INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH THIRUVANANTHAPURAM [IISERTVM]

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GST NO.32AAAJI0299R1ZS

IISER/PUR/1774/AN/SE/22-23

15 Mar 2023

RE-TENDER CORRIGENDUM

Sub: Supply, Installation and commissioning of Aerosol number size distribution measurement system: reg

Ref: Tender ID No. 2023_IISRT_733063_1

The above mentioned tender is re-tendered, with revised technical specifications as per Annexure 1.

Due date: 06 Apr 2023, 1500 Hrs.
Date of opening: 07 Apr 2023, 1530 hrs

All other Terms and Conditions remains same.

Thanking You,

Yours Faithfully,

15/03/2023

Deputy Registrar (Purchase & Stores)

Annexure I

Aerosol number size distribution measurement system:

Detailed Conditions and Technical Specifications

General Conditions	
1	The broad scope is to supply, install, and operationalize at Indian Institute of Science Education and Research Thiruvananthapuram (IISER TVM), including imparting essential training to the faculty (for operation, data collection and analysis), a Scanning Mobility Particle Spectrometer; (hereafter referred to as SMPS) for the standalone and continuous measurements of ultrafine and fine particle number size distribution having the following generic specifications. SMPS should include all essentials subsystems for standalone operation at the site such as (a) electrostatic classifier/Differential Mobility Analyzer (DMA), (b) Condensation Particle Counter (CPC) or equivalent instrument for particle detection up to the desired size and concentration levels, and (c) all accessories such as internal and external pumps, sampling inlet, Nafion dryer, data acquisition, processing and display software and a data logger for storing the data for later scientific analysis. Itemized quote(s) with detailed technical compliance statement and other documents, as required, must be provided. Quantity required: ONE SMPS
2	The specifications mentioned below are generic in nature and any deviation, compliance OR new proposal for equivalent configuration should be mentioned clearly in the technical compliance statement.
3	The material should be delivered and installed at IISER TVM at the specified location.
4	The vendor should have demonstrated installation and maintenance of SMPS systems for studying ultrafine and fine particle number size distribution in India for reputed institutes and maintained them for at least two years. Documentary evidence in the form of purchase orders, completion certificates and maintenance reports must be submitted along with the bid.
5	The vendor should provide on-site installation and demonstration and provide support in case of a relocation of the SMPS system. User manuals for all sensors should be given. Training should be provided to the IISER TVM officials on the operation and maintenance of the SMPS system as well as imparting essential training on operation, data collection and analysis.
6	After the installation, Vendor should make a visit to IISER TVM and undertake the free maintenance every six months during the warranty period, i.e., 3 years. During that, the vendor should undertake preventive and breakdown maintenance immediately by replacement of defective parts with new ones to ensure no data loss during the maintenance/calibration.
7	SMPS system operating temperature range: 0 °C to +40 °C; operating Relative Humidity range: 0 to 90% (non-condensing); operating pressure range: 1013 to 800 millibar or lower.

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8	Flow rates must be user selectable: in the range of 1 – 3 litres per minute for aerosol sample air and 3 – 10 litres per minute for sheath air.
9	Size accuracy: 5% or better for single particle counting
10	Measurement time/scan time (user selectable): 30 to 600 seconds depending on the size range
11	Number of size bins/channels: higher than 50 per decade of the particle size, preferably user selectable
12	The SMPS system should be user programmable for user selectable monodisperse operation for user determined time and automatically switching size ranges at the programmed time interval
13	Data acquisition system/data logger (computer/laptop) including software for control, operation and first cut analysis and display of size spectra of each scan should be included
14	Sample temperature and relative humidity should be measured using appropriate sensors included in the instruments and the information should be logged with every measurement. Datasheet for the sensors should be included in the technical bid.
15	Conditioning of the inlet air must be done to check for the high moisture content in the aspirated air. A nafion dryer must be used at the sampling stage to perform moisture conditioning on the sample air getting into the SMPS system.
16	It should be mentioned clearly in the commercial bid whether the costs mentioned are inclusive of taxes or not.
17	The bid should contain the authorization from manufacturer, details of Service Centre, Technical details with make, model and specification of each component, technical compliance statement, list of customers, brochures etc., wherever applicable.
18	The purchaser reserves right to accept any tender in part or full without assigning any reasons. The enquiry is not a commitment, and the purchaser reserves the right to reject or cancel any or all offers.
19	Payment will be done only after getting the approval from the concerned personnel at IISER TVM on the installation, data collection, and smooth operation of the SMPS system
20 *	Measurement size (diameter) range: Basic system should be from 10 nm (or smaller) to 1000 nm (or higher), but the basic instrument should be amenable for extending the lower limit to finer size particles of size down to 3 nm (essential) and 1 nm (preferred) in the future.
*** Optional**	
21	If the supplier has options to measure particle sizes below 10 nm, it should be detailed in the technical bid and provided as a separate itemized quote in the financial bid. The difference between the basic system requirements and the optional additions must be clearly distinguishable in the technical as well as financial bids. It should be mentioned clearly what additions/changes are needed in future in each component (including, but not limited to, CPC and DMA, and must be quoted separately) to study the lower particle sizes.

