

**Tender Document for supply of  
Q- PCR/ Air Quality Monitoring System**

**To  
Department of Environmental Biotechnology  
School of Environmental Sciences  
Bharathidasan University**

**TENDER DOCUMENT**



**BHARATHIDASAN UNIVERSITY  
TIRUCHIRAPPALLI - 620 024**



**BHARATHIDASAN UNIVERSITY  
TIRUCHIRAPPALLI - 620 024.**

**TENDER NOTIFICATION**

**R. C. No. 16999/E12/2015/dated. 23.11.2018**

**Sealed tenders are invited for the supply of Q-PCR/ Air quality monitoring system. Detailed tender documents with specifications, terms and conditions etc., can be had from websites [www.bdu.ac.in](http://www.bdu.ac.in) & <http://www.tenders.tn.gov.in>. The Last date for receipt of the tenders in this office is **11.12.2018, 3.00 P.M.****

**REGISTRAR**

### Tender Summary

Tender No	No. /dated.
Amount of EMD (Rs)	1% of the total cost of the estimate amount (G.O.Ms.No. 270 Finance (Salaries) Department dt: 19.09.2017 regarding “The Tamil Nadu Transparency in Tenders Rules, 2000 – Amendments” in the form of Demand draft (only) at the time of submission. Otherwise their tender application will be rejected. No exemption can be made under any circumstances.
Cost of the Tender Document (Downloadable one)	Rs. 5000/- (D.D. in favour of Bharathidasan University, Tiruchirappalli - 620 024, Tamilnadu.)
Bid Submission	11.12.2018, 3.00 PM
Bid Outer Cover Opening	11.12.2018, 4.00 PM
Bid opening (Technical)	Will be decided on the day of opening.
Bid opening (Commercial)	Will be decided on the day of opening.

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## **1. Introduction**

The University established in February 1982, is named after the great revolutionary Tamil Poet, Bharathidasan (1891-1968). The motto of the University “**We will create a brave new world**” has been framed from Bharathidasan’s poem “புதியதோர் உலகம் செய்வோம்” The University endeavors to be true to such a vision by creating in the region a brave new world of academic innovation for social change.

The University is unique in its being “composite” in character. It has disciplines of Arts, Science, Engineering & Technology, Indian & other languages and Management. In all, it has 16 Schools and 30 Departments, 10 Centers and Bharathidasan Institute of Management.

The affiliating jurisdiction is over 138 Arts & Science/Fine Arts Colleges and 18 Approved Institutions. Among the affiliated colleges, more than 50% are offering PG programmes and 25% are offering M.Phil. /Ph.D. programmes. A good number of them are nationally recognized for quality education. The programmes offered through affiliated colleges are so diversified.

## **2. Invitation for Bids**

1. This invitation to the tenderer is for the supply of **Real Time PCR and Air Quality Monitoring System** to the **Department of Environmental Biotechnology, School of Environmental Sciences, Bharathidasan University, Tiruchirappalli – 620024**
2. Tenderers are advised to study the tender document carefully. Submission of tender shall be deemed to have been carried out after careful study and examination of the tender document with full understanding of its implications.
3. Sealed offers prepared in accordance with the procedures enumerated in instruction to Tenderers (3) clause 1 should be submitted to the office of **The Registrar, Bharathidasan University, Tiruchirappalli – 620 024, Tamil Nadu** not later than the time laid down, at the address given in the schedule for invitation to tender under Clause 6.
4. **All bids must be accompanied by an Earnest Money Deposit of 1% of quoted value of the instruments, and a D.D. of Rs.5000/- towards document cost (Download one) in favour of Bharathidasan University, Tiruchirappalli-620024, Tamil Nadu (Separate DD for Document Cost and EMD & Separate Bid for each Instrument).**

5. This tender document is not transferable.

6. Schedule for invitation to tender

<b>Last date for submission of Bid documents</b>	<b>11.12.2018, 3.00 pm</b>
<b>Date till which the Bid is valid</b>	<b>180 days from the date of submission.</b>
<b>Venue of Submission of Bid documents</b>	<b>O/o The Registrar, Bharathidasan University, Tiruchirappalli, 620 024, Tamil Nadu.</b>

7. Tender through email / Fax will not be considered. **Tender form without the commercial bid will not be considered.**

Note: The University shall not be responsible for any postal delay about non receipt/non delivery of documents.

