



भारत सरकार/Government of India
अंतरिक्ष विभाग/Department of Space
द्रव नोदन प्रणाली केंद्र
LIQUID PROPULSION SYSTEMS CENTRE
एच ए एल II स्टेज, 80 फीट रोड
HAL II STAGE, 80 FEET ROAD,
बेंगलूरु/BANGALORE-560 008
फोन सं./Phone No.080 25037171/140
ई-मेल/Email: purchase@lpscb.gov.in



दिनांक/Date: 01.12.2025

लोक निविदा सूचना सं. एल बी2025000338-01 दिनांक 01.12.2025
PUBLIC TENDER NOTICE NO. LB2025000338-01 DATED 01.12.2025

प्रदूषण निगरानी प्रणाली की आपूर्ति, संस्थापन, एवं प्रदर्शन के लिए निविदा।
Tender for Supply, Installation, and Demonstration of Pollution Monitoring System

निविदा वर्गीकरण: लोक निविदा
Tender Classification: PUBLIC TENDER

निविदा की निर्धारित तिथियाँ/TENDER SCHEDULE

बोली प्रस्तुति की आरंभिक तिथि/Bid Submission Start Date	: 01.12.2025 17:00
बोली स्पष्टीकरण की नियत तिथि/Bid Clarification Due Date	: 08.12.2025 14:00
बोली प्रस्तुतीकरण की नियत तिथि/Bid Submission Due Date	: 15.12.2025 10:00
बोली खुलने की तिथि/Bid Opening Date	: 15.12.2025 10:30
मूल्य बोली खुलने की तिथि / Price Bid Opening Date	: 31.12.2025 14:00

निविदा दस्तावेज़ <https://www.isro.gov.in/> OR <https://eproc.vssc.gov.in> या इसरो ई-प्रापण पोर्टल से डाउनलोड किए जा सकते हैं।/Tender documents can be downloaded from <https://www.isro.gov.in/> OR <https://eproc.vssc.gov.in> or ISRO E-Procurement Portal.

हस्ताक्षरित/Signed
क्रय व भंडार अधिकारी/Purchase & Stores Officer

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
LIQUID PROPULSION SYSTEMS CENTRE (LPSC-B)
BANGALORE**

**Tender for Supply, Installation & Demonstration of Pollution
Monitoring System**

Bids to be submitted online

**Tender No.: LPSC-B/Liquid Propulsion Systems Centre,
Bengaluru/LB202500033801 dated 01-12-2025**

A. Tender Details

Tender No :	LPSC-B/Liquid Propulsion Systems Centre, Bengaluru/LB202500033801
Tender Date :	01-12-2025
Tender Classification:	GOODS
Purchase Entity :	Liquid Propulsion Systems Centre, Bengaluru
Centre :	LIQUID PROPULSION SYSTEMS CENTRE (LPSC-B)

Supply, Installation & Demonstration of Pollution Monitoring System

Supply, Installation & Demonstration of Pollution Monitoring System

A.1 Tender Schedule

Bid Submission Start Date :	01-12-2025 17:00
Bid Clarification Due Date :	08-12-2025 14:00
Bid Submission Due Date :	15-12-2025 10:00
Bid Opening Date :	15-12-2025 10:30
Price Bid Opening Date :	31-12-2025 14:00

B. Tender Attachments

Technical Write-up/Drawings

Document : RFP of Pollution Monitoring System

Instructions To Vendors

2. Instructions to Vendors

1. LPSC(B) invites offers through eprocurement portal (<https://eproc.isro.gov.in>) for the supply / service of items as listed in the Tender document.

2. Prospective vendors interested in participating in the tendering process need to get registered in the e-procurement portal by using Digital Signature Certificate. Offers submitted through our online portal only shall be considered and offers received through fax or email or in person shall not be considered.

3. The Tenderers are requested to update their address and contact details, if necessary and submit the Bids online at least two days prior to closing date to avoid last minute system / network related problems. In case of any technical issues, tenderers may write to helpdesk team (eprocure@vssc.gov.in, egps@lpscb.gov.in) for resolution. Request for the extension of the due date for such instances shall not be considered.

4. GST @ 5% is applicable for following goods mentioned under Sl. No. 243B as per Department of Revenue Notification No. 25/2018 - Integrated Tax (Rate) dated 31/12/2018 (Amendment to Notification Nos. 07/2018 dated 25/01/2018 and 01/2017 dated 28/06/2017) and Department of Revenue Notification No. 24/2018 - Central Tax (Rate) dated 31/12/2018 (Amendment to Notification Nos. 06/2018 dated 25/01/2018 and 01/2017 dated 28/06/2017) and Government of Karnataka Notification No. 24/2018 dated 31/12/2018 (Amendment to Notification Nos. 06/2018 dated 25/01/2018 and 01/2017 dated 29/06/2017).

"Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for Launch Vehicles and Satellites and Payloads"

5. LPSC(B), ISRO is eligible for Customs Duty Concession vide Notification No. 50/2017-Customs dated 30/06/2017 (Sl. No. 539), Notification No. 5/2018-Customs dated 25/01/2018 (Sl. No. 539A) and Notification No. 05/2025-Customs dated 01/02/2025 (Sl. No. 539A). Necessary Customs Duty Concession Certificate shall be provided if applicable.

6. Offer Validity: The offer shall be valid for a period of 90 days (for Single Part Tender) and 120 days

(for Two Part Tender) from the date of opening of the tender or any other period as specified in the Tender document. Offers with lesser validity period than that specified are liable for exclusion from the procurement process.

7. In case of Two Part Tender, Tenderers shall not mention any kind of price element in Techno-Commercial Bid. If any Price element is mentioned in the Techno-Commercial bid, their offer shall be liable for rejection.

8. LPSC(B) reserves the right to accept or reject any quotation in part or in full or part without assigning any reason thereof. LPSC(B) shall be under no obligation to accept the lowest tender and reserves the right to accept whole or any part of the tender or part of the quantity offered and the Tenderers shall supply the same at the rates quoted.

