
Steve

From: Robert Crabbs <Robert.Crabbs@ucf.edu>
Sent: Thursday, September 1, 2022 4:08 PM
To: Steven Vallee <steve.v@creol.ucf.edu>
Subject: Re: RQ-UCF-00002746 - IPG Photonics Sole Source

Steve:

I queried the following laser manufacturers/suppliers for availability of laser that meet our requirements:

RPMC laser - proper wavelength (975nm), very low power
Bektel - proper wavelength (1550nm), low power
Keopsys - proper wavelength (532nm), no high power available
Coherent - very high power, not the wavelengths we require

Main requirements:

1550nm, 1000W power
532nm, 500W power

975nm, 400W power

Bob Crabbs
Program Manager/PI
TISTEF Site, KSC
UCF/Center for Directed Energy
321-861-3083
Cell: 321-505-3114
<http://tistef.creol.ucf.edu>

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.

From: Steven Vallee <steve.v@creol.ucf.edu>
Sent: Wednesday, August 31, 2022 3:24 PM
To: Robert Crabbs <Robert.Crabbs@ucf.edu>
Cc: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Bob,

Please see the questions in the email below from the buyer reviewing the IPG lasers review. Please reply all with your responses. Thanks!

Regards,
Steve

From: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Sent: Wednesday, August 31, 2022 10:30 AM
To: Steven Vallee <steve.v@creol.ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Steve,

I need more information on the attached SS for my review. Can you please ask the PI to provide the required specs for the lasers. It was mentioned that there are no other companies that make comparable lasers in the wavelength choices and high-power levels needed. What are the required wavelengths and power needed for these lasers? and was there a list of suppliers that the PI research on for this type of lasers to conclude that IPG Lasers is the sole source vendor?

Thanks,
Trinh

From: Brian Sargent <Brian.Sargent@ucf.edu>
Sent: Wednesday, August 17, 2022 11:21 AM
To: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Subject: FW: RQ-UCF-00002746 - IPG Photonics Sole Source

Hi Trinh,

Assigned to you.

What is the status of the PI Physik's SS?

Thanks!

Brian

From: Trinh Nguyen <Trinh.Nguyen@ucf.edu>
Sent: Wednesday, August 17, 2022 10:10 AM
To: Brian Sargent <Brian.Sargent@ucf.edu>
Subject: RQ-UCF-00002746 - IPG Photonics Sole Source

Good morning Brian,

The above Req has a SS attached to it from CREOL. I can review this one. Please assign to me.

Thanks,
Trinh

Trinh Nguyen

Travel/Procurement Specialist III
Knights Experience Team (kNEXT)

University of Central Florida
Research Pavilion
12424 Research Parkway, Suite 355
Orlando, FL 32826

☎ 407.823.5889
Trinh.Nguyen@ucf.edu

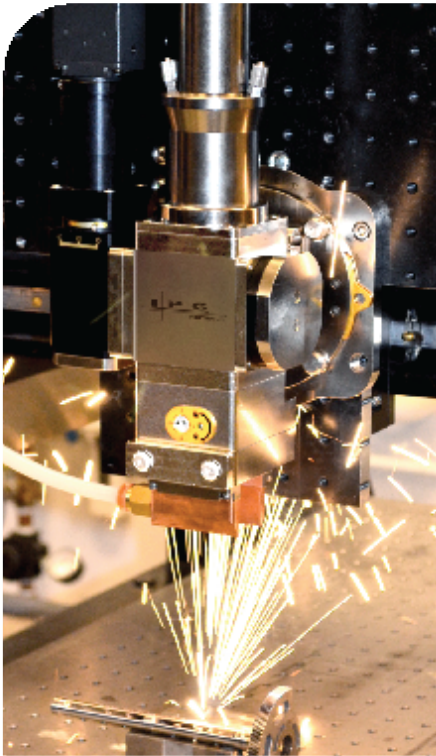
ucf.edu | kNEXT.ucf.edu | [Workday Help](#)

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.



IPG Photonics Corporation
50 Old Webster Road,
Oxford MA, 01540 United States

FORMAL QUOTATION



IPG-24697 - v1

University of Central Florida
Bob Crabbs

Johnny Poon
Sales Manager, Scientific
(650) 279-2995
jpoon@ipgphotonics.com

Please Submit all Purchase Orders to
purchaseorder.us@ipgphotonics.com



Company Overview



Ordering Checklist



Installation Guide



Products & Pricing

www.ipgphotonics.com

The Power to Transform®

The information contained in this document, including all of its attachments, is confidential and proprietary information of IPG Photonics Corporation and intended only for the use of the individual or entity named above. If you have received this communication in error, please immediately notify the sender by telephone or via email.



