Tender

For

Medical Gas Pipeline System

At

All India Institute of Medical Sciences, Jodhpur

NIT No.	**:**	**Admn/General/218/2013-AIIMS.JDH**
NIT Issue Date	**:**	**September 06, 2013.**
Last Date of Submission	**:**	**September 30, 2013 at 03:00 PM**
Pre Bid Meeting	**:**	**September 23, 2013 at 03:00 PM**

All India Institute of Medical Sciences, Jodhpur
Basni Phase - II, Jodhpur – 342005, Rajasthan
Telefax: 0291- 2740329, email: aoadmin@aiimsjodhpur.edu.in
www.aiimsjodhpur.edu.in

All India Institute of Medical Sciences (AIIMS), Jodhpur, Rajasthan, an apex healthcare institute being established by Parliament of India under aegis of Ministry of Health & Family Welfare, Government of India, invites sealed tenders for supply & installation of the following items at the institute. You are requested to quote your best offer along with the complete details of specifications, terms & conditions.

S.No.	Item Description	Quantity
1.	Medical Gas Pipeline System	1

Quotation should be sealed and super-scribed with tender number and address to:

"Administrative Officer
All India Institute of Medical Sciences, Jodhpur
Basni, Phase-II
Jodhpur-342005, Rajasthan".

The sealed quotations should reach the Institute, latest by September 30, 2013 at 03:00 PM and it will be opened on same day at 04:00 PM in the Project Cell, Resident Complex, AIIMS, Jodhpur of the Institute in the presence of the bidder(s) or their authorized representative(s), who will present at the scheduled date and time.

Terms & Conditions:

1. **Preparation and Submission of Tender:** The tender should be submitted in two parts i.e. Technical Bid and Financial Bid. The Technical Bid and the Financial Bid should be sealed by the bidder in two separate covers "**Technical Bid for Tender for Supply of Medical Gas Pipe Line System**" and "**Financial Bid for Tender for Supply of Medical Gas Pipe Line System"**. Both Sealed Envelopes should be kept in a main/ bigger envelope super-scribed as **"Tender for Supply of Medical Gas Pipeline System"**

2. **Earnest Money Deposit:**
   The bidder shall be required to submit the Earnest Money Deposit (EMD) for an amount of Rs. 1,50,000/- (Rupees One Lakh Fifty Thousand only) by way of demand drafts only. The demand drafts shall be drawn in favour of **"All India Institute of Medical Sciences, Jodhpur"**. The demand drafts for earnest money deposit must be enclosed in the envelope containing the technical bid.

   The EMD of the successful bidder shall be returned after the successful completion of contract / order and for unsuccessful bidder(s) it would be returned after award of the contract. Bid(s) received without demand drafts of EMD will be rejected.

   The EMD, in case of unsuccessful Bidders shall be retained by the Purchaser, upto a maximum period of 6 months 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 along with Original Cash Deposit Receipt issued by the institute. No interest will be payable by the AIIMS authorities on the EMD.

The firms who are registered with National Small Industries Corporation (NSIC) / OR Small Scale Industrial (SSI) are exempted to submit the EMD (copy of registration must be provide along with)

3. **Tender Fee:** Tender fee will be Non-refundable amount of one thousand (Rs. 1000/-).

4. **Rate:** Rate should be quoted in Indian Rupees (INR) on DOOR Delivery Basis at AIIMS, Jodhpur, Rajasthan, Inclusive of all the Charges, with break-ups as:

    - Basic Cost.
    - VAT /CST as applicable.
    - Total Cost (F.O.R at AIIMS Jodhpur).

5. **Validity:** The quoted rates must be valid for a period for 180 days from the date of closing of the tender. The overall offer for the assignment and bidder(s) quoted price shall remain unchanged during the period of validity. If the bidder quoted the validity shorter than the required period, the same will be treated as unresponsive and it may be rejected.

    In case the tenderer withdraws, modifies or change his offer during the validity period, bid is liable to be rejected and the earnest money deposit shall be forfeited without assigning any reason thereof. The tenderer should also be ready to extend the validity, if required, without changing any terms, conditions etc. of their original tender.

6. **Warranty / Guarantee:**

    6.1 The supplier shall provide comprehensive on-site warranty (Including All Spares, Accessories and Labour) for a period of 5 years from the date of final acceptance of the complete system after successful and complete installation and commissioning with regular updation of newer technology as and when evolved.