9. Bank Details: Tenderer shall provide their bank details such as IFSC code, IBAN No. , SWIFT etc. along with their offer which shall be not be changed till completion of supply/service.

10. Applicable Law: The Contract shall be governed by Indian Law for the time being in force and jurisdiction shall lie in the Courts of India.

11. Only Class-I and Class-II Local suppliers as per Public Procurement Policy (Preference to Make in India) Order, 2017 are eligible to participate in the bid unless otherwise specified in the Tender document.

12. As far as implementation of Public Procurement Policy (Preference to Make in India) Order, 2017 is concerned, the Office Orders vide No. P-45021/2/2017-B.E-II dated 15/06/2017, which is partially modified by Order No. P-45021/2/2017-PP(BE-II) dated 28/05/2018, Order No. P-45021/2/2017-PP(BE-II) dated 29/05/2019, Order No. P-45021/2/2017-PP (BE-II) dated 04/06/2020 and Order No. P-45021/2/2017-PP (BE-II) dated 16/09/2020 and subsequent Amendments issued by the Department for Promotion of Industries and Internal Trade (DPIIT), Ministry of Commerce and Industry regarding Class-I / Class-II local suppliers, Purchase preference, verification of local contents etc. shall be applicable to this tender unless otherwise specified in the Tender document.

Therefore, bidders may ensure compliance of the same while submitting tenders.

13. Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006 unless otherwise specified in the Tender document. Such MSEs shall produce documentary proof of registration as per provisions of the Policy i.e. registration with District Industries Centre (DIC) or Khadi and Village Industries Commission (KVIC) or Khadi and Industries Board (KVIB) or Coir Board or National Small Industries Commission (NSIC) or Directorate of Handicrafts and Handlooms or Udyog Aadhar Memorandum or any other body specified by Ministry of MSME.

14. As per the Rule 144 (xi) of General Financial Rules, 2017, any bidder from a country which shares a land border with India will be eligible to bid in this tender, only if the bidder is registered with the Competent Authority. Competent Authority for the purpose of registration shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

15. Resolution of Disputes: Any dispute, disagreement or question arising out of or relating to or in consequence of the contract or to its fulfillment, or the validity of enforcement thereof which cannot be settled mutually, or the settlement of which is not herein specifically provided for, shall within 30 (thirty) days from the date either party informs the other in writing that such dispute or disagreement exists be referred to arbitration by the sole arbitrator. The Arbitrator shall be appointed as per the Indian Arbitration and Conciliation Act 1996 and proceedings will be conducted in Bangalore. The Arbitration proceedings shall be conducted in accordance with and subject to the Arbitration and Conciliation Act 1996 (Act 26 of 1996) as amended from time to time and the decision of the Arbitrator shall be final and binding on the parties thereto. Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the Arbitrator shall be shared equally by the parties unless the award provides otherwise. Subject to provisions of this clause, the courts at Bangalore shall have exclusive jurisdiction. Performance under this Contract shall, however continue during Arbitration proceeding and no payment due or payable by the parties hereto shall be withheld unless any such payment is/ or forms a part of the subject matter of the Arbitration proceedings.

16. Force Majeure: Neither party shall bear responsibility for the complete or partial non-performance of any of his obligations if the non-performance results from such force majeure circumstances such as, but not restricted to, flood, fire, earthquake, civil commotion, sabotage, explosion, epidemic, quarantine restriction, strike, lock-out, freight embargo, acts of the Government, acts of public enemy and other acts of God as well as war or revolution, military operation, blockade, acts or actions of State authorities or any other circumstance beyond the control of the parties provided the other party is notified in writing within 21 days from the date of commencement of the unforeseeable event.

3. Local Content Declaration

1. DECLARATION OF LOCAL CONTENT

(To be given on company letter head with self certification - For tender value below Rs. 10 Crores

(To be given by Statutory Auditor or Cost Auditor or Cost Accountant or CA - For tender value above Rs. 10 Crores)

Date:

To,

Sub: Declaration of Local content

Tender Ref No:

Name of Tender:

1. Country of Origin of Goods being offered:

2. We hereby declare that items offered has -----% local content:

3. Details of Local Value additions:

4. Address At which Local value addition is being made:

"Local Content" means the amount of value added in India which shall, be the total value of the item being offered minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

It is certified that the above mentioned Local content is excluding the following (a) (b) & (c):

- a. Imported items sourced locally from resellers/distributors are excluded from calculation of the above local content.
- b. The license fees/royalties paid/ technical charges paid out of India shall be excluded from local content calculation.
- c. Procurement/Supply of repackaged/refurbished/rebranded imported products as understood commonly shall be treated as reselling of imported products and shall be excluded from calculation of local content. The definition of repackaged /refurbished/rebranded imported products is as follows; Refurbishing means repair or reconditioning of an imported product does not amount to manufacture because no new goods come into existence. Repackaging means repacking of imported goods from bulk pack to smaller packs would not ordinarily amount to manufacture of a new item. Rebranding means relabeling or renaming or change in symbol or logo/makes or corporate image of a company/organization/ firm for an imported product would amount to rebranding.

It is certified that as per DPIITs OM Ref P-45021/102/2019-BE-II-Paart(1)(E-50310) Dtd. 04/03/2021 the local content mentioned above, by which we are Class-I local suppliers / Class-II local suppliers, does not contain services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC / value addition.

"False declaration will be in breach of Code of Integrity under Rule175(1)(i)(h)of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law."