IPG CORPORATION

IPG Photonics Corporation is the number one developer and manufacturer of unique high power diode-pumped fiber lasers, high power fiber amplifiers, and direct diode systems that enable a growing number of material processing, telecommunications, medical and advanced applications. With its corporate headquarters operating out of Oxford, Massachusetts, IPG has manufacturing in Germany, Russia and Italy, and sales and service centers in China, France, India, Italy, Japan, Singapore, Spain and Portugal, South Korea, Turkey and the United Kingdom with more sites being added regularly. Established in 1990, IPG has since shipped to some of the largest for-profit companies in the US, EU, Japan, Korea and numerous other locations globally, as well as leading government and university research institutions.

IPG OPERATIONS

IPG showcases market leadership in both technology and production for fiber lasers, components, as well as in customer support. As the only fiber laser manufacturer that is vertically integrated, IPG develops and manufactures all of their key components, including, but not limited to: semiconductor diodes, active and passive fibers and specialty optical components. All of these products are manufactured in four facilities with state of the art production capabilities, thus ensuring IPG's ability to meet all high quality standards and demand requirements.

IPG has ISO 9001: 2008 certification, assuring customers that the business processes are both well-documented and conform to the same standards of quality upheld by most of the world's largest and most highly-regarded companies. What this means to customers is that IPG is able to meet specific requirements, accelerate development of new products, maintain high performance and industry leading quality standards. The certainty that each of their lasers and amplifiers will meet these expectations is based on the empirical comfort that comes with the most rigorous testing and quality control standards. Each key component is tested or burned-in for hundreds of hours, and in the end, only the best components that have passed the stringent control standards are used.

THE IPG ADVANTAGE

- Lower Total Cost of Ownership. Fiber lasers offer strong value to customers because of their lower total operating costs due to their low maintenance costs, high reliability and energy efficiency.
- Superior Performance. Fiber lasers provide high beam quality over the entire power range.
- Ease of Use. The all solid-state design and integrated fiber delivery of fiber lasers makes them easy to operate, maintain and integrate into laser-based systems.
- Compact Size and Portability. Fiber lasers are typically smaller and lighter than traditional lasers, and their portability and versatility allow them to be used in new laser applications.
- High Level of Customization. The design of fiber lasers generally provides a broad range of wavelength choices and increased beam control, allowing users to select the precise wavelength and beam parameter that best match their application and materials.

Unlike conventional lasers that require adjustments and replacement parts, fiber lasers are all solid-state with no parts to adjust or replace. Under normal circumstances our diodes have an expected life of over 100,000 hours and never have to be replaced. Customer satisfaction is our goal at IPG. We strive to make the best lasers and amplifiers in the world and back it up with our commitment to service. *After 20+ years in this business and thousands of units deployed in the field, we know what our customers expect and demand, and work diligently to exceed those expectations.*



CUSTOMIZED APPLICATIONS REPORT

Did you know IPG Photonics has three application processing centers in just the US alone? Our Applications Engineers are highly trained and are readily available to evaluate your job's requirements. And unlike most job shops, our applications processing is a service offered free of charge and includes your customized report. Please contact our local applications lab by visiting our website: http://www.ipgphotonics.com/company_contact.htm

PAYMENT TERMS

Have you submitted a credit application? IPG can supply standard terms depending on the approval of your company's credit. Please ensure that the terms have been established before submitting a purchase order. Any deviations for IPG's standard terms require further approval and may delay the order. Note that payment terms and credit limits are subject to periodic review. IPG reserves the right to modify existing payment terms from those stated on any quotation. If IPG determines that a deposit is required IPG reserves the right to postpone manufacturing until payment is received.

TERMS & CONDITIONS & PRODUCT WARRANTY

Make sure to review all of the terms and conditions included with the formal quote to ensure everything is in line to process your order correctly and efficiently. IPG's terms will supersede any other terms submitted unless otherwise agreed upon. Make sure to review the Product Warranty for the standard coverage. If you require an extended warranty it may be available depending on your desired product. For all CW industrial products each additional year costs 7% of the cost of the laser system, including optics, excluding process fibers and chillers. Additional coverage cannot be purchased if laser is out of warranty.

INTERNATIONAL SHIPMENTS

For all shipments outside the US, IPG requires that the Enhanced Proliferation Control Initiative Questionnaire (EPCI) be completed and submitted along with the purchase order. Depending on the products, customer, end user, end use and destination, an export license may be required. Additionally, due to the large instance of our lasers being integrated, IPG asks that the end user statement be completed for all orders so we can supply more comprehensive in field support.

SERVICE AND INSTALLATION

Does your desired system require any installation or on-site training? Make sure to discuss your requirements with your salesperson. For full service information please refer to page 4 of this document.

SUBMITTING PURCHASE ORDERS

Once all details have been finalized, please submit a formal purchase order to purchaseorder.us@ipgphotonics.com. Please make sure to include on your purchase order: billing information, shipping information, requested delivery date (please make sure to specify delivery vs. dock date), approved payment terms, EXW Origin, E.P.C.I. Form if required, End User Statement, a main point of contact and a unique purchase order number. Once submitted, your order will be reviewed internally. When your order has been approved you will receive an order acknowledgement.

