Clear Fields

UCF | Procurement Services

SOLE SOURCE CERTIFICATE AND POSTING NOTICE

(Greater than $150,000)

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.

This form and related documentation shall be submitted through Workday Help using case type Waivers and Sole Source. Please do not attach to a requisition or send via email for review and approval.

WD case subject title should have common structure for easy tracking, to include:

- Exemption type (Sole Source)
- Supplier name
- Purchase amount

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 Manager or 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.

Once the completed sole source is received, Procurement Services in collaboration with kNEXT 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.

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) hours. Upon expiration of said posting period, Procurement Services will process a purchase order upon receipt of the requisition.

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: M. Heeke 4078236802

Product/Service Cost: $443,580.00

✓ One Time Purchase __Term Contract: _____

__ Multiple Purchases __ Duration: _____

Company Name: Quantum Design

Email: rickh@qdusa.com

Contact Person: Rick Hapanowicz

Title: USA Sales Manager

Product and/or Service: OptiCool 7 Tesla Cryogen Free Split-Coil Superconducting Magnet System

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 the 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.

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.

Alexander Khanikaev Digitally signed by Alexander Khanikaev Date: 2024.03.06 13:25:30 -05'00'	Alexander Khanikaev	3/5/2024
Signature	**Printed Name and Title (PI/Researcher/Director/Chair)**	**Date**
David J Hagan Digitally signed by David J Hagan Date: 2024.03.06 14:43:59 -05'00'	David J Hagan	3/6/2024
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). Approvals may be documented and supported via email.

Trinh Nguyen	Trinh Nguyen, Procurement Specialist	4/2/2024
Signature	**Printed Name and Title (Procurement Specialist)**	**Date**
See below email for approval		
Signature	**Printed Name and Title (Procurement Services Manager or Associate Director)**	**Date**
See below email for approval		
Signature	**Printed Name and Title (Asst. Vice President for Tax, Payables & Procurement)**	**Date**

See below email for approval		
Signature	**Printed Name and Title (Chief Financial Officer)**	**Date**

POSTING NOTICE

4/2/2024 / 3:30 pm EST	4/5/24 / 3:30 pm EST	2408	Trinh Nguyen
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.

OptiCool 7 Tesla Cryogen Free Split-Coil Superconducting Magnet System is a magneto-optical cryostat that will be used for measurements of the magnetic, electrical, and optical properties of photonic materials. The magneto-optical cryostat is a core instrument for optical spectroscopic system for performing experiments at cryogenic temperatures with the presence of strong external magnetic fields.

2. Describe the required specifications or requirements and why are they essential to the accomplishment of your work.

A magneto-optical cryostat has to operate in a range of temperatures from 1.8K to 350K and be capable to provide magnetic fields up to 7T, that is crucial for the projects in PI's group, including light-matter interactions in topological polaritonic systems integrating 2D materials, where the optical properties of studied materials and strength of light-matter interactions strongly depend on the ambient temperature and external magnetic field. The design of the system have to allow installation of nanopositioners for precise positioning of nano-sized samples. Optical access through multiple windows to the sample volume of cryostat is essential for performing experiments with various geometrical configurations. Vibrations of the system should not exceed 10 nm peak to peak at the sample location.

Provide the names of other suppliers, products and/or services that you have investigated and explain why they do not meet the required specifications or requirements. It may be helpful to present your information in a table like the one below.

Required Specifications	Supplier 1	Supplier 2		
Multiple windows access	N	Y		
Strong magnetic field (up to 7T)	Y	N		
Base temperature under 2K	Y	N		

Other suppliers of cryogen-free magneto-optical cryostats:
Supplier 1: (Attocube systems AG, model attoDRY2100) in this system sample is buried deep inside the cryostat housing, so optical access is realized by the use of measurement inserts that restrict geometrical configurations of experiments and limit the use of free beam optics.
Supplier 2: (Montana Instruments), model CryoAdvance 50 with a magneto-optical module) The magnetic field in this system is produced by an external module that can apply field only up to 0.7 T. Also, this system has a higher base temperature (3.2 K).