Yours faithfully,

(Signature of the Bidder/OEM with Official seal)

C. Bid Templates

C.1 Technical Bid - Supply, Installation & Demonstration of Pollution Monitoring System

1. Pollution Monitoring System

Hydrazine Sensor (N₂H₄)

Item specifications for Pollution Monitoring System

Hydrazine Sensor (N₂H₄)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Type	Electrochemical	Yes / No / Explain		
2	Gas	N ₂ H ₄	Yes / No / Explain		
3	Range	0-1ppm	Yes / No / Explain		
4	Lower Detection Limit	0.05ppm	Yes / No / Explain		
5	Linearity tolerance	≤± 5% of measured value	Yes / No / Explain		
6	Repeatability/ accuracy: Zero	≤± 0.05 ppm	Yes / No / Explain		
7	Repeatability/ accuracy: Sensitivity	≤± 5% of measured value	Yes / No / Explain		

2. Pollution Monitoring System

Ammonia Sensor (NH₃)

Item specifications for Pollution Monitoring System

Ammonia Sensor (NH₃)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Type	Electrochemical	Yes / No / Explain		
2	Gases	NH ₃	Yes / No / Explain		
3	Range	0-100 ppm	Yes / No / Explain		

4	Lower Detection Limit	15 ppm	Yes / No / Explain		
5	Linearity tolerance	$\leq \pm 5\%$ of measured value	Yes / No / Explain		
6	Repeatability/accuracy:Zero	$\leq \pm 3$ ppm	Yes / No / Explain		
7	Repeatability/accuracy: Sensitivity	$\leq \pm 5\%$ of measured value	Yes / No / Explain		

3. Pollution Monitoring System

Transmitter

Item specifications for Pollution Monitoring System

Transmitter

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Type	Intrinsically safe transmitter	Yes / No / Explain		
2	Gases to be detected	NH ₃ & N ₂ H ₄	Yes / No / Explain		
3	Range	As per sensor	Yes / No / Explain		
4	Display	Large graphic display. Display should show values in digital	Yes / No / Explain		
5	Selection Keys	Navigation keys for menu selection and setting	Yes / No / Explain		
6	Analog output	4-20mA	Yes / No / Explain		
7	Digital output	HART or equivalent standard protocol	Yes / No / Explain		
8	Power Supply	Suitable DC power supply should be provided	Yes / No / Explain		
9	Relay	Alarm relay should be provided	Yes / No / Explain		
10	Temperature	10-40 Deg. C	Yes / No / Explain		
11	Pressure	Ambient	Yes / No / Explain		
12	Humidity	20-80%	Yes / No / Explain		

13	Enclosure	NEMA-4 with M 20 gland	Yes / No / Explain		
14	Explosion Standard	EExia T4 IIC	Yes / No / Explain		
15	Mounting	Wall Mounting	Yes / No / Explain		
16	The mentioned accessories to be provided	1. Wall mounting Kit. 2. 4-20mA I/O card. 3. Relay Module	Yes / No / Explain		
17	All essential accessories which are not listed should be mentioned separately		-		

4. Pollution Monitoring System Controller

Item specifications for Pollution Monitoring System Controller

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	No. Of Channels	Minimum 13 channels or standard channel configuration	Yes / No / Explain		
2	Type	Control unit for location in a non-hazardous area	Yes / No / Explain		
3	Gases	NH3 & N2H4	Yes / No / Explain		
4	Range	User defined measuring range.	Yes / No / Explain		
5	Input	All configuration by Laptop/computer	Yes / No / Explain		
6	Output	1. Alarm provision to be provided for faults. 2. Acknowledgement provision for alarm. 3. LAN protocol should be supported (TCP/IP). 4. Controller shall display transmitter output in digital format for each channel.	Yes / No / Explain		

7	Display	1. Backlit LCD or better. 2. LEDs shall be provided for each channel (function, fault, alarm).	Yes / No / Explain		
8	Keys	Necessary keys to be provided	Yes / No / Explain		
9	Interface	Interface cable to interface with the computer	Yes / No / Explain		
10	Power Supply	AC Supply : 230 V AC, 50 Hz	Yes / No / Explain		
11	Temperature	10-40 Deg. C	Yes / No / Explain		
12	Pressure	Ambient	Yes / No / Explain		
13	Humidity	20-80%	Yes / No / Explain		
14	Protection Class	IP 65	Yes / No / Explain		
15	Mounting	Wall Mounting/Panel Mount	Yes / No / Explain		
16	Excitation	Controller shall be able to provide excitation to transmitter and retrieve output from transmitter	Yes / No / Explain		
17	Accessories to be provided	1. Wall mounting Kit. 2. 4-20mA I/O card. 3. Relay Module. 4. Interface cable to interface with the computer. 5. TCP/IP Gateway Module/ Modbus Gateway. 6. Necessary Software for data monitoring and acquisition.	Yes / No / Explain		
18	All essential accessories which are not listed should be mentioned separately.		-		

5. Pollution Monitoring System

Display Console

Item specifications for Pollution Monitoring System

Display Console

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	CPU	Intel core i7,3.4GHz, 8MB cache or higherversion,64-bit processor i7, 12th Generation	Yes / No / Explain		
2	Chipset	Intel Q8 series	Yes / No / Explain		
3	Screen	23.8", LED backlight, 1920 X1080& built-in speaker	Yes / No / Explain		
4	Memory	8 GB 1600MHz DDR4 RAM with 32 GB expandability	Yes / No / Explain		
5	Graphics	Integrated Intel HD graphics	Yes / No / Explain		
6	Ethernet provision	1. Mother board -1 No. 2. Additional network interface card- 1No.	Yes / No / Explain		
7	USB ports	Minimum 5	Yes / No / Explain		
8	Optical drive	16 X DVD \pm RW	Yes / No / Explain		
9	Keyboard	Multimedia keyboard with USB 2.0 Interface	Yes / No / Explain		
10	Mouse	2-Button optical scroll mouse with USB 2.0/3.0 Interface with Mouse Pad	Yes / No / Explain		
11	Operating System	64 Bit windows 11 professional or the latest version with perpetual license	Yes / No / Explain		
12	MS Office	New Microsoft office with perpetual license for the Windows OS shall be provided	Yes / No / Explain		
13	Hard Disk	1TB SATA III	Yes / No / Explain		
14	Display Node shall be loaded with monitoring and acquisition software.		-		