[Credit Application](#)

[E.P.C.I. Form](#)

[End User Statement](#)

[Terms & Conditions](#)

[Product Warranty](#)

INSTALLATION COSTS

IPG Photonics requires on-site installation for all high power systems. This service also includes training which is outlined in our Commissioning and Training Checklist. Installation is billed at a flat rate dependent upon distance from IPG service sites. Technicians are deployed out of two locations: Oxford, MA and Novi, MI; based on these sites two rates have been determined. For services within a 90 mile driving distance a \$1,300.00 rate is assigned, for all other installations within the continental US and certain parts of Canada the rate is \$2,600.00 per service. A formal quotation will be provided determining which rate will be assigned. For installations not within this zone the service will be billed at a rate of \$1,300 USD per day plus travel and expenses. Travel time is billed at 50% of the labor rate. Costs will be billed after they are incurred. Decommissioning and reinstallation will follow the same rate structure.

Please provide address of installation at the time of quotation for proper costing. If change of address occurs then the customer must notify IPG in writing and adjust the purchase order accordingly if rate is affected. No services will be scheduled without a formal purchase order in place.

HOW TO BOOK YOUR INSTALLATION

To schedule installation or any additional services for your IPG laser please contact our service department at service@ipgphotonics.com. Installations must be booked at least two weeks in advance but not before the order acknowledgement has been received. All pre-commissioning must be completed before scheduling service; please refer to IPG's Pre-Commissioning Guide for full details. No services will be scheduled until a formal purchase order is provided. Contact IPG sales for a formal quote if required.

ADDITIONAL SERVICE

For information on additional service please review our Service Plan as well as our Service Terms. In order to provide the most comprehensive post installation services we do ask that you complete the Laser Location Statement located on the final page of the Service Terms.



IPG Photonics Corporation
50 Old Webster Road,
Oxford MA, 01540 United States

QUOTATION

Page 5/6

QUOTE NUMBER

IPG-24697 - v1

QUOTE DATE

06/14/2022

PRINT DATE

6/14/2022

QUOTE CURRENCY

USD

QUOTE EXPIRY

09/12/2022

INCOTERMS

EXW-Origin

PAYMENT TERMS TBD**SALESPERSON INFORMATION**

Johnny Poon
Sales Manager, Scientific

Phone: (650) 279-2995
jpoon@ipgphotonics.com

CONTACT INFORMATION

Bob Crabbs
robert.crabbs@ucf.edu

Phone: (321) 861-3083
Fax:

BILL TO:**SHIP TO:**

University of Central Florida
Bob Crabbs
Finance And Accounting Office 12424
Research Parkway Suite 300
Orlando, FL 38226-3249
United States

University of Central Florida
Finance And Accounting Office 12424
Research Parkway Suite 300
Orlando, FL 38226-3249
United States

IPG's delivery date is an estimate and is subject to change due to applicable government orders, disruptions in the supply of labor or materials or other circumstances arising from the COVID-19 pandemic. IPG reserves the right to adjust IPG's business operations and allocate IPG's resources in accordance with applicable government orders as IPG solely determines.

Delivery 12-16 weeks ARO, Warranty: 1 years, 5% discount provided

LINE	PRODUCT NAME/ DESCRIPTION	QTY	UOM	UNIT PRICE	DISCOUNT	TOTAL PRICE
GLPNRW500GLPS01X	GLPN-500-R 500 Watt Green quasi-CW fiber Laser. 532 nm central wavelength. 1.2 nm average pulse duration with fixed frequency. Water cooled, rack-mount design.	1	Each	\$137,500.00	(\$6,875.00)	\$130,625.00
LASER	LASER ELSX1010XXRXGFU, Model# ELS-1000, 1kW 1567nm laser	1	Each	\$225,000.00	(\$11,250.00)	\$213,750.00
DLM-400-AC-Y14	DLM-400-AC-Y14 400 Watt direct diode laser module, randomly polarized, 975+/-5nm central wavelength, air cooled, collinear red aiming diode, 5 meter 200um fiber to 5mm collimator Feed Fiber Diameter: 300; Feed Fiber Length: 5	1	Each	\$30,030.00	(\$1,501.00)	\$28,529.00


Subtotal \$372,904.00



Delivery 12-16 weeks ARO, Warranty: 1 years, 5% discount provided

QUOTATION			Page 6/6
QUOTE NUMBER IPG-24697 - v1	QUOTE DATE 06/14/2022	PRINT DATE 6/14/2022	

A handwritten signature in blue ink, likely belonging to Johnny Poon, located to the left of his name and title.


Johnny Poon,
Sales Manager, Scientific

TOTAL (USD)


\$372,904.00

Once all details have been finalized, please submit a formal purchase order to
purchaseorder.us@ipgphotonics.com.

This Quote is IPG Confidential. All Prices are in US Dollars unless otherwise noted. Customer's acceptance of this quotation by issuing a PO will constitute customer's agreement with terms and conditions of this quotation and those stated in IPG's Standard Terms and Conditions of Sale (<https://ipgphotonics.box.com/v/Sales-terms-and-conditions>.) IPG's standard warranty is one year unless stated otherwise. Sales tax and any other applicable taxes are not included in above price.

