

TENDER (E - PROCUREMENT MODE)

FOR

SUPPLY & INSTALLATION OF AMBIENT AIR QUALITY MONITORING  
ANALYZERS, FTIR, STEREO ZOOM MICROSCOPE &  
VISIBLE SPECTROPHOTOMETERS



Tender No.:47011/01-04/ICB/2016-17/Mat. dated 24 Jan 2017

**Central Pollution Control Board**  
**(Ministry of Environment Forests & Climate Change)**  
**“Parivesh Bhawan” East Arjun Nagar.**  
**Delhi – 110032. India**  
**Tel. Nos. 22308202, 43102030 – Extn.242, 243**

## INDEX

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<b>S.No.</b>	<b>Contents</b>	<b>Page No.</b>
01.	Terms & Conditions	3-16
02.	Checklist for bidders	17
03.	Bid Form	18
04.	Undertaking	19
05.	Schedule of Earnest Money	20
06.	Location of delivery and installation	21
07.	Buy Back Details	22
08.	Pre Contract Integrity Pact	23-30
09.	Specification of instruments/equipments	31-54
10.	References	55

1. Central Pollution Control Board, Delhi invites online Bids for supply, installation, commissioning, testing, demonstration and training of Continuous Ambient Air Quality Monitoring Analyzers {consists of (SO<sub>2</sub>, O<sub>3</sub>, CO, NO-NO<sub>2</sub>-NO<sub>x</sub>, NH<sub>3</sub>, BTEX & PM<sub>2.5</sub> Analyzers), Multi Calibration System, Computer Systems along with printer and DAS, Display Board Data Transmission Devices, Day Light & Night Visible Data Display Systems}, FTIR, Stereo Zoom Microscope and Visible Spectrophotometers as per specifications given in the Annexure attached to the Tender form. CPCB also intends to phase out few Continuous Ambient Air Quality Monitoring Analyzers. Details of 36 nos. of old analysers offered under buy back are attached as Annexure-V. The buyer offered this exchange offer on “**As is where is basis**” All offers should be made in English and should be written in both figures and words. Tender forms can be downloaded from the CPP Portal (<http://eprocure.gov.in/eprocure/app>) & CPCB’s website <http://www.cpcb.nic.in>
2. The bidders are requested to read the tender document carefully and ensure compliance with all specifications/instructions herein. Non-compliance with specifications/instructions in this document may disqualify the bidders from the tender exercise. The Chairman, Central Pollution Control Board reserves the right to select the item (in single or multiple units) or to reject any quotation wholly or partly without assigning any reason. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

### **CRITICAL DATE SHEET**

<b>Description of Activities</b>	<b>Date (dd.mm.yyyy)</b>	<b>Time (hrs.)</b>
Published Date	24.01.2017	14.00
Bid Document Download/Sale Start Date	24.01.2017	14.00
Clarification Start Date	24.01.2017	14.00
Clarification End Date	31.01.2017	18.00
Pre Bid Meeting	10.02.2017	11.00
Minutes of the pre-bid meeting to be uploaded	15.02.2017	15.00
Bid Submission Start Date	16.02.2017	10.00
Bid Submission End Date	17.03.2017	18.00
Bid Opening Date	21.03.2017	11.00

### **Preparation and submission of bids:**

3. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender publishing on the CPP Portal.
4. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
5. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents – including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
6. The Tender shall be submitted online on <http://eprocure.gov.in/eprocure/app> in two parts viz. Technical Bid and Financial Bid. In the Technical Bids, the bidders are required to upload all the documents in .pdf format. All quotation (both Technical and Financial should be submitted in the E-procurement portal).
7. Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through <http://eprocure.gov.in/eprocure/app>. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site <https://eprocure.gov.in/eprocure/app> under the link “Information about DSC”.
8. Technical & Financial Bids should be submitted in PDF format.
9. In case of Financial bids, a standard BOQ format has been provided in PDF format. Bidders are required to download the BoQ PDF file and fill their financial offer on the same BOQ format. After filling the same, submit it online in PDF format, without changing the financial template format. If the BoQ format file is found to be modified by the bidder, the bid will be rejected.

10. The tender will be rejected straightway without assigning any reasons if the firm involves in any criminal cases, declared black listed by any Govt./Semi govt. department/agencies etc.
- 11. Central Pollution Control Board intends to phase out few Continuous Ambient Air Quality Monitoring Analyzers and Visible Spectrophotometers as part of technology upgradation. There are Thirty Six (36) such Continuous ambient Air Quality Monitoring Analyzers of CO, SO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, and Portable Calibrators of M/s Environment S.A. France Make and Four (04) Visible Spectrophotometer of Cecil (Italy make). The details of old Analyzers and Visible Spectrophotometers offered under buy back are attached as Annexure-V. The buyer offered this exchange offer on “as is where is basis”. The bidders may quote the option of buy back offer in Financial Bid BOQ format.**
12. All the firms participating in the Tender must attach a list of their owners/ partners etc. and a Certificate to the effect that the firm is neither blacklisted by any Govt. Department nor any Criminal Case is registered against the firm or its owner or partners anywhere in India be attached with technical bid.
13. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF formats. Bid documents may be scanned with 100 dpi with black and white option.
14. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
15. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
16. Kindly add scanned PDF of all relevant documents in a single PDF file like, compliance sheet, OEM/Principle Certificate etc.
17. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
18. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

19. The Vendors who have earlier supplied the equipment to any of the Ministries/Department/Public Sector Undertaking/Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.
20. The technical and financial bids should be submitted online through portal <http://eprocure.gov.in/eprocure/app> in original. The financial bid should include the cost of main equipment/item and its accessories. If there is any separate cost for installation etc. that should be quoted separately.
21. Each bidder should mark the tender reference on the top bids submitted online.
22. For any technical related queries about e-Procure Portal, please call the Helpdesk. The Help Desk Number 0120-4200462, 0120-4001002

Tel : 0120-4200462, 01204001002  
Mobile : 91 8826246593  
E-mail : support-eproc@nic.in

23. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in - support of their reputation, credentials and past performance in .pdf format.
24. The rates should be quoted in figures (typed or printed) and cutting should be avoided. The final amount should be in figures as well as in words. If there are cuttings, they should be duly initialled, failing which the bids are liable to be rejected.
25. Any bids received after last date of Tender Submission shall not be considered.
26. Financial Bids of those bidders who are declared technically qualified will only be opened.
27. While sending rates, the firm shall give an undertaking to the effect that "the terms/conditions mentioned in the enquiry letter/Tender Notice against which the rates are being given are acceptable to the firm." in .pdf format. In case the firms do not give this undertaking, their rates will not be considered.
28. The supplier/ **authorized Indian agent/Representative/ Indian supplier should have minimum two years' continuous agency /partnership/joint venture/participation or collaboration with their principal foreign supplier. The documentary proof of such agency**

**ship /authorization/MOU should submit alongwith the technical part. The bid of the firm does not contain the proof of such nomination/authorization as Indian agent will be rejected.**

29. **The bidder should provide a complete list of spares and consumables required for 10 (ten) years for trouble free operation and maintenance of the instrument and a certificate to be given by manufacturer that spare parts will be made available for ten years. A price list of such spare parts also be given.**
30. Annual maintenance contract: The bidder should quote the charges for annual maintenance contract after the warranty period for the instrument listed in annexure-IV of this tender document.
31. The instrument for which Tenders are invited will have to be supplied within 90 days from the date of L.C. opening in the case of foreign suppliers. A period of 30 days will be allowed from the date of purchase order in the case of Indian manufacturers/suppliers.
32. The after sales service is most important to be considered for comparison of the bids. Bid of those firms who do not have Indian Agents or sufficient infrastructure facilities to provide after sales service during warranty period will not be considered.
33. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.
34. The tenders will be received online through portal <http://eprocure.gov.in/eprocure/app>. All tender documents received after the specified date and time shall not be considered.
35. In the event of any dispute or difference(s) between the vendee Institute (Central Pollution Control Board) and the vendor(s) arising out of non-supply of material or supplies not found according to specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to "The Chairman, Central Pollution Control Board", who may decide the matter himself or may appoint arbitrator(s) under the Indian Arbitration and Conciliation Act, 1996. The decision of the arbitrator shall be final and binding on both the parties.
36. The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.
37. All disputes shall be subject to High Court, Delhi Jurisdiction only.
38. All tenders in which any of the prescribed conditions is not fulfilled or any

condition is put forth by the tenderer shall be summarily rejected.

39. The bidders or their authorized representatives may also be present during the opening of the Technical Bid, if they desire so, at their own expenses.

40. Note: Price bids of only those bidders will be opened whose technical bids are found suitable by the committee appointed for the purpose.

41. Clarifications:

In case the bidders require any clarification regarding the tender document, they are requested to submit their queries on the e-mail i.e. [sethuraman.cpcb@nic.in](mailto:sethuraman.cpcb@nic.in). Answers of the queries will be uploaded online on e-procurement portal after pre-bid meeting.

42. A pre-bid meeting will be held as per date mentioned in this document. Only authorized representatives will be allowed to attend the meeting. They should also bring Letter-Head of the firm with an undertaking that any decision/negotiation taken by them would be accepted by firm.