6. Armoured cable
3 core x 1.5 sq.mm

7. Power Cables
3 core x 1.5 sq.mm

8. Communication Modbus LD Cable (RS 485)

9. Installation & Commissioning

10. Comprehensive Annual Maintenance Contract (CAMC) for 2 years

Supporting Documents required from Vendor

1. User manual, diagnostic procedure and technical catalogue (English) for Safety sensors, transmitter, controller and display node, should be supplied along with item delivery and installation

2. In case of quote by an agent, agent shall submit a valid authorization certificate obtained from OEM along with quote

3. ATEX approvals Certificate for transmitters shall be provided

4. Certificate of Origin

5. Detailed specifications of quoted items

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	Warranty: 12 months from the date of acceptance at site	Yes / No / Explain	
2	Delivery schedule: 6 months from the date of PO	Yes / No / Explain	
3	THIS IS A TWO PART TENDER : DO NOT MENTION THE PRICE ELEMENT IN TECHNO COMMERCIAL BID. IF ANY PRICE ELEMENT MENTIONED IN THE TECHNICAL BID, YOUR OFFER WILL NOT BE CONSIDERED.	Yes / No / Explain	
4	Goods and Services Tax (GST): Kindly mention percentage of GST considered in your offer along with HSN Code.	Yes / No / Explain	
5	Delivery Terms: FOR LPSC, Bangalore.	Yes / No / Explain	
6	Sl. No. 2 should be considered as: Delivery Period: The supply including installation, if any, shall be completed within 06 months from the date of receipt of PO or date of issue of FIM (if applicable), whichever is later.	Yes / No / Explain	
7	Payment Terms: 100% payment shall be made within 30 days of receipt and acceptance including installation, if any, of the items at our site.	Yes / No / Explain	
8	Liquidated Damages (LD): If the ordered items are not supplied within the delivery schedule, LD shall be levied from your bill @ 0.5% of the order value per week or 0.5% of the value of the stores for which the delivery is delayed for each week of delay subject to a maximum of 5% of the order value. However, in case of inordinate delay in completion period, LD @ 10% shall be recovered.	Yes / No / Explain	
9	Warranty: The items shall be warranted for a minimum period of 12 months from the date of supply or acceptance of items at our site which ever is later. Necessary warranty certificate shall be furnished along with the supply.	Yes / No / Explain	

10	Performance Bank Guarantee (PBG): You have to submit PBG towards fulfilment of warranty obligations and performance of the system for 3% of the Order Value from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value valid till the completion of warranty period plus 60 days as per the format provided by Department.	Yes / No / Explain	
11	Security Deposit (SD): You have to furnish a Bank Guarantee from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value for 3% of the order value within 10 days of receipt of order towards the faithful execution of the order valid till the completion of the scope of work as per order plus sixty days (as claim period). SD shall only be applicable for order value above INR 50.00 Lakhs. SD shall be returned to you immediately on execution of the order satisfactorily as per order terms. In case of non-performance / poor performance, the amount shall be withheld.	Yes / No / Explain	
12	SD cum PBG: In case, if parties are unable to provide two separate BGs, i.e. one for SD and one for PBG, they can submit a combined BG for SD & PBG within 10 days of receipt of order for 3% of order value valid till the completion of total contractual obligation (i.e. supply period plus warranty period plus 60 days) as per the format provided by the Department.	Yes / No / Explain	
13	Insurance: Being a Government of India Department, Insurance is not required at our cost. Please ensure the safe delivery of the ordered item with proper AIR / SEA / ROAD worthy packing.	Yes / No / Explain	
14	Free Issue Material (FIM), if applicable: You have to submit Bank Guarantee for a value equivalent to FIM (if applicable) from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value towards issue of FIM. The BG shall be valid till receipt and acceptance of supply and satisfactory accounting of FIM.	Yes / No / Explain	
15	Address, contact details like Telephone Number, e-mail, etc. on which order to be placed.	Yes / No / Explain	

16	Details of Principal: Address, contact details like Telephone Number, e-mail, etc. (if applicable)	Yes / No / Explain	
17	Bank Details: Bank name, Branch address, Account No., IFSC Code, IBAN Number, SWIFT, etc.	Yes / No / Explain	
18	Local Content (%): Please mention the percentage of Local Content and the location where local value addition takes place (Kindly enclose self-certification document in the prescribed format)	Yes / No / Explain	
19	MSE Status: Kindly mention the classification under MSE and submit supporting documentation (if applicable)	Yes / No / Explain	
20	Validity of offer: 120 days from the date of opening of tender or as specified in the Tender Document.	Yes / No / Explain	
21	Comprehensive AMC: We reserve the right to enter into a separate AMC after completion of warranty period. Kindly include your cost of Comprehensive AMC for a period of two years after expiry of warranty period.	Yes / No / Explain	
22	Preventive Maintenance: Two preventive maintenance visit in one year i.e. total of four visits over period of 2 years	Yes / No / Explain	
23	Breakdown Maintenance: The breakdown calls shall be attended within 48 hours of intimation. (Although unlimited free breakdown calls are stipulated, Party may indicate the number of free breakdown visits considered in their offer and for additional breakdown visits, party may quote the charges separately on per day / per visit basis)	Yes / No / Explain	
24	Payment Terms for AMC: Maintenance charges shall be paid within 30 days after completion of each satisfactory Maintenance against submission of Invoice and Service report duly certified by the End User Division.	Yes / No / Explain	
25	Security Deposit (SD): You have to furnish a Bank Guarantee from a Nationalized / Scheduled Bank on non-judicial stamp paper of appropriate value for 3% of the AMC value within 10 days of receipt of order towards the faithful execution of the order valid till the completion of the scope of work as per order plus sixty days (as claim period).	Yes / No / Explain	