The estimated delivery dates listed above are based on IPG's existing business conditions at the time of the quotation. Changing business conditions, component availability, and timing of order may impact the final delivery date. A firm delivery date will be confirmed upon receipt of order. Model Numbers subject to change based on final product spec.

Due to EAR regulations items quoted may require an export license depending upon the product and its intended destination(s). Please consult your salesperson for detailed information."

	<p>PRELIMINARY PRODUCT SPECIFICATION</p> <p>QCW Green SM Fiber Laser</p> <p>Model: GLPN-500-R</p>	<p>Spec: PS-GLPN-500-R</p> <p>Revision: 2</p> <p>Page: 1 of 4</p> <p>Date : 06/04/2019</p>
--	--	--


1.0 Optical Characteristics

Characteristic	Test condition	Symbol	Min.	Typ.	Max.	Unit
Central Wavelength	--	λ_c	530	532	534	nm
Modes of Operation	--	--	Quasi CW			--
Pulse Repetition Frequency	--	PRF	120	180	210	MHz
Pulse Duration	--	τ	1.0	1.2	2.0	ns
Average Output Power	--	P_{MAX}	500	525	--	W
Output Power Tuning Range	--	--	10-500	5-525	--	W
Peak Output Power	$P_{OUT} = P_{MAX}$	--	--	2500	--	W
Output Beam Mode	--	--	TEM ₀₀			--
Output Beam Quality	--	M^2	--	1.1	1.2	--
Output Power Stability Long term (over 8 hours)	Peak-to-Peak $P_{OUT} = P_{MAX}$ T = const	--	--	+/-2	--	%
Polarization of Output Signal	--	--	Linear, Horizontal			--
Output Polarization Extinction Ratio	--	PER	100:1	200:1	--	--
Relative Level of Residual Pump Power to the Green Output Power	$P_{OUT} = P_{MAX}$	--	--	-40	-30	dB
Switching ON Time	$P_{OUT} = P_{MAX}$	--	--	20	--	ms
Switching OFF Time	$P_{OUT} = P_{MAX}$	--	--	30	--	μ s

2.0 Optical Output

Characteristic	Test condition	Symbol	Min.	Typ.	Max.	Unit
Feeding / Dump Cable Length	--	L	--	2	--	m
Feeding / Dump Cable Outer Diameter	--	--	--	16	--	mm
Feeding / Dump Cable Bend Radius	--	--	250	--	--	mm
Output Termination	--	--	Sealed Bulk Head			--
Beam Diameter	At the output window, 1/e ² level	--	--	0.6	--	mm
Beam Divergence	Full angle, 1/e ² level	--	--	10	--	mrاد
Beam Ellipticity	--	--	--	3	10	%

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	<p>PRELIMINARY PRODUCT SPECIFICATION</p> <p>QCW Green SM Fiber Laser</p> <p>Model: GLPN-500-R</p>	<p>Spec: PS-GLPN-500-R</p> <p>Revision: 2</p> <p>Page: 2 of 4</p> <p>Date : 06/04/2019</p>
--	--	--

3.0 General Characteristics

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature Range <ul style="list-style-type: none"> Main Console Optical Head 	Measured by integrated thermo sensors	--	+10 +10	--	+35 +45	°C
Storage Temperature	--	--	-10	--	+60	°C
Warm-up Time <ul style="list-style-type: none"> to Start of Operation to Full Stabilization 	--	--	--	6 60	--	min
Humidity	Non-condensing	--	0	--	95	%
Cooling Method <ul style="list-style-type: none"> Main Console Optical Head 	--	--	Water Passive			--
Main Console Weight	--	--	--	48	--	kg
Optical Head Weight	--	--	--	3.5	--	kg
Main Console Dimensions	W x H x D	--	448 x 176 x 678			mm
Optical Head Dimensions	W x H x D	--	130 x 60 x 213			mm

4.0 Cooling


Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Method	--	--	Tap or DI-water			--
Water Temperature	--	--	21*	22	25	°C
Water Pressure	--	--	1.5	--	3.5	bar
Water Flow	--	--	8	--	--	l/min
Chiller Cooling Capacity	--	--	2.5	--	--	kW

* Always above dew point

5.0 Electrical Characteristics

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	50-60 Hz Single phase	--	200	--	240	VAC
Power Consumption	--	--	--	2800	--	W

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	<p>PRELIMINARY PRODUCT SPECIFICATION</p> <p>QCW Green SM Fiber Laser</p> <p>Model: GLPN-500-R</p>	<p>Spec: PS-GLPN-500-R</p> <p>Revision: 2</p> <p>Page: 3 of 4</p> <p>Date : 06/04/2019</p>
--	--	--