### **3. Instruction to Tenderers**

#### **A. Introduction**

##### **1. Bid Submission Procedure**

Two cover System is to be followed for this tender:

a) Technical Bid in a separate cover

b) Commercial Bid in a separate cover

1.1. Technical and Commercial Bid by the tenderers should be placed in two separate envelopes super-scribed with separate bid titles as follows;

a) Technical Bid (2 copies)

b) Commercial Bid (2 copies)

Tenders without the commercial bid will be rejected.

**Tender should be submitted separately for each instrument.**

1.2. The tenderers have to qualify for the commercial bid.

1.3. Please note that the price should be mentioned only in the Commercial Bid.

1.4. Item wise pricing should be given in the commercial bid as per the format specified.

1.5. All the documents, viz., Technical Bid and Commercial bid prepared as above are to be kept

in two sealed covers super-scribed with Tender Number, Due Date, Name of Instrument, and “Do not open before **11.12.2018, 4.00 PM.**” should be specified.

1.6. The cover thus prepared should also indicate clearly the name and address of the Tenderer.

P.S.: In case, fine tuning of technical specifications are required, the University reserves the right to ask for revised commercial bid. In the absence of revised Commercial Bid, the original shall be held valid.

## **2. Cost of Tender**

2.1 The Tenderer shall bear all costs associated with the preparation and submission of Bid, including cost of presentation for the purposes of clarification of the bid.

2.2 If so desired by the University and University will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering Process.

3. The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document. Failure to furnish all information required in the Tender Document or submission of a bid not substantially responsive to the Tender Document in every respect will be at the Tenderer’s risk and may result in the rejection of the bid.

## **4. Clarification of Tender Document**

A prospective Tenderer requiring any clarification of the Tender Document may notify the University in writing at the University’s mailing address. The University will respond in writing to any request for clarification of the Tender Document, received. Email or written copies of the University response (including and explanation of the query but without identifying the source of inquiry) will be given to all prospective Tenderers who have received the Tender Documents.

## 5. Amendment of Tender Document.

- 5.1. At any time the University may for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderers, modify the Tender Document by an amendment.
- 5.2. The amendment will be notified in the University's website "www.bdu.ac.in" and in Tamil Nadu Government's website: "http://tenders.tn.gov.in/"
- 5.3. In order to afford prospective Tenderers reasonable time in which to take the amendment into account in preparing their bids, the University may, at its discretion, extend the last date for the receipt of Bids.

## B. Preparation of Bids

### 6. Language of Bids

The Bids prepared by the Tenderer and all correspondence and documents relating to the bids exchanged by the Tenderer and the University, shall be written in English.

### 7. Documents Comprising the Bids

The Bids prepared by the Tenderers shall comprise of following components:

#### a) Annexure A:

S.No.	Eligibility Criteria	Requisite Document
	The Tenderer must have reputed dealing in Scientific instruments for the last five years	Qualifying data duly filled in as per relevant Proforma provided in the bid proposal that the Tenderer is eligible to bid and is qualified to perform the contract, if its bid is accepted (Proforma).
	The Tenderer company must have a valid latest Income Tax Certificate	Copy of Latest Valid Income Tax Clearance Certificate / PAN Certificate.
	EMD of 1% of quoted value	<u>DD in favour of Registrar,</u> <u>BHARATHIDASAN UNIVERSITY</u> <u>Trichirappalli-620 024, T.N.</u>
	Cost of the Tender document (For Each Instrument)	<u>Rs.5000/- DD in favour of</u> <u>BHARATHIDASAN UNIVERSITY,</u> <u>Trichirappalli-620 024, T.N</u>



	The Tenderer must submit proposal sheet as per terms of the Tender document certifying that they accept all terms and conditions of the Tender Document	Bid Proposal sheet duly filled in, signed and complete in all aspects (Proforma -I).
	Is the Tenderer a Public / Private Limited Company having its Corporate/Head Office in Tamil Nadu and a local direct office in Tiruchirappalli	Address, Contact Person, Phone/Fax/Email of all Directors along with PAN / IEC / VAT/TAN/TIN Service, Tax Details. Registration No., along with Date of Registration is to be provided.
	Are they authorized for the equipment quoted by the manufacturer?	Letter of authorization from the manufacturer.