Size classification: Specifications	
22	Type: Electrostatic, mobility based using Differential Mobility Analyzer (DMA).
23	If multiple DMAs are required for ultrafine and fine particle size ranges, options should be provided with the implications to the cost.
24	The different DMAs should be compatible with the classifier unit and the counting unit and the switching between the different DMAs should not lead to significant data loss.
25	Aerosol neutralizer source: Radioactive/X-ray source, along with atomic energy regulatory board (AERB) clearances, if any, as required. The vendor must be fully responsible in obtaining the AERB clearance, if required. If the neutralizer does not require AERB clearance, a documentary evidence to that effect should be provided from the supporting data from AERB
26	DMA Voltage range: 5 – 10,000 Volts or better to provide the required channel resolution
27	Polarity: Positive or Negative.

Condensation Particle Counter (CPC): Specifications	
28	Condensing liquid: Butanol/isopropanol or equivalent liquid for particle counting, with suitable outlet of the exhaust. The Vendor must facilitate components required to ensure that the condensing liquid exhaust fumes do not reside inside the laboratory environment.
29	CPC should be compatible with the above classifier/DMA to operate in the scanning mobility particle spectrometer (SMPS) mode, as well as operatable as a standalone unit, if needed. The CPC should also be compatible for any later augmentation of the system for lower size measurements
30	Response time: less than 5 seconds
31	Minimum detectable particle size: 10 nm or smaller, with the appropriate DMA. The CPC should be compatible for measuring lower size particles (going down up to 3 nm mandatory and 1 nm preferred) in the future, if supported with appropriate classifier. It should be mentioned clearly what additions/changes are needed in future in each component (and they should be quoted separately) to study the lower particle sizes.
32	Measurement range: 10^2 – 10^5 particles/cm^3 or better, in single particle counting mode; higher concentrations being preferred.
33	Data logging capability with universal serial bus (USB)/removable memory card/Ethernet should be there.
34	Suitable vacuum source (pump – external/internal) should be included.

Operating conditions for the SMPS system	
35	Operating temperatures: 0 °C – 40 °C
36	Operating relative humidity: 0 – 90 %; non-condensing

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37	Operating pressure range: <800 – 1013 hPa
38	Power source: 220 – 240 Voltage AC at 50 Hz must necessarily be supported

Others	
39	Operation manuals/user guides of individual parts and components should be provided
40	All essential accessories (including pre-impactor, if any), tubing, consumable filters for standalone operations should be included.
41	All the components in the SMPS system must be factory calibrated. The calibration certificates should be provided.
42	Warranty: three-year onsite warranty. Authorized personnel from the Vendor must make a visit twice in a year and do the required calibration and maintenance to ensure smooth operation of the SMPS system and continuous data collection.
43	Essential consumable spares for three years operation should be included in the quote, with cost shown separately. The consumable spares provided by the Vendor must be listed out clearly.
44	Annual Maintenance Contract (AMC) rates for five years beyond the warranty period should be indicated separately, including details of essential consumable and replacement spares and their costs.
45	Sampling air inlet size cut off (for e.g., Particulate Matter 2.5) filters and associated components should be provided and essential details of it should be clearly mentioned.
46	All necessary software essential for viewing, processing, and collecting data should be provided along with the system. A laptop/workstation with operating system (preferably MS Windows) and other software compatible for the data collection and real time visualization of the SMPS data should be provided. The Vendor should demonstrate this to the IISER TVM officials during the time of installation.
47	Data storage: In-built data storage facility for minimum two weeks should be there.

48	Output data format: ASCII/similar formats or option to convert the data to common data formats, as approved by the concerned personnel from IISER TVM.
49	All software and hardware items for the operation (real-time/offline), visualization/status monitoring, analysis, calibration, testing and maintenance of the system should be provided.
50	All necessary accessories/tools such as tubes, cables, suitable calibration fixtures, cleaning items, connectors, etc. required for the continuous operation and maintenance of the SMPS system should be provided.
51	Minimum three-year comprehensive onsite warranty for the entire setup (including individual components) should be provided. The vendor should specify the warranty details and AMC conditions. Comprehensive Annual Maintenance Charges subsequent to the warranty period should be provided for additional five years (i.e., after the warranty); but only in the price bid. During the warranty period, a mandatory visit to the site should be made by the vendor or

	vendor's authorized engineer to check the calibration/re-calibrate the instrument, and also to do preventive maintenance. In case of an emergency situation when the instrument is not operating, the vendor should provide the required support within a week, to prevent data loss.
52	Details of authorized service centres must be provided. In the case of dealers, an authorized dealership certificate should be enclosed.
53	The complete service manual including the circuit diagrams and instruction manuals (original copies) of the system should be supplied along with the delivery/shipment by the supplier in the event of a purchase order. This should be clearly mentioned in the offer.
54	The essential and optional accessories and spares, their prices required for five years of satisfactory operation of the system should be offered. Prices for the accessories and spares should be itemized only in the financial bid. Each part/component of the system and the spare/accessories required, their quantity recommended, and the individual price for all these should be clearly listed out.

15/03/2023