    6.2 The supplier should install, operate (24 x 7 with trained manpower) and maintain manifold and medical gas pipeline system.

    6.3 The Supplier (manufacturer) shall set-up a maintenance base to provide maintenance service, of the entire system being offered, at short notice during the warranty period. The technical maintenance personnel of the supplier responsible for supervision and maintenance shall be available to reach the site(s) within 1 hour's notice.

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

    6.5 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.

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

    6.7 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.

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

7. **Uptime guarantee:** The firm should provide uptime guarantee of 95%

8. **Downtime penalty Clause**
   a. 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 two days for each additional day of down time will be enforced. The vendor must undertake to supply all spares for optimal upkeep of the equipment for at least FIVE YEARS after handling over the unit to the Institute. If accessories / other attachment of the system are procured from the third party, then the vendor must produce cost of accessory / other attachment and the CMC from the third party separately along with the main offer and the third party will have to sign the CMC with the Institute if required.
   b. The principals or their authorized service providers are required to submit a certificate that they have satisfactory service arrangements and fully trained staff available to support the uptime guarantee.

9. **Scope of work:**
   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.

10. **Delivery & Installation**: All the goods ordered shall be delivered & installed within 60 days from the date of issue of purchase order. All the aspects of safe delivery, installation and commissioning shall be the exclusive responsibility of the supplier. The successful tenderer will also provide basic required training for supplied items.

    If the supplier fails to delivered, installation and commissioning of the goods on or before the stipulated date, then a penalty at the rate of 2% per week of the total order value shall be levied subject to maximum of 10% of the total order value.

11. **Performance Security:** The supplier shall require to submit the performance security in the form of irrevocable Bank Guarantee (BG) / or Fixed Deposit Receipt (FDR) issued by any Nationalised Bank for an amount of which is equal to the 10% of the order value and should be kept valid for a period of 60 day beyond completion of all the contractual obligation, Including CMC period.

12. **Arbitration:** If any difference arises concerning this agreement, its interpretation on payment to the made there-under, the same shall be settled out by mutual consultation and negotiation. If attempts for conciliation do not yield any result within a period of 30 days, either of the parties may make a request to the other party for submission of the dispute for decision by an Arbitral Tribunal containing Sole Arbitrator to be appointed by the Secretary, Department of Legal Affairs. Such requests shall be accompanied with a panel of names of three persons to act as the sole arbitrator. In case of such arbitrator

refusing, unwilling or becoming incapable to act or his mandate having been terminated under law, another arbitrator shall be appointed in the same manner from among the panel of three persons to be submitted by the claimant. The provision of Arbitration and Conciliation Act, 1990 and the rule framed there under and in force shall be applicable to such proceedings.

13. **Breach of Terms and Conditions:** In case of breach of any terms and conditions as mentioned above, the Competent Authority, will have the right to cancel the work order/ job without assigning any reason thereof and nothing will be payable by AIIMS, Jodhpur in that event the security deposit shall also stands forfeited.

14. **Insolvency etc:** In the event of the firm being adjudged insolvent or having a receiver appointed for it by a court or any other order under the Insolvency Act made against them or in the case of a company the passing any resolution or making of any order for winding up, whether voluntary or otherwise, or in the event of the firm failing to comply with any of the conditions herein specified AIIMS, Jodhpur shall have the power to terminate the contract without any prior notice.

15. **Force Majeure:** If, at any time during the subsistence of this contract, the performance in whole or in part by either party of any obligation under this contract is prevented or delayed by reasons of any war or hostility, act of public enemy, civil commotion, sabotage, fire, floods, explosion, epidemics, quarantine restriction, strikers lockout or act of God (hereinafter referred to as events) provided notice of happening of any such eventuality is given by party to other within 21 days from the date of occurrence thereof, neither party hall by reason of such event be entitled to terminate this contract nor shall either party have any claim for damages against other in respect of such non-performance or delay in performance, and deliveries have been so resumed or not shall be final and conclusive.
    Further, that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 60 days, either party may, at least option to terminate the contract.

16. **Liquidated Damages**
    (i) The date of delivery of the store, stipulated in the acceptance of the tender should be deemed to be the essence of the contract and delivery must be completed not later than the dates specified therein. Extension will not be given except in exceptional circumstances. Should, however, deliveries be made after the expiry of contracted delivery period, without prior concurrence of the purchaser and be accepted by the consignee, such delivery will not deprive the purchaser of this right to recover liquidated damages under clause (ii) below.