**(b) Technical Bid shall consist of following:**

1	Technical Details
2	Name & Designation of the person responding to the tender
3	Name, designation of person for contact

**(c) Commercial Bid consisting of the following:**

1	Commercial Deviations
2	Commercial Bid

- i. Bid prices duly filled, signed and complete as per the Price Schedule on the prescribed Quotation Proforma (Proforma-IV). The Tenderer shall indicate the firm prices, the Terms of Reference of which are given in the Technical Specifications. Two Soft copies of deviations in the specified format given in Proforma-IV.
- ii. Commercial Deviations from the terms and conditions and specifications as specified in the Bidding Documents (Proforma-V). Two Soft copies of deviations in the specified format given in Proforma-V. The University reserves the right to carry out the capability assessment of the Tenderers and is not bound to place order on the lowest bidder. The University's decision shall be final in this regard.

## **4. Terms and Conditions of the Tender**

### **4.1. DELAY IN THE VENDOR'S PERFORMANCE & PENALTY:**

- 4.1a) Delivery of the Goods and performance of Services shall be made by the Vendor in accordance with the time schedule specified by the purchaser in this schedule of requirement.
- 4.1b) An unexcused delay by the vendor in the performance of its delivery obligations shall render him liable to any or all of the following penalties: Imposition of liquidated damage and termination of this order for default.

### **4.2. PROFESSIONAL PRACTICE**

The Tenderer shall adhere to professional scientific/engineering and consulting standards recognized by international professional bodies and shall observe sound management, technical and scientific/engineering practices. It shall employ appropriate advanced technology and safe and effective equipment, machinery, material and methods. The Tenderer shall always act in respect of any matter relating to this contract, as faithful advisors to the University and shall, at all times, support and safeguard the University's legitimate interests in any dealings with the third party.

### **4.3. USE OF CONTRACT DOCUMENTS AND INFORMATION**

- 4.3a. The Tenderer shall not, without the University's prior written consent, disclose the contract or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of University in connection there with to any person other than a person employed by the Tenderer in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as may be necessary for purposes of such performance.
- 4.3b. The Tenderer shall not without the purchaser's prior written consent, make use of any document or information.
- 4.3c. Any document other than the contract itself shall remain the property of the University and shall be returned (in all copies) to the University on completion of the tenderer's performance under the contract if so required by the University.

#### **4.4. EARNEST MONEY & SECURITY DEPOSIT:**

Vendor shall deposit Earnest money along with tender document in the form of Demand Draft / Banker's Cheque in favor of the **Registrar, Bharathidasan University, Tiruchirappalli**. Tenders without earnest money will be rejected.

#### **4.5. SCHEDULE OF PAYMENT:**

4.5.1. Payment will be made only after the installation of the items and after issue of certificate by the Committee.

4.5.2. VAT / Sales Tax, Services Tax and Octroi shall be paid on actuals, as applicable.

4.5.3. Tenderer should specify the TAN / PAN/ TIN.

#### **4.6. WARRANTY PERIOD AND MAINTENANCE SERVICES:**

The Vendor will be responsible for the comprehensive maintenance (free of charge) during the warranty period of scientific instruments mentioned in the technical specifications in detail after the installing at BHARATHIDASAN UNIVERSITY.

#### **4.7. PRICES**

The prices quoted for the Items/Services shall be firm throughout the period of contract & this contract will be valid up to the date of final payment to the supplier and shall not be subject to any upward modification whatsoever. The rates should be quoted FOR sites. The commercial bids must be on the prescribed format as given in this document. The University is exempted from paying Customs Duty.