26	Down-time Compensation: In case the break-down are not attended to in time, i.e. within 48 hrs of our intimation, down-time compensation at the rate of 0.5% (of the Annual Maintenance charges per day) shall be recovered from you subject to a maximum of 5% of the contract value.	Yes / No / Explain	
27	Maintenance shall be carried out at our premises only. In case any item has to be taken to your premises for repairs, necessary Bank Guarantee for the value of the item shall be furnished, and valid till returning of the item.	Yes / No / Explain	
28	During AMC, in the event of damages to our property or injury to our personnel due to the negligence of your employees, the responsibility shall solely rest with you.	Yes / No / Explain	
29	Income Tax, as applicable shall be deducted from your bill, at source.	Yes / No / Explain	
30	PENALTY CLAUSE: In case service provider fails to complete the required work hours specified/month by the focal point, down time compensation @ 0.5% of cost of the non-completed work hours will be recovered per week. The quantum of down time compensation to be recovered will be decided by the service receiver after assessing the quantum of work hours not completed and the decision will be final and binding on the service provider.	Yes / No / Explain	
31	FALL CLAUSE: Service charges quoted by the party shall in no event exceed the lowest charges at which the party does the "AMC for Servers or of identical description to any other part during the period for the contract. If at any time during this period the Party reduces the AMC charges to any other party, such reduction of AMC charges shall be notified to the Purchase & Stores officer, LPSC, ISRO, Bengaluru - 560 008 and from that time such reductions of service charges shall stand correspondingly reduced in this agreement also and bill/invoice should be raised accordingly.	Yes / No / Explain	
32	Any other terms	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	Pollution Monitoring System Hydrazine Sensor (N ₂ H ₄)	9.00 Nos.		-		
2	Pollution Monitoring System Ammonia Sensor (NH ₃)	4.00 Nos.		-		
3	Pollution Monitoring System Transmitter	13.00 Nos.		-		
4	Pollution Monitoring System Controller	1.00 Nos.		-		
5	Pollution Monitoring System Display Console	1.00 Nos.		-		
6	Armoured cable 3 core x 1.5 sq.mm	500.00 m		-		
7	Power Cables 3 core x 1.5 sq.mm	100.00 m		-		
8	Communication Modbus LD Cable (RS 485)	100.00 m		-		
9	Installation & Commissioning	1.00 Times		-		
10	Comprehensive Annual Maintenance Contract (CAMC) for 2 years	2.00 Years		-		

Common charges (Applicable for all items)

P & F Charges	
Freight if any (Value)	

Installation & Configuration	
Other Costs, if any (Value)	
Taxes, if any (Percentage)	

Annexure-I

Supply, Installation and Demonstration of Pollution Monitoring System

1.0 Requirement

The proposed requirement is for Monopropellant thruster test facility for High Altitude & Sea Level Testing of Monopropellant Thrusters for various EOS programs at LPSC(B), Tumakuru campus. During testing Hydrazine is used as a propellant for High Altitude and Sea Level Testing of Monopropellant thrusters. Hydrazine is a toxic and inflammable liquid. Also, in HAT Facility, Ammonia released is due to decomposition during firing of thrusters. To measure the pollution at various locations and alarm the facility if pollution level exceeds its threshold, it is proposed to install Ammonia and Hydrazine sensors at various locations at the facility.

The following facilities are proposed at LPSC, Tumakuru campus

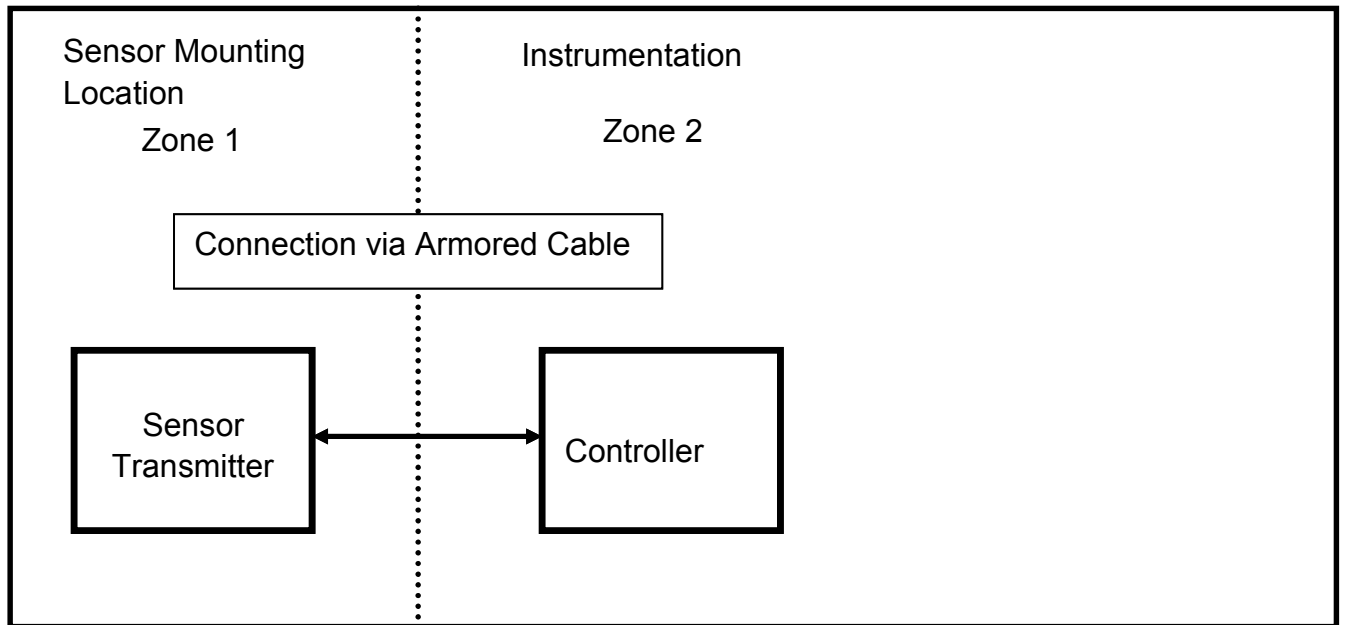
1. Hydrazine Storage Room
2. Compatibility Study Laboratory
3. High Altitude Test Facility
4. Sea Level Test Facility
5. Run Tank Room for Sea Level and High-Altitude Test Facility

The pollution monitoring sensors (Diffusion type) requirement for the facility is given below.