3. State in detail why only this and no other product(s)/service(s) will satisfy the department's requirements. Description may include unique features, compatibility, specifications, availability, delivery time frame etc. (For example, please list the features or special conditions that are unique and only available from one supplier. Note: Price is not a valid reason.)

The OptiCool system implements an innovative highly integrated design that means that even with a superconducting magnet the sample is not buried inside a large cryostat, far away from the optics. This design gives OptiCool cryostat its most unique feature: a top optical port, seven side optical ports, and a bottom port to allow optical access to the sample from a wide array of directions. The OptiCool system operates from 1.7K to 350K, while a split-coil conical magnet offers fields perpendicular to the optical table up to 7 T. An additional set of nanopositioners allows an arbitrary orientation and a nanoscale precise positioning of the sample. The OptiCool system from Quantum Design is the best that fits our requirements with a large 0.7 NA top optical port and the possibility to integrate an objective inside the system. In addition, the system also has a bottom window and 7 side ports with NA 0.11 which will be used for transmission type measurements and off-axis reflection geometries with different magnetization orientations. The OptiCool system has a large 89mm x 84mm temperature-controlled region, which simplifies optical alignment and allows the use of various configurations of sample stages. The OptiCool cryostat has vibrations of less than 10nm peak to peak at the sample location. The totality of all these features makes OptiCool a unique state-of-the-art magneto-optical cryostat and an irreplaceable core tool for optical spectroscopic system with a wide range of possibilities.

4. Are there resellers or distributors? If yes, please list names and contact information.

The OptiCool system will be purchased directly from the manufacturer - Quantum Design.

5. Will this purchase obligate UCF to this vendor for future purchases such as maintenance, licensing, or continuing need? ___ Yes ✓ No

If yes, please provide details regarding future obligations and/or needs to include number of years and total spending amount of obligations:

We anticipate no major operating costs (other than electricity and gases).

6. What efforts have been made to obtain the best pricing available? Please provide an explanation to support the belief that the price is fair and reasonable.

By our request the vendor generously applied a 'preferred customer' discount - $60,000 from the initial price of the system ($503,580), that is 12% from the total cost. The discount was enabled by our prior purchase of the tool for our laboratory at City College of New York. Taking into account unique add-on features of the OptiCool magneto-optical cryostat, the price of $443,580 with the discount applied to the original quote ($503,580) looks fair and reasonable.

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: Quantum Design
Product: OptiCool 7 Tesla Cryogen Free Split-Coil Superconducting Magnet System
Total Amount: $443,580.00
Dept: CREOL

Requirement: The department wants to purchase a magneto-optical cryostat system to use for measuring magnetic, electrical, and optical properties of photonic materials. The system's required specifications are listed in the below table.

Research Conducted: The PI listed three suppliers that can provide a magneto-optical cryostat system and the only one that can meet all required specifications is the one from Quantum Design.

Required Specifications	**Attocube Systems AttoDRY2100**	**Montana Instrument CryoAdvance 50**	**Quantum Design OptiCool 7 Tesla Cryogen**
Multiple window access - Have several optical ports to allow optical access to the sample from a wide array of directions.	No	Yes	Yes
Strong magnetic fields (up to 7T)	Yes	No	Yes
Base temperature under 2K	Yes	No	Yes
Operating temperature range from 1.7K to 350K	No	No	Yes
A large 0.7 numerical aperture (NA) top optical port to integrate an objective inside the system.	No	No	Yes
large 89mm x 84mm temperature-controlled region to simplify optical alignment and allows the use of various configurations of sample stages.	No	No	Yes
Vibration of less than 10nm peak to peak at the sample location.	Yes	Yes	Yes

Quantum Design offers the below unique features in their OptiCool system that the other two suppliers can't provide.

