

Pl.A1/Phy/2505-5/2021

**Department of Physics, University of Kerala, Kariavattom,  
Thiruvananthapuram, Kerala, India – 695 581, Ph: 91 471 2308920**

Date: 20/12/2021

**E-Tender Notice (Re-tender)**

Department of Physics, University of Kerala, Thiruvananthapuram invites open tenders through e-Procurement (in two bid system) for the purchase of Z-scan setup for nonlinear optical studies.

Last date and time for submission of tender online	: 20/12/2021 5 pm
Last date and time for submission of tender offline	: 29/12/2021 5 pm
Date and time of opening of tender	: 01/01/2022 11 am
Hard copies of the sealed tenders to be submitted to the office of	<b>The Registrar, University of Kerala, Senate House campus, Palayam Trivandrum- 695 034, Kerala Tel: +91-471-2305631, 2386202 (O)</b> <b>e-mail: regrku@gmail.com</b>
For technical details contact	<b>Dr. I. Hubert Joe., Associate Professor, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No. 9447220563</b>  E-Mail: hubertjoe@gmail.com

**For further details logon to [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)**

## Technical specifications of the required item

### 1. Optical Breadboard with Rigid Support

Dimension	:	1200x800mm
Material	:	5mm thick magnetic SS top skin410 Grade
Type	:	Honeycomb
Holes	:	M <sub>6</sub> tapped holes at 25 mm grid

### 2. DPSS Laser with Mount

Wavelength	:	532nm+-1nm
Output Power	:	100mW
Power Stability	:	<5% (over 2 hours)
Warm-up Time	:	15minutes

### 3. Filter Wheel with 6 Neutral Density Filters

Type	:	Absorptive ND filter
Mount	:	Black Anodized Aluminium
Material	:	Schott
Surface Quality	:	40 - 20 (scratch-dig)
Dimensional Tolerance:	+-0.2 mm	
Clear Aperture	:	90 %
Surface Flatness	:	$\lambda/4$ @632.8nm
Optical Density	:	1.0, 2.0, 2.3, 3.0, 3.3, 4.0
Parallelism	:	$\leq 10$ arc sec
Damage Threshold	:	$> 500$ mJ / cm <sup>2</sup> (532nm, 10ns, 10Hz, $\varnothing 0.340$ mm)

### 4. Variable Beam Splitter with Mount

Material	:	N - BK7
Coating	:	S <sub>1</sub> - Protective Aluminium S <sub>2</sub> - Anti-reflection Coating
Diameter	:	75mm
Thickness	:	3mm
Dimensional Tolerance	:	+-0.2 mm
Surface Quality	:	40 - 20 (scratch-dig)
Surface Flatness	:	$\lambda/4$ @ 632.8 nm
Parallelism	:	$\leq 1$ arc min
Mount	:	Black Anodized Aluminium

### 5. Kinematic Mirror Mount with Metallic Mirror

Material	:	Borofloat (Schott)
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Coating	:	Protected Aluminium
Diameter	:	25mm
Clear Aperture	:	90 %
Surface Flatness	:	$\lambda/4$ @632.8nm Parallelism
	:	$\leq 3$ arc min Reflectivity,
$R_{avg}$	:	$> 88\%$ @ 450nm - 2 $\mu$ m,
	:	$> 93\%$ @ 2 $\mu$ m - 20 $\mu$ m
Damage Threshold	:	$< 200$ mJ / cm <sup>2</sup> (532nm, 10ns)
Mount	:	Black Anodized Aluminium (with 80tpi lead screw)

## 6. Achromatic Lens with Rigid Lens Mount

Material	:	N-BK7
Design Wavelength	:	587.6 nm
Focal length	:	286 mm & 100 mm
Focal Length Tolerance	:	$\pm 1\%$
Surface Quality	:	40 - 20 (scratch-dig)
Diameter Tolerance	:	+0.2mm
Clear Aperture	:	$> 90\%$ of Diameter
Centering Tolerance	:	$\leq 3$ arc min
Mount	:	Black Anodized Aluminium

## 7. Variable Aperture with Mount

Material	:	Aluminium (Mount) Spring Steel (Lever)
Max. Aperture	:	25mm
Min. Aperture	:	1.5mm
Mount	:	Black Anodized Aluminium

## 8. Circular Disc with Apertures

Material	:	Black Anodized Aluminium
Aperture Diameters	:	0.50mm, 0.75mm, 1.00mm 1.25mm, 1.50mm, 1.75mm, 2.00mm, 2.50mm, 3.00mm

## 9 .Motorized Precision Linear Translation Stage

Actuator	:	Stepper motor
Drive Mechanism	:	Lead screw
Travel range offered	:	150 mm
Resolution	:	0.1 mm
Construction	:	Aluminium Alloy B51S
Finish	:	Black anodized

## 10. Cuvette with holder

Material	:	Fused Silica
Path length	:	1mm
Outer dimension	:	44.5 x 20 x 3mm
Inner dimension	:	35 x 10 x 1mm
Volume	:	0.35 mL approx.
Holder	:	Black Anodized Aluminium

## 11. Detector Unit

Detector Type	:	Si Photodiode
Active Area	:	5.8mm X 5.8mm
Spectral Response	:	320-1100nm

## 12. Detector Measurement with Control Electronics Unit

Drive	:	Bipolar stepper motor drive
Current Control	:	PWM current control
Step	:	1/16 micro step
Control	:	Microprocessor controlled
Detector Interface:	:	Single/Dual/Triple channel detector Interface
Operation	:	PC based operation, Serial port (RS232C) Connectivity

## 13. Black Screen with Rigid Base

Dimension	:	300x200 mm
Material	:	Acrylic
Base material:	:	Magnetic Steel

## 14 Cuvette (UV Fused silica)

Material : UV Fused silica  
Path length : 1mm  
Outer dimension : 44.5 x 20 x 3mm  
Inner dimension : 35 x 10 x 1mm  
Volume : 0.35 mL approx.

## 15 Dual Channel Energy/Power meter

Power Range : 1  $\mu$ W to 10 kW or better  
Monitor Accuracy :  $\pm 0.75$  % for 25 % to full scale  
Statistics : Current Value, Max, Min, Average, Std Dev., RMS & PTP Stability, Time  
Energy Range : 30 fJ to 20 kJ or better  
Resolution (Digital) : Normal Mode: Current scale/4096 or better  
Monitor Accuracy  
<500 Hz (MB), <1200 Hz (MT) : 1 %  
500 to 1 200 Hz (MB) : 2 %  
1 200 to 6 000 Hz (MT) : 3 %  
6 000 to 10 000 Hz (MT) : 6 %  
Data Display : Real Time, Ratio, Line Plot, Histogram, Statistics and 3D Histogram  
Serial Commands and Data Transfer Via : USB (standard) or Ethernet (option) a  
Real Time Data Transfer Rate : 10 kHz/Channel in normal mode, no missing point (for pyroelectrics only)  
Rising Edge External Trigger : 3-24 V @ 13 mA, optically isolated

## 16. Energy Detector

MAX MEASURABLE ENERGY (WITH ATTENUATOR) : 3.9 J  
MAX REPETITION FREQUENCY : 300 Hz  
EFFECTIVE APERTURE : 12 x 12 mm or more  
Maximum Measurable Energy  
1064 nm, 7 ns, 10 Hz : 0.85 J - 3.9 J (With attenuator)  
266 nm, 7 ns, 10 Hz : 0.70 J - 0.81 J  
Noise Equivalent Energy : 0.7  $\mu$ J or better  
Sensitivity : 60 V/J or better  
Max Repetition Frequency : 300 Hz  
Maximum Pulse Width (typical) : 400  $\mu$ s  
Rise Time (typical 0-100 %) : 550  $\mu$ s  
Calibration Uncertainty :  $\pm 3$  % minimum  
Repeatability <0.5 % or better  
Maximum Average Power Density : 10 W/cm<sup>2</sup>

**Warranty:** 1 year from the date of delivery

### **General Conditions:**

1. Every tenderer should submit Tender fee of **Rs. 2,500/-**
2. Every tenderer should submit Earnest Money Deposit (EMD) of **Rs. 8,000/-**
3. The tender shall be submitted in the two bids viz. Technical Bid and Financial Bid. Only those qualified in technical bid will be eligible for participating in financial bid. A presentation regarding the technical specification and item to be supplied shall be done before the technical evaluation committee if requested.
4. The bidder should be a manufacturer or their dealer specifically authorized by the manufacturer to quote on their behalf for this tender as per Manufacturer Authorization Form and Indian agents of foreign principals, if any, who must have designed, manufactured, tested and supplied the equipment(s) similar to the type specified in the "Technical Specification". Such equipment must be of the most recent series/models incorporating the latest improvements in design. The models should be in successful operation for at least one year as on date of Bid Opening.
5. **Compliance Statement:** Along with the technical details provide a tabular column indicating whether the equipment quoted by you meets the specifications by indicating 'YES' or 'NO'. If 'YES', support the claim by providing original brochures. **Venders should provide clear brochures/data sheets about the equipment and its working. Also include adequate proof for the claim regarding the performance.**
6. **Reference:** Names of Institutes with contact person and telephone/ email where similar equipment supplied by you in India [Preferably South India] shall be mentioned in the bid.
7. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.
8. The price should be inclusive of all taxes, duties, transportation, insurance, installation etc. Nothing extra will be paid in addition to the quoted rate. Any amount in Indian rupees for installation, commission, labour, spares, service etc shall be entered in item 2 of BoQ.
9. Payment Terms: 90% payment shall be made through irrevocable LC on presentation of complete and clear shipping documents and balance 10% of the amount shall be released after the receipt, installation commissioning and acceptance of the equipment.

10. Validity of tender: Tender submitted shall remain valid at least for 120 days from the date of opening the tender. Validity beyond 120 days, from the date of opening of the tender shall be by mutual consent.
11. Delivery and installation: Proposed delivery schedule should be mentioned clearly. Delivery and installation and training (one week) should be made at the Department of Physics, University of Kerala, Kariavattom campus, Trivandrum without extra cost cost (inclusive of documentation, demurrage, customs duty, clearance and transportation charges). University of Kerala will provide customs duty exemption certificates if required.
12. Service facility: Supplier should mention their details of service setup and manpower in Thiruvananthapuram who are responsible for after sales support.
13. The model number, make, and a printed literature of the product shall submit positively.
14. In case of any dispute, the decision of the University authority shall be final and binding on the bidders.
15. The undersigned reserves the right to reject any or all of the tenders received without assigning any reason thereof.
16. The quoted item should be under **comprehensive warranty for 5 years** or more.
17. If any component is found to be defective during the warranty period, the vendor has to replace the defective item immediately at their own cost.
18. For any queries please contact, Dr. Subodh G. Assistant Professor, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No. 9633983404 E-Mail: gsubodh@gmail.com

### **Documents to be Uploaded**

1. Signed Compliance Matrix
2. Detailed Technical Brochure
3. Under taking of support for next 10 Years
4. BoQ
5. Detailed Financial Bid
6. Hard copy of Bank Guarantee if opted

**The Registrar,  
University of Kerala,  
Senate House campus, Palayam  
Trivandrum- 695 034, Kerala.**