S.No.	Location		Quantity		Distance from Panel Room(m) approx.
			Ammonia (NH ₃)	Hydrazine (N ₂ H ₄)	
1.	Hydrazine Storage		0	2	100
2.	Chemical Lab		0	1	30
2.	Compatibility Study laboratory		0	1	100
3.	High Altitude Test Facility	Vacuum Pump Room	1	0	40
		Chamber Area	1	1	50
4.	Sea Level Test Facility		1	1	35
5.	Run Tank Room for Sea Level and High-Altitude Test Facilities		0	2	40
6.	Spares		1	1	-
	Total		4	9	

Table-1

The interconnection between controllers to sensors is via armoured cable.



Schematics Representation

2. Scope of Vendor:

2.1 Scope of Work:

1. Supply, installation and commissioning of pollution monitoring sensor (**N2H4 Qty. 09 Nos. and NH3 Qty. 04 Nos.**), transmitters, controller, explosion proof cables, consumables and any other required accessories.
2. Data monitoring and acquisition software for pollution monitoring at Instrumentation Control Room.
3. Supply of display console with preloaded data monitoring and acquisition software.
4. Supply of necessary cables (Armoured Cables, Ethernet Cable & Communication Cable etc.).
5. Onsite calibration and supply of calibration gases of pollution monitoring sensors during installation and AMC visits.
6. Vendor shall be responsible for procurement and supply of
 - Sensors and Transmitter
 - Controllers
 - Display Node
 - Cables (Explosion Proof Cables, Ethernet cables and any other cables required)
 - Fabrication of wall mounting bracket for Transmitter and controller
 - Any other accessories required for system and installation
7. Vendor shall be responsible for end to end installation, commissioning and testing of pollution monitoring system.
8. Pole erection for Sea Level Test Facility (outside) for mounting the transmitter or wherever required is under the scope of vendor.

2.2 Terms and Conditions:

1. Vendor shall submit the layout drawings to LPSC (B) for approval and clearance from LPSC (B).
2. Installation and commissioning of the pollution monitoring system shall be carried out by trained engineers.
3. Vendor shall be responsible to supply all cable, accessories and consumable required for installation and commissioning.

4. Vendor shall be responsible for cable laying, interconnection between transmitters to controller and to display node.
5. Vendor shall be responsible for Installation and commissioning of the pollution monitoring and application software including relevant operating system. Vendor shall demonstrate the functionality of software and data logging feature.
6. Vendor should ensure functional performance of all elements in the pollution monitoring system.
7. Installation and demonstration of pollution monitoring system at site should be conducted as per the layout drawings. **Refer Annexure-IV**
8. Wiring and workmanship shall be of good quality. Wiring should be identified with clear identification tags.
9. Party shall clearly specify the name of the agency/third party which will provide service support during warranty and AMC period.
10. Vendor shall be responsible for manpower required for installation and demonstration.
11. Delivery schedule shall be within 6 months including installation and demonstration from the date of receipt of purchase order.
12. Approximate length of cable is given in Table-1 however actual will be paid after final installation.
13. While on a job in the event of damages to our property or injury to our personnel due to the negligence of the supplier's employee, the responsibility shall solely rest with the vendor.
14. The department shall not be responsible for any injury to vendor personnel, or damage to his equipment caused at our site.
15. All supplied items shall be state-of-the-art technology.
16. Any tooling required for fabrication and testing shall be realized by the vendor.
17. High quality workmanship using well trained, well qualified certified personnel and well supervisory manpower shall be employed.
18. Any non-conformance observed during the execution phase shall be reported to LPSC (B) formally through a non-conformance report along with the root cause.
19. All consumables required for testing the system shall be arranged by the vendor.

2.3 Warranty:

The full system shall be warranted for a minimum period of 12 months from the date of acceptance at our site.

2.4 Documents:

The following documents shall be submitted along with the offer

1. Detailed specifications of quoted items.
2. Certificate of Origin.
3. ATEX approvals Certificate for transmitters shall be provided
4. In case of quote by an agent, agent shall submit a valid authorization certificate obtained from OEM along with quote.

The following documents shall be submitted along with the supply

1. User manual, diagnostic procedure and technical catalogue (English) for Safety sensors, transmitter, controller and display node.

2.5 Comprehensive Annual Maintenance Contract:

The party should undertake **comprehensive** AMC for a period of two years after completion of warranty. The quote shall be in Indian rupees. The comprehensive AMC is to be carried out only by the authorized Indian service provider of the manufacturer.

The supplier shall compulsory under take the AMC after the completion of warranty. The scope of work given below

2.5.1 Scope of work:

Two preventive maintenance visits per year and duration shall be till completion of maintenance. The scope shall also include any number of breakdown visits.

1. Cleaning and functional checking of all sensors, transmitter, I/O modules, relay modules and controller once in a 6 month.
2. Supply of requisite calibration gases for calibration of all Ammonia Sensors.
3. Calibration of Ammonia sensors once in a sixth month and issue of calibration certificate.

4. Replacement of the Hydrazine sensors once in a year is under the supplier's scope including purchasing.
5. Replacement of the Ammonia sensors once in a year is under the supplier's scope including purchasing.
6. Replacement of any faulty component in transmitter, I/O modules, relay modules and controller is under the supplier's scope including purchasing.
7. Any number of break down visits should be attended within 48 hrs after reporting.
8. Details of sensors including the validity date & date of manufacturing to be produced to LPSC before replacement.

2.5.2 Type of contract:

The proposed Annual Maintenance Contract shall be of Comprehensive type.

The quantity of the equipment to be covered and activities under AMC are as follows

Sl.No.	Item	QTY.	Description
1.	AMC for NH3 sensor inclusive of sensor replacement (once in a year) with calibration (once in a 6 months) for 2Years (after completion of 1 year warranty)	4	Calibration of sensors once in 6 months and replacement in sensors once in 1 Years.
2.	AMC for N2H4 sensor inclusive of sensor replacement once in a year for 2Years (after completion of 1 year warranty)	9	Replacement in sensors once in a Year. Inspecting twice in a year
3.	AMC for Pollution Monitoring Controller including all modules.	Control unit with all accessories	Cleaning and functional checking of controllers twice in a year. Replacement of faulty parts.
4.	AMC for Pollution Monitoring Transmitter for each sensor with or without pump	13	Cleaning and functional checking of transmitter twice in a year. Replacement of faulty parts.
5.	Display Console	1	Cleaning and functional checking of display console twice in a year. Replacement of faulty parts.