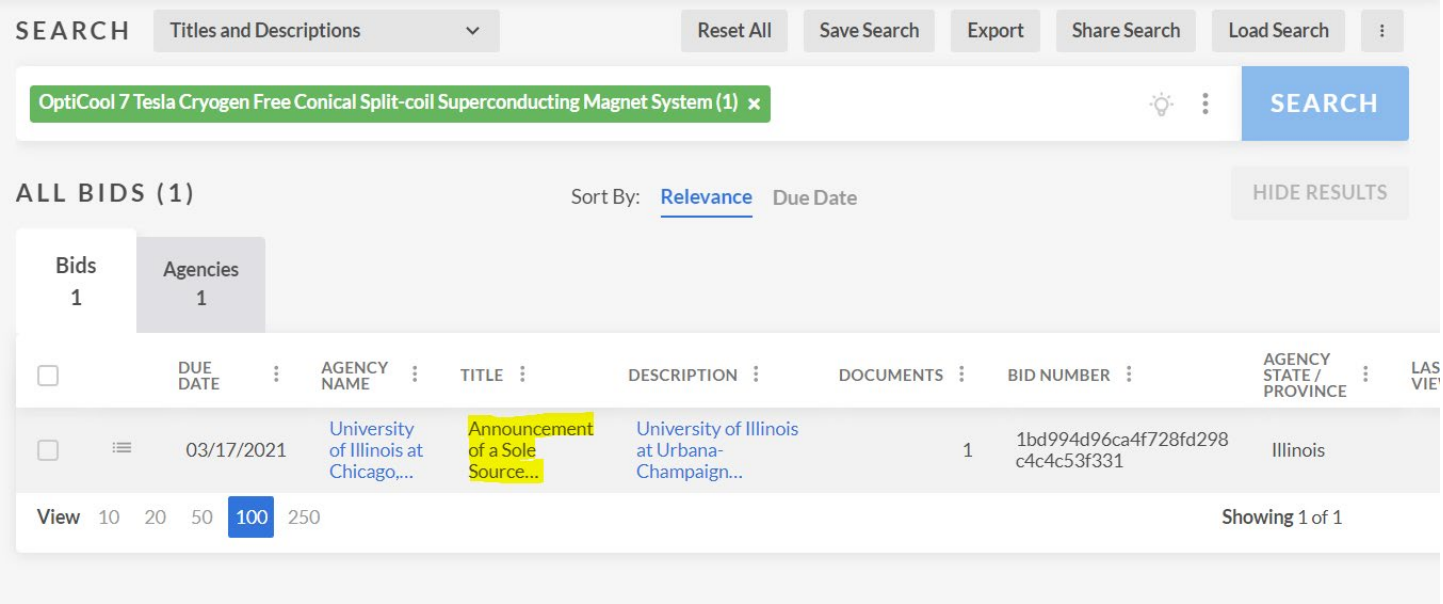
- Operating temperature range from 1.7K to 350K.
- A large 0.7 numerical aperture (NA) at the top optical port.
- A large sample volume space, 89mm x 84mm

There are no distributors for this system. The OptiCool will be purchased directly from the manufacturer, Quantum Design, in North America.

Price is fair and reasonable: The price is deemed fair and reasonable given that the system from Quantum Design has unique features that are not available in the other systems, and it is the only one that can satisfy all required

specifications. It was also noted that the supplier applied a $60K deduction from the initial list price of the system, a 12% discount.

GovSpend: Searching in GovSpend, I was able to locate the below approved Sole Source justification form from University of Illinois at Chicago, dated March of 2021, for the same system with noted unique features that supports the above research done by CREOL.



A bid from University of Illinois at Chicago, Urbana-Champaign, and Springfield for Announcement of a Sole Source Purchase.

