Tender Notice No.: 19 / 2015 – 16 / MPGS – Cath Lab / IGIMS / STORE (Group – A)

BIDDING DOCUMENT

For

Supply, Installation and Commissioning of Centralized Medical Gas Pipeline System at newly constructed Cardiac Cat Lab Unit at 2nd Floor, Diagnostic Block (Besides Auditorium) at I.G.I.M.S. – Patna.

INDIRA GANDHI INSTITUTE OF MEDICAL SCIENCES,
SHEIKHPURA, PATNA – 800 014 (BIHAR)

CONTENTS

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Schedule – I

1. Instruction to Bidders

1.1 Bids are invited, for and on behalf of Director, Indira Gandhi Institute of Medical Sciences – Patna from established, reputed and experienced manufacturers or their authorized representatives for **Supply, Installation and Commissioning of Centralized Medical Gas Pipeline System at newly constructed Cardiac Cat Lab Unit at 2nd Floor, Diagnostic Block (Besides Auditorium) at I.G.I.M.S. – Patna** as per the enclosed Technical Specifications (Annexure-I)..

1.2 Bidders are invited to study the tender document and terms & conditions carefully. Submission of tender shall be deemed to have been done after careful study and examination of the tender document with full understanding of its implications.

1.3 The scope of work shall include Supply, Installation, Commissioning, & Satisfactory Demonstration. This will also include testing, packing, transportation, scheduling of transportation, transit insurance, delivery at sites, unloading, storage, job site storage, insurance, installation any other services associated with the delivery of the equipment and materials providing warranty of services and operation and maintenance of other related equipment / items required for complete installation. The successful bidder will assume full responsibility of the complete system until final acceptance.

1.4 It will be imperative on each bidder to fully acquaint himself with all the local conditions and factors which would have any effect on the performance of the System. No request for the change of price, or time, schedule of delivery of stores shall be entertained after the purchaser on account of any local condition or factor accepts the offer.

1.5 The bidders are required to have a survey including a site visit before furnishing the quotations and make further enquiries (if any) from **Senior Bio-Medical Engineer, I.G.I.M.S. - Patna**. Any expenses, in connection with the visit and surveys, shall be borne by the bidders themselves.

2. Schedule of Tender

2.1 The non-transferable Tender Document will be sold on payment of tender fee of Rs.2000/- (Rupees Two Thousand only - non-refundable) through demand draft payable at Patna drawn in favour of the Director, IGIMS, Patna.

2.2 The non-transferable tender document can be downloaded from the institute website www.igims.org. The cost of the tender document as stated in para 2.1 above is to be enclosed in a separate envelope with note "**Cost of Tender Document**" at the cover of the envelope.

2.3 The sealed bids will be **accepted up to 15 / 03 / 2016 up to 4:00 P.M.** by regd. / speed post / courier services in the office of the Director, IGIMS – Patna

2.4 The Commercial bids of the short listed bidders will be opened at the office of the Director, IGIMS – Patna as the case may be in the presence of their authorized representatives, if any.
(The date of opening of commercial bids will be communicated to the technically successful bidders).

25 All the correspondences shall be addressed to the Office of the Director, I.G.I.M.S., Sheikhpura, Patna – 800 014 (Bihar, India)

3. On site functional assessment of the similar installation and equipment of the short listed Bidders will be undertaken, if necessary, by the Committee duly constituted by the IGIMS.

4. Purchaser's Right to Vary Quantities at the time of Award

The Purchaser reserves the right to vary the quantities and/or services and/ or split the order among the selected Bidders.

5. Purchaser's Right to accept any Bid and to reject any or all bids

The Purchaser reserves the right to accept any bid, and to annul the tender process and reject all bids at any time, without assigning any reason. Prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Purchaser's action.

6. Bidder Qualification

The "Bidder" as used in the tender documents shall mean one who has signed the Bid Form. The Bidder may be either the manufacturer of the equipment/ material for which prices are quoted on the Price Schedule or his duly authorized representative, in which case he shall submit a certificate of authority. All certificates and documents received hereby, shall, as far as possible, be furnished by the manufacturer/ representative of the firm.

7. Bid Security/Earnest Money

7.1 **Bid Security** amount should be enclosed along with the Technical Bid for an amount equal **to 2% (two percent) of the total quoted project value** in the form of Bank Guarantee from any Indian Scheduled Bank valid for one year from the date of opening the tender or by way of Demand Draft drawn in favor of Director, IGIMS, Patna, failing which the tenders will be out rightly rejected. Bid Security/EMD, if already deposited against other tenders, shall not be adjusted against this tender.

7.2 The "**Bid Security/Earnest Money Demand Draft**", in case of unsuccessful Bidders, shall be retained by the Purchaser, upto a maximum period of One year from the date of opening of the Bids or till the finalization of the tender, whichever is later. The Bid security shall be refunded to the unsuccessful tenderers on written request. No interest will be payable by the Purchaser on the Bid Security/EMD.

7.3 The Bid Security/Earnest Money shall be forfeited;

a) If a Bidder withdraws his bid during the period of bid validity specified by the Bidder in the Bid; or

b) In the case of the finally selected Bidder, if the Bidder fails;
   i. to sign the Contract in accordance with Clause 17; or
   ii. if, at any stage, any of the information/declaration is found false

7.4 Bid security/Earnest Money in respect of the finally selected Bidder(s) will be discharged upon the Bidder(s) executing the Contract and successful completion of work-

8. Period of Validity of Bids

Bids shall remain valid for One year from the date of bid opening prescribed by the Purchaser. The Purchaser may reject a bid valid for a shorter period as non-response

9. THE FORWARDING LETTER/UNDERTAKING ALONGWITH CHECKLIST FOR TERMS & CONDITIONS DULY SIGNED SHOULD INVARIABLY BE RETURNED ALONGWITH QUOTATIONS FURNISHED, FAILING WHICH THE TENDER SHALL BE REJECTED.

10. Terms and Conditions of Tendering Firms

10.1 Printed terms and conditions of the Bidder will not be considered as forming part of their Bids. In case terms and conditions of the contract applicable to this invitation of tender are not acceptable to any Bidder, he should clearly specify deviation in his Bid.

11. Bid Requirements

11.1 The Bidder must quote for the equipment with all items and quantities as listed under the Schedule for Requirements.

11.2 Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total unit price as declared in the Price Schedule the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail. If the supplier does not accept the correction of the errors, its bid will be rejected.

11.3 The Bid Documents are not transferable and the cost of the documents is not refundable under any circumstances.

11.4 Bids from Bidders who have not downloaded the Bid document or Bids not accompanied by Bid Security or Bids from representatives without letter of Authority from the manufacturers will be summarily rejected.

11.5 Telex/Fax bids and incomplete bids will be summarily rejected.

11.6 Bidders should enclose, along with the Techno-Commercial Bid of their offers, the full details including proposed configuration of offers with full documentation, descriptive literature/leaflets supplementing the description and point out any special feature of their system. All documentation is required to be in English.

11.7 The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

11.8 All pages of the Bid being submitted must be signed and sequentially numbered by the Bidder.

11.9 All information in the offer must be in English. Information in any other language must be accompanied by its authenticated translation in English. Failure to comply with this may render the offer liable to be rejected. In the event of any discrepancy between the offer in a language other than English and its English translation, the English translation will prevail.

12. Bid Prices

12.1 IN CASE OF IMPORT, THE TENDERERS ARE REQUIRED TO QUOTE FOB & CIF VALUE SEPARATELY DULY MENTIONING THE BREAKUP DETAILS FOR FREIGHT & INSURANCE. THIS CONDITION SHOULD BE STRICTLY ADHERED TO FAILING WHICH THEIR TENDER WILL BE SUMMERLY REJECTED.

12.2 The bidder shall indicate on the Price Schedule attached to these documents the Unit Prices and the total Unit Prices of the goods it proposes to supply under the Contract in the following manner:

i) Unit FOB & CIF price separately for each item (excluding customs duty) giving breakup of freight & Insurance charges.
ii) Customs duty on per unit CIF price
iii) Local levies, if any, on per unit price
iv) Other incidental charges, if any, on per unit price
v) Unit price, for destination
vi) Total unit price, for destination. Excise duties, sales tax if included should be explicitly specified.

12.3 It should be noted that payment by the Purchaser towards customs duty and local levies, if any would be made on actual. The purchaser would provide appropriate forms applicable to purchases made.

12.4 The prices quoted by the Bidder and accepted by the sub-committee duly constituted by IGIMS shall hold good till the completion of the works and no additional claims will be admissible on account of any price variation or fluctuation in market rates.

12.5 Payments made consequent to any notified change in custom duties, excise duties and sales tax (both increase and decrease) shall be to the Purchaser's account. For such claims of variation, the Bidder shall produce the Government notification as documentary evidence. Price variation due to any other cause shall be on Bidder's account.

12.6 The finally selected Bidder will have to apply to the proper Government Authority for grant of requisite License /foreign exchange for such items as required and the purchaser will only tender such assistance, as considered necessary.

12.7 The firm has to provide the breakup expenditure of different quoted items as well as total expenditure clearly for the system.

13. Contents of Bid

The Bid prepared by the Bidder shall comprise of the following two components:

a) **Technical Bid** comprising of the following and to be filled on the format sheets provided in the tender document. This is mandatory:-
   i) Bidders particulars (Annexure – A)
   ii) Bid Form (Annexure – B)
   iii) Bidder profile (Annexure – C)
   iv) Manufacturers' Authorization Form (Annexure – D)
   v) Proforma of Guarantee for supply of spares during the post warranty period (Annexure – E)

b) **Financial Bid / Price bid** to be submitted in the company's letter head duly signed & sealed by their authorized signatory/ies in the format of price bid mentioned in the bidding document.

14. Procedure for Submission of Bids

14.1 It is proposed to have a **Two Cover System** for this tender
   a) Technical Bid in one cover
   b) Financial Bid in one cover

14.2 Technical Bid of the Tender should be covered in a separate sealed cover super-scribing the wordings "Technical Bid".

PLEASE NOTE THAT PRICES SHOULD NOT BE INDICATED IN THE TECHNICAL BID. TENDERS SUBMITTED WITHOUT FOLLOWING THE TWO BID SYSTEM PROCEDURE WILL BE SUMMARILY REJECTED.

14.3 Commercial Bid of the tender should be covered in a separate sealed cover superscribing the wordings "Commercial Bid".

14.4 Both the Technical Bid cover and Commercial Bid cover prepared as above are to be kept in a single sealed cover superscribed with Tender Number and Group..

14.5 The cover thus prepared should also indicate clearly the name and address of the Bidder.

14.6 Each copy of the tender should be a complete document and should be bound as a volume. Different copies must be bound separately.

14.7 The sealed cover as mentioned at Clause 14.4 above shall be deposited with the **Director, IGIMS, Sheikhpura, Patna through registered / speed post / courier services.**

15. Opening of Bids by Purchaser

15.1 The bids (technical only) will be opened in the presence of Bidders/representatives who choose to attend on the date and time as mentioned. The Bidders/ representatives who are present shall sign a register evidencing their attendance. The Bidder's representatives shall furnish letter of authority

from their firm to attend the bid opening. Financial bids of Bidders, whose bids are found technically suitable (after the presentation, if any,) only will be opened later on. The information pertaining to opening of Financial Bid will be sent to separately. The decision of the sub-committee on technical suitability shall be final and shall not be opened for discussion.

16. Award of Contract

Prior to the expiry of the period of bid validity, the Purchaser will notify the finally selected Bidder(s) in writing by registered letter or by e-mail, to be confirmed in writing by registered letter or by Hand in person, that its bid has been accepted. If a need for extension of the bid validity period arises, it should be extended by mutual agreement. The notification of award will constitute the formation of the Contract.

17. Signing of Contract

17.1 At the same time as the Purchaser notifies the finally selected Bidder(s) that its bid has been accepted, the finally selected Bidder(s) shall collect the Work Order from the office of the Director.

17.2 Within 7 (seven) days of the receipt of Work Order, the finally selected Bidder(s) shall start the work and complete it within fifteen (15) days.

17.3 Without prejudice to any legal remedy, failure of the finally selected Bidder(s) to comply with the requirement of Clause 7.3 (a) or Clause 7.3 (b) shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Purchaser may make the award to the next lowest evaluated Bidder or call for new bids.

18. Inspection and Tests

The Purchaser shall have the right to inspect and/or test the equipment for conformity to the Contract Specifications.

18.1 In case any inspected or tested equipments fail to conform to the specifications, the Purchaser may reject them and the supplier shall either replace the rejected equipments or make all alterations necessary to meet specification requirements free of cost to the Purchaser.

18.2 The supplier shall provide installation and standard tests for the individual equipment before the delivery of the system at site.

18.3 The supplier shall test each individual equipment and the complete system after installation at site and prepare a test report. This shall be compared with the factory test report to ensure that there is no deterioration in the equipment parameters during storage, transportation and installation.

18.4 Leaflets and literature should invariably be attached for ready references along with complete documentation of all the measurements conducted during installation period which shall be submitted by the supplier for future reference.

18.5 The technical problems faced during installation, testing and commissioning period and their solutions shall be submitted by the supplier at the time of handing over the completed works.

18.6 For the purpose of taking over the equipment/system supplied pursuant to this contract, an acceptance test shall be carried out at the Purchaser/Consignees destination site. The equipment which meets the acceptance test shall only be accepted by the Purchaser.

18.7

(a) Acceptance Test at site shall be conducted of individual equipment and complete system to ensure that individual equipment and complete system meets the technical specifications and other operational and technical requirements of tender.

(b) The Purchaser shall have the right to reject any individual equipment or complete system, if in its opinion the same does not meet technical specifications, operational or technical requirements. The decision of the purchaser in this regard shall be final.

(c) The delivery, installation or commissioning shall not be deemed to have been completed unless all the equipments and systems are accepted by the purchaser.

19. Spare Parts

19.1 The Bidder will undertake that supplies of necessary maintenance equipment and spare parts will be made available for all items/equipments and the complete system for at least ten years on a continuing basis. However, this does not relieve the supplier of any warranty obligations under the Contract.

19.2 The Bidder shall include in his tender, the details of essential spares, their quantity and unit prices as per schedule of requirements. Detailed explanation to confirm that quantity of spares quoted as per requirement of this clause shall be given.

19.3 In addition to the essential spares, Bidder shall indicate additional recommended quantities of spares for efficient maintenance of the equipment and the systems for a period of 5 years, after the completion of warranty period, to ensure that the quality and reliability objective is achieved. The details on which unit price and the total cost or recommended spares is based shall be included in the tender as an option. However, the cost of such recommended spares shall not be considered for tender evaluation

20. Warranty

20.1 Complete work should have comprehensive (labour, spares and all type of consumables) onsite warranty **for five years**; commencing from the date of issue of installation certificate by the institute.

20.2 Incremental Cost (if any) for, upgradation, if required, should form part of the contract for the Warranty period.

20.3 The technical maintenance personnel of the supplier responsible for supervision and maintenance shall be available to reach the site(s) within 24 hour's notice.

20.4 If the performance of any individual equipment or system is not satisfactory, the same shall be replaced by the supplier free of cost.

20.5 If it is found that to meet the performance criteria, any extra equipment is required the same will be provided free of cost by the supplier.

20.6 All faults appearing and their rectification shall be periodically advised to the hospital, the period being not more than a month.

20.7 Any lacuna or lacunae noticed in the functioning of the installation as a result of any design feature shall be rectified by the supplier free of cost.

20.8 **The Supplier shall fully associate the engineers and technicians of the Institute during installation, testing, commissioning, operation and maintenance period.**

21. After Sales Services and Comprehensive Maintenance Contract (Post Warranty CMC)

After sales services will be provided by the supplier during and after guarantee period of the equipment. Details along with the yearly comprehensive maintenance charges for five year after warranty shall be forwarded provided.

22. Previous Installations

The names and address of the institutions/hospitals where the supplier has already installed/supplied the equipment indicating the dates of installations may be given (in India and abroad).

23. Delivery, Installation and Commissioning

23.1 Delivery of the goods at the Institute premises shall be completed by the Supplier within 15 days from the date of Supply Order.

23.2 The installation, testing and commissioning of the proposed system shall be completed within 21 days from the date of Supply Order, failing which necessary action as deemed fit under rules, will be taken against the defaulter.

24. Incidental Services

24.1 The supplier is required to provide Hardware and Software up gradation from time to time, at mutually agreed terms. During warranty all Software updated version / up gradations are expected to be provided at free of cost to Purchaser.

24.2 Further, any bugs/shortcomings detected by the purchaser/user as well as the supplier himself shall be rectified at free of cost to purchaser beyond warranty period

25. Site Preparation

25.1 The site for installation of the equipment shall be provided by the purchaser as per the required specification and environmental conditions before the installation of System.

25.2 Site Plan and System layout plan including civil/electrical work or other related works shall be prepared by the supplier.

25.3 Earthling arrangements for all the equipment shall be completed as per standard practice

26. Termination for default

The purchaser may without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, terminate the contract in whole or in part.

i) If the supplier fails to deliver or install system within the time period(s) specified in the contract.

OR

ii) If the supplier fails to perform any other obligation(s) under the contract.

27. Use of Contract Document & Information

The supplier shall not, without the Purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample of information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the supplier in the Performance of the contract

28. Property Rights

The Supplier shall indemnify the Purchaser against all third party claims of infringement of patent, copyright, trademark, license of industrial design rights, software piracy arising from use of the goods or any part thereof in the Purchaser's country.

29. Payment

Procedure for payment: The paying authority on production of the following documents shall make 90% Payment.

i. Invoice in triplicate are to be submitted to the paying authority along with the other documents after completion of the supply.

ii. Stock Entry Certificate is to be obtained in the body of the Invoice in triplicate.
iii. The original Challan Copy.
iv. Installation and Completion certificate of the Turnkey job issued by the institute authority.
v. Warranty certificates.

The balance 10% payment will be released after expiry of warranty period of five years or on submission of Bank Guarantee of the same amount with a validity to cover up the warranty period.

30. Packing and Marketing

Best trade packing suitable for safe Rail/Road/Air/Sea transit shall be used subject to packing and marking being acceptable to the Inspecting Authority.

(a) The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the contract. The packing shall be sufficient to withstand without limitation, rough handling during transit and exposure to extreme temperature, salt and precipitation during transit and open storage. Packing case, size and weights shall take into consideration, where appropriate, the remoteness of the Goods final destination and absence of heavy handling facilities at all points in transit.

(b) The packing marking shall show the description of quantity of contents, the name of the consignee and address, the gross weight and distinctive number of mark sufficient for purpose of identification. Each package shall contain:

i) A packing note quoting the name of the purchaser.
ii) The number and date of order
iii) Nomenclature of the gods
iv) Schedule of parts of each complete equipment giving part number with reference to assembly.

Notwithstanding anything stated in this clause, the supplier shall be entirely responsible for loss, damage, deterioration, depreciation of the goods due to faulty packing.

31. PREPARATION AND DELIVERY OF TENDER

Tender documents must be signed by the tenderers in full along with their stamp.

32. Arbitration

If, at any time, any question, dispute or difference whatever shall arise between the two parties (IGIMS on the one hand and vendor on the other hand) in relation to the purchase either of the parties may give to the other notice in writing of the existence of such a question, dispute or difference and the same shall be referred to two arbitrators, one to be nominated by the Director, IGIMS, and the other to be nominated by the firm. Such a notice of the existence of any question, dispute or difference in connection with this purchase shall be served by either party within 30 days of the beginning of such dispute failing which all rights and claims shall be deemed to have been forfeited and absolutely barred.

Before proceeding with the reference the arbitrators shall appoint/nominate an Umpire. In the event of the arbitrators not agreeing in their award the Umpire appointed by them shall enter upon the reference and his award shall be blinding on the parties. The venue of the arbitrator shall be at IGIMS. The provision of the Indian Arbitration and Reconciliation Act 1996 and of rules framed if under and any statutory modification thereof shall be deemed to apply and be incorporated for the supply, installation and commissioning etc.

Upon every or any such reference, the cost of any incidents to the reference and award(s) respectively shall be at the discretion of the arbitrators or in the event of their not agreeing, of the Umpire appointed by them who may determine the amount thereof or direct the same to be fixed as between solicitors and client or as between parties and shall direct by whom and in what manners the same shall be borne and paid.

33. Jurisdiction

The courts at Delhi will have the jurisdiction to try any matter, dispute or reference between the parties arising out of the contract. It is specifically agreed that no court outside and other than Court shall have jurisdiction in the matter.

34. Force Majeure

Any failure of omission or commission to carry our the provision of the contract by the supplier shall not give rise to any claim by any party, one against the other, if such failure of omission or commission arises from an act of God, which shall include all acts of natural calamities such as fire, flood, earthquake, hurricane or any pestilence or from civil strikes, compliance with any stature and/or regulation of the Government, lockouts and strikes, riots, embargo or from any political or other reasons beyond the supplier's control including war (Whether declared or not) civil war or state or insurrection, provided that notice or the occurrence of any event by either party to the other shall be given within two weeks from the date of occurrence of such an event which could be attributed to Force Majuere conditions.

The Institute reserves the right to accept or reject in whole or in part any or all the quotations received without assigning any reasons thereof.

35. Termination for Insolvency

The purchaser may at any time terminate the contract by giving written notice to the supplier, without compensation to the suppliers, if the supplier becomes bankrupts or otherwise insolvent (which events shall of themselves be a breach of the contract on the part of the supplier), provided such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

36. Termination for Convenience

The purchaser, may by written notice sent to the supplier terminate the contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of work under the contract is terminated becomes effective.

The good that are complete and ready for shipment within 30 days after the supplier's receipts of notice of termination shall be purchased by the purchaser at the contract terms and prices. For remaining goods the purchaser may elect.

a) To have any portion completed and delivered at the contract terms and prices; and/or
b) To cancel the remainder

37. Government Language

The contract shall be written in the language of the Bid (English Language) as specified by the Purchaser. All correspondence and other documents pertaining to the contract shall be in English.

38. Operation

The firm should be responsible for running the system for at least one year or till such time our staff is trained to handle the system. Training of the staff will be responsibility of the firm at the expense of the firm.

39. Up time guarantee:

The firm should provide uptime guarantee of 95% (95% of 365 days).

40. Downtime penalty Clause

41.1 During the comprehensive warranty period, the guarantee uptime of 95% of 365 days will be ensured. In case the down time exceeds the 5% limit penalty of extension of guaranty period by one weak for each additional day of down time will be enforced.

41.2 The principals or their agents are required to submit a certificate that they have satisfactory service arrangements and fully trained staff available to support the uptime

SPECIAL TERMS AND CONDITIONS FOR TENDER SUBMISSION

1. The tenderer should have been in this business for a period of at least five years in the country in relation to the type of equipment/drugs for which the quotations/tenders are being submitted.

2. A proof of ownership/partnership etc. shall be submitted along with verification of address, telephone & fax numbers.

3. The attested copies of latest Income tax clearance certificate and sales tax certificate, if applicable, should be submitted in absence of which tender shall be rejected.

4. The tenderer should submit statement of financial standing from their bankers. The name of the bank along with full address is to be furnished.

5. The supplier should submit a statement of overall turnover for the previous three years. If applicable a copy of the applicants annual report and accounts for each of the last three years should also be submitted.

6. The tenderer is also required to submit performance report from other similar organizations where the firm is registered for supply and erection of similar projects of hospital equipments/System. He will also submit list of organizations where the System has been installed by the firm.

7. The tenderer has to give a certificate that the firm has not been blacklisted in the past by any Institution - Government/Private.

8. The tenderer is also requested to submit authority letter from manufacturers/principals of supplying equipment /drugs without which tender will not be considered.

9. The tenderer/supplier has to give an affidavit on a non-judicial stamp paper that there is no Vigilance / CBI case pending against the firm/supplier.

10. If the tenderer gives a false statement on any of the above information the firm/supplier will not be considered and their quotation/tender shall be rejected and the security deposited shall be forfeited.

11. The Institute will have the right to reject any tender without assigning any reason.

12. The manufacturer should submit all the quotations directly or through their authorized distributor provided the manufacturer accepts responsibility for any lapse on the part of distributor and authorization certificate must be enclosed.

13. Quality assurance certification like ISO 9000 series should be enclosed wherever applicable.

14. It is mandatory for bidder(s) top provide maintenance visits on per month basis during warranty as well as during Comprehensive Annual Maintenance Contract (including Labour + Spares + all type of consumables) period and also attend all breakdown calls within 24 hours from the receipt of the information.

To be enclosed with Technical Bid

ANNEXURE-A

BIDDER PARTICULARS

1. Name of the Bidder :

2. Address of the Bidder:

3. Name of the Manufacturer (s):

4. Address (es) of the Manufacturer:

Telephone :

Telex :

Fax :

e-mail address :

Signature

Name

Designation

Company

Date

Company Seal

To be enclosed with Technical Bid

ANNEXURE-B

BID FORM

Dated:

To,

_____

_____

_____

Sir,

Having examined the Bidding Documents of Tender No._____ undersigned offer to supply, install, commission, operate maintain_____ and we undertake, if our bid is accepted, to complete delivery of all the items specified in the contract Within_____weeks calculated from the date of receipt of your Notification of Award and to complete the installation, testing commissioning.....

Signature and Seal

(In the capacity of)

Only Authorized to sign bid for and on behalf of.....……

To be enclosed with Technical Bid

ANNEXURE-C

BIDDER PROFILE

A. General Information:

(i) Location of Corporate Headquarters :

(ii) Date and Country of Incorporation :

(iii) Manufacturing Facility (S)
Location
Size
Capacity

(iv) No. of Service Facility(S) in India
Location
Strength
Area Covered

(v) Average yearly turnover for last three years:

(vi) Geographical Distribution of the Supplier:
No. of Offices
Locations
Staff strength

(vii) Total No. of installations of the system offered.

(viii) No. of Employees

	Total No.	Manufacturing	R&D (If any)
Hardware Maintenance			
Software			

B. Reference of Major installation with similar products (attach documents in support, if available)

S. No.
Customer Name, Address Product Description Telephone Fax Number (No. of Machines installation year wise)

_____

_____

Date..... **Signature and seal of bidder**

To be enclosed with Technical Bid

ANNEXURE-D

PROFORMA FOR AUTHORITY FROM MANUFACTURERS

No..... **Dated.....**

To,

Dear Sir,

Sub: Tender No.....

(Name and Address of the Authorized representative) to represent us, to tender, negotiate and conclude
the contract on our behalf with; you against Tender no.....……..
No company/firm or individual other than M/s.....……. are authorized to represent us in regard to this business against this specific tender.

Yours faithfully,
Signature and seal
Name…….....
For & on behalf of M/s
.....…….....
(Name of Manufacturers)

Note: This letter of authority should be on the letter head of the manufacturing concern and should be signed by a person competent and having the power of attorney to bind the manufacturers.

To be enclosed with Technical Bid

ANNEXURE-E

PROFORMA OF GUARANTEE FOR SUPPLY OF SPARES DURING POST WARRANTY PERIOD

To:

Dear Sir,

In consideration of the (hereinafter referred to as "Purchaser" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assignees) having awarded to M/s……..... with its Registered/Head office at …….... (hereinafter referred to as the "Supplier" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assignees), a contract by issue of the Purchaser's letter of Award no……..... dated entering into a formal contract to that effect with the Purchaser on .....…….. vide agreement dated……..... (hereinafter referred to as the contract).

We the supplier hereby give a guarantee for the supply of all necessary spares demanded for the routine and emergency maintenance of being supplied by us to for a period of not less than 5 years after the warranty period of 5 years and life time spares thereafter in case asked for by the purchaser.

We further clarify that for the first 5 years i.e. warranty period of 5 years, we are covered by the warranty clause as mentioned. For the remaining period of 5 Years and thereafter for the life time, a detailed list of spares will be supplied to the purchaser for the purpose of enabling him to decide spares needed for routine and emergency maintenance.

Dated..... day of.....20.....

Witness :

(Name of manufacturers)
Signature and Seal

(Signature)

Name:
For & on behalf of M/s

SCHEDULE- II

SCHEDULE OF REQUIREMENT

Supply, installation and commission of Comprehensive Medical Gas Pipeline System (Vacuum, Oxygen, Compressed Air & Nitrous Oxide) at newly constructed Cardiac Cat Lab Unit at 2nd Floor, Diagnostic Block (Besides Auditorium)

Part – A: To cover Cardiac Surgical Step Down ICU (12 Beds; Oxygen, Vacuum & Compressed Air):	
Description	**Qty. (approx.)**
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 130 Mtrs. 060 Mtrs. 060 Mtrs. 060 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems)	2 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	12 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	24 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	12 Nos.
Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3Gas System)	02 Nos.
Part – B: To cover Post OP ICU (09 Beds; Oxygen, Vacuum & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 90 Mtrs. 060 Mtrs. 060 Mtrs. 060 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems) for 15mm, 22 and 28mm)	2 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	09 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	18 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	09 Nos.
Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3Gas System)	02 Nos.
Part – C: To cover Operation Theatre 1, 2 and 3 (Oxygen, Vacuum, Nitrous Oxide & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 070 Mtrs. 150 Mtrs. 070 Mtrs. 070 Mtrs.
Valve with Valve Box and Pressure Gauge (4 – Gas Systems) for 15mm, 22, 28mm and 28mm)	3 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for	06 Nos.

Data Cable Input and provision for one Nurse Call System.)	
Rigid Pendants with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets and 2 Nos. of 5/15 A Power Sockets with individual switches.)	03 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	18 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	09 Nos.
Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum, Nitrous & Compressed Air – 4G System)	03 Nos.
Operation Theatre Vacuum Unit	10 Nos.
Part – D: To cover Cath Lab. – 1, 2 & 3 (Oxygen, Vacuum & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 60 Mtrs. 90 Mtrs. 90 Mtrs. 90 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems)	3 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	03 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	06 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	3 Nos.
Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3Gas System)	3 Nos.
Part – E: To cover Pre – Cath Room (8 Beds, Oxygen, Vacuum & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 90 Mtrs. 45 Mtrs. 45 Mtrs. 45 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems)	2 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	08 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	16 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	8 Nos.
Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3 Gas System)	1 Nos.
Part – F: To cover Post – Cath Room (10 Beds, Oxygen, Vacuum & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 95 Mtrs. 50 Mtrs. 50 Mtrs. 50 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems)	2 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	10 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	20 Nos.

Ward Vacuum Unit 600ml Jars with Regulator	10 Nos.
Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3 Gas System)	1 Nos.
Part – G: To cover CCU(16 Beds, Oxygen, Vacuum & Compressed Air):	
Medical Grade Copper Pipes: a. 12 mm OD x 0.9mm Thick b. 15 mm OD x 0.9mm Thick c. 22 mm OD x 0.9mm Thick d. 28 mm OD x 1.0mm Thick	 150 Mtrs. 65 Mtrs. 65 Mtrs. 65 Mtrs.
Valve with Valve Box and Pressure Gauge (3 – Gas Systems)	2 Nos.
Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)	16 Nos.
Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle	32 Nos.
Ward Vacuum Unit 600ml Jars with Regulator	16 Nos.
Operation Theatre Vacuum Unit	10 Nos.
Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3 Gas System)	2 Nos.
Part – H: To interconnect all the units (i.e. Cardiac Surgery Step Down, Post OP ICU, O.T.'s, Cath Labs, Post Cath & Pre Cath) for Oxygen, Vacuum, Compressed Air & Nitrous Oxide.	
Medical Grade Copper Pipes: a. 54 mm OD x 1.2 mm Thick b. 42 mm OD x 1.2 mm Thick c. 28 mm OD x 1.0 mm Thick	 240 Mtrs. 240 Mtrs. 350 Mtrs.
Valve with Valve Box and Pressure Gauge (4– Gas Systems) for 54mm, 42mm, 28mm and 28mm)	02 Nos.
Part – I: Additional Accessories:	
High Pressure Tube (Oxygen, Vacuum, Nitrous Oxide & Compressed Air)	100 Mtrs.
Low Pressure Tube	100 Mtrs.
Nebulizer Kit	100 Nos.
Part – J: Manifold Room Equipments / Instruments:	
Oxygen Manifold: Oxygen Manifold with middle frame: 2 x 10 Cylinder Oxygen Manifold should be suitable to withstand a pressure of 145 Kg/cm2, along with high pressure copper annealed tail pipes with end Brass adapter suitable for Oxygen Cylinders and manifold. **Oxygen Manifold Emergency with Middle Frames: 3should be suitable Cylinders Oxygen Manifold should be suitable to withstand a pressure of 145 Kg/cm2, along with high pressure copper annealed tail pipes with end Brass adapter suitable for Oxygen Cylinders and manifold.** **A High Pressure Regulator to be mounted on the Manifold System for reducing the cylinder pressure suitable to the line pressure.** **Semi Automated Control Panel.**	1 Set

Compressed Air System: **To design, fabricate, test & install Medical Compressed Air System comprising of Triplex (3 Nos.) System Air Compressors each should have 15 HP Motor mounted 500 litres Reservoir Tank and Filter, Non-Return Valve, Isolation Valves, Common Air Dryer and Pressure Reducing Station.**	1 Set
Vacuum System: **To design, fabricate, test & install Medical Vacuum System comprising of Twin System of Vacuum Pumps each should have 10/15 HP Motor, common 2000 litres Reservoir Tank, Filter, Non-Return Valve, Isolation Valves, Auto-Switch Gear to set minimum and maximum operating vacuum .**	1 Set
Note: Valve (1/8") (Butterfly Knob) is to be provided for individual drop down pipes of 12mm.	

Summary of Requirement:

1.	**Medical Grade Copper Pipes**: a. 54 mm OD x 1.2 mm Thick b. 42 mm OD x 1.2 mm Thick c. 28 mm OD x 1.0 mm Thick d. 22 mm OD x 0.9 mm Thick e. 15 mm OD x 0.9 mm Thick f. 12 mm OD x 0.9 mm Thick	 240 Mtrs. 240 Mtrs. 790 Mtrs. 440 Mtrs. 520 Mtrs. 685 Mtrs.
2.	**Valve with Valve Box and Pressure Gauge (3 – Gas Systems) for 15mm, 22 and 28mm)**	13 Nos.
3.	**Valve with Valve Box and Pressure Gauge (4 – Gas Systems) for 15mm, 22, 28mm and 28mm)**	03 Nos.
4.	**Valve with Valve Box and Pressure Gauge (4– Gas Systems) for 54mm, 42mm, 28mm and 28mm)**	02 Nos.
5.	**Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets, 4 Nos. of 5/15 A Power Sockets with individual switches, Point for Data Cable Input and provision for one Nurse Call System.)**	64 Nos.
6.	**Rigid Pendants with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets and 2 Nos. of 5/15 A Power Sockets with individual switches.)**	03 Nos.
7.	**Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle**	134 Nos.
8.	**Ward Vacuum Unit 600ml Jars with Regulator**	67 Nos.
9.	**Operation Theatre Vacuum Unit**	10 Nos.
10.	**Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3 Gas System)**	11 Nos.
11.	**Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum, Compressed Air & Nitrous – 4 Gas System)**	05 Nos.
12.	**Additional Accessories:** **a. High Pressure Tube (Oxygen, Vacuum, Nitrous Oxide & Compressed Air)** **b. Low Pressure Tube** **c. Nebulizer Kit**	 100 Mtrs. 100 Mtrs. 100 Nos.

13.	**Oxygen Manifold**	1 Set
14.	**Compressed Air System**	1 Set
15.	**Vacuum System**	1 Set
16.	**Electrical Control Panel for the operation of Compressed Air System and Vacuum System**	1 No.

Note:

1. **The quantity mentioned is only the tentative requirement and may increase or decrease as per the decision of Tender Inviting Authority. The rates quoted should not vary with the quantum of the order or the destination. The payment will be made based on the actual measurement after completion of work.**

2. **The power supply at proposed manifold room will be provided by the institute. However, the electrical supplies to Audio / Visual alarms are to be provided by the successful bidder.**

3. **The sketch map of the area to be covered under medical gas pipe line system through this tender may be obtained from office of the Senior Bio-Medical Engineer, I.G.I.M.S. – Patna.**

4. Making holes in the slab, walls, Removing false ceiling & placing back, if any, etc. will be the responsibility of the vendor and the same will be made good by him. Related malba will be removed by the contractor and will be disposed in the dumping yard as decided by the Institute Authorities.

5. Other related electric work, if any, for making the manifold functional will be executed by the vendor.

6. All civil/electrical work will be carried out as per CPWD specifications.

7. **Valve (1/8") (Butterfly Knob) is to be provided for individual drop down pipes of 12mm.**

8. **The financial bid should be quoted in following format:-**

Sl. No.	Item Description	Unit Price	Qty.	Amount
1.	**Medical Grade Copper Pipes**: a. 54 mm OD x 1.2 mm Thick b. 42 mm OD x 1.2 mm Thick c. 28 mm OD x 1.0 mm Thick d. 22 mm OD x 0.9 mm Thick e. 15 mm OD x 0.9 mm Thick f. 12 mm OD x 0.9 mm Thick		 240 Mtrs. 240 Mtrs. 790 Mtrs. 440 Mtrs. 520 Mtrs. 685 Mtrs.	
2.	**Valve with Valve Box and Pressure Gauge (3 – Gas Systems) for 15mm, 22 and 28mm)**		13 Nos.	
3.	**Valve with Valve Box and Pressure Gauge (4 – Gas Systems) for 15mm, 22, 28mm and 28mm)**		03 Nos.	
4.	**Valve with Valve Box and Pressure Gauge (4– Gas Systems) for 54mm, 42mm, 28mm and 28mm)**		02 Nos.	
5.	**Bed Head Panel with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets and 2 Nos. of 5/15 A Power Sockets with individual switches.)**		64 Nos.	

6.	**Rigid Pendants with facility of Gas Outlets (Double Lock Outlet with Parking Facility) for Oxygen, Vacuum and Air with 5/15 Power Sockets. (Duly fitted with 2 Nos. of Oxygen Outlets, 1 No. of Vacuum Outlet, 1 No. of Compressed Air Outlets and 2 Nos. of 5/15 A Power Sockets with individual switches.)**		03 Nos.	
7.	**Oxygen Flow Meter (0 – 15 LPM) brass body with unbreakable Humidifier Bottle**		134 Nos.	
8.	**Ward Vacuum Unit 600ml Jars with Regulator**		67 Nos.	
9.	**Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum & Compressed Air – 3 Gas System)**		11 Nos.	
10.	**Digital Medical Gas Line Pressure Area Alarm (Oxygen, Vacuum, Compressed Air & Nitrous – 4 Gas System)**		05 Nos.	
11.	**Additional Accessories:** **a. High Pressure Tube (Oxygen, Vacuum, Nitrous Oxide & Compressed Air)** **b. Low Pressure Tube** **c. Nebulizer Kit**		100 Mtrs. 100 Mtrs. 100 Nos.	
12.	**Supply, installation and commissioning of Oxygen Manifold**		1 Set	
13.	**Supply, installation and commissioning of Compressed Air System**		1 Set	
14.	**Supply, installation and commissioning of Vacuum System**		1 Set	
15.	**Electrical Control Panel for the operation of Compressed Air System and Vacuum System**		1 No.	
			Add Taxes…	
			Net Amount:	

SCHEDULE - III

DETAIL TECHNICAL SPECIFICATIONS OF VARIOUS ITEMS

1. Distribution piping

- Solid drawn, seamless, deoxidized, non arsenical, half hard, tempered and degreased copper pipe conforming to any one of the standards .All copper pipes should be degreased & delivered capped at both ends. The pipes should be accompanied with manufacturers test certificate for the physical properties & chemical composition. Copper pipe will also have reputed third party inspection certificate (Eg. Loyd's).
- Fittings shall be made of copper and suitable for a steam working Pressure of 17 bar and especially made for brazed socket type connections.
- The Isolation Valves will be made of chromium plated brass and Non Lubricated Ball type. All valves shall be pneumatically tested for twice the working pressure and Factory Degreased for medical gas service.

Installation & Testing

- Installation of piping shall be carried out with utmost cleanliness. Only pipes, fittings and valves that have been degreased and fittings brought in polythene sealed bags shall be used at site.
- Pipe fixing clamps shall be of nonferrous or non-deteriorating plastic suitable for the diameter of the pipe.
- All pipe joints shall be made using flux less brazing method. All joints shall be made of copper-to-copper and brazed by silver brazing filler material without flux.
- Adequate supports shall be provided while laying pipelines to ensure that the pipes do not sag. Suitable sleeves shall be provided wherever pipes cross through walls / slabs. All pipe clamps shall be non-reactive to copper.
- After erection, the pipes will be flushed with dry nitrogen gas and then pressure tested with dry nitrogen at a pressure equal to twice the working pressure or 150 psig, whichever is higher for a period of not less than 24 hours.
- All the piping system shall be tested in the presence of the site-engineer or his authorized representative.

2. Painting

- All exposed pipes should be painted with two coats of synthetic enamel paint and colour codification should be as per IS: 2379 of 1963.
- The Pipe Sizes to be used are from among as under:

Pipe OD (in mm)	Thickness (in mm)
54 mm OD	1.2 mm Thick
42 mm OD	1.2 mm Thick
28 mm OD	1.0 mm Thick
22 mm OD	0.9 mm Thick
15 mm OD	0.9 mm Thick
12 mm OD	0.9 mm Thick

3. Oxygen Manifold:

Oxygen manifold minimum of 2 x 10 cylinders (bulk cylinder of D type) having top frame comprising of high pressure copper pipe of size 5/8" ID x 7/8" OD with high pressure brass fitting made of high tensile brass, NRV and high pressure copper tailpiece made of high pressure copper size 3/16"x 3/8" OD. This will be a secondary source of oxygen supply, shall automatically supply the pipeline when primary source of supply become exhausted or fails. Reserve source of supply will be provided by three cylinders manifold system with high flow regulator with gauges and safety valves. Reserve system will be operational in case primary and secondary system fails in emergency. All three sources will remain permanently connected and change over will be automatic. The system shall have source shut-off valve for easy changing and positioning, without hook. The cylinder should be placed with the help of cylinder brackets and fixing chains which should be zinc plated appropriate. A filter having pore size of no greater than 100µm shall be provided between the cylinders and the first pressure regulator.

A High Pressure Regulator to be mounted on the Manifold System for reducing the cylinder pressure suitable to the line pressure.

4. Compressed Air System:

To design, fabricate, test & install Medical Compressed Air System comprising of Triplex (3 Nos.) System Air Compressors each should have 15 HP Motor mounted 500 litres Reservoir Tank and Filter, Non-Return Valve, Isolation Valves, Common Air Dryer and Pressure Reducing Station.

The air compressor will have air-cooled, oil free, at least three-air compressor source for continuous duty application. Air compressors should be critical maintenance free (CMF) and seizure free technology, which ensures that the compressors can, withstands continuous use under high temperature and posse's high resistance to extreme environments.

Type of Compressor: Air Cooled Oil Free Reciprocating Compressor

Capacity: 1500-2000 liters per minute and maximum pressure 121 psig.
Working Pressure: 9 Kg/Cm2
Motor: 15 HP (3 Ph)
The Compressed Air System will have 3 identical Air Compressors (while 1^{st} or 1^{st} & 2^{nd} Compressor will run the 2^{nd} & 3^{rd} or 3^{rd} will remain as stand by.

Following should be provided with compressors:

- 3 – Stage Breathing Air Filters
- Check valve delivery pipe
- Two compressed air receiver
- One dew point alarm sensor shall be fitted to the pipeline system downstream of all conditioning system.
- One dryer with shut-off valve and automatic drains.
- An absorber, a catalyst and filter as required removing contaminants.

Supply system of medical grade air with compressor should comply with the following:

Oxygen	$\geq$ 20.4% and $\leq$ 21.4% V/V
Total oil concentration	$\leq$0.1mg/m^3 measured at ambient pressure
Carbon monoxide conc.	$\leq$5ml/m^3
Carbon dioxide conc.	$\leq$ 500 ml/ m^3
Water vapors content	$\leq$ 67 ml/ m^3
Sulfur dioxide	$\leq$1 ml/ m^3

$NO+NO_2$ $\leq 2ml/ m^3$

5. Vacuum System:

To design, fabricate, test & install Medical Vacuum System comprising of Twin System of Vacuum Pumps each should have 10/15 HP Motor, common 2000 litres Reservoir Tank, Filter, Non-Return Valve, Isolation Valves, Auto-Switch Gear to set minimum and maximum operating vacuum. Bacteria Filter is to be provided for complete bacteria removal down to 0.0001% penetration when tested to BS 3928 Standard.

a. Supply system for vacuum shall comprise at least three sources of supply, one reservoir, two parallel bacterial filter and one drainage trap, to suitably ensure flow rate of vacuum as per the international norms at each outlet.

Oil sealed rotary vane vacuum pumps; a control panel and a receiver mounted on a common base frame should comprise the package. Out of three, each vacuum pump shall be capable of supplying the system design flow to ensure continuity of supply.

Each pump shall be oil lubricated, dynamically balanced multi-vane design with heavy duty aluminum alloy vanes. The vane housing shall be a double walled construction. The oil lubrication system shall be a pressure differential design with full re – circulation and multi-stage exhaust oil separation rated at minimum 99.99% efficiency.

Water vapor condensation in the cylinder shall be prevented by means of an automatic as ballast valve. A non-return valve to prevent oil migration upon shut down. Each pump should have a 5- micron inlet filter.

Each reservoir shall be fitted with shut-off valve (s), a drain valve, and a vacuum gauge. Exhaust from vacuum pump shall be piped outside and shall be provided with the means of to prevent insect, debris and water. Exhaust shall be located remote from any air intake, doors, window and other opening in the building.

The exhaust shall be provided with a drain at its lowest point. Means shall be provided to prevent transmission vibrations to the pipeline.

All sources of electrical supply should be connected to the emergency supply. The control system should provide automatic lead / lag sequencing with circuit breaker, disconnects for each vacuum pump visual and audible reserve unit alarm, with isolated contacts for remote alarm, manual-off-auto lighted selector switches and runtime hour.