Table-2

2.5.3 Period of contract:

1. The maintenance contract shall be valid for a period of 2 years (after completion of 1 year warranty) however it shall be open to purchaser to terminate the contract at any time during its currency by giving one-month advance notice in writing.
2. The maintenance contract may be extended for one more year based on satisfactory performance of the vendor and on mutual consent between LPSC and Vendor, with same rates and terms & conditions. However, there is no guarantee of any extension or renewal of the contract after expiry of the initial 2 years.

2.5.4 Preventive Maintenance:

The authorized Indian service provider shall perform preventive maintenance twice in a year.

2.5.5 Breakdown Maintenance:

1. The authorized Indian service provider shall attend any number of breakdown calls per year, immediately within 48 hours of intimation during the contract period on payment basis.
2. The Breakdown maintenance visit charges shall be quoted separately.

2.5.6 Payment Terms:

1. Maintenance charges shall be paid after every half yearly on pro-rata basis on completion of satisfactory service.
2. However, at the end of each service, a service report duly signed by contractor, Indentor and Indentor Divisional Head/DGM/GM shall be obtained from the user division to the effect that the items have been serviced and is working satisfactorily and shall be submitted to the Accounts Officer, LPSC Bengaluru along with bill / invoice in duplicate with a copy to Purchase and Stores Officer (Stores).
3. The Breakdown maintenance charges shall be paid after each visit.

3. Scope of LPSC:

1. Required building as per the layout will be provided.
2. 230VAC, 50Hz single phase power supply is under the scope of LPSC (B).
3. To provide consumables like water, electricity, etc.
4. To provide final acceptance matrix and evaluation of the system.

5. To provide final acceptance of the system based on the acceptance test data analysis and review committee clearance.

4. Instructions to bidder & General Conditions:

1. Proposals are invited for the specified scope of work in two-part bid basis. The two part are
Part-1: **Technical and Unpriced commercial part**
Part-2: **Priced commercial part**
2. All risks in transit shall be exclusively borne by the bidder and shall pay only for such item as are actually received in good condition in accordance with the purchase order.
3. Department may open Part-1 of the bids on the due date of opening at stipulated time. Subject to meeting the minimum evaluation criteria, price bid (Part-2) of the technically and commercially acceptable bids shall be opened at a later date.
4. **No cost related information shall be provided in the Techno-commercial bid (Part-1). If so, the bids shall be rejected and not considered for further evaluation.**
5. Compliance to proposal requirement: Technical compliance statement shall be submitted by bidder without which offer will not be considered for evaluation. Department expects bidder's compliance to requirement of proposal document without any deviation. Deviation if felt absolute necessary shall be furnished in the techno commercial part (not in proposal document or price bid). Department shall not take a cognizance of any deviation stipulated elsewhere in the bid. Any willful attempt by the bidder to camouflage the deviation by giving them in the covering letter or any other document that are enclosed may render the bid itself non responsive.
6. The detailed breakup cost of the items i.e. sensors; transmitters, controllers, display, cabling etc. shall be provided in the **Price bid only (Part-2)**. However, an unpriced replica of the same shall be submitted in Techno-commercial bid (Part-1).
7. The detailed breakup cost of the AMC shall be provided in the **Price bid only (Part-2)**. However, an unpriced replica of the same shall be submitted in the Techno-commercial bid (Part-1).

8. The order shall be placed to a single party. Incomplete bidding shall lead to rejection of bid.
9. While on a job in the event of damages to our property or injury to our personnel due to the negligence of the supplier's employee, the responsibility shall solely rest with the supplier.
10. The department shall not be responsible for any injury to supplier personnel, or damage to his equipment caused at our site.

5. Bill of Materials

S.No.	Description	Qty. (Nos)	Vendor
1	Hydrazine (N ₂ H ₄) Sensor	9	
2	Ammonia (NH ₃) Sensor	4	
3	Transmitter without Pump	13	
4	Controllers	2	
5	Display Console	1	
6	Cables (Armoured, Power, interface cable, Ethernet etc)	As per requirement	
7	Calibration Gas	As per requirement	
8	Accessories	As per requirement	
9	Consumables	As per requirement	

Table-3

6. Specifications of Pollution Monitoring System:

6.1 Specifications of N₂H₄ Sensor Qty. 9Nos:

S.No.	Description	Specification
1	Type	Electrochemical
2	Gas	N ₂ H ₄
3	Range	0-1ppm
4	Lower Detection Limit	0.05ppm
5	Linearity tolerance	≤± 5% of measured value
6	Repeatability/ accuracy: zero Sensitivity	≤± 0.05 ppm ≤± 5% of measured value

Table-4

6.2 Specifications of NH3 Sensor Qty. 4Nos:

S.No.	Specification	Description
1	Type	Electrochemical
2	Gases	NH ₃
3	Range	0-100 ppm
4	Lower Detection Limit	15 ppm
5	Linearity tolerance	≤± 5% of measured value
6	Repeatability / accuracy: zero Sensitivity	≤± 3 ppm ≤± 5% of measured value

Table-5

6.3 Specifications of Transmitter Qty. 13Nos:

S.No.	Specification	Description
1	Type	Intrinsically safe transmitter
2	Gases to be detected	NH ₃ & N ₂ H ₄
3	Range	As per sensor
4	Display	Large graphic display. Display should show values in digital
5	Selection Keys	Navigation keys for menu selection and setting
6	Analog output	4-20mA
7	Digital output	HART or equivalent standard protocol
8	Power Supply	Suitable DC power supply should be provided
9	Relay	Alarm relay should be provided
10	Temperature	10-40 Deg. C
11	Pressure	Ambient
12	Humidity	20-80%
13	Enclosure	NEMA-4 with M 20 gland
14	Explosion Standard	EExia T4 IIC
15	Mounting	Wall Mounting
	Accessories	Wall mounting Kit
		4-20mA I/O card
		Relay Module
		All essential accessories which are not listed should be mentioned separately