43. Only two representatives will be allowed to attend the pre-bid meeting on behalf of tendering firm. The representatives, who are deputed to attend the meeting, should be bearing an authority letter, whose specimen signatures should have attested by the firm's authorized signatory having seal of the firm.

44. The legible scanned copy of latest receipt/return in respect of Sales Tax/VAT deposited with Sales Tax/VAT department in the language of English/Hindi must be attached with technical bid. The latest deposit receipt/return of Sales Tax/VAT should be of previous financial year showing therein that the tax is deposited up to 31/03/2016 or for the subsequent period in the current financial year.

45. Tender Cost:

The bidder should submit a demand draft of Rs. **1000/-** (Rupees One Thousand only) towards non-refundable tender fee, drawn in favour of "Central Pollution Control Board". The bidder will upload the signed and scanned copy of proof for payment of Tender document cost on e-procurement portal.

46. **IMPORTANT:** - BIDDER CAN QUOTE THE RATES FOR ALL THE INSTRUMENTS OR SOME OF THE INSTRUMENTS AGAINST ONE TENDER DOCUMENT. HOWEVER, SEPARATE PRICE BID AND TECHNICAL BID SHOULD BE SUBMITTED FOR EACH ITEM CLEARLY MENTIONING THE ITEM CODE NUMBER, ITEM NAME ON THE TOP OF THE ENVELOPES WITH SENDERS NAME AND ADDRESS. THE



CENTRAL POLLUTION CONTROL BOARD RESERVES THE RIGHT TO ACCEPT THE TENDER IN FULL OR IN PART. THE BID FOR EACH ITEM SHOULD BE IN SEPARATE SHEETS/PAGES AND FOR THE SAKE OF IDENTITY, COMPILATION, INSTRUMENT/ITEM CODE NUMBER AND DESCRIPTION OF ITEM SHOULD BE WRITTEN ON THE TOP OF EACH BID. EMD SHOULD SUBMIT SEPARATELY AGAINST EACH ITEM. ITEMS-WISE TECHNICAL SPECIFICATION AND PRICE SHOULD BE IN SEPARATE SHEETS i.e. THERE SHOULD BE SEPARATE ENVELOPES FOR EACH ITEMS CONTAINING TECHNICAL, PRICE BID & ITEMS WISE EMD; INCASE, BIDDERS DESIRES TO QUOTE MORE THAN ONE ITEM. **Those tenders do not comply the above instructions will not be considered.**

47. Earnest Money Deposit (EMD):

The bidder shall furnish, as part of its bid, bid security for each instrument/equipment separately for the amount mentioned in Annexure-III of this tender. Execution of Bid Security by the bidder's Bank on the basis of prevailing exchange rate shall be used for arriving at the amount of bid security in the Bid Currency. **EMD to be drawn in favour of "Central Pollution Control Board" payable at Delhi.** The bidders should enclose a pre-receipted bill for the EMD to enable us to return the EMD of unsuccessful bidders. Failure to deposit Earnest Money will lead to rejection of tender. In the event of the awardee bidder backing out, EMD of that bidder will be forfeited.

48. EMD Exemption:

**Central Pollution Control Board may accept bids without EMD from those bidders who are registered with the Central Purchase Organization, National Small Industries Corporation (NSIC) or the concern Ministry or Department as Manufacturer. To claim the exemption, the bidder must be offering goods manufactured by themselves. Exemption will not be granted in case the bidder is acting as an agent for some other vendor. The Firm who seek exemption from depositing earnest money being small scale industry, being registered with NSIC, DGS&D and other Government agencies which entitles them for exemption must submit the valid Registration Certificate - cover the instrument offered by them along with the permissible value. The copy of Government Notification granting exemption from deposit of EMD must be submitted along with the Techno-commercial part of tender alongwith the bid. (EMD Exemption will be granted only to those items specified in the certificate of Registration).**

#### 49. Pre – Qualification Criteria:

- (i) Bidders should be the manufacturer / authorized dealer. Letter of Authorization from Original Equipment Manufacturer (OEM) on the same and specific to the tender should be enclosed.
- (ii) The Vendors who have earlier supplied the equipment to any of the Ministries/Department/Public Sector Undertaking/Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.
- (iii) An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.
- (iv) OEM should be internationally reputed Branded Company.
- (v) Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.
- (vi) Furnishing of wrong/ambiguous information in the compliance statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.

#### 50. Prices:

- (i) The Prices quoted should be inclusive of all taxes or duties, packing, forwarding, freight, insurance, custom clearance, handling charges, transportation, delivery and commissioning etc. at destination site as per delivery schedule at Annexure IV. Central Pollution Control Board is registered with DSIR, Govt. of India and is exempted from Custom / Excise Duty. Exemption Certificate to this effect will be issued by Central Pollution Control Board. Hence, Customs/Excise Duty exempted price should be quoted. The rates shall be firm and final. Nothing extra shall be paid on any account.
- (ii) **The foreign bidders should quote the price in foreign currencies. The price quoted should be on CIF/FOR Destination basis. The Indian agent/their authorized representative should arrange the custom clearance from the customs. The Board will provide the concessional custom duty exemption certificate and other required documents.**

- (iii) **The incidental expenses towards sending the instruments to the designated locations mentioned in Annexure-IV such as arranging transport, insurance, labour, including charges to the custom clearing agent etc. to be borne by the supplier/their authorized Indian representative. The Indian agent/ their representatives should be responsible for the safety of the instruments during the transit from airports to the designated locations.**
- (iv) **The agency commission will be paid in Indian Rupees. The charges on account of agency commission should be mentioned clearly in the bid Indian suppliers, the price should be quoted in Indian Rupees on FOR destination as per the installation points/locations mentioned at annexure-IV. However, the authorized Indian supplier should have minimum two years of continues partnership/joint venture /participation or collaboration with their principal foreign supplier.**
- (v) The foreign bidders must indicate the following information in their proforma invoice alongwith the Price Bid separately for each instrument/equipment.
  - a) Country of Origin.
  - b) Port of Shipment.
  - c) Name & Address of beneficiaries Bank, Branch name with Account No., IBAN No. & SWIFT Code.
  - d) Minimum delivery period.
  - e) Whether transshipment/partner shipment is required or not.
  - f) Agency commission, if any payable to the Indian Agent, their Complete address, telephone & fax number.
- (vi) The items have to be supplied in standard packing. The foreign supplier should use the minimum possible packets and should reduce the size of the packing in volume to avoid extra demurrage in the bonded warehouse in India, if any.

**Important - Bank charges: Three months' time for shipment and further 21 days for negotiation will be given. All Bank charges inside the country (in India) will be buyers account and all Bank charges outside the country should be borne by the supplier / beneficiary's. The bidders may note this and quote the price of the instrument/equipment accordingly. In the case of Foreign Suppliers, they will have to ensure shipment of the consignment as per the validity of the letter of credit established in this regard. In case of extension of supply date is sought, the bank charges should be borne by the Supplier/their authorized Indian representatives.**

- (vii) In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. IAC shall be paid after satisfactory installation & commissioning of the

goods at the destination.

- (viii) For imported equipment, the Letter of Credit will be opened for the amount excluding agency commission in Indian Rupees. The firm should clearly mention the address of foreign bank in the financial bid.
- (ix) In case of indigenous item, the vendor should clearly mention the final FOR Destination specified in Annexure-V, as applicable in their bid.

51. Validity:

The bid should be valid for acceptance up to a period of 180 Days. The Bidders should be ready to extend the validity, if required without any additional financial implications.

52. Delivery:

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 24 weeks of the issue of purchase order unless otherwise prescribed. If the bidder fails to deliver and place any or all the Equipments or perform the service by the specified date, penalty at the rate of 1% per week of the total order value subject to the maximum of 10% of total order value will be deducted.

53. Central Pollution Control Board, in order to satisfy itself can order on the spot enquiry to verify the soundness & capability of the item and any other information given by the tendering firms.

54. The tendering firm will also submit an **undertaking** that the product offered by them is as per technical specifications of the tender.

55. Installation, Training & Demonstration:

**Bidders need to provide adequate training to the nominated persons of Central Pollution Control Board at their cost. Central Pollution Control Board will not bear any training expenditure. The supplier is required to done the installation and demonstration of the equipment within one month of arrival of materials at the Central Pollution Control Board site of installation, otherwise the penalty clause will be the same as per the supply of material.**

56. Warranty:

**Bidders must give the comprehensive on-site warranty of at least three years from the date of successful installation of Equipment and also give the warranty declaration that “everything to be supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.**

57. Any deviation in the material, and the specifications from the accepted terms may liable to be rejected and the bidders need to supply all the goods in the specified form to the satisfaction/specifications specified in the order / contract and demonstrate at their own cost.

**58. Performance Bank Guarantee: A performance bank guarantee from a scheduled bank in India for an amount equal to 10% of the price for duration of two months beyond the expiry of warranty period will be taken from the supplier or Indian agent (successful bidder).**

59. Terms of Payment: Payment will generally be made only after delivery and satisfactory installation, testing, commissioning etc depending upon the availability/release of funds by the Govt. Hence the agencies/contractors shall have no claim in case of delayed payment and no interest will be paid for the delayed payment.