#### **4.8. TAXES AND DUTIES**

The Tenderer shall be entirely responsible for all taxes, duties, license fees, octroi, etc. incurred until delivery of the ordered Goods to the purchaser. However, VAT / Sales Tax, Surcharge, Professional / Service Tax, Octroi in response of the transaction between the purchaser and the Tenderer shall be payable extra by the purchaser if so stipulated in the notification award.

#### **4.9. INSURANCE**

The Tenderer shall be responsible for all the Goods supplied under the contract and these shall be fully insured against loss or damage incidental to manufacture or acquisition transportation, storage, delivery, and installation, commissioning and running.

#### **4.10. TENDERER'S PERSONNEL**

The Tenderer shall employ and provide such qualified and experienced personnel as are required to perform the services under the contract.

#### **4.11. CONFIDENTIALITY**

The Tenderer and their personnel shall not, either during the term disclose any proprietary or confidential information relating to the services, contract or the university's business or operations without the prior written consent of the University.

#### **4.12. FORCE MAJEURE**

Notwithstanding the provisions of the tender, the Tenderer shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that its delay in performance or other failure to perform its obligations under the contract is the result of an event of Force Majeure.

4.12a. For purposes of this Clause, "Force Majeure" means an event beyond the control of the Tenderer and not involving the Tenderer and not involving the Tenderer's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the University, either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

4.12b. If a Force Majeure situation arises, the Tenderer shall promptly notify the University in writing of such conditions and the cause thereof. Unless otherwise directed by the University in writing, the Tenderer shall continue to perform its obligations under this order as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event, the University may terminate its order by giving a written notice of minimum 30 days to the Tenderer, if as a result of Force Majeure, the Tenderer being unable to perform a material portion of the services for a period of more than 60 days.

**4.13.** The University reserves the right to accept or reject any Tender in whole or in part without assigning any reason therefore.

**4.14.** The University is under no obligation to accept the lowest Tender.

#### **4.15. OTHER CONDITIONS**

4.15a. All disputes, differences, claims and demands arising under or pursuant to or touching the contract shall be referred to the sole arbitrator of the **Registrar, BHARATHIDASAN UNIVERSITY**. The award of the sole arbitrator shall be final and binding on both the parties under the provisions of the arbitration Act, 1940 or by statutory modification reenactment thereof for the time being in force. Such arbitration shall be held at Tiruchirappalli.

4.15b. In all matters and disputes arising there under, the appropriate Courts at Tiruchirappalli shall have jurisdiction to entertain and try them.

#### **5. Technical Specifications for Q- PCR and Air quality monitoring system**

The technical specifications specified in this section are minimum suggestive. Bids not meeting these minimum specifications are liable to be rejected. In case the equipment quoted exceeds/differ the tender specifications, the same should be clearly defined by the bidder.

##### **1. Q-PCR**

The bidders are required to fulfill the following eligibility conditions and furnish documentary evidence.

- The bidder / Principal must have supplied similar kind of materials /item /equipment in the past in India.
- The bidder must furnish the name of the persons and contact details of the customers to whom the similar kind of materials /item /equipment has been previously sold.
- The bidder must produce a certificate from the Principal that they are the authorized dealer / agent tender for this materials /item /equipment.
- Successful bidders must supply, install and demonstrate about the equipment without any additional cost.
- The bidder should have the facility to service the equipment after the warranty period.
- The instruments and accessories should be Delivered at place (DAP)

- Minimum of three year warranty against any Defective workmanship from the date of Supply

## **Generic specifications for the purchase of Q-PCR**

1. Open system capable of running various chemistries, reagents and plastic ware so that different chemistries using TaqMan, SYBR green etc. all can be performed.
2. Maximum Ramping speed not less than 5 °C per sec
3. Temperature range 0– 100 °C with accuracy of  $\pm 0.2$  °C and uniformity of  $\pm 0.4$  °C within 10 sec of arrival at 90 °C
4. Minimal optical detection should be 5 filtered excitation and detection/Multiplexing 5 or more than 5 genes
5. Should have mode for Melt curve analysis.
6. System must be capable of working with minimum sample volume.
7. System should be provided with appropriate analysis workstation, along with comprehensive software package, easy-to-use, unlimited user licenses.
8. Provide Cooling centrifuge with following specifications