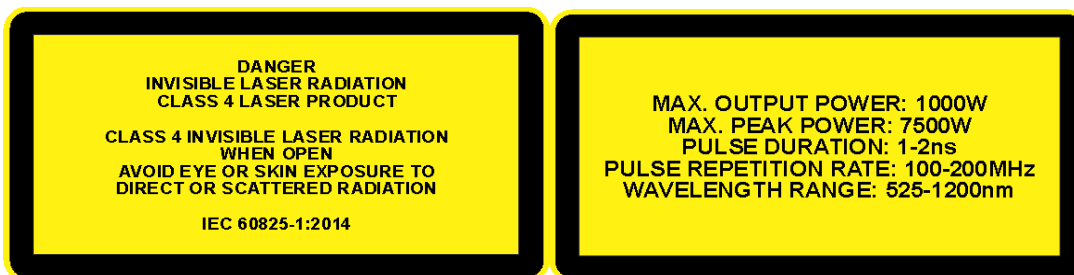
6.0 Control Interface

Characteristic	Description
Controls	Local Control (Touch Screen on Front Panel) Remote Control (Ethernet and RS-232)
Safety Interlock	Dual Channel (through Harting Connector)


7.0 Certification

Test Data Shipped With Each Product.

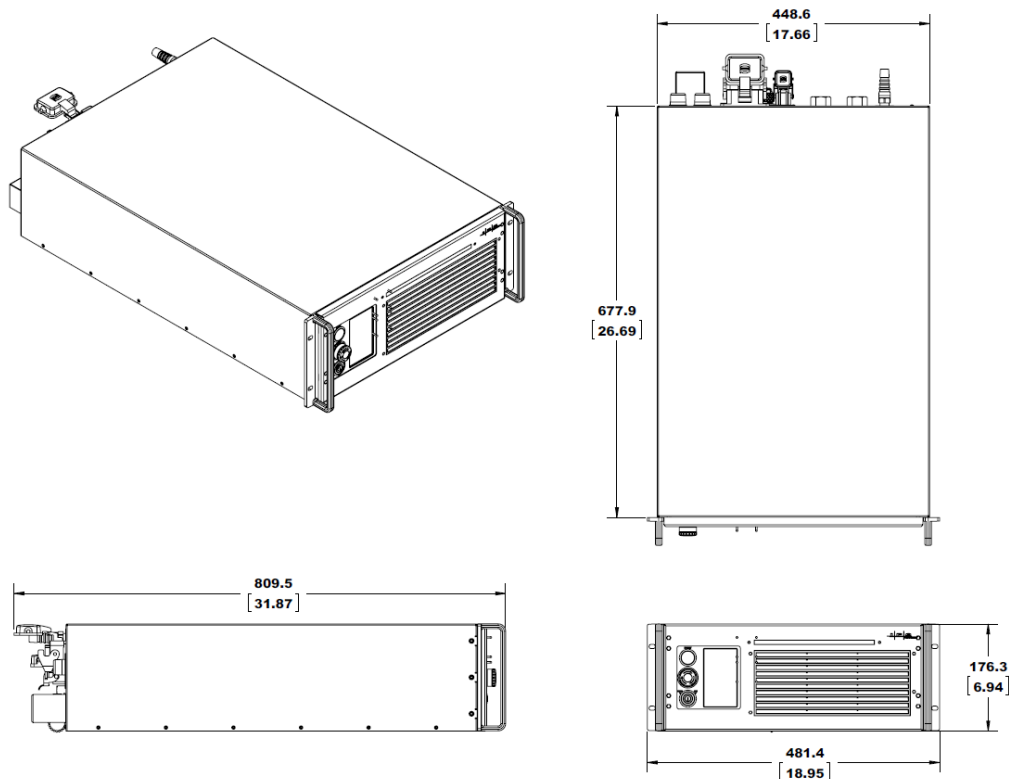
- Output Power vs. Power Setpoint
- Output Power Stability (over 8 hours)



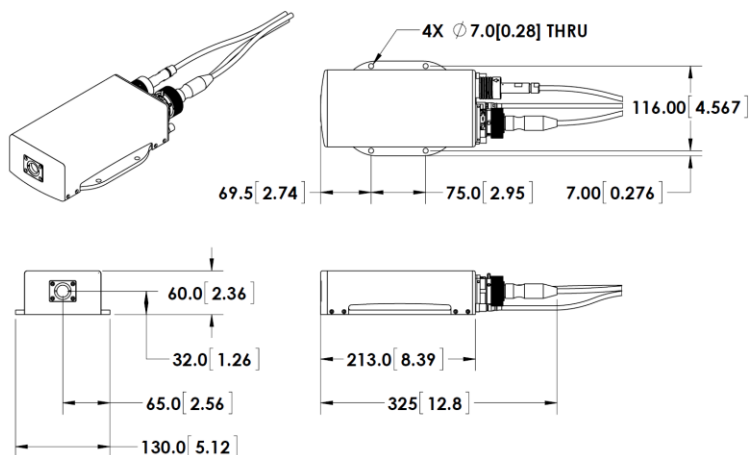
CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	<p>PRELIMINARY PRODUCT SPECIFICATION</p> <p>QCW Green SM Fiber Laser</p> <p>Model: GLPN-500-R</p>	<p>Spec: PS-GLPN-500-R</p> <p>Revision: 2</p> <p>Page: 4 of 4</p> <p>Date : 06/04/2019</p>	
--	--	--	--

8.0 Drawings




MAIN CONSOLE



OPTICAL HEAD

DIMENSIONS: MM [IN]

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 1 of 6 09/27/2018
--	---	--------------------------------------	--

Product Specification

LASER MODEL

ELS-1000

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.