- (i) In case of imported supplies, payment (excluding Indian agency commission, if any) will be made through irrecoverable Letter of Credit in two instalments. 80 % of the money will be released on submission of shipping of documents. Remaining 20 % will be released after successful installation of the instrument and submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty. All the bank charges within India will be borne by the Institute and outside India will be borne by the Supplier.
- (ii) In case of required item quoted in INR, 80% payment will be made through E-payment after receipt of material in good condition and Remaining 20% will be released on successful installation of the instrument and on submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty.

60. Tender expenses and documents: All costs incurred by the bidder in the preparation of the tender shall be at the entire expense of the bidder.

61. Tender Evaluation Criteria: The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened. After examination of the technical bid and price bid, CPCB will have discretion to award the contract to more than one firm, if their L-1 rates are same.

62. CPCB reserves the right to relax any terms and condition in the govt. interest with the approval of Competent Authority.

### **63. FORCE MAJEURE**

Vendor shall not be considered in default if delay in delivery occurs due to causes beyond his control such as acts of God, natural calamities, civil, wars, strikes, fire frost, floods, riots and acts of usurped power. Only those causes which have a duration of more than 7 calendar days shall be considered cause of force majeure. A notification to this effect duly certified by the Local Chamber of Commerce/Statutory Authorities shall be given by the Vendor to the buyer by registered letter. In the event of delay due to such cases a length of time equal to the period of force majeure or at the option of the buyer, the order may be cancelled. Such cancellation would be without any liability whatsoever on the part of buyer. In the event of such cancellation the vendor shall refund any amount advanced by the Purchaser and deliver back any material issued to him by the Purchaser and release facilities, if any, provided by the Purchaser.

### **INJURY AND DAMAGE**

#### **64. Injury or Death of Persons**

The Supplier shall be liable for and shall indemnify the Board against any liability, loss claim or proceedings whatsoever arising under any statute or law in respect of personal injury death or any disability caused by the carrying out the Works unless due to any act or neglect of the Board, or of any person for whom the Board is responsible.

#### **65. Damage to Property**

The Supplier shall be liable for and indemnify the Board against and insure and cause any Manufacturers and subcontractors to insure against any expense, liability, loss claim or proceedings in respect of any damage whatsoever to any real or personal property for any one occurrence in so far as such damage arises out of or in the course of or by reason of the carrying out of the Works and is due to any negligence, omission or default

of the Supplier or any person for whom the supplier is responsible or any Manufacturers and subcontractors or person whom the Manufacturers and subcontractors are responsible.

## **66. ROYALTY AND PATENTS**

(i) The Supplier shall pay all royalties and licenses fees for the use of any patented item, whether it may be an invention, method, arrangement, article, process or appliance used in connection with the performance of the Contract. The supplier shall indemnify and save harmless the Board against any and all costs, damages and expenses of any nature or kind whatsoever which may arise out of or result from a claim by any person, firm or corporation that the manufacture, purchase, use of sale of any of the inventions, methods, arrangements, articles processes or appliances used in connection with the performance of this Contract infringes any patent of such other rights. The Supplier shall, at the request of the Board, defend the Board against any suit brought to enforce any such claim at the Suppliers expense.

(ii) In case any such patented item used on or in conjunction with the Works is in suit held to constitute and infringement of its use enjoined, the supplier shall either secure for the Board the right to continue using the said item by suspension of the injunction, by procuring for the Board a license or otherwise, or will replace such items with a non-infringing item or modify it so that it becomes non-infringing or with the Board's approval remove the said enjoined item and refund to the Board the sums paid thereof.

## **67. Return of EMD:**

- (i) The earnest money of unsuccessful bidders will be returned to them without any interest after awarding the contract.
- (ii) The earnest money of the successful bidder will be returned to them without any interest after supply of material.

68. Manual and documentation: All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument.

69. This call of tenders does not bind the Central Pollution Control Board to place order. The Central Pollution Control Board reserves the right to cancel the tender at any stage (point of time) without assigning any reason.

70. Bidders should go through the tender terms, conditions and specifications carefully and fill in the attached compliance statement accurately and unambiguously. They should ensure that all the required documents are furnished along with the bid.

**71. NOTE: -**

**(A) THE SELF ATTESTED & STAMPED SCANNED COPIES OF FOLLOWING DOCUMENTS REQUIRED TO BE ATTACHED WITH TECHNICAL BID:-**

1. The Demand draft of **Rs.1000/-** as Application Fee.
2. E.M.D. in favour of Central Pollution Control Board duly signed, scanned and attached amounting as per schedule of requirements.
3. Certificate regarding registration with DGS&D/NSIC, if claim EMD exemption.
4. Sale Tax/VAT Registration Certificate.
5. Copy of latest Sales Tax/VAT deposit receipt.
6. Technical specifications alongwith literature/brochure of the quoted product.
7. Tender Acceptance Letter.
8. List of owners/partners/directors etc.
9. Certificate for non-blacklisting of firm and non-registration of criminal case.
10. Undertaking that the product offered by them is as per technical specifications of the tender.
11. Undertaking for comprehensive warranty/guarantee for the period.

**(B) All the original documents as mentioned above as well as the original payment instrument like Demand Draft/Bank Guarantee /Pay order or banker cheque of any scheduled bank against Tender Fee/EMD, samples as specified in this tender document have to be sent to the address of the Purchaser by post/speed post/courier/by hand on or before bid Submission closing date & time. Beyond that the tender shall be summarily rejected without assigning any reason.**

**(C) PRICE BID:-** The price schedule will be uploaded **only on CPP Portal** in pdf format provided with the tender document.

**72. The offline financial bids will not be accepted. The option in the rates will not be entertained.**

Sd/-  
N. Sethuramalingam  
Adm Officer (Material)



## CHECKLIST FOR BID/TENDER SUBMISSION

(The following check-list must be filled in and submitted with the bid documents)

### Pre-Qualification Bid

Sr No.	Particulars	Yes/No
1.	Have You attached Demand draft of <b>Rs.1000/-</b> as Application Fee?	
2.	Have You attached E.M.D. in favour of amounting as per requirements ?	
3.	Have You attached Certificate regarding registration with DGS&D/NSIC, if claim EMD exemption?	
4.	Have You attached Sale Tax/VAT Registration Certificate ?	
5.	Have You attached Copy of latest Sales Tax/VAT deposit receipt?	
6.	Have You attached Technical specifications alongwith literature/brochure of the quoted product ?	
7.	Have You attached Tender Acceptance Letter ?	
8.	Have You attached List of owners/partners/directors etc?	
9.	Have You attached Certificate for non-blacklisting of firm and non-registration of criminal case?	
10.	Have You attached Undertaking that the product offered is as per technical specifications of the tender?	
11.	Have You attached Undertaking for comprehensive warranty/guarantee ?	
<b>Price Bid</b>		
12.	Have you signed and attached the priced bid form ?	

**PRICE - BID FORM**

**ANNEXURE - I**

**No. /ICB**

Details showing quantity, specification and other details of the instruments offered (to be filled by the bidder and must be kept in "Price Bid" part of the Tender)

Sl.No and Item code Number of instruments as per our tender Document	Name of Instrument	The Specification offered by the Bidder	Difference in Specifications of tender document and that of Bid, if any	Quantity	Unit Price (in Rupees excluding rates at col. no. 7)	Taxes and other expenditures (Sales Tax/VAT, C.S.T, freight, cost of installation & training (in case of indigenous items)etc.	Total Amount in Rupees for indigenous items	Less the amount for the old Analyzers/ Visible Spectrophotometer under buy back offer (as per Appx 'V')	Total Amount CIF/FOR Destination for imported items
1	2	3	4	5	6	7	8	9	10

NOTE:- If this sheet is not sufficient to accommodate the bid the additional sheets containing the same proforma but all such sheets including this one must be signed by the Bidder along with the seal. This Annexure must enclose in the Proforma Invoice price bid for item wise. Separate Bid form should be attached against each item, quoted for. Administrative Officer (Material)

**Signature with date & stamp of the bidder**

**UNDERTAKING**

DATE \_\_\_\_\_  
TENDER NOTICE NO \_\_\_\_\_  
TO

THE CHAIRMAN  
CENTRAL POLLUTION CONTROL BOARD  
(MINISTRY OF ENVIRONMENT & FORESTS GOVERNMENT OF INDIA)  
C.B.D. CUM OFFICE COMPLEX  
EAST ARJUN NAGAR DELHI- 110 032.

Sir,

Having examined the conditions of Tender Document and specifications of the instruments, the receipt of which is hereby acknowledged. We, the undersigned, offer to supply, delivery and install the following:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 8.
- 9.
- 10.
- 11.
- 12.

(Please add additional pages, if required).The above supply, installation shall be in conformity with the specifications and conditions of supply.

We undertake if our bid is accepted to deliver the instruments quoted by us, we shall deliver and install within the period indicated by us in our offer.

We agree to abide by this bid for a period of 180 days from the date fixed for Bid opening and it shall remain binding upon us and may be accepted at any time before expiration of that period.