### **Accessories**

1. Centrifuge with rotational speed  $\geq 14,000$  rpm,  $\geq 18$  positions for 1.5/2.0 ml tubes, temperature range of 0-+40 °C with precooling function
2. Vertical gel electrophoresis system with two mini gels of 8cm x7cm, casting stand and frames, glass plates and Stain free 12% acrylamide starter kit.
3. Western Blotting System with at least two mini gels of size at least 10x7.5cm, Buffer requirement should not exceed 450 ml –500ml per run.
4. Horizontal agarose Gel electrophoresis system with 15x15 cm gel support, Gel caster, combs, tank capacity of one litre, UV trays.

### **Power Supply:**

1. Output range: 5-250V, fully adjustable in 1 V steps 0.1-3.0 Amps, fully adjustable in 1mA steps and 300W maximum
2. Safety regulatory should be equal to EN-61010, CE
3. Type of output: constant voltage, constant current with automatic cross over

4. Output terminals: 4 pair recessed banana jacks floating in parallel
5. Timer: 1-999 min, fully adjustable
6. Should have option of Pause/resume run function

## **2. AIR QUALITY MONITORING SYSTEM**

The bidders are required to fulfill the following eligibility conditions and furnish documentary evidence.

- The bidder / Principal must have supplied similar kind of materials /item /equipment in the past in India.
- The bidder must furnish the name of the persons and contact details of the customers to whom the similar kind of materials /item /equipment has been previously sold.
- The bidder must produce a certificate from the Principal that they are the authorized dealer / agent tender for this materials /item /equipment.
- Successful bidders must supply, install and demonstrate about the equipment without any additional cost.
- The bidder should have the facility to service the equipment after the warranty period.
- The instruments and accessories should be Delivered at place (DAP)
- Minimum of three year warranty against any Defective workmanship from the date of Supply

### **Generic specifications for the purchase of Air quality monitoring system**

Compact Continuous Ambient Air Quality Monitoring (CAAQM) station (System) for automated Real time Acquisition of Gaseous and Particulate Pollutants data in outdoor ambient air for fixed or mobile air monitoring network. CAAQM station must be a Single Fully Integrated system and must have modular design for easy installation and maintenance. System software must provide capability to view the “Data and System Information” remotely using any devices like PC, Laptop, Tablet or smart phone.

### **Physical attribute and Installation Capabilities of system**

**CAAQM system must have following physical attributes & installation capabilities**

- **Size** – System must be compact including samplers and must have carry handles for easy movements.
- **Operating environment** – System must have operating environment temperature range of -35°C to +50°C so that it can be installed in any part of Indian terrain.
- **Enclosure** – System must have IP65 grade enclosure to protect it from heavy rains, high temperature, sand, or snow.
- **Installation** – System must be capable of getting installed on a Pole, or on roof or on a wall or in a vehicle to create mobile monitoring. Appropriate installation components must be supplied with the system.
- **Power** – System must run on 230V / 50Hz single phase power and must also have capability to get operated using Solar Power.
- **Security** – System must have locked door for best security.

## **CAAQM System Capabilities**

### **Stable Internal Temperature**

- CAAQM system must have built-in capability to maintain its Internal Temperature at specified user defined temperature or any similar equivalent capability which will allow users to install it in any external environmental terrain.
- CAAQM system must have capability to Set and Control the internal temperature of the system within +/- 0.3°C or better of set internal temperature to maintain all the Gas & Particulate sensors at constant temperature so that their measurement results don't get affected because of variation of external environmental temperature between -35°C to +50°C.
- CAAQM system must have physical devices like chiller & heaters or any other equivalent devices to maintain the internal temperature of system within specified temperature limits.