Please find the details here:
https://app.govspend.com/bidDetails/view/aHR0cHM6Ly93d3cucHJvY3VyZS5zdGF0ZXVuaXYuc3RhdGUuaWwudXMvZHNwX25vdGljZS5jZm0%2FVW5pPVVJVUMmUE49MUtSQjIxUjA0MDgxODk%3D?criteria=eJytkEFLw0AQhf_KsudEBA9CbxKpeBCR9iY9THYn6eh2NuxO0FD6352USCyUQkFy2Mxj9u333t5-4mAX1iUSTAS2sNltcQeq1eRLDzJqMnSoSpti3-n4EYl1BPY6uC0Fn1CF9_3kVkOaLwm0-a3HNKjUEAav2nI8n0a3GyEJ-MD-EbNCdEKRdbGDPqNuNhAyFkePo_9XTOP9V92rYgzm3qwxBzBVGmKLbJYJ0VSRyUEwqy6QlC6S_vYdJhfZ906IW_MCLaOY1ZAFd_pegBqDXdwW1lMWYKfkd4fNn6gjPn6DkwnqUPymbShod_mamq7uQVKPZxudmrlEWkyclx8rZ9c5Gkd55vVZsv-LMIFzZDwJdNL2Rr8fF5rq0w

Sole Source Justification Form

Bulletin Reference Number: 1KRB21R0408189

Requesting Agency/University: UIUC

Sole Source Justification Form - Part I

Section I - General Information

Department/Bureau/Section: UIUC MRL

Need Identified Date: Nov 1, 2020

Supply/Service Need By Date: Aug 1, 2021

Project Title: OptiCool 7 Tesla Cryogen Free Conical Split-Coil Superconducting Magnet Cryostat System

Vendor: Quantum Design

Provide a description of the supplies or services required: Magneto-optical cryostat with a 7 Tesla spit-coil conical superconducting magnet with a variable temperature sample space, an operating temperature from 1.7 K to 350 K with 9 optical access ports with fused silica windows, and key components including sample pods, sample space thermally anchored wiring, cryocooler, compressor, control electronics and associated cables, power supplies, pumps and software

Value: Estimated

Value of Initial Term, this Change Order or Amendment: 200,000

Will this Sole Source amend a Professional or Artistic Services contract? ☐ Yes ☒ No

*Sole Source may not be used for amendments for Professional or Artistic Services if the amendment would increase the value by more than 5% of the initial award or extend the term by more than 60 days.

Type: New Sole Source

Section II - Proposed Term

☒ One-Time Purchase ☐ Term Contract

Section III - Funding Source

Select the type of funding to be used (Check all that apply): ☒ State Appropriate Funds ☒ Federal Funds ☐ Other (Explain):

Section IV - Sole Source Justification

This purchase is economically only available from a single source **primarily** because it is: (If "Other" explain in one sentence)

Items are Required for Research and No Other Source is Able to Meet the Researcher's Documented Need

Are there secondary justification(s) for this sole source? ☒ Yes ☐ No

Another justification that this purchase is only available from a sole source is because it is:

Items are Copyrighted or Patented and the Items are Only Available from the Holder

Another justification that this purchase is only available from a sole source is because it is:

N/A

Section V - Purchase History

Has the Agency or University Purchased these supplies or services in the past? ☐ Yes ☒ No

Section VI - Business Rationale

Sole Source Justification Form

Bulletin Reference Number	1KRB21R0408189
Requesting Agency/University	UIUC

1. Provide a detailed explanation of the need for the supplies or services:

Faculty research projects in the NSF funded I-MRSEC and IQUIST at UIUC MRL require studying the optical properties of quantum and nanoscale materials at low temperatures (down to 1.7 K) and high magnetic fields (up to 7 T). Interesting quantum phenomena occur at these low temperatures and high magnetic fields. This procurement is for the a magneto-optical cryostat that will permit these projects. For the projects to be successful it is necessary that samples can be mounted in a cryostat that is stable against vibrations with a small working distance for the optical ports. The numerical aperture (NA) of the top port should be greater than 0.7. The crysotat and superconducting magnet should be cooled using a closed cycle He system to permit long acquisition of data without changing He dewars. The cryostat should have optical access ports to allow both optical transmission and reflection such that the magnetic field can be made both perpendicular and parallel to the sample. The cryostat will also be used in electro-optic experiments in a magnetic field. These experiments require thermally anchored wires that can be attached to sample devices. The sample space should be large enough to mount sample devices and optical mirrors inside the sample space. The cryostat should also include all necessary pumping system and control electronics.