We are submitting a Demand Draft for Rs...../in bid Currency in favour of "Central Pollution Control Board", Delhi towards the Earnest Money.

This Bid, together with your written acceptance thereof in your notification of award shall constitute a bidding contract between us.

We understood that you are not bound to accept the lowest or any bid you may receive.

Dated this.....day of.....2017

**Signature of authorized Person, Name with Stamp & full Address.**

**SCHEDULE OF EARNEST MONEY**

<b>S. No.</b>	<b>Item Code</b>	<b>Instrument / Equipment</b>	<b>Quantity Requirement</b>	<b>EMD (Rs.)</b>
1.	<b>ICB-01</b>	<b><u>ANALYSZERS</u></b>		4,00,000.00
		SO <sub>2</sub> Analyser	03	
		O <sub>3</sub> Analyser	03	
		COAnalyser	03	
		NO-NO <sub>2</sub> -NO <sub>x</sub> Analyzer	01	
		NH <sub>3</sub> Analyzer	01	
		BTEX Monitor/ Analyser	02	
		Ambient PM <sub>2.5</sub> Analyser	01	
		Multi-calibration systems for gaseous analysers comprising of Gas Dilution System, High Performance Zero Air Generator and Multi point calibration of Ozone Analyser, complete as required. System should be DAS Compatible for remote calibration from central server.	02	
		Work station Computer system along with printer and DAS Software	03	
		Display Board Data transmission Device	02	
		Day Light & Night Visible Data Display System	02	
2.	<b>ICB-02</b>	FTIR	01	30,000.00
3.	<b>ICB-03</b>	Stereo Zoom Microscope	01	60,000.00
4.	<b>ICB-04</b>	Visible Spectrophotometer	04	15,000.00

**Annexure-IV****Locations of Delivery and Installation of the Instruments / Equipments**

<b>S. No.</b>	<b>Item Code</b>	<b>Instrument / Equipment</b>	<b>Quantity Requirement</b>	<b>Locations</b>
<b>1.</b>	<b>ICB-01</b>	<b><u>ANALYSZERS</u></b>		
i).	SO2Analyser		03 Nos.	ITO, Calibtation Lab, and Portable Station
ii).	O3 Analyser		03 Nos.	ITO, Calibtation Lab, and Portable Station
iii)	CO Analyser		03 Nos.	ITO, Calibtation Lab, and Portable Station
iv)	NO-NO <sub>2</sub> -NO <sub>x</sub> Analyzer		01 No.	Portable Station
v)	NH <sub>3</sub> Analyzer		01 No.	Portable Station
vi)	BTEX Monitor/ Analyser		02 Nos.	ITO and Portable Station
vii)	Ambient PM <sub>2.5</sub> Analyser		01 No.	Portable Station
viii)	Multi-calibration systems for gaseous analysers comprising of Gas Dilution System, High Performance Zero Air Generator and Multi point calibration of Ozone Analyser, complete as required. System should be DAS Compatible for remote calibration from central server.		02 Nos.	ITO, Calibtation Lab,
ix)	Work station Computer system along with printer and DAS software		03 Nos ( 02 Nos. Desktop and one Laptop)	ITO, Calibration Lab, (desktop) and Portable Station (Laptop)
x)	Display Board Data transmission Device		02 Nos.	ITO, Portable Station
xi).	Day Light & Night Visible Data Display System		02 Nos.	ITO, Portable Station
<b>2.</b>	<b>ICB-02</b>	FTIR	01 No.	CPCB Head Office, Delhi
<b>3.</b>	<b>ICB-03</b>	Stereo Zoom Microscope	01 Nos	CPCB Zonal Office Bhopal
<b>4.</b>	<b>ICB-04</b>	Visible Spectrophotometer	04 Nos.	CPCB Head Office, Delhi

**DETAILS OF ITEMS OFFERED UNDER BUY BACK SCHEME**

<b><u>Analyzers</u></b>			
<b>Sr.No.</b>	<b>Item Name</b>	<b>Qty.</b>	<b>Remarks</b>
1.	CO Analyser ESA 11M ESA	05 Nos.	Purchase year 2002
2.	O <sub>3</sub> Analyzer 41 M ESA	05 Nos.	-do-
3.	SO <sub>2</sub> Analyzer 21F ESA	05 Nos.	-do-
4.	NO <sub>x</sub> Analyser 31 ESA	05 Nos.	-do-
5.	VOC Analyzer ESA	02 Nos.	2002
6.	VE 3M ESA (Portable Calibrator)	06 Nos.	01 -1994 01-2000 04-2002
7.	CO Analyzer ESA 12 M	02 Nos.	2006
8	O <sub>3</sub> Analyzer 42  M ESA	02 Nos.	2006
9	SO <sub>2</sub> Analyzer 22M ESA	02 Nos.	2006
10.	NO <sub>x</sub> Analyzer 32 M 240 ESA	02 Nos.	2006
<b>Visible Spectrophotometers</b>			
11.	Visible Spectrophotometers (Cecil Make) - CE 1011	04 Nos.	Purchase year 2003

## PRE CONTRACT INTEGRITY PACT

### General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on .....day of the month of .....2016, between, CPCB, An autonomous body acting through Shri ....., (Designation of the officer, Ministry/Department, Government of India) hereinafter called the “BUYER”, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns of the First Part and M/s..... represented by Shri....., Chief Executive Officer (hereinafter called the “BIDDER / SELLER” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER CPCB work under the ageis of Environment & Forests, performing its functions as per the provisions of Water Act 1974, Air Act ,1981 and EPA Act, 1986.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to :-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

### Commitments of the BUYER

- 1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process,

bid evaluation, contracting or implementation process related to the contract.

- 1.2 The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
- 1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
- 1.4. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an inquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

### **Commitments of BIDDERS**

2. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-
  - 2.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
  - 2.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour



to any person in relation to the contract or any other contract with the Government.

- 2.3\* BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
- 2.4\* BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
- 2.5\* The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacture/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
- 2.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 2.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 2.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 2.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 2.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

- 2.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 2.12 If the BIDDER or any employee of the BIDDER or any person action on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filling of tender.
- 2.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

### **3. Previous Transgression**

- 3.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.
- 3.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

### **4. Sanctions for Violations**

- 4.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-
- (i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER (s) would continue.
  - (ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.
  - (iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

- (iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
  - (v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.
  - (vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money (s) due to the BIDDER.
  - (vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.
  - (viii) To recover all sums paid in violation of this Pact by BIDDER (s) to any middleman or agent or broker with a view to securing the contract.
  - (ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.
  - (x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.
- 4.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.
- 4.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor (s) appointed for the purposes of this Pact.

5. **Fall Clause**

5.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

6. **Independent Monitors**

6.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

6.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

6.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

6.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

6.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

6.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

- 6.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
- 6.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

7. **Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of Commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

8. **Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat/place of the BUYER.

9. **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

10. **Validity**

- 10.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.
- 10.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

11. The parties hereby sign the Integrity Pact at  
.....on.....

BUYER

BIDDER

Name of the Officer.  
Designation  
Deptt./MINISTRY/PSU

CHIEF EXECUTIVE OFFICER

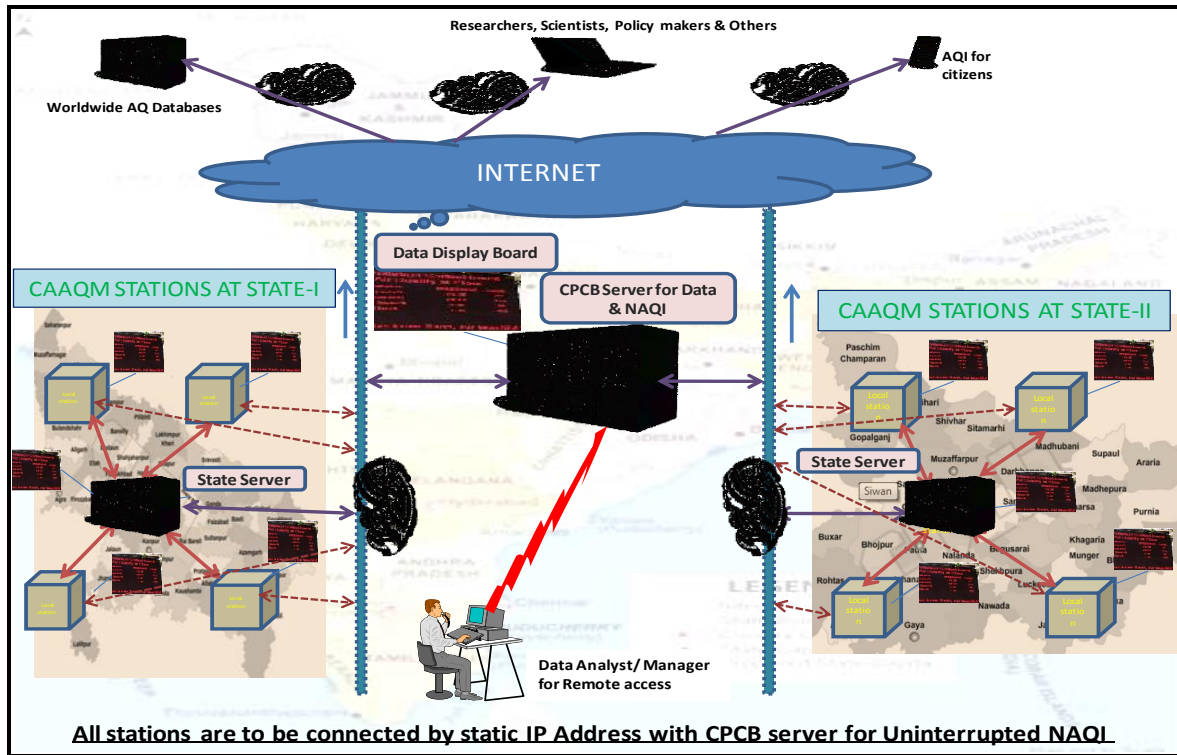
Witness

Witness

1.....  
    1.....  
2.....  
    2.....