### **Power consumption**

- Average Power consumption of CAAQM system must be 100w and must not exceed 180w with full configuration
- System must have capability to get operated using Solar Power/battery/electric power

### **Calibration of System**

- CAAQM station must be factory calibrated against NIST traceable “Standard Reference Materials” (SRM's) at the time of shipping and must have individual sensor calibration certificates issued by the manufacturers.
- CAAQM station must have Field Calibration capability using Standard Zero and standard Reference Gases for regular periodic calibration.
- Gas calibration must be carried out using calibration device which must have NIST traceable Mass Flow Controller & Mass Flow Meter.  
Gas sensor calibration by changing electronic parameters will not be accepted.

### **Sampling Capabilities of System for Gases & Particulate Measurements**

- CAAQM system must have Active Sampling capability for most accurate air measurements.



- CAAQM system must have built-in brushless DC pump of 2 LPM or equivalent device inside the system for Continuous Active Air Sampling.
- CAAQM system must have sampling inlets made up from inert materials like Teflon &/or Glass-coated Stainless-steel and must be followed by tool-less replaceable PTFE filter to filter the air before entering the sensors.
- CAAQM system must preferably have “Heated Sampling Inlet” to remove humidity from entering the system.
- Both Gas & Particulate sampling inlets must have pre-filters to filter out larger particulate matter & other objects to allow only gases and desired particulate matter to enter the system.
- CAAQM system must have separate built-in pump with 1 LPM capacity for Sampling of air to measure Particulate Matter in ambient air.
- The Particulate Matter inlet assembly preferably should be maintained at elevated temperature to avoid any adverse effects of high humidity.

### **Gas and Particulate Matter Sensors Specifications**

#### **NITROGEN OXIDE (NOx) SENSOR**

Principle	:	Gas Sensitive Semiconductor NOx Sensor
Measurement	:	for measurement of NOx and NO2 in Ambient Air
Internal Convertor	:	Built-in convertor to convert 95% or more of NO to NO2
Scrubber	:	Sensor must have built in scrubber preferably thermal scrubber to remove effect of ambient Ozone
Zero Cycle Compensation	:	To compensate Sensor Drift & eliminate interference of VOC's
Measurement Ranges	:	0 - 500 ppb
Lower Detectable Limit	:	+/- 1 ppb or better
Precision	:	<u>&lt; 3 ppm or better</u>
Zero Noise	:	< 1 ppb or better
Zero Drift (24 Hrs)	:	≤ 1 ppb or better
Span Drift	:	better than or equal to 0.3 % of full scale
Linearity	:	+/- 1% or better of full scale
Power Consumption	:	12V DC through system input of 240VA 50Hz Single Phase
Air Flow Rate through Sensor:	:	Min. 0.050 LPM to Max 0.075 LPM (Liters per minute)
Sensor Design	:	Sensor must have modular design for quick installation
Calibration	:	Zero and Span calibration using Zero Air & Reference Gases No SW correction should be carried out as calibration procedure

#### **SULPHUR DIOXIDE (SO2) SENSOR**

Principle	:	Gas Sensitive Electrochemical SO2 Sensor
Measurement	:	SO2 in Ambient Air
Measurement Ranges	:	0 – 10 ppm
Lower Detectable Limit	:	1 ppb (0.001 ppm) or better
Precision	:	<u>&lt; 9 ppb (0.009 ppm) or better</u>
Zero Noise	:	≤ 5 ppb (0.005 ppm) or better
Zero Drift (24 Hrs)	:	≤ 1 ppb (0.001 ppm) or better
Span Drift	:	better than or equal to 0.2 % of full scale
Linearity	:	+/- 1% or better of full scale

Power Consumption : 12V DC through system input of 240VA 50Hz Single Phase  
 Air Flow Rate through Sensor: Min. 0.050 LPM to Max 0.075 LPM (Liters per minute)  
 Sensor Design : Sensor must have modular design for quick installation  
 Calibration : Zero and Span calibration using Zero Air & Reference Gases  
 No SW correction should be carried out as calibration procedure