A programmable logic controller should control the automatic alteration of the vacuum pumps with provisions for simultaneous operation if required and automatic activation of reserve unit if required. The control system shall include an automatic minimum run time adjustment to control run time based on demand.

b. Electrical Control panel (For Air - Compressor & Vacuum Pump):

The complete system should work on duplex sequencing and cascading system. The panel should be floor mounted enclosed type. Panel must have one common electrical control panel for both vacuum pumps and both air compressors with automatic switch gear system, for motors, two vacuum switches, two Air pressure switches, complete with wiring & cabling, electrical contractors with single phase preventing units, and main voltmeter, Ampere meters-4, hour meters-4, duplex system, sequencing & cascade system for vacuum pumps and air compressors. The electrical control panel shall be of cubical type made of CRCA sheet of 16 g with epoxy power coating. The panel shall offer the following facilities.

Main incoming switch of required capacity with bus bar system and light indications for incoming for outgoing power supply with voltmeter and ampere meter selector switches. Individual circuits with switch fuse unit, starters, and controls for 2 nos. Air compressors, controls for 2 nos. Vacuum pumps with duplex, sequencing and cascade systems.

Duplex: For every impulse alternate pump shall start and in case of failure if any pump the next pump shall start automatically. Sequencing : The first & second machines will start in sequence Cascade: All pumps shall be connected to a cascade system. In case oneo pump is not able to generate the required vacuum the second shall start and assist the already running pump. When demand reduces the system shall come back to the first pump only. This electrical control panel should have expandable type means the hospital load increase in future which can be add one / two air compressor and vacuum pumps without any alteration.

6. Operation Theatre Pendants:

The Retractable Ceiling Pendant shall be of pneumatically / electrically operated type. The pendant shall consist of an upper section for rigid mounting at the ceiling level and a telescopic lower section capable of being extended to a maximum of 18 inches.

The retractable section of the pendant will be lowered or raised at any position. With the aid of an internal tracking system, the movement of the telescopic portion will glide freely up or down.

The upper and lower section should be made of 16 gauge stainless steel with a # 4 satin finish and should be complete with

- Removable access panel
- Stainless Steel Ceiling Collar
- A heavy gauge steel mounting plate, equipped with brazed type copper fittings for all medical gas connections above the ceiling line.

All electrical and medical gas services shall be provided to the face of the lower section by means of flexible hoses and cables. All threaded connections will comply with NFPA, CGA and ISS recommendations preventing interchanging of connections.

The Retractable Ceiling Pendant should have provision to accommodate the following:

Oxygen	- 2 nos.
Compressed Air	- 1+1 nos.(4bar & 7bars)
Vacuum	- 2 nos.

5/15 amps switch socket outlet: 4

Any combination of Ground Jacks, Computer Outlets, Communication Devices, Slides and IV Hooks

7. Digital Alarm System:

Four Channel Microprocessor Controlled Alarm for Pneumatic & Vacuum Services should have the following features:

- Digital Display of Line Pressure for all the services with factory calibrated pressure sensors.
- Color coded LED Display of Line pressure status (High – Caution – Normal – Caution–Low)
- Audible Alarm for High & Low pressure condition.
- Test and Alarm Acknowledge (Mute) facility. (Alarm acknowledges (Mute) time span is programmable from 1 to 60 min).
- Programming facility of alarm limits from front panel (Password protected).
- Facility to connect to remote alarm box by potential free contacts provided in the alarm box.
- Small and compact design. Light Weight (3 kg)
- Imported highly sensitive gas pressure sensors & USA/CE marked power supply.
- Mounted on a powder coated MS box.
- Nut & Nipples are to be provided for connection with Pneumatic supply line.
- Low voltage internal operation with input power supply of 220V AC.
- Battery Backup
- Easy wall mounting facility

8. Double Lock Outlet:

Outlets shall be manufactured with a 165 mm length, Copper inlet pipe stub which is silver brazed to the outlet body. Body shall be of one piece brass construction. For positive pressure gas services, the outlet shall be equipped with a primary and secondary check valve and the secondary check valve shall have break safe mechanism and also comply to EN 737 pressure test standards and rated at minimum 200 psi in the event the primary check valve is removed for maintenance.
The outlet assembly should have separate colour coding for each services and will accept only corresponding gas specific adaptors. All outlets shall be cleaned and de-greased for medical gas

service, factory assembled and tested. The medical gas outlets should be of quick connecting and wall mounted modular type.

9. BPC Flow meter with Humidifier:

Back Pressure Compensated flow meter will be of accurate gas flow measurement with following features:

a. Control within a range of 0 – 15 lpm (calibration within +/- 10%).
b. It will meet strict precision and durability standard.
c. The flow meter body shall be made of brass chrome plated materials.
d. The flow tube and shroud components shall be made of clear, impact resistant polycarbonate.
e. Flow Tube shall have large and expanded 0 – 5 lpm range for improved readability at low flows.
f. Inlet filter of stainless steel wire mesh to prevent entry of foreign particles.
g. The humidifier bottle shall be made of unbreakable polycarbonate material and autoclavable at 121 degree Centigrade temperature.

10. Ward Vacuum Units:

Should be ISO 9000 certified and complies HTM-2002, B.S. Standard. Ward Suction Unit must be a full quality assurance system medical device consists of :

- Suction regulator should be supplied with a safety jar, including an anti overflow safety device.
- Should have continuous suction controller with reliability & fine adjustment. Should have plastic body and cover, preventing risk of corrosion.
- Should have vacuum gauge, on/off knob allowing for the quick restoration of a vacuum level.
- Must have central adjustment knob with a color-coded, polycarbonate, autoclavable, unbreakable, fitted with an anti overflow safety device.
- Collection jar should be unbreakable and autoclavable, Polycarbonate jars, Jar capacities must be between 1000-1500ml.

11. Operation Theatre Vacuum Unit:

- Unit will be consisting minimum of two reusable 2000-3000 ml shatter resistance bottle, including an anti overflow safety device, each made up of autoclavable polycarbonate jars.
- A vacuum regulator with instant ON/OFF switch and a three way selector switch with an option to operate either-Left-right-both.
- All above items will be mounted on a trolley having free moving castor

12. Bed Head Panels for ICU/HDU:

Bed Head Panels horizontal/ vertical It should have the following features-

- Minimum length (Approx.): 1.2 meter.
- Efficient, safe & Robust design in extruded aluminium section.
- Smooth curved surfaces, with acceptable colour choice should have an integrated rail system to mount accessories Segregation of services i.e. low voltage supplies, high voltage supplies, and medical gases should be maintained throughout.
- Entire pipe line should run in continuous horizontal panels with no break for each unit & length as per area where it has to be installed.
- Facility as per under:

Gas Outlets: Oxygen Outlets: 2; Vacuum Outlets: 1; Medical Compressed Air – 1.

Additional Features: Should have Infusion pump mount pole with adopter for mounting at least two pumps, Electrical outlets- 4 (Combined 15/5 A Switch & Sockets), Point for data Cable – 1 No., Provision for one Nurse Call System.

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