# TECHNICAL SPECIFICATIONS

## TECHNICAL SPECIFICATIONS FOR CONTINUOUS AMBIENT AIR QUALITY MONITORING (CAAQM) STATION (REAL TIME)



**Central Pollution Control Board**  
East Arjun Nagar, Shahdara  
Delhi - 110032.

# 1. CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYSERS for SO<sub>2</sub>, NO-NO<sub>2</sub>-NO<sub>x</sub>, NH<sub>3</sub>, CO, O<sub>3</sub> and BTEX

## 1.1 (General Specifications for all Analysers)

- 1.1.1 The analyzers should be 19" rack mounting model with facilities for fixing the analyzers from front side.
- 1.1.2 The front panel preferably have ON / OFF Switch.
- 1.1.3 The display of the entire important status signal viz. Sample flow, temperature, concentration, range selection, manual / auto mode, zero / span mode and all error messages should be on front panel.
- 1.1.4 The analyzers should operate at operating voltage 230 volts  $\pm$  10 volts AC and 50 Hz  $\pm$  3% frequency. The power supply input to be protected against spikes from and to the analyzer by an LC filter. The power connection cable should be CEE type complete with 15 Amperes plug adaptable to Indian mains socket.
- 1.1.5 The analyzers must function properly in Indian conditions without any defect between 0 – 50° C ambient temperature, 10 – 95% relative humidity and in high ambient dust levels. The data capture rate should not be less than 90% of operational time.
- 1.1.6 The Manufacturer shall provide comprehensive hands-on training for operational & preventive maintenance for one week for at least three persons.
- 1.1.7 The analyzers must have zero point internal calibration system and in agreement with minimum detection limit of each analyzer. The calibration procedures are to be integrated into the software system (DAS) for automatic calibration & remote calibration.

## CALIBRATION GAS CYLINDER

- 1.1.8 (a) The supplier of analyzers shall also have to supply the respective parameter's Calibration Gas Cylinder (Highly polished aluminium 10 litre Water capacity) along with SS regulators (double stage), traceable to NIST standard at all the locations (ITO, Calibration Lab and Portable station). The every calibration gas cylinder should have NIST traceability certificate. The concentration range of calibration gas cylinders are as under:-

S.NO.	Components	Gas concentration range in ppm
1.	SO <sub>2</sub>	40-50 ppm
2.	NO	40-50 ppm
3.	CO	400-600 ppm
4.	NH <sub>3</sub>	10-15 ppm
5.	BTEX	4-6 ppm



(b) The Particulate Matter (PM<sub>2.5</sub>) analysers should have reference calibration foil/ membrane along with certificate for the calibration of PM<sub>2.5</sub> analysers.

1.1.9 The analyzers shall be supplied with all ancillaries necessary for operation with pump (preferably in built) and any other items such as charcoal scrubber, Teflon air sample intake filter, drier, Teflon tubing suitable for connection to air sampling manifold. All such items are to be itemized. Dust filter in all the analyzers should be provided before solenoid valve to protect frequent chocking of solenoid valve.

1.1.10 The connector systems for out-going signal for recording and the computer terminal should be on back panel with screw type connecting pins.

1.1.11 All ambient gas analyzers shall be approved by the USEPA / TUV. However, in case of BTEX and Ammonia Analyzer specifications as given will be considered. **Method of measurement used shall also comply with the stipulation on National Ambient Air Quality Standards (NAAQS) 2009** (Details of Methods of Measurement is available at MoEF and CPCB websites). All analyzers shall be micro – processor controlled with automatic calibration using an external dilution calibrator and calibration standards. All analyzers should be fully integrated in the rack cabinet, fully calibrated & tested before supply and ready for start – up at the respective sites. Analyzer must exhibit performance equal to or better than values specified in the Calibration & test certificate provided with each analyzer.

1.1.12 The manufacturer shall specify the cross sensitivity of measurement for all the analyzers.

1.1.13 Each set of analyzers shall be supplied with two copies of elaborate operation manuals comprising details as below:

Parts (I) should comprise installation, operational and troubleshooting details;

Parts (II) should have details about preventive, routine and corrective maintenance;

Parts (III) should comprise details of all electrical, electronic and pneumatic circuit diagrams, details of each spare parts, catalogue No. etc. and details of each electronic card / PCB's; and

Parts (IV) Schematic diagram for possible repair & maintenance.

Parts (V) Standard Operating Procedure (SOP) for each analyzer.

Parts (VI) List of equipments and other accessories along with contact details of supplier.

1.1.14 **Digital Output:**

a) Multi drop RS 232 port shared between gas Analyzers, Dust Analyzer (PM<sub>2.5</sub>& PM<sub>10</sub>), Meteorological Sensors and computer for data, status and control. Communication should have a USB port, TCP/IP Ethernet connection

1.1.15 **Quality Control and Standard**

Data shall be collected and validated according to US EPA standards, using the methodologies included in 40 Code of Federal Regulations. All analyzers shall

have current US EPA reference or equivalent method designation and shall be of the latest design.

1.1.16 All the analysers should have on site comprehensive warranty/guarantee for a period of three (03) years. The warranty/guarantee will start from the date of successful installation & commissioning of analysers at the respective locations.

1.1.17 The suppliers shall have to supply all the recommended consumables and spares for continuous operation of 03 years along with list of items with each analyzer / calibrator / PM<sub>2.5</sub> analyzer.

1.1.18 The supplier should submit an undertaking from the OEM / Principal supplier for providing service, spare parts and consumables support for at least 10 years.

## 2. AMBIENT AIR QUALITY MONITORING ANALYSERS (GAS)

### 2.1 AMBIENT SULPHUR DIOXIDE (SO<sub>2</sub>) ANALYSER

01.	Principle	:	UV Fluorescence
02.	Measurement	:	SO <sub>2</sub> in Ambient Air
03.	Display	:	Digital
04.	Ranges	:	Auto ranging 0 - 200 ppb
05.	Lower Detectable Limit	:	1 ppb
06.	Noise Level	:	0.5 ppb
07.	Zero Drift	:	< 1 ppb/24 Hrs. with automatic zero compensation
08.	Span Drift	:	<1 ppb in 24 hrs.
09.	Linearity	:	± 1% of full scale
11.	Response Time	:	120 sec or less
12.	Calibration	:	Please see Multi-calibration section (Sl. No. 4) and also General Specifications (1.1.7 and 1.1.8)
13.	Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
14.	Digital Output	:	Multiple drop RS 232, USB port /TCP/IP, Ethernet
15	Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

## 2.2 AMBIENT OXIDES OF NITROGEN (NO-NO<sub>2</sub>-NO<sub>x</sub>) ANALYSER

1.	Principle	:	Chemiluminiscence
2.	Measurement	:	NO-NO <sub>2</sub> - NO <sub>x</sub> in Ambient Air
3.	Display	:	Digital
4.	Ranges	:	Auto ranging 0-2000 ppb
5.	Lower Detectable Limit	:	1 ppb
6.	Noise Level	:	0.5 ppb
7.	Zero Drift	:	< 1 ppb/24 Hrs.
8.	Span Drift	:	< 2% in 15 days of full scale
9.	Linearity	:	± 1% of full scale
10.	Response Time	:	120 sec or less
11.	Calibration	:	Please see Multi-calibration section (Sl. No. 4) and also General Specifications (1.1.7 to 1.1.8).
12.	Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
13.	Digital Output	:	Multi drop RS 232 port, USB port /TCP/IP ,Ethernet
15	Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

## 2.3 AMBIENT AMMONIA ANALYSER (NH<sub>3</sub>)

01.	Principle	Chemiluminiscence (NH <sub>3</sub> conversion to NO by oxidation. NO <sub>2</sub> also converted to NO. The difference obtained by measuring NO in output of two sample stream as equal to NH <sub>3</sub> )
02.	Measurement	NH <sub>3</sub> in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0-1000 ppb
05.	Lower Detectable Limit	1 ppb