	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 2 of 6 09/27/2018
--	---	--------------------------------------	--

Table of Contents:

1.0 Optical Characteristics	3
2.0 General Characteristics.....	4
3.0 Interfaces	4
4.0 Regulatory Compliance	5
5.0 Water-Air Chiller (optional)	5
6.0 Laser Layout	6


CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 3 of 6 09/27/2018
--	---	--------------------------------------	--

1.0 Optical Characteristics

Characteristics	Test conditions	Symbol	Min.	Typ.	Max	Unit
Operation Mode			CW, QCW			
Polarization			Random			
Nominal Output Power		P_{NOM}		1000		W
Output Power Tuning Range			10		100	%
Central Emission Wavelength	$P_{\text{OUT}} = 1 \text{ kW}$		1550	1567	1570	nm
Emission Linewidth	$P_{\text{OUT}} = 1 \text{ kW}$				6	nm
Switching ON/OFF Time	$P_{\text{OUT}} = 1 \text{ kW}$				100	μsec
Output Power Modulation Rate	$P_{\text{OUT}} = 1 \text{ kW}$				1.0	kHz
Output Power Stability	Over 1 hr, $T_{\text{WATER}} = \text{Const}$				2.0	%
Output Beam Quality	BPP			4.0	4.5	mm*mrad
Fiber Length		L		5		m
Fiber Cable Bend Radius: unstressed stressed		R	100 200			mm
Output Termination			HLC-8 Connector (QBH compatible)			

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 4 of 6 09/27/2018
--	---	--------------------------------------	--

2.0 General Characteristics


Parameters	Test conditions	Min.	Typ.	Max	Unit
Operation Voltage (3 phases)		400 - 460V/3P+PE			VAC
Frequency		50/60			Hz
Power Consumption	P _{OUT} = 1 kW		6	7	kW
Operating Temperature Range		+ 15		+ 45	°C
Humidity	T < 25 °C			80	%
Storage Temperature	Without water	- 40		+ 75	°C
Dimensions, H x W x D	NEMA-12 IP-55	632 x 1000 x 803			mm
Weight			160	180	kg
Plumbing		NPT Threaded Stainless Steel and/or Plastic Tubing			
Cooling*		IPG air/water chiller			

*-Optional

3.0 Interfaces

Interface		Description
Front Panel	Controls	Emergency STOP Pushbutton START Pushbutton Power ON Keyswitch
	Indicators	Interlock Active Laser Power Supply On Emission On
Rear Panel		Ethernet - Harting RJ45 Data 3A Analog Control – Harting Han 7 D Safety Interface – Harting Han 24 D Hardwiring – Harting Han 64 D Chiller – Harting Han 18 D External Laser Permission – Harting Han 10 D

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 5 of 6 09/27/2018
--	---	--------------------------------------	--


4.0 Regulatory Compliance

Function	Description
Safety	EN 954-1 Category 3
Laser	CDRH 21 CFR 1040.10 Class IV EN 60825-1
Electrical (See IPG Specification P99-010408)	UL-508 NEC NFPA 79 EN 60204-1

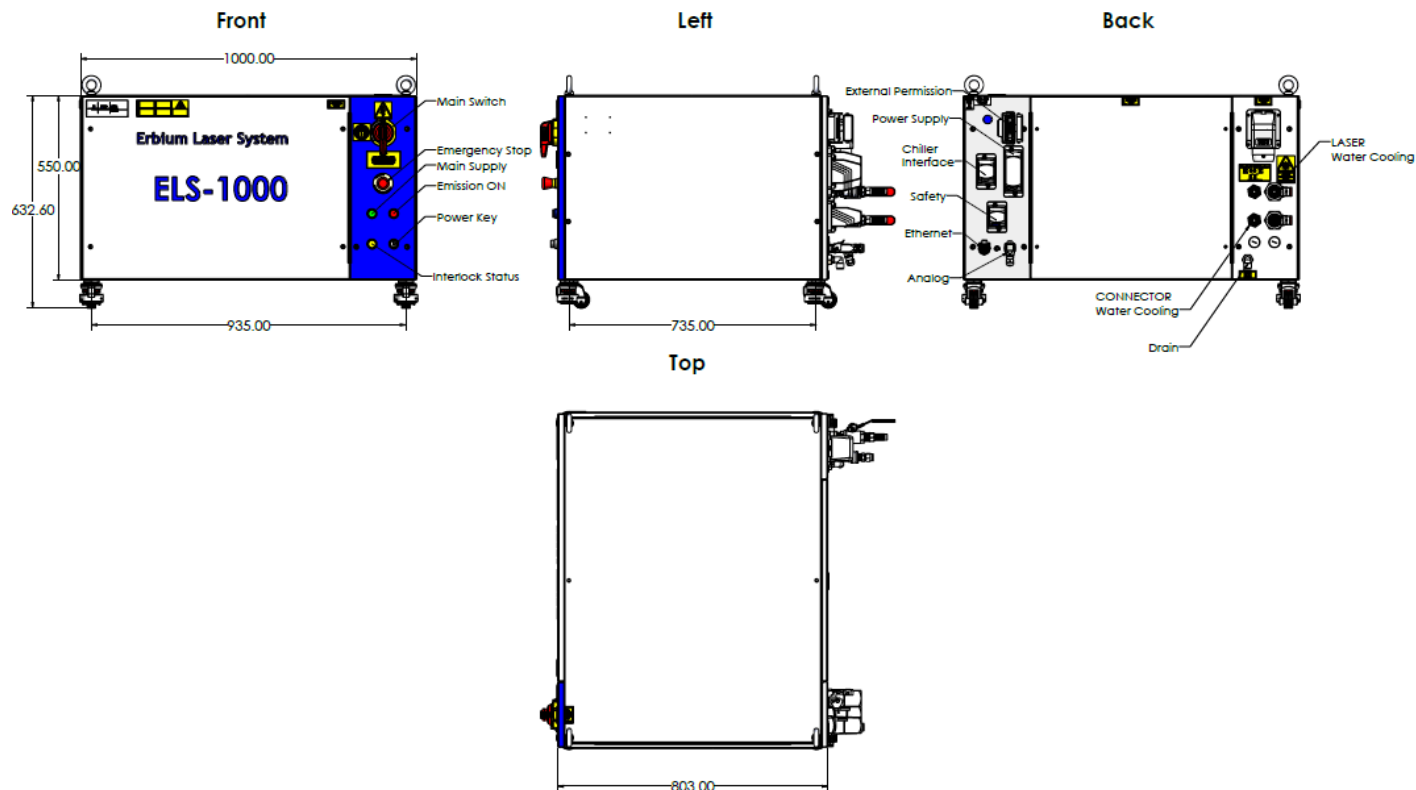
5.0 Water-Air Chiller (optional)

Item	Parameter	Value	Unit
(DI) water for the laser and external optics cooling	Flow	20 - 25	l/min
	Pressure	1,5 - 3	bar
	Temperature	20 - 25	°C
Operating voltage	3 Ph AC line 50/60 Hz	400-460V/3P+PE	VAC
	Max. Operation Current	18-22	A
	Starting current	58.5	A
General characteristics	Operation temperature range	+5 ... + 45	°C
	Storage temperature without water	- 40 ... + 75	°C
	Dimensions WxDxH	631 x 1117 x 1408	mm
	Weight (net)	320	kg


CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	PRODUCT SPECIFICATION LASER Model ELS-1000	Spec: Revision: Page: Date:	PS-ELS-1000 1 6 of 6 09/27/2018
--	---	--------------------------------------	--

6.0 Laser Layout



CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation. No representations and warranties are made hereby, except in a binding purchase order.

	<p align="center">SPECIFICATION DIODE LASER Model DLM-400-AC-Y14</p>	Spec: Revision: Issue date: Page:	G22-29658 -- 04.09.14 1 of 2
---	---	--	---------------------------------------

1. Optical characteristics

N	Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
1	Operation Mode			CW / Modulated			
2	Polarization			Random			
3	Nominal Output Power		P_{nom}	400			W
4	Emission Wavelength	Output power: 400 W	λ	960		980	nm
5	Emission Linewidth	Output power: 400 W	$\Delta\lambda$			6	nm
6	Long-term Power Instability	Output power: 400 W Time interval: 4 hrs (T=Constant)			±2	±3	%
7	Switching ON/OFF Time	Output power: 400 W				30	μs
8	Red Guide Laser Power			0.1		1.0	mW

2. Optical output

N	Characteristics	Min.	Typ.	Max.	Unit
1	Output Fiber Core Diameter	300*			μm
2	Output Fiber NA			0.22	
3	Output Fiber Length		5	TBD	m
4	Output Fiber Termination	Collimator** or QBH-compatible connector			
5	Delivery Cable Bending Radius	50			mm

* Other output fiber core diameters are available upon request.