2. Provide a list and describe in detail the specifications required to satisfy the need:

The specifications of the magneto-optical cryostat need to be as follows:
1) Closed cycle cryocooler with water cooled compressor
2) Variable magnet field between in the sample space between 0 and 7 T
3) Variable temperature from 1.7 K to 350 K
4) 9 Optical Access Ports with fused silica windows including 7 side ports, 1 top port and 1 bottom port
5) The numerical aperture (NA) of the 7 side ports needs to be greater than 0.11 and the top port NA is greater than 0.7
6) Two exchangeable sample pods
7) Thermally anchored twisted pairs from the sample pod and wiring points
8) The sample volume space should be larger than 80 mm x 80 mm
9) Vibrations of less than 10nm peak to peak at the sample location

3. Provide detail explaining the justification selected in Section IV to explain why the requested supplies or services are the only ones available that can satisfy the agency or university requirements?

This is primarily because Quantum Design is the only vendor that can provide a magneto-optical cryostat with fields as high as 7 T and temperature as low as 1.7 K combined with the large sample space (greater than 80 mm x 80 mm) and crucially vibrations of less than 10 nm peak to peak at sample location. Quantum Design is the only vendor that has an optical top port with NA greater than 0.7. Quantum Design has a patent (WO 2011/112987 A3) that permits this level of cryocooling while maintaining low vibrations and a high numerical aperture.

4. What are the unique features of the supplies or services that are not available in any other product or by any other vendor? Provide specific quantifiable factors/qualifications:

1) No other product has the required NA is greater than 0.7
2) No other product has a sample space greater than 80 mm x 80 mm
3) No other product has vibrations of less than 10 nm peak to peak at sample location using a closed-cycle cryocooler with a magnetic field upto 7 T and temperature down to 1.7 K
4) 1) The product will be used for TeraHertz spectroscopy on quantum materials, in particular on antiferromagnetic metals, quantum spin liquids and superconductors. These materials display interesting phenomena only below a certain temperature and above a certain magnetic field. For example, we intend to study the quantum phase transition in the material $RuCl_3$ with this system, which occurs at a magnetic field above 4 T (Vendor A system can only reach 1 T) and a temperature below 4 K. In this case both high magnetic field and low temperature are critical. Similarly, we intend to study vortex states in superconductors with THz spectroscopy.. For that we have to cool down below 5 K and apply a magnetic field above 3 to 4 T. These cannot be accomplished with any other system on the market while keeping the low working distance which is necessary for the THz spectrometer.

5. Has the Agency or University considered alternative supplies or services to satisfy their need? ☒ Yes ☐ No

Sole Source Justification Form

Bulletin Reference Number	1KRB21R0408189
Requesting Agency/University	UIUC

5a. If yes, name the alternative vendors whose supplies or services were evaluated:

Vendor A

5b. If yes, what were the alternatives for each vendor and why were they unacceptable? Be specific with regard to features, characteristics, requirements, capabilities and compatibility:

Vendor A supplies the Cryostation s50 - MO which can only go up to a magnetic field of 1 T instead of 7 T and has a lowest possible temperature of 3.4 K instead of 1.7 K. Vendor A does have a closed-cycle cryostat that can go down to 1.7 K but that does not have a magnetic field.