**CARBON MONOXIDE (CO) SENSOR**

Principle : Gas Sensitive Electrochemical CO Sensor  
 Measurement : CO in Ambient Air  
 Measurement Ranges : 0 – 25 ppm  
 Lower Detectable Limit : ≤ 40 ppb (0.040 ppm) or better  
 Precision : < 50 ppb (0.050 ppm) or better  
 Zero Noise : ≤ 20 ppb (0.020 ppm) or better  
 Zero Drift (24 Hrs) : ≤ 20 ppb (0.020 ppm) or better  
 Span Drift : better than or equal to 0.2 % of full scale  
 Linearity : ≤ 1% or better of full scale  
 Power Consumption : 12V DC through system input of 240VA 50Hz Single Phase  
 Air Flow Rate through Sensor: Min. 0.090 LPM to Max 0.160 LPM (Liters per minute)  
 Sensor Design : Sensor must have modular design for quick installation  
 Calibration : Zero and Span calibration using Zero Air & Reference Gases  
 No SW correction should be carried out as calibration procedure

**PARTICULATE MATTER SENSOR FOR MEASUREMENT OF PM10 + PM2.5 + PM1 + TSP SIMULTANEOUSLY**

Principle : Optical Particle Counter that converts Particle counts to a Mass Fraction for Simultaneous measurement of PM10 & PM2.5 & PM1 & TSP fractions.  
 Particle Size Measurements : PM10 + PM2.5 + PM1 + TSP  
 Measuring Range : PM10 – 0 - 5000 microgram/m3 or better  
 PM2.5 – 0 – 2000 microgram/m3 or better  
 PM1 – 0 – 200 microgram/m3 or better  
 TSP – 0 – 5000 microgram/m3 or better  
 Resolution : ± 1 microgram/m3 or better  
 Minimum Detectable Limit : < 1 microgram/m3 or better  
 Air Flow through Sensor : 1 LPM (Liter Per Minute)  
 Sampling Head : Which can measure PM10 + PM2.5 + PM1 + TSP simultaneously  
 Power Consumption : 12V DC through system input of 240VA 50Hz Single Phase  
 Pump Capacity : ≥ 1 LPM  
 Sensor Design : Sensor must have modular design to install it in AQM65 system within minutes.

**System Modularity**

- CAAQM system must have modular design and must enables users to add or service any additional gas analyzer modules on-site any time after system is installed.

- CAAQM station must be completely Integrated Single system and must have Sampling Devices, Gas Sensors, Particulate Matter sensors, Weather sensors, Computing devices like PC and Data transmitting devices within the system.

**Software, Data Acquisition and Communication**

- CAAQM system must have Cloud based software to provide anywhere access to Data and System control to users.
- Cloud Based software must provide multi user access.
- Software must have accessibility using any devices like PC, Laptop, Tablet or Smartphone through web browsers like Chrome, Explorer etc.
- CAAQM station must have Integrated fan-less industrial PC or equivalent device, running on internal webserver for the instrument control and continuous data acquisition and storage so that data is never lost.
- CAAQM system must have various Remote communication capability which must include WIFI, Ethernet LAN, and cellular IP GPRS modem (excluding SIM).
- CAAQM system software must provide Remote System Configuration, System Diagnostics, System Journal entries, System Calibration and Data Acquisition
- CAAQM system software must have capabilities to send SMS and email alerts to users and must provide Automated Data Export via FTP / email.
- System software must provide Gas concentration data both in ppm or mg/m<sup>3</sup> units.

**Software Licenses**

System must be supplied with free system software which must get all available updates free of cost till 2 years after installation. System also must have ONE year of Cloud Subscription.

**System Accessories**

System must be quoted with Accessory or a Service Kit which must have Teflon & Tygon Tubing, Leak Gauge, Zero Filter and Flow assembly, Calibration Accessories, Lure fitting, Spare Cables, Tube cutter and additional Sample Gas Flow filters etc. The Spare fittings, tubing and Filters must last for atleast 2 years.

**6. Bid Proposal Proforma**

**Proforma -I BID PROPOSAL SHEET**

Tenderer’s Proposal Reference No. & Date :

Tenderer’s Name & Address :

Person to be contacted :

Designation :

Telephone No.

Email Id.:

Fax No: