

**Department of Physics, University of Kerala, Kariavattom,
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No.Pl.A1/Phy-3/17

01-12-2017

E-Tender Notice

Department of Physics, University of Kerala, Kariavattom, invites tenders for the purchase of Raman Spectrometer with following specifications.

Last date and time for submission of tender online	:16.12.2017 at 5.30 p.m
Date and time of opening of tender	: 20.12.2017 at 11 a.m
For technical details contact	Dr. Subodh G., Head, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No. 9633983404 E-Mail: gsubodh@gmail.com

For further details logon to www.etenders.kerala.gov.in

TECHNICAL SPECIFICATIONS

Raman Spectrometer

Raman spectrometer must be capable of recording the Raman spectra of all kinds of samples. Micro Raman Spectrometer should include high stability open space research grade confocal microscope, transfer and filtering optics, an achromatic spectrograph equipped with gratings, multichannel detector, multi lasers, XY manual stage and the relevant software and computer platforms with the following specifications. The system should be UV ready and directly coupled system (no fiber coupling).

Spectrum range: 200 nm – 2100 nm or better

- (a) Raman Range: 10 cm^{-1} - 4000cm^{-1} or better for 785 nm laser and 50 cm^{-1} – 4000 cm^{-1} for 532 nm laser.
- (b) Spectral resolution: 0.5 cm^{-1} or lesser
- (c) Spatial resolution: True confocal microscope: laser diameter smaller than 1 micron and axial confocal performance better than 2 microns. The system should be optimized for all objective lens measurements.
- (d) Gratings: Suitable grating should be provided to achieve a spectral resolution of 0.5 cm^{-1} or better. Gratings should be mounted on a motorized turret driven by software, to vary spectral resolution. The gratings should be quickly and easily interchangeable without realignment.
- (e) Interface: USB and/or HDMI
- (f) Power supply : 220-230 VAC, single phase

1. Entrance Optics Assembly

- (a) Computer controlled laser power selection should be provided with at least of 9 levels.
- (b) Laser line filters (Bandpass filters) adjustable kinematic mount for Rayleigh rejection filter. Fine tuning of filter operation angle.

2. Microscope

- (a) Internal white light eliminator with variable elimination intensity.
- (b) Research grade microscope with removable bottom stage.
- (c) Should be equipped with following plan achromatic objectives.
 - 5X visible,
 - 10X visible,
 - 100X visible,
 - 50X LWD** visible objective, suitable for high temperature operation.

- (d) High grade Colour video camera for viewing the sample under white light illumination and to simultaneously visualize the laser spot. Switching between video and Raman mode is automated/manual upto 4 types of lasers.

3. Confocal coupling between microscope and spectrometer

- (α) Continuously-adjustable confocal pinhole from a few microns to 1 mm driven by software. Visible lenses and fully achromatic mirror/lens based coupling optics.

4. Detector

- (a) 1024 x 256 pixels front illuminated chip/back illuminated chip
- (b) Spectral range: 200-1050 nm or better
- (c) Chip size: 1" for maximum wavelength coverage and fast spectral measurement
- (d) Quantum efficiency (QE) greater than 30 % (Visible and IR wavelengths)
- (e) Read out noise typically 7 e-/pixel; Dark current typically 0.005 e-/pixel/sec
- (f) The system should have two additional ports for attaching the additional detectors for future upgradation with IR detectors.

5. Backward alignment control system

- (a) Allows the visual control of the optical alignment of the laser from the sample to the detector

6. Laser

- i) Near Infrared Diode Laser, 300 mW or better at 785 nm or better, air cooled for external mounting on kinematic laser baseplate capable of recording the range $10\text{ cm}^{-1} - 4000\text{ cm}^{-1}$.
- ii) 532nm with 100 mW or better and Raman filters to record Raman 50 cm^{-1} to 4000 cm^{-1} or better.

- (a) Motorised laser beam steering for computer controlled laser alignment.

7. Polarizer and Analyzer for NIR region [700-1100nm] to do polarized Raman studies.

Computer and Software

Operating optimised computer:

- (a) Dual core
- (b) 4 GB RAM
- (c) DVD-RW
- (d) 500 GB SATA HDD
- (e) Windows latest Professional version (64 bit)
- (f) 17" TFT Colour Monitor.
- (g) Image Capture for viewing and saving on screen white light images.
- (h) Windows compatible software for the instrument

8. Variable temperature cell: Micro thermometric cell should work from -196°C to 600°C .

9. **UPS:** Suitable UPS with Isolation Transformer with a minimum of 3 hour back up period.
10. A suitable dehumidifier
11. A detailed compliance statement against above mentioned technical specification should be enclosed in the technical bid. The technical bids without detailed compliance statement will be summarily rejected.


Optional accessory


i) 325 nm Air cooled He-Cd lasers with 20 mW or better, UV objective and UV grating.


Warranty: Comprehensive warranty for equipment without Lasers is not less than **five years**.


For Lasers warranty is for one year.

General Conditions:


 The tender shall be submitted in the two bid 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.

 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 from 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.


 **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.**


 **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.


 Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.


 **Every tenderer should submit Tender fee of Rs. 2,500/-**

 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.


 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.


 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.

 Delivery and installation: Proposed delivery schedule should be mentioned clearly. Delivery (including transport from airport), installation and training should be made at the Department of Physics, University of Kerala, Kariavattom campus, Trivandrum without extra cost. University of Kerala will provide customs duty exemption certificates if required.


 Service facility: Supplier should mention their details of service setup and manpower in Thiruvananthapuram who are responsible for after sales support.

 The model number, make, and a printed literature of the product shall submit positively.

 In case of any dispute, the decision of the University authority shall be final and binding on the bidders.

 The undersigned reserves the right to reject any or all of the tenders received without assigning any reason thereof.

 The quoted item should be under **comprehensive warranty for 5 years** or more.

 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.

Documents to be Uploaded

- 1 Signed Compliance Matrix



Detailed Technical Brochure



Under taking of support for next 10 Years



BoQ