    (ii) If the supplier fails to delivered, installation and commissioning of the goods on or before the stipulated date, then a penalty at the rate of 2% per week of the total order value shall be levied subject to maximum of 10% of the total order value. In the case of package supply where the delayed portion of supply materially hampers installation and commissioning of the systems, liquidated damages charges shall be levied as above on the total value of the concerned package of the purchase order. Quantum of liquidated

damages assessed and levied by the purchaser shall be final and not challengeable by the supplier.

17. Payment Term:

- 90% payment of the total order value shall be released after the successful installation/ commissioning of the ordered goods against the submission of the test report.
- Balance 10% of the order value shall be released after the submission of the performance security.

18. Incidental Services

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 gradation are expected to be provided at free of cost to AIIMS Jodhpur.

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.

19. Site Preparation for installation:

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.

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

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

20. The prices quoted by the Bidder and accepted by the committee duly constituted by AIIMS Jodhpur 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.

21. Payment 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.

22. The finally selected Bidder will have to apply to the Prescribed Government Authority under existing acts/rules/regulation at the time of award and execution of contract for grant of requisite Licenses for operation of Manifold services or foreign exchange for such items as required and the purchaser will only tender such assistance, as considered necessary.

23. Before the equipment is taken over by the Purchaser/Consignee, the Supplier shall provide manuals of the equipment / systems. This shall include the following:

23.1 System Interface Drawings, Wiring diagrams

23.2 System Interconnection and Block diagrams

23.3 User Operation Manuals
23.4 Equipment Maintenance Manuals

24. The bidder should be registered with ESI and PF.

25. Bidder should quote separate price for maintenance and operation of manifold room and the entire MGPS system on per year basis.

26. The vendor should collect the copy of building layout plan and visit the site, for complete evaluation of the project and feasibility of his material before submitting the bid.

27. Copper pipes to be certified by a recognized certifying agency for its compliance to specific standard.

28. Bidder must submit Printed catalogue and technical data sheet to substantiate offer.

29. Bidder must submit User list and at least 5 Performance Satisfaction report of similar type of work, within last 5 years from major government hospitals.

30. Bidder shall submit a copy of the tender document and addenda thereto, if any, with each page of this document should be signed and stamped to confirm the acceptance of the entire terms & conditions as mentioned in the tender enquiry document.

31. Yearly business turnover of over Rs. 3 crore for last 3 year. Company's annual reports should be provided in support of this.

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

33. The bidder should be capable to inspect the centralised medical gas pipeline system by internationally accredited "Lloyd or equivalent certified Person". Regarding this matter, necessary proof has to be provided alongwith the offer.

34. AIIMS Jodhpur shall have the right to inspect and / or test the equipment for conformity to the Contract Specifications.

35. AIIMS Jodhpur reserves the right to ask the tenderers for submitting the sample of the item for which rates have been quoted Technically Qualified Bidders may be asked to submit samples along with their quoted items no. and their firm name without indicating any prices before opening of Financial Bid to AIIMS, Jodhpur for Inspection.

36. The quantity of item given in the tender is tentative, which may be increased or decreased as per the institute’s requirement.

37. Signed & stamped compliance sheet of the technical specification of the goods with technical printed literature must be enclosed with the bid.

38. Conditional bid will be treated as unresponsive and it may be rejected.

39. The Institute reserves the right to accept in part or in full or reject any or more tender(s) without assigning any reasons or cancel the tendering process and reject all tender(s) at any time prior to award of contract, without incurring any liability, whatsoever to the affected bidder or bidder(s).

40. Applicable Law:

- The contract shall be governed by the laws and procedures established by Govt. of India, within the framework of applicable legislation and enactment made from time to time concerning such Commercial dealings / processing.
- Any disputes are subject to exclusive jurisdiction of Competent Court and Forum in Jodhpur, Rajasthan, India only.

Annexure-I

Technical Specification

S.No	Item	Specifications	Qty.
1.	**Medical Gas Pipeline System**	Scope of Work/Requirements: 1 **Oxygen Manifold**: 1.1 Oxygen Manifold: Main with Middle Frames 2 x 6 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. Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves; high pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The design of middle and bottom frames should be provided to fit both round and flat bottom cylinders safely. The manifold shall be tested (hydraulically) at 3500 psig and necessary test certificates accompany along with the supply. Only Non Halogenated Polymer materials are to be used in the Non Return Valves supplied along with the manifold. 1.2 Fully-Automatic Control Panel – Oxygen: • Control panel will have two first stage regulators each capable of delivering 100 - 200 psig outlet pressure. It should comply international standards: HTM 02-01/NFPA99/ISO-7396-1 • Both the first stage regulators in the oxygen control panel will have non-halogenated polymer in the high pressure side to ensure that there will be no ignition due to adiabatic compression. Furthermore, 40 micron filter should be provided at the inlet of each high pressure regulators of the oxygen control panel. • The first stage regulators will be connected to a common second stage regulator which will deliver an outlet pressure of 60 psi g. • The first two regulators meant for first stage will be capable of switchover system incorporated from "RUNNING" to "RESERVE" bank due to differential pressure. • The control panel will provide for two individual content contact pressure gauges to indicate the cylinder pressure in the two wings of	

			the manifold and common pressure gauge to indicate the delivery / line pressure. • The control panel will have built in audio-visual signal lamp indications for bank Changeover. • The control panel will be covered with aesthetically suitable cover for safe operation indicating the respective services. • Control panel will have built in transformer to ensure safe operation by low voltage.	
		1.3	Oxygen Manifold: Emergency with Middle Frames Two 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 adapters suitable for Oxygen Cylinders and manifold. Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves; high pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The manifold should be tested (hydraulically) at 3500 psig and necessary test certificates should accompany along with the supply. A High Pressure Regulator to be mounted on the Manifold System for reducing the cylinder pressure suitable to the line pressure. Only Non Halogenated Polymer materials are used in the Non Return Valves & Pressure Reducers supplied along with the manifold.	
		2	**Nitrous Oxide Manifold :**	
		2.1	Nitrous Oxide Manifold: Main with Middle Frames 2 x 1 Cylinder Nitrous- Oxide 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 Nitrous oxide Cylinders and manifold. Top frame comprising of high pressure copper pipe of size 5/8" I.D. x 7/8" OD with high pressure brass fittings made of high tensile brass, NRV and high pressure copper tailpipes made of high pressure copper pipe of size 3/16 inch I.D. x 3/8 inch OD. The manifold will be hydraulically tested to 3500 psig. The manifold will be so designed that it shall suit easy cylinder changing and positioning. The system will have non–return valves for easy changing of cylinders without closing the bank. The cylinder will be placed with the help of cylinder brackets and fixing chains which will be zinc plated.	

		2.2	Semi-Automatic Control Panel – Nitrous Oxide: • Control panel will have two first stage regulators each capable of delivering 100 - 200 psig outlet pressure. It should comply international standards: HTM 02-01/NFPA-99/ISO 7396-1 • Both the first stage regulators in the oxygen control panel will have non-halogenated polymer in the high pressure side to ensure that there will be no ignition due to adiabatic compression. Furthermore, 40 micron filter should be provided at the inlet of each high pressure regulators of the oxygen control panel. • The first stage regulators will be connected to a common second stage regulator which will deliver an outlet pressure of 60 psi g. • The first two regulators meant for first stage will be capable of switchover system incorporated from "RUNNING" to "RESERVE" bank due to differential pressure. • The control panel will provide for two individual content contact pressure gauges to indicate the cylinder pressure in the two wings of the manifold and common pressure gauge to indicate the delivery / line pressure. • The control panel will have built in audio-visual signal lamp indications for bank changeover • The control panel will be covered with aesthetically suitable cover for safe operation indicating the respective services. • Control panel will have built in transformer to ensure safe operation by low voltage. • N2O Control Panel will have in built heating arrangement to ensure that there will be no freezing in the delivery line during high flow requirement.	
		2.3	Nitrous Oxide Manifold: Emergency Single cylinder with outlet point, regulator and High pressure tube.	
		3.	**MEDICAL COMPRESSED AIR COMBINED AIR PLANT AND SURGICAL AIR PLANT (7BAR)** – 1000 LPM – Triplex system Air Plant System The Medical Air system shall conform to NFPA 99/EN ISO 7396-1/HTM02-01. Medical quality air to the European Pharmacopoeia monograph shall be delivered at pressures of 700kPa (7 bar) gauge for supply of the hospital medical or surgical air systems. The entire system shall be 'Triplex" such that any single functional component failure will not affect the integrity of the medical compressed air supply.	

		3.1 Sources of Supply - HTM02-01/NFPA99/ISO 7396-1 Triplex compressor configurations will produce the primary supply with two compressors in standby. Each compressor will be capable of supplying the specified volumetric flow for duplex and triplex plant, and half flow for quadruple. Control System The central control system shall provide an intelligent human machine interface incorporating on board flash memory and real-time clock for recording operational parameters in the inbuilt event log. The central control system shall operate at low voltage and include BMS connection for plant fault, plant emergency, reserve fault and pressure fault. Visualisation of plant inputs, outputs and status through a web browser, using a simple Ethernet connection shall be available. The central control unit shall incorporate a user friendly 5.7" high-definition colour display with clear pictograms and LED indicators, providing easy access to system operational information. A mechanical back-up facility shall ensure continued operation in the event of a control system malfunction. The control system shall normally employ automatic rotation of the lead compressor to maximise life and ensure even wear. Compressors Compressors shall be oil injected rotary screw compressors suitable for both continuous and frequent start/stop operation at a nominal outlet pressure of 750 kPa (7.5 bar) gauge. Compressors shall be supplied with a block and fin style after cooler with a dedicated quiet running fan to maximise cooling and efficiency. A multistage oil separator capable of achieving 2ppm oil carry over shall be fitted to minimise contamination and maintenance. EFF1 (CEMEP)rated TEFC, IP55 class F electric motors shall be used and incorporate maintenance-free greased for life bearings. Motors with lower efficiency ratings are not acceptable. 3.2 Dryer/Filter/Regulator System The duplexed filter and dryer module shall incorporate high efficiency water separators, oil filters, heatless regenerative desiccant dryer, dust/activated carbon filters, hopcolite filters and anti-bacterial filters with autoclavable element. Electrical contacts shall be installed on the filters to provide warning alarms on the dryer controller in the event of high pressure drop (ie blockage) and shall also include connections for BMS.	

		Contaminants in the delivered air downstream of the bacterial filters shall be maintained at levels below those shown in the following table: Contaminant Threshold H2O 67 ppm v/v Dry particulates Free from visible particulates in a 75 litre sample Oil (droplet or mist) 0.1 mg/m³ CO 5 ppm v/v CO2 500 ppm v/v SO2 1 ppm v/v NO 2 ppm v/v NO2 2 ppm v/v Dryer Purge Control The dryer control system shall incorporate a Purge Saver Energy Management system that freezes the regeneration of the desiccant once adequate dew point is reached in the inactive tower. Only when the dew point level in the active tower deteriorates to an unacceptable level, will the intelligent controller switch towers. This shall be achieved by including an additional dew point sensor and associated software in the dryer controller to effectively manage the system as well as providing on screen measurements of purge savings. Dew Point Monitoring The dryer shall incorporate a ceramic dew point hygrometer with an accuracy of $\pm 1^0$C in the range -20 to -80^0C atmospheric dew point and 4-20mA analogue output. Aluminium oxide or palladium wire sensors are not acceptable. An alarm condition shall trigger on the dryer control panel if the dew point exceeds a -46^0C atmospheric set point. The plant control unit shall incorporate a multifunctional LCD displaying, amongst other things, the dew point of the delivered air to enable monitoring of the air quality by the hospitals estates department. Volt free contacts shall be included to enable the dew point alarm signal to be connected to a central medical gas alarm system and/or building management system (BMS). To enable periodic calibration of the dew point sensor element, the hygrometer shall be remotely connected downstream of the dryer via a micro-bore tube. It is not acceptable to install the sensor directly into the medical air supply pipeline. Receiver Assembly Air receivers shall comply with BS EN 286-1, supplied with relevant test certificates. Each air receiver shall be hot dip galvanised inside and out	

			and fitted with a zero loss electronic drain valve. Float type drain valves are not acceptable. The receiver assembly shall be fitted with a pressure safety valve capable of passing the maximum flow output of the compressor at 10% receiver overpressure. The receiver shall be further protected by a safety pressure relief valve and include a pressure gauge. The system shall consist of 1 receiver vessel each shall be of 1500 litres. There shall be the followings available for enhanced operation of the air plant system:- • Phase sequence relays that prevent unintentional reverse operation of the compressors. • Synthetic oil for increased compressor life • Tropical thermostatic sensors for countries with high humidity CE Marking The standard range of Medical Air plant systems are 'CE' marked under the Medical Devices Directive 93/42/EEC with approval from notified body no. 0088 (Lloyd's Register Quality Assurance). Under this directive, the specified products are classified as Class IIa Medical Devices.	
		4.0	**VACUUM PLANT** – 500 Liters per minute/ System Capacity 1500 litres per minute at 19 INCH Hg – Triplex system fully compliant to NFPA 99/EN ISO 7396-1/HTM02-01 standards	
		4.1	Medical Vacuum The Medical Vacuum System shall ensure the minimum pipeline. Vacuum level of 450mmHg is maintained at the plant service connection point at the rated volumetric 'free air' flow rate with two pumps in standby. The bacteria filtration system shall be 'duplexed' such that each filter can be isolated for replacement of the filter cartridge.	
		4.2	Vacuum Pumps Four Vacuum pumps shall be air-cooled, oil lubricated rotary vane type suitable for both continuous and frequent start/stop operation at nominal inlet vacuum levels of between 578mmHg and 728mmHg. Composite carbon fibre rotor blades shall be fitted to minimise the cost of maintenance. Rotors shall be driven by directly coupled TEFV electric motors. Pump inlets shall include a wire mesh filter and integral non-return valve to prevent oil suck back and pressure increases in the vacuum system. Each vacuum pump shall have an integral separator filter to ensure a virtually oil-free exhaust. Each pump shall be fitted with anti-vibration pads between the pump foot and mounting frame.	
		4.3	Bacteria Filters	

			The duplex bacteria filter system shall incorporate high efficiency filter elements. A differential vacuum indicator shall be installed across the filter to indicate blockage. Additional pressure sensors shall be installed at the inlet and outlet of the filter to measure the pressure drop across the filters. Each filter shall be designed and sized to carry the full plant design flow capacity with a pressure drop not exceeding 33mbar (25mmHg). Bacteria Filter elements shall have penetration levels not exceeding 0.005% when tested by the sodium flame method in accordance with BS 3928:1969 and utilising particles in the 0.02 to 2 micron size range. Drain flasks shall be connected to each filter. Drain flasks shall be manufactured from transparent Pyrex with a polymer coating on the inner and outer surfaces in order to maintain a seal in the event of inadvertent breakage of the Pyrex flask. All drain flasks shall be suitable for sterilisation and be connected via a manual isolating valve.
		4.4	Control System The central control system shall provide an intelligent human machine interface incorporating on board flash memory and real-time clock for recording operational parameters in the in built event log. The central control system shall operate at low voltage and include BMS connection for common fault. Visualisation of plant inputs, outputs and status through a web browser, using a simple Ethernet connection shall be available. The central control unit shall incorporate a user friendly 5.7" high-definition colour display with clear pictograms and LED indicators, providing easy access to system operational information. Cascading of vacuum pumps shall be achieved by measuring the vacuum level at the plant inlet with a pressure transducer. A mechanical back-up facility shall ensure continued operation in the event of a control system malfunction. The control system shall normally employ automatic rotation of the lead pump to maximise pump life and ensure even wear.
		4.5	Vacuum Receiver(s) Vacuum receiver(s) shall be supplied with relevant test certificates and have a total volume of at least 100% of the plant output in 1 minute in terms of free air aspired at normal working pressure. Each vacuum receiver shall be hot dip galvanised inside and out. One receiver tanks of total 500 litres capacity.

		4.6 CE Marking The standard range of Medical Vacuum plant systems are 'CE' marked under the Medical Devices Directive 93/42/EEC with approval from notified body no. 0088 (Lloyd's Register Quality Assurance). Under this directive, the specified products are classified as Class IIa Medical Devices. 5 **Distribution Piping :** SCOPE The scope of work shall cover all distribution piping and terminal units for oxygen, nitrous oxide, vacuum and compressed air. MATERIALS Solid drawn, seamless, de-oxidized, non-arsenical, half-hard, tempered and de-greased copper pipe conforming to EN 13348: 2008. All copper pipes will be de-greased & delivered capped at both ends. The pipes will be accompanied with manufacturers test certificate for the physical properties & chemical composition. Copper pipe will also have third party inspection certificate from Lloyd's' Register Services. The Pipe Sizes to be used are from among as under: Copper fittings shall be made of copper and suitable for a steam working Pressure of 17 bar and especially made for brazed socket type connections. All copper fittings will be conforming to EN 1254-1, should be factory de-greased, certified, and individually packed and identified for medical use. Fittings should be kite marked up to 54 mm size. **6 Isolation valves** The isolation valves will be Non Lubricated, 900 turn level, Ball type, suitable for oxygen service. All valves shall be pneumatically tested for twice the working pressure and factory degreased for medical gas service before supply. **7 Service valve box** 2 /3/4 Gas types. **INSTALLATION & TESTING** Installation of piping shall be carried out with utmost cleanliness. Only pipes, fittings and valves which have been de-greased 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 joints shall be made of copper to copper and brazed by silver brazing filler material without use of any flux. All brazing shall be done by	

		using a brazing rod CP 104 (5% silvercopper phosphorous brazing alloy) and copper-to-brass or gunmetal shall only be joints using brazing rod AG 203 (43% Silver-copper-zinc-brazing alloy) manufactured to EN-1044. Inert gas welding technique should be used by oxygen free Nitrogen gas inside copper pipes while brazing to avoid carbon deposition. SL. NO. COPPER PIPE'S OUTER DIAMETER — THICKNESS OFCOPPER PIPE 5.1 12 mm — 1 mm 5.2 15 mm — 1 mm 5.3 22 mm — 1 mm 5.4 28 mm — 1 mm 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 and then pressure tested with dry air at a pressure equal to 1.5 times of 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. 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. **8** **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 acknowledge (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.	
			9 **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.	
			10 **BPC Flow meter with Humidifier :** Back Pressure Compensated flow meter will be of accurate gas flow measurement with following features: · Control within a range of 0 – 15 lpm (calibration within +/- 10%). · It will meet strict precision and durability standard. · The flow meter body shall be made of brass chrome plated materials. · The flow tube and shroud components shall be made of clear, impact resistant polycarbonate. · Flow Tube shall have large and expanded 0 – 5 lpm range for improved readability at low flows. · Inlet filter of stainless steel wire mesh to prevent entry of foreign particles. · The humidifier bottle shall be made of unbreakable polycarbonate material and autoclavable at 121 degree Centigrade temperature.	
			11 **Ward Vacuum Units :** · Ward Vacuum Unit shall be of light weight and compact. The unit will consist of a regulator, · A 600 ml. Reusable collection jar, made of unbreakable poly carbonate material and fully autoclavable at 134 degree centigrade · A wall bracket for mounting the jar assembly on the wall. · The vacuum regulator shall be infinitely adjustable and have vacuum gauge which indicates suction	

		supplied by the regulator. Safety trap shall be provided inside the jar to safeguard the regulator from overflowing. **12 Theater Vacuum Units :** The unit shall be consisting of two reusable 2000 ml shatter resistant bottle, each made up of poly carbonate material and fully autoclavable at 134^{o} centigrade. A vacuum regulator with instant ON / OFF switch and a three way selector switch with an option to operate either - Left, Right or Both. All the above items shall be mounted on a Trolley having free moving castor wheels. **13 Bed Head Panels for ICU/HDU** Bed Head Panels horizontal/ vertical It should have the following features- Minimum length 1.2 meter. Efficient, safe & Robust design in extruded 19luminium 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 -Oxygen -2, Vacuum-1, Medical air -1, Infusion pump mount pole with adopter for mounting at least two pumps. - Electrical outlets- 6. Combined 15/5	

Annexure-II

TECHNICAL BID

Name of Firm/Contractor/Supplier	
Complete Address & Telephone No.	
Name of Proprietor/Partner/Managing Director/Director.	
Phone & Mobile No.	
Name and address of service centre nearby Jodhpur.	
Whether the firm is a registered firm Yes/No (attached copy of certificate)	
PAN No. (enclose the attested copy of PAN Card)	
Service Tax No. (enclose the attested copy of Service Tax Certificate)	
VAT No. (enclose the attested copy of VAT Certificate)	
Whether the firm has enclosed the Bank Draft/Pay Order/Banker's cheque of Rs.1,50,000/- as Earnest Money Deposit.	
Whether the firm has enclosed the Bank Draft/Pay Order/Banker's cheque of Earnest Money Deposit.	
Whether the Firm/Agency has signed each and every page of Tender/NIT	
Please provide full list of consumables.	
Any other information, if necessary	

Authorized signatory of the bidder with seal.

Annexure-III

Format for Financial Bid

(To be submitted on the letterhead of the company / firm separately for each item)

A.