06.	Noise Level	0.2% of reading
07.	Zero Drift	<5 ppb /24 Hrs.
08.	Span Drift	< 2% in 15 days of full scale
09.	NH <sub>3</sub> /NO converter	Quartz at approx. 1000 <sup>o</sup> C
10.	Linearity	± 1% of full scale
11.	Response time	300 second
12.	Rise / fall Time (95% of the final value)	< 30 Sec
13.	Calibration	Please see Multi-calibration section (Sl. No. 4) and also calibration section in General Specifications (1.1.7 to 1.1.8).
14.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA /4 – 20 mA and Digital output
15.	Digital Output	Multi drop RS 232 port, USB port /TCP/IP ,Ethernet
16.	Consumable and Spares	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

## 2.4 AMBIENT CARBON MONOXIDE (CO) ANALYSER

01.	Principle	:	Non Dispersive Infra-Red (NDIR) with Gas Filter Correlation/ Cross Flow Modulation Method
02.	Measurement	:	CO in Ambient Air
03.	Display	:	Digital
04.	Ranges	:	Auto ranging 0 - 100 ppm.
05.	Lower Detectable Limit	:	0.1 ppm
06.	Noise Level	:	0.05 ppm with time constant ± 30 seconds
07.	Zero Drift	:	< 0.2 ppm/7 days
08.	Span Drift	:	< 1% full scale in 24 hrs.
09.	Linearity	:	Continuous ± 1%

10.	Response Time	:	30 seconds or less
11.	Calibration	:	Please see Multi-calibration section (Sl. No. 4) and also General Specifications (1.1.7 to 1.1.8).
12.	Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
13.	Digital Output	:	Multiple drop RS 232port, USB port /TCP/IP ,Ethernet
16.	Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

## 2.5 AMBIENT OZONE (O<sub>3</sub>) ANALYSER

01.	Principle	:	UV Photometric / Chemiluminiscence
02.	Measurement	:	O <sub>3</sub> in Ambient Air
03.	Display	:	Digital
04.	Range	:	Auto ranging 0 - 500 ppb
05.	Lower Detectable Limit	:	1.0 ppb
06.	Noise level	:	± 0.5 ppb
07.	Zero Drift	:	< ½% per month
08.	Span Drift	:	< 1% per month
09.	Linearity	:	Continuous ± 1%
10.	Response Time	:	30 seconds or less
11.	Calibration	:	With built in Zero and span generator and also see Multi-calibration section (Sl. No. 4)
12.	Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
13.	Digital Output	:	Multiple drop RS 232 port, USB port /TCP/IP ,Ethernet
16.	Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

## 2.6 AMBIENT BTEX ANALYSER

### 2.6.1 GENERAL

A complete analyzer system comprising of sampling pump, transfer line, analyzer, detector, calibrator, computer hardware and software for instrument control, data storage, display, acquisition, processing and for selective determination of volatile compounds in ambient air optimized for Benzene, Toluene, Ethyl Benzene and o, m, p –Xylenes. Continuous unattended measurement system of individual BTX should work without external cryogenic cooling. System should have protocol compatible to communicate & transfer data to DAS. Raw data storage capacity without erase minimum for three month or more. The system should be delivered with all necessary spares, consumables, tubing etc. for making it functional.

### 2.6.2 TECHNICAL SPECIFICATIONS

A single stage membrane Pump collect ambient sample automatically an inbuilt adsorption trap. Subsequent, the sample will be dissolved and injected on wide bore capillary gas chromatographic separation. Sample volume controlled by thermal mass flow controller (dust protected). Sample flow range may be 20 - 100 ml/min or more (adjustable). Sample volume should be between 400 ml – one liter or more of ambient air over a 10-15 min sampling cycle. All sample transfer tubing should be in stainless steel and flow & pressure sensor to be preferred with digital display.

### 2.6.3 DETECTOR

Photo Ionization Detector (**PID**) having approval from EPA/TUV or equivalent International Agency. The system should have auto-clean & auto calibration facilities. PID Lamp eV should be 10.6eV. PID sensitivity sensor should be available to check sensitivity.

### 2.6.4 MINIMUM SPECIFICATIONS

Principal	:	Based on gas Chromatographic separation and Photo Ionization Detector (PID)
Measurement	:	Benzene, Toluene, Ethyl-benzene, m.p-Xylene

		and 0-Xylene.
Display	:	Digital
Range	:	0 - 100 ppb (0.32 – 325µg/m <sup>3</sup> )
Lower detectable limit	:	0.2 ppb (0.65µg/m <sup>3</sup> ) for 15 min cycle for Benzene
Temperature Range	:	5 - 35°C or more
Repeatability	:	Retention Time : <0.1% RSD Concentration: <1.0% RSD
Typical Cycle Time	:	Total Cycle Time should not exceed 15min i.e. Sample Collection Time -15 min approx. Analytical Time- 15 min approx.
Sample Volume	:	1 liter for 15 min cycle.
Desorption tube	:	Carbotrap
Pre concentration	:	Carbopack
Calibration	:	The Analyzer should be capable to calibrate through Multi Calibration System also. Please see Multi-calibration section (Sl. No. 4) and also General Specifications (1.1.7 & 1.1.8).
Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
Digital Output	:	Multi drop RS 232 port, USB port /TCP/IP ,Ethernet
Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

### 3 CONTINUOUS PM<sub>2.5</sub> MONITORING ANALYSER (β-RAY ATTENUATION)

Based on the principle of β-ray attenuation, particulate sampled through the instrument and collected on fiberglass filter tape. Before and after, sampling β-ray radiation is measured by scintillation / G.M. counter. An internal microprocessor handles all sequences and automatically calculates the concentration of PM<sub>2.5</sub>.

01.	Principle	:	$\beta$ -ray attenuation
02.	Particle Size Cut Off	:	0 – 2.5 Microns
03.	Measuring Range	:	0 – 1000 $\mu\text{g}/\text{m}^3$
04.	Resolution	:	1% of the measurement range
05.	Lower Detection Limit	:	< 4.8 $\mu\text{g}/\text{m}^3$ (1 hour)
06.	Detector	:	Plastic Scintillator / GM Counter / Silicon-Semiconductor base
07.	Air Flow Rate	:	16.7 Liters / minute
08.	Filter Material	:	Glass Fiber Filter
09.	Display	:	LED / LCD
10.	Sampling Head	:	Dynamic heated sampling head for measurement of $\text{PM}_{2.5}$ with adjustable temperature 20 – 70 $^{\circ}\text{C}$
11.	Calibration	:	Reference membrane facility should be provided for multipoint calibration of analyzer [please see General Specification at SI.No. 1.1.8 (b)].
12.	Compatibility	:	Analyzer should be compatible with protocols of DAS system to be used in station.
13.	Roll Length	:	Minimum 20 meters
14.	Analog Output	:	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
15.	Digital Output	:	Multi drop RS 232 port ,USB port /TCP/IP ,Ethernet
16.	Measurement Cycle Time	:	1 hour
17.	Consumable and Spares	:	Supply of recommended requirements of 03 years of continuous operation along with the list of items.

#### 4. MULTICALIBRATOR

Calibration system should provide for the calibration of the ambient air quality monitoring analysers (Gas).



#### 4.1 MULTI POINT GAS CALIBRATION SYSTEM:

1. The Gas Calibration System should be capable to do the following:
  - (i) Multipoint calibration using automatic dilution system for the calibration of SO<sub>2</sub>, NO, CO, NH<sub>3</sub> and BTEX analyser.
  - (ii) Auto calibration (user selectable).
  - (iii) Generate zero air of 99.9% purity (High Performance Zero Air Generator to be provided).
  - (iv) Gas Phase Titration (GPT) with O<sub>3</sub> generator having 100% converter efficiency for conversion of NO<sub>2</sub> to NO.
  - (v) Calibration using permeation tubes for which at least two chambers based Permeation system has to be provided.
  - (vi) The Permeation System should be capable to accept permeation tubes up to 6 cm in length and 2cm in diameter with user selectable temperature setting of 40 °C and 50 °C.
2. System should be 19" rack mountable.
3. System should be DAS compatible for remote calibration from Central Server.
4. The system should also have facility for multipoint calibration of Ozone analyzer.
5. Supply of consumable and spares of recommended requirements of 03 years of continuous operation along with the list of items.

#### 5. WORKSTATION COMPUTER/LAPTOP AND PRINTER

This has to be installed at CAAQM station for the preparation of AQI along with the station computer.