5c. Explain how the market evaluation was conducted?
**This evaluation is to determine available options within a market. If the evaluation is to determine quality or best suited option, this is not the appropriate source selection. Under no circumstances shall the evaluation consist of testing alternative options. These activities must be conducted in a competitive transparent environment (i.e. IFB or RFP).*

Vendor A closed cycle optical cryostat that can go down to a temperature of 4 K is priced around 150,000 (based on prior purchase by MRL). That system does not have a magnetic field and cannot be cooled down to a temperature of 1.7 K. Similarly, systems that incorporate superconducting magnets to get fields as high as 7 T are typically priced > 200 K and do not have optical access (based on prior work by PIs in MRL). Based on this and the fact that Quantum Design uses a proprietary design, the price is fair. The principle researcher went to vendor fairs, conferences, and spoke with individual researchers and sales representatives.

6. Are there resellers or distributors?

☐ Yes ☒ No ☐ N/A

7. What efforts were made to get the best possible price (i.e. did the agency/university negotiate) and how did you determine the price for this purchase is considered fair and reasonable?

Price includes a $32,500 discount and a $110,00 trade-in credit for other systems purchased from Quantum Design in the past.

8. Will this purchase obligate the State to this vendor for future purchases such as maintenance, licensing or continuing need?

☐ Yes ☒ No

9. What will be the financial or other impact to the State if this sole source is not approved and a competitive bid is required?

If put to a competitive bid, the University would only receive one responsive bidder. The delivery estimate is 8 months from date of order adding additional time delays the research project. If we wait on a bid we will miss a federal funding review in April.

10. Is there any additional information you would like to add to justify this sole source?

Both time and functionality are critical. A sole source purchase would ensure us the system we need and minimize the time until the new system is operational. There is a federal funding review to occur in April that could jeopardize the project if this is not ordered. This could result in loss of employment and research.

Sole Source Justification Form

Bulletin Reference Number	1KRB21R0408189
Requesting Agency/University	UIUC

Section VII

Requesting Department Signature Required

I know and understand the contents of this Sole Source Justification and attest that all statements are true and correct and the fairness and reasonableness of the price was adequately confirmed.

Requesting Department Representative: Mauro Sardela Digitally signed by Mauro Sardela Date: 2021.03.02 11:52:49 -06'00' | Phone Number: 2172440547 | Date: Mar 2, 2021

Printed Name: Mauro Sardela | E-mail Address: Sardela@illinois.edu

State Agency Bureau/Division Head or University Purchasing Director Approval and Signature Required

I know and understand the contents of this Sole Source Justification and attest that all statements are true and correct and the fairness and reasonableness of the price was adequately confirmed. (All prior form fields will lock once this e-signature is completed)

Agency Bureau/Division Head or University Purchasing Director and Not a Designee: Bradley Henson | Phone Number: 217-300-2459 | Date: March 2, 2021

Printed Name: Bradley Henson | E-mail Address: bhenson4@uillinois.edu

SPO Approval and Signature Required

☒ I have reviewed and understand the contents of this Sole Source Justification and agree with the State Agency or University determination.

☐ I have reviewed and understand the contents of this Sole Source Justification and do not agree with the State Agency or University determination. As a result, the State Agency or University must explore other sourcing methods to satisfy their need.

State Purchasing Officer Signature: Catherine Bradbury | Phone Number: (217)993-2327 | Date: 3/2/2021

Printed Name: Catherine Bradbury | E-mail Address: Catherine.Bradbury@illinois.gov

Sole Source Justification Form

Bulletin Reference Number: 1KRB21R0408189

Requesting Agency/University: UIUC

Sole Source Justification Form - Part II

Section I - General Information

Project Title

Vendor

Initial Date of Procurement Bulletin Posting

Was a Sole Source hearing held per 30 ILCS 500/20-25?

☐ Yes - Complete Section II and III below (Section II will only be visible when this option is selected)

☐ No - Section II not required, go to Section III below

Section III - CPO Approval and Signature Required

☐ Based on my review, I authorize the Agency/University to proceed in accordance with the published Notice referenced above.

☐ Based upon my review, I authorize the Agency/University to proceed with the following Changes.

☐ Based on my review, the Agency/University is not authorized to proceed with this sole source as presented and my recommendation is that it be cancelled.