Table-6

6.4 Specifications of Controller:

Sl.No.	Specification	Description
1	No. Of Channels	Minimum 13 channels or standard channel configuration
2	Type	Control unit for location in a non-hazardous area
3	Gases	NH ₃ & N ₂ H ₄
4	Range	User defined measuring range.
5	Input	All configuration by Laptop/computer 4-20mA transmitter with 2 or 3 core cable/ HART
6	Output	<ul style="list-style-type: none">• Alarm provision to be provided for faults• Acknowledgment provision for alarm• LAN protocol should be supported (TCP/IP)• Controller shall display transmitter output in digital format for each channel
7	Display	<ul style="list-style-type: none">• Backlit LCD or better• LEDs shall be provided for each channel (function, fault, Alarm)
8	Keys	Necessary keys to be provided
9	Interface	Interface cable to interface with the computer
10	Power Supply	AC Supply : 230 V AC, 50 Hz
11	Temperature	10-40 Deg. C
12	Pressure	Ambient
13	Humidity	20-80%
14	Protection Class	IP 65
15	Mounting	Wall Mounting/Panel Mount
	Accessories	Wall mounting Kit
		4-20mA I/O card
		Relay Module
		Interface cable to interface with the computer
		TCP/IP Gateway Module/ Modbus Gateway
		Necessary Software for data monitoring and acquisition
		All essential accessories which are not listed should be mentioned separately.
		Controller shall be able to provide excitation to transmitter and retrieve output from transmitter

Table-7

6.5 Specifications of Display Console Qty. 1Nos:

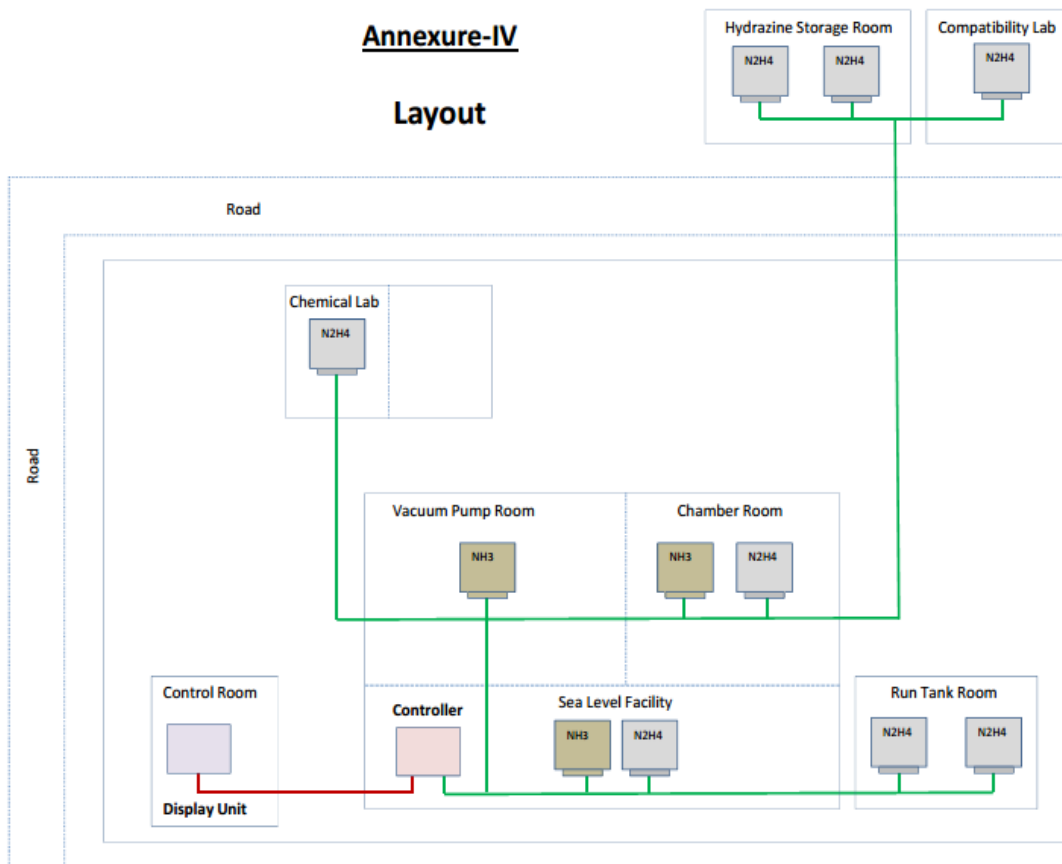
Sl. No	Parameters	Specification
1	CPU	Intel core i7, 3.4GHz, 8MB cache or higherversion, 64-bit processor i7, 12 th Generation
2	Chipset	Intel Q8 series
3	Screen	23.8", LED backlight, 1920 X 1080 & built-in speaker
4	Memory	8 GB 1600MHz DDR4 RAM with 32 GB expandability
5	Graphics	Integrated Intel HD graphics
6	Ethernet provision	Mother board - 1 No. Additional Network Interface Card- 1 No

7	USB ports	Minimum 5
8	Optical drive	16 X DVD \pm RW
9	Keyboard	Multimedia keyboard with USB 2.0 Interface Mouse: 2-Button optical scroll mouse with USB 2.0
10	Mouse	2-Button optical scroll mouse with USB 2.0/3.0 Interface with Mouse Pad
11	OS	64 Bit windows 11 professional or the latest version with perpetual license
12	MS Office	New Microsoft office with perpetual license for the Windows OS shall be provided
13	Hard Disk	1TB SATA III
	Display Node shall be loaded with monitoring and acquisition software.	

Table-8

Annexure-IV

Layout



Layout of Pollution Monitoring System