Sr.No	Specifications	
1	<b>CPU</b>	Intel® Core i7 4 <sup>th</sup> generation or higher
2	<b>Memory</b>	8 GB DDR-III, 1600MHz, or better
3	<b>Ethernet ports</b>	Integrated intel ® Ethernet LAN 10/100/1000
4	<b>PCI Slots</b>	Two PCIe16 half height
5	<b>Optical Drive</b>	DVD R/W Internal
6	<b>HDD's</b>	3.5" 1TB, SATA drives
7	<b>Power</b>	Standard suitable power supply

Sr.No	Specifications	
	<b>Supply</b>	
8	<b>Key board</b>	Optical Keyboard same as OEM ( or inbuilt for laptop)
9	<b>Mouse</b>	Standard Optical Mouse same as OEM (or inbuilt for laptop)
10	<b>I/O ports</b>	4*USB 3.0
11	<b>Monitor</b>	17" Wide LCD TFT Color Monitor or better (for Desktop) or 14/15" LED Screen( for LAPTOP)
12	<b>Wireless adapter</b>	USB Wireless adapter x 1 no (or integrated in laptop)
13	<b>OS</b>	Open source Ubuntu latest release and Windows OS 7 /8 /10
14	<b>Warranty</b>	Warranty is comprehensive on site including spares for 3 / 3 / 3 years
15	<b>Type</b>	Tower type Black in color preferably or as per the fitting in station rack
16.	<b>Laser Printer</b>	<p>Color Laser printer with wireless and Ethernet connection</p> <ul style="list-style-type: none"> <li>• Print speed Color &amp; black: 4 / 14 ppm</li> <li>• Resolution: 600 x 600 dpi</li> <li>• Processor speed 264 MHz Print or better</li> <li>• Paper handling input, standard 250-sheet input tray</li> <li>• Duplex printing Automatic (standard)</li> <li>• Media sizes supported A4 A5</li> <li>• wireless connectivity and automatic two-sided printing</li> <li>• automatically connect to wireless network,</li> <li>• Easily print from virtually anywhere in the office with Ethernet and wireless connectivity</li> <li>• Connect via USB, access tools from PC to manage printer.</li> <li>• 1,500-page toner cartridge or better</li> </ul>

**6. DATA ACQUISITION SOFTWARE (DAS) (CAAQM) (MINIMUM REQUIREMENT)**

**(i) Data Acquisition and Handling System at Station**

Type I: System comprises of data logger having DAS and station computer.

Or

Type 2: System comprises of station computer with DAS facilities.

Data logger/DAS with 8 analog, 24 digital inputs. Ability to log channels at different intervals and should have capability of averaging and displaying real time data and averaged data over a period of 1 min, 15 min, ½ hr, 1 hr, 4 hrs, 8 hrs, 24 hrs, 1 month and year. Communication between data logger and station computer should be using standard USB/RS232/RS485/ Ethernet Connector. The data logger should have internal battery with charger and if it is PC based UPS serves the purpose.

The data logger/DAS should support LAN and Internal GSM modem/ Wifi for data transfer to central server. Station computer for data logging will be in addition to workstation computer required for calculating AQI, and will be of same or better specifications that of work station computer.

Presently network is envisaged for 250 such stations.

The software captures data from all channels in the system and stores in the station Computer.

## **(ii) Data Acquisition**

- a) Frequency of data acquisition
  - i) User selectable 1,5,30,60,120 second averaging duration online digitally.
  - ii) Minimum frequency will be subject to capability of analyzer cycle.
- b) Channel size
  - i) 32 Channels or more supported
  - ii) Expandable to 64 channels, if required in future
- c) Data input

Either Analog (0-1 volt/0-10 volt/2-20mA/4-20mA)

or Digital to configure with the PC. The condition is that system should remotely operatable.
- d) User configurable channels, stations and equipment with communication parameters.
- e) Analyzer data channel should comprise of Name, Units, Communication Address, Validity Range, Operation and Error Status.
- f) Provision to incorporate conversion factors such as PPB to  $\mu\text{g}/\text{m}^3$  etc.
- g) Software should be equipped to configure the analyzers with it, irrespective of company make and communication protocol of the analyzer and the output mode i.e. Analog or Digital (RS 232) of the instrument.
- h) The output should be provided in user defined units.

### **(iii) Data Collection**

- a. Average data over user selectable time (1,5,30,60 seconds time interval) period.
- b. Operational status, Error status, calibration status and calibration values observed from the analyzer should be captured and should be made available along with the data with a frequency of maximum five minutes.
- c. System should collect of the diagnostics of the instrument comprising actual diagnostics parameters and their values at least once in every five minute to check the state of the health analyzer.
- d. Calibration parameters
  - i. Provision to entering zero calibration, span calibration values of gas cylinder/permeation to devices
  - ii. Provision for collecting zero calibration, span calibration values(pre calibration & post calibration) in to the database for further analysis.
  - iii. Provisions to collect electronic system pre calibration & post calibration values from the analyser to ascertain the percentage deviation/ correction applied during each calibration and record it in database at station & Central computer.

### **(iv) Data Storage**

- (a) Data along-with diagnostic, calibration, alarms should be stored at station computer at a defined path.
- (b) Interval of data dumping will be same as defined in the data collection.
- (c) System should be capable to keep every second acquired data from 32 channels for a period of minimum five years.
- (d) Current data should be stored as per ISO-7168-1:1999I format and should be available in folder named as c:\Data\ at an interval of 15 minutes. As an example c:\data\01.05.2015.xml. the file will be appending without double data entry and as per ISO format.
- (e) Data should also be stored for last two years in E:\data\Year\Month\day i.e. e:\data\2015\05\01.05.2015.xml ....
- (f) If data encryption is done, then decryption procedure should be made available in soft file format to check the data at station at any point of time. To convert data on continuous basis for exporting to AQI software, procedure should be available without any licensing. AQI calculating Software will be provided by CPCB/SPCB.

### **(v) Data Display (Statistical analysis of data)**

- a. Main window for real time display of all measured parameters with status of all analyzers/sensors.
- b. In 4-in-4 graphs and 4-in-1 graph formats
- c. In tables of 4-in-1 format
- d. Real time multi – graphs over user selectable time period i.e. 6.00 AM to 6.00 AM etc.
- e. Display of graphic & tabular display of the current data.

- f. Graphical form should comprise of 4-4 graphs, 4-1 graphs in user defined format ( 1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)
- g. Tabular form should comprise of 4 channel list in user defined format (1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)
- h. Station instruments basic configuration etc. should be visible on screen continuously.
- i. Statistical analysis tools like regression analysis, co-relation analysis and other analysis as per industry standards in the field of environment should be available and if not the firm should develop these for CPCB within a time frame of six months.
- j. The system should have procedures for normal analysis tools like calculation of data with respect to a threshold value, average, minimum, maximum, calculation of violating value with respect defined values(National Air Quality Standards) for defined period for the database etc.
- k. Data analysis of diagnostics parameters
- l. Data analysis of Pre calibration and post calibration data (if facility not available, should be developed within six months)
- m. Data analysis of corrections applied of each calibration cycle (if facility not available should be developed within six months)

**(vi) Data Backup**

- n. There should be defined data backup procedure through which data can be extracted from station computer in simple text format/excel/ ISO format(user definable).
- o. There should be defined restore procedure also to restore the data in case of data loss.
- p. A display screen should be available to update the user about data availability.

**(vii) Data Validation automatic checks at station software.**

- a. Zero level and span level checks if performed cyclically and defined results are not obtained up to +/- 5%(user definable 0-10%) then system should alarm the user of system failure and the recorded alarm should be transmitted to central software.
- b. After instruments perform the calibration the results obtained should be recorded and should be transmitted to central computer.
- c. There should be provision of two databases one is raw database and another corrected database.
- d. Validation of data through calibration database Pre calibration & post calibration values collected.

### **(viii) Calibration of systems**

- a. Calibration window for analyzer for the calibration from computer.
- b. Remote Access to Calibration: Calibration exercise need to be done remotely. All necessary arrangements for it should be made in the system.
- c. Calibration data file may be prepared separately and data should be excluded from the database
- d. Calibration database need to be formed, stored and transmitted to central server.
- e. Calibration cycles to be as per the models of the instruments.
- f. Calibration records should store the calibration values displayed by instrument.
- g. Diagnostics during calibration should also be recorded.

### **(ix) Location of station**

- a. Fixed and Mobile Stations location to be recorded and North correction feature should be available.
- b. Latitude and longitude of stations be recorded

### **(x) Data transfer to Central**

- All data captured at station computer should be transferred to central software.
- a. User selectable time frame for transmission of data to central server.
  - b. Diagnostics (actual diagnostics parameter values recorded each time in the station), configurations(station channel configurations), alarms(generated alarms) should be transmitted.

### **(xi) Data transfer to Display Boards at Public site**

software should have provisions to connect data output including current pollutants concentration, AQI, advertisement, etc. to the display boards (LEDs), to be installed at public site. For the purpose Data display device has been recommended in the document.

## **7. OTHER TECHNICAL CONDITIONS**

1. Compatible Hardware required for data transmission through Data Display Connection Device has to be installed.
2. Should support the latest formats of Windows 32 bit or 64 bit. Any new patches developed or upgraded software during project duration should be provided without additional cost.
3. Manual of complete system should be provided.
4. Firm should provide the hardware required for data acquisition along with all the software's required like OS, Networking software, Remote functionality software and should maintain hardware and software for a warranty / guarantee period of 03 years.