☐ Other

CPO Signature

CPO Phone

Printed Name

Date

CPO E-mail

Alexander Khanikaev, Ph.D.
CREOL, The College of Optics and Photonics
4304 Scorpius Street
Orlando, FL 32816
Phone: 212-650-7518
Email: khanikaev@gmail.com

February 27, 2024
QUOTATION
QRH2024022702

OptiCool System

7 Tesla Cryogen Free Conical Split-Coil Superconducting Magnet System

SYSTEM PRICING

1	**OptiCool 7 Tesla Cryogen Free Conical Split-Coil Superconducting Magnet System** Includes: • 7 Tesla Split-Coil Conical Superconducting Magnet • Variable Temperature Sample Space Operating temperature range from 1.7K to 350K. • 8 Optical Access Ports: - 7 Side Ports, 40 mm diameter, 24.5 mm clear bore, NA > 0.11 - 1 Top Port, 50 mm diameter, 41.5 mm clear bore, NA > 0.7 • **2 User Sample Pods**, each with 89 mm x 84 mm Sample Volume • **X300 Standard Sample Space Wiring** Includes: - 8 Thermally Anchored Twisted Pairs from Sample Pod to User Port - Wiring points and thermal anchors for up to 80 user wires • Cryocooler cold-head and water-cooled compressor. • Control Electronics and computer. • Superconducting Magnet Power Supply. • OptiCool MultiVu Control Software. • All cables, hoses and pumps for operation. • System Manuals. • System User Kit containing tools and spares. • System Installation, Start-up and Training. • One year system warranty (Including parts and labor) Begins after delivery and installation.	$359,440
2	**X130 Integrated XYZ Piezo Positioner with Wiring Set**	$57,630
3	**X201 Internal Objective Mounting Hardware**	$20,200
4	**X210 Low Working Distance Top Window 4318-600-01 UNCOATED** A low working-distance (LWD) top window for use with external microscope objectives.	$5,500
5	**X310 High Frequency Coax Wiring (40GHz Connectors)**	$9,470
6	**ZnSe Window Kit for Low Working Distance Window (Uncoated) P/N 4318-602-21** **Includes:** • **4320-632-21: 1 mm thick, LWD Glued ZnSe Vacuum Window** • **4320-633-21: 1 mm thick, LWD ZnSe shield Window, Boxed** • **4320-616: 8.6 mm diameter Window frame** • **4320-605: 3 mm orifice insert plate**	$1,500
7	**OPTICOOL RAPID THERMAL TEMPERATURE STAGE & CONTROLLER** Allows for rapid cycling of the sample temperature in the OptiCool environment.	$16,900
8	**X240 Low Window Access with X242 Cryostat Riser** Bottom optical window and system stand-offs	$27,730
9	**X280 Optical Fiber Feedthrough**	$5,210

Quantum Design, Inc.
10307 Pacific Center Court, San Diego, CA 92121
Main Office: (858) 481-4400 x118 - Direct Phone: (847) 772-1721
E-mail: rickh@qdusa.com - Web: www.qdusa.com

	ITEM TOTAL	$503,580
	PREFERRED CUSTOMER DISCOUNT	($60,000)
	SYSTEM TOTAL	**$443,580**

PAYMENT TERMS
40% upon order
50% upon shipment
10% upon installation

NET 30

INVOICE ON PARTIAL SHIPMENTS

LEAD TIME 8 Months for OptiCool system
11 Months for X130 Positioner Stack

FREIGHT FOB DESTINATION, PREPAID AND ADD

VALIDITY OF OFFER 45 Days

WARRANTY 1 Year

FOR SALES AND ORDERING INFORMATION, PLEASE CONTACT:

Rick Hapanowicz, Ph.D.
U.S.A. & Canada Sales Manager
Quantum Design
Phone: (858) 481-4400 x118
Direct Phone: (847) 772-1721
Email: rickh@qdusa.com