** By default a collimator with beam diameter 8 mm is installed. Other beam diameters are available upon request.

3. General characteristics


N	Characteristics	Min.	Typ.	Max.	Unit
1	Cooling method	Forced Air			
2	Operating Ambient Temperature Range	10		40	°C
3	Humidity	10		95	%
4	Storage Temperature	- 40		+ 75	°C
5	Dimensions, WxDxH	264 x 432 x 150			mm
6	Weight			25	kg

4. Electrical characteristics

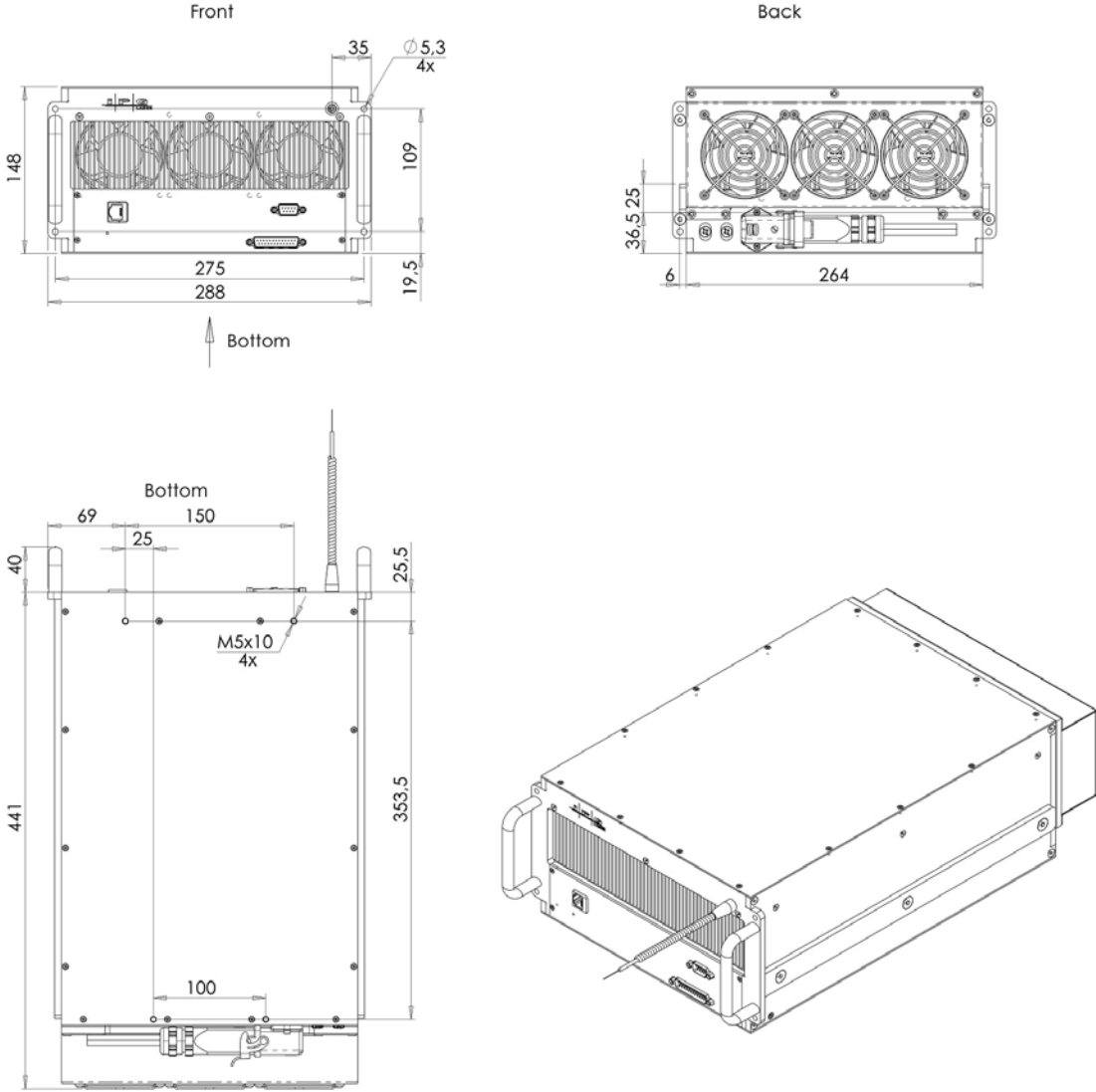
N	Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
1	Supply voltage for house keeping		U_{HK}	4.5		25	VDC
2	Housekeeping Power Consumption				2.5	3.5	W
3	Main supply voltage for pump diodes		U_P	47	48	49	VDC
4	Maximum power consumption				1000	1200	W
5	Control			Analog / RS-232 / Ethernet *			

* For details refer to the appropriate interface specification or user guide.

CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation.
No representations and warranties are made hereby, except in a binding purchase order.

	<p align="center">SPECIFICATION DIODE LASER Model DLM-400-AC-Y14</p>	<p>Spec: Revision: Issue date: Page:</p>	<p>G22-29658 -- 04.09.14 2 of 2</p>
---	---	--	---

5. External layout



CONFIDENTIAL: This document and any data disclosed therein is the property of IPG Photonics Corporation and its affiliates, and constitute and contain proprietary information. Neither receipt nor possession of this document confers or transfers any right to duplicate, use, or disclose any information contained herein except as expressly authorized in writing by IPG Photonics Corporation.

No representations and warranties are made hereby, except in a binding purchase order.