## 8. DISPLAY BOARD DATA TRANSMISSION DEVICE

S. No.	Item Desc.	Specifications
1.	PROCESSOR	Intel® Atom™ Processor E3815 (1.46 GHz Single Core, 512 KB Cache, 5W TDP) or equivalent Or 900 MHz or higher quad-core ARM Cortex-A7
2.	Memory	Memory slots for MicroSD or full size SD card slot with Memory support for at-least 8 GB
3.	Ports	<ul style="list-style-type: none"> <li>a. One HDMI</li> <li>b. LAN Port for Ethernet Network Connection</li> <li>c. Minimum of 3 USB Port with support for USB 2.0 or USB 3.0.</li> </ul>
4.	OS Support	Linux, or Windows OS
5.	Communication Options	<ul style="list-style-type: none"> <li>a. LAN Communication</li> <li>b. Wifi Communication – Wifi Hotspot enabled/ GPRS Comm. Enabled</li> </ul>
6.	Power Supply	5 to 12 V DC through 220 V 50Hz AC Supply adapter or USB driven.
7.	Size	Mechanical Chassis Size not to exceed 9" x 6"x 6" with stand alone tower/box.
8.	Operating Environment	Operating Temperature 0° C to +50° C Humidity upto 90%
9.	Device Support	05 Years
10.	Antivirus	It should be secured If Windows than life time antivirus should be there.
11.	General	Supplier will configure and deploy the communication mechanism. Complete manual of the device should be provided.
12.	Accessories	01 Meter HDMI Cable
13.	Internet	To be provided by the vendor either through GSM SIM or through Wifi Enabled Dongles.
14.	Display Board should show	Last data saved.
15.	Display board should show	Last updated time should be displayed
16.	Software	The vendor is responsible to provide software which can download the data from Station computer, AQI, Advertisements etc. store it and display on the Display Board seamlessly.

17.	Consumable and Spares	Supply of recommended requirements of 03 years of continuous operation along with the list of items.
18.	Warranty / Guarantee	Onsite comprehensive for total period of 03 years.

## 9. DAY LIGHT & NIGHT VISIBLE DATA DISPLAY SYSTEM

### (A) LOCATION NEAR TO CAAQM STATION

1.	Size of Display System ( H X W ) feet and Pixel	4 X 7 feet , 16 mm (+/- 0.5 mm ) pixel pitch, 3500 m <sup>2</sup> minimum pixel Density
2.	Visibility Range	50 Meters (Day time)
3.	Brightness	8500 NIT or higher
4.	Display of Colour Elements	1Red , 1Green, 1Blue pixel
5.	Minimum Life span of the system	LED Life 100000 Hours
6.	Viewing angle	Viewing angle of 140° Horizontal/77° Vertical
7.	Operating and non operating Temperture	-15-55° C
8.	No of Color	281 trillion Colors , 256 brightness level dimming capability
9.	Video processing	24 bit Video processing, 100 % Digital
10.	Diode Density	1100m <sup>2</sup> / 1000 ft <sup>2</sup> ( minimum )
11.	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 20000 hz refresh frequency
12.	LED internal and External Cabinet type , Serviceability	Internal LED frame should be made of Aluminium and External cabinet should be factory made without pin holes , LED Display should be serviceable from front and back
13.	Color Temperature - Adjustable	4500 - 9000 K range
14.	Input Power Requirement/ Consumption	120/240v, 50/60Hz , Power consumption 200 W ( maximum ) / m <sup>2</sup>
15.	Type	Discrete Diode
16.	Display Mounting	Structure based upon location. Uni Pole or hanging
17.	General	The system should also have the facility to display the enviromental picture through video camera/vcr/cd playeretc. for public awareness.



18.	Power Cable Laying	Depending upon location, cabling is to be done by the firm
19.	Device at station to pick up data and transmit it to LED	Display data connectivity device with GSM SIM has to be installed near by LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet .LED to be placed away from the station premises.
20.	Certification	CE, UL/Ulc listed
21.	IP Rating	Display Module IP67, Cabinet IP 65
22.	Consumable and Spares	Supply of recommended requirements of 03 years of continuous operation along with the list of items.
23.	Warranty / Guarantee	Onsite comprehensive for total period of 03 years.

## **(B) Protocol for Data Transmission from CAAQM Stations**

Presently CPCB is operating NAQI network which uses this protocol mentioned below for the data collection at central server to generate NAQI which is made available to the public. The Instrument Supplier will have to generate the data output immediately after installing the CAAQMS at any location in this format so that station gets integrated into the existing system immediately.

However, the proposed procedure given in this document of data management through ISO 7168 format would be applied after proper system checks and setup. In parallel both systems will be operated for nearly six months and finally, ISO based system will be adopted for future data management from CAAQMS in the entire country.

## **(C) Data Format**

- Data file on real time basis having 15 minutes average values in a prescribed format attached at Annexure-I should be generated at the station for which Instrument Supplier is responsible.
- File should be updated after every 15 minutes.
- Data intervals like 00:15, 00:30, 00:45, 01:00 should be fixed at the station.
- Station file name should be exactly as the name of the station to be displayed on the web portal. i.e. Sanathnagar, NehruNagar. Here precaution is to be taken that no space between words should be given or no special characters should be used.
- File should be recorded in a folder c: \data \sanathnagardata.txt
- File should allow data appending sequentially.

- Date of last file record appended in the file should be recorded and data afterwards be placed in the data file.
- File appending should continue subject to max 97 lines. First in First out mechanism shall be followed in keeping file size to 97 lines.
- Hence, in the specified folder c:\Data\ there will be a single file which will keep appending as per format attached.
- Duplicate entry of any data should not be made in the file.
- System should have capability to create previous record data file for which user will give the date. This is required to have lost data makeup in the final database, if any.

#### **(D) Data Mapping**

- Protocol for each parameter is fixed as below:
  1. 15 Minutes average value will be provided by the operator of the CAAQMS
  2. Each SPCB will have the parameter as mentioned in the table only. Not even a small gap or space is provided other than the mentioned table is acceptable.

10. **ICB-02** Specification of FTIR Spectrometer for Plastic Material Identification

S. No	Feature	Value
1.	Spectral Range	7800 cm <sup>-1</sup> to 350 cm <sup>-1</sup>
2.	Spectral Resolution	0.5 cm <sup>-1</sup>
3.	Interferometer	Mikelson
4.	Detector	DLaTGS
5.	Optics	Helium-Neon Laser Gun
6.	ATR measurement system	Germanium ATR
7.	Sample Interface	Required
8.	Software	Validated software (NIST/ASTM)
9.	Computer Interface and Software Control	PC based software control
10.	Warranty	2 years
11.	Power Supply	230v/50Hz
12.	Demountable Cell	
13.	Wavelength range	7800 cm <sup>-1</sup> to 350 cm <sup>-1</sup>
14.	Software	PC based FTIR operating system and inbuilt library of all spectra required.
15.	NIST Traceable Polystyrene Card	
16.	Sensitivity	Minimum signal to Noise 30000:1
17.	Beam Splitter	KBr

11. **ICB-03 Specification of Stereo Zoom Microscope with digital Camera Attachment for Taxonomic Identification of Benthic Macro Invertebrates.**

- 8.1 Zoom ration with 7.5x-60x magnification range (1x objective, 10x eyepiece)
- Repeated observation at specific magnification
- The modular system should offer complete flexibility and upgradability.
- Optics Carrier
- Eyepiece 10x/238, adjustable, 2<sup>nd</sup> gen (02 Nos).
- Trinocular Tube 50%
- Objective achromat 1.0x, WD-90mm
- Focus Drive 300mm M-series
- Microscope Carrier
- Incident light base, small
- Intermediate adapter for TL and IL Base

**Illumination :-**

- LED3000 RL, 58 mm
- LED3000 SLI (Spot Light Illumination)
- Adapter LEDx3000 SLI/MCI-Routine
- Power Supply for LED 3000/LED5000
- Power Cable 2m, EURO
- Digital Camera & SW Kit
- C-mount Video Adaptor 0.5x

12. **ICB-04 Specifications of Visible Spectrophotometer**

S. No	Feature	Value
1.	Spectral Band Width	5nm or better
2.	Optical System	Single beam grating based single detector
3.	Wavelength Range	325 to 1000 nm
4.	Accuracy	Better than or equal to 1 nm
5.	Readability	1 nm
6.	Photometric Readout	Digital LCD or LED. Selectable for Transmittance (T), Absorbance (A), Concentration (C)
7.	Range	0.0 to 150.0 T 0.000 to 3.0 A 0.000 to 1999 C
8.	Accuracy	Better than 1% or 0.005 A
9.	Noise	Better than 0.0005 A at 500 nm
10.	Drift	0.03hour after warm up
11.	Filter and Lamp Selection	Automatic Coupled with wavelength
12.	Peek Seek	Automatic with baseline flattening
13.	Cell Holder	For holding up to 50 nm pathlength rectangular cuvette
14.	Interface	RS-232 C
15.	Power	230 ± 10 V / 50 Hz AC
16.	Standard item to be supplied	Two pairs of square glass cuvettes (10 mm pathlength), Operation and maintenance manual (English), Dust Cover, Power Cable with Plug to suit Indian Socket.

17.	Consumables and Spares	For Three years operation
18.	Optional Accessories	1. Printer (Internal) 2. Absorbance filters (0.25,0.5,1.0,1.5A) and Wavelength Filters (Holmium and Didymium) with certificate

**References:**

1. Technical Handbook for Installation, Maintenance, Calibration, Data Connectivity and Data Quality Check of Continuous Ambient Air Quality Monitoring System (Real Time)
2. Guidelines for the Measurement of Ambient Air Pollutants, Volume-II
3. National Ambient Air Quality Standards (2009)