S.No.	Item Description	Makes	Unit	Approximate Qty	Price
1.	OXYGEN SYSTEM 1. Main Oxygen Manifold 2 x 6 cylinders with NRV's, Tail pipes and Middle frame		SET	1	
	2. Fully - automatic Oxygen Control Panel (indigenous) with automatic changeover from Running Bank to Reserve Bank of cylinders and having non-halogenated polymer in the high pressure side of the primary regulators and 40 micron inlet filter		Nos.	1	
	3. 2-cylinder Emergency Oxygen Manifold complete with tail pipe, NRV and Pressure Reducung System having non-halogenated polymer materials in the high pressure side of the regulator		SET	1	
2.	NITROUS OXIDE SYSTEM				
	1. Main Nitrous Oxide Manifold 2 x 1 cylinders with NRV's, Tail pipes and Middle frame		SET	1	
	2. Semi - automatic N2O Control Panel with Automatic Changeover (indigenous) from Running Bank to Reserve Bank of cylinders		Nos.	1	
	3. 1-cylinder Emergency Nitrous Oxide Manifold complete with tail pipe, NRV and Pressure Regulator(Double Stage)		SET	1	
3.	COMPRESSED AIR SYSTEM				
	1. Consisting of 3 nos Air Compressors, Tank Mounted, each Receiver Capacity 500 ltrs, common Air drier, Pressure Reducing Unit etc.		SET	1	
	2. 3-Stage Breathing Air Filter as per specifications,		SET	1	

4.	VACCUM SYSTEM				
	1. 3 nos. rotary vane vacuum pumps with Receiver, Filters, Electricals, etc. as specified in the spec		SET	1	
5.	COPPER PIPING AS PER EN 13348 WITH THIRD PARTY				
	1. Copper Pipe for Medical use with 12 OD X 1.0 mm		Mtr	92	
	2. Copper Pipe for Medical use with 15 OD X 1.0 mm		Mtr	862	
	3. Copper Pipe for Medical use with 22 OD X 1.0 mm		Mtr	448	
	4. Copper Pipe for Medical use with 28 OD X 1.0 mm		Mtr	265	
6.	FACTORY DEGREASED ISOLATION VALVES FOR MEDICAL USAGE WITH BRASS ADOPTERS				
	1. Isolation Valve for 15 mm Copper Pipe i.e (1/2")		Nos.	2	
	2. Isolation Valve for 22 mm Copper Pipe i.e (3/4")		Nos.	2	
	3. Isolation Valve for 28 mm Copper Pipe i.e (1")		Nos.	2	
7.	VALVE BOX (WITHOUT VALVES) FOR MEDICAL USAGE				
	1. Valve Box - 3 Gas Service (size 15mm X 15mm X 22mm) with NIST Connection & S.S.Valve for O2		Nos.	2	
	2. Valve Box - 5 Gas Service (size 15mm X 15 mm X 22mm) with NIST Connection & S.S. Valve for O2		Nos.	3	
8.	DIGITAL ALARM SYSTEMS				
	1. 3 Gas Microprocessor Controlled Alarm With Digital Display		SET	2	
	2. 5 Gas Microprocessor Controlled Alarm With Digital Display		SET	3	
9.	GAS OUTLETS				
	1. Double Lock with probe - Oxygen		SET	33	
	2. Double Lock with probe - Nitrous Oxide Set		SET	5	
	3. Double Lock with probe - Air 4 Medical Air Set		SET	28	
	4. Double Lock with probe - Air 7 Medical Air Set		SET	5	
	5. Double Lock with probe - Vacuum Set		SET	33	
10.	SUCTION AND OXYGEN THERAPY				

	PRODUCT				
	1. Oxygen Flowmeter BPC (0- 15 LPM) with Humidifier Set		SET	23	
	2. Ward Vacuum Unit with Regulator and 600ml polycarbonate jar Set		SET	23	
	3. Theatre Suction Unit with 2 x 2000 ml Polycarbonate Jars Set		SET	5	
	4. Kit Conversion - Oxygen Set		SET	5	
	5. Kit Conversion - Nitrous Oxide Set		SET	5	
	6. High Pressure Tubing		Mtr	30	
	7. Low Pressure Tubing		Mtr	120	
11.	BED HEAD PANEL		No	23	

Note:

1. The quantity of item given in the tender is tentative, which may be increased or decreased as per the institute's requirement.
2. Bidder should quote separate price for maintenance and operation (24 x 7) of manifold room with trained manpower and the entire MGPS system on per year basis.
3. Bidder must provide list of spares and consumables along-with their rates.

1. I/We have gone through the terms & conditions as stipulated in the tender enquiry document and confirm to accept and abide the same.
2. No other charges would be payable by the Institute.

Authorized signatory of the bidder with seal.