HSCC/SES/MGMS/2018 Dated: 20.03.2018

All Bidders

Amendment -II

Subject: Supply , Installation, Testing & Commissioning of Medical Gas Manifold System at Indian Institute of Technology (IIT), Kharagpur.

IFB No. : HSCC/SES/MGMS/IIT-Kharagpur/2018 dated 20.02.2018

This has reference to above IFB.

The following Amendment may be noted which shall be treated as part of the tender document and to be submitted duly signed & stamp along with tender.

Sr. No.	Bidders Queries	Reply
1	SCC-Vol. III, Page 26, 39.2.4 Water Supply & Power Supply The contractor will provide water & electricity to the Consultant's office free of cost for the required quantity by the Consultant's site office. Kindly clarify the readiness of site.	Tender terms and conditions prevail.
2	SCC-Vol. III, Page 37, 15. Guarantee and Defects Liability Period & Technical Specification- Vol. IV, Page 19, Point 5 & Vol. V, Page 3, BOQ, field 21. The defect liability shall be valid for a period of 1 year (12 months) from the date of satisfactory completion of works and issue of provisional taking over certificate. & The bidder should quote rates for operation of manifold system during 5 years DLP and 5 years CMC (Optional). & Operation during one year DLP Mismatch between SCC, BOQ and technical specification on DLP period. Kindly clarify	The defect liability shall be valid for a period of 1 year (12 months) from the date of issue of take-over certificate.
3	SCC- Vol. III, Page 38/39, 21.0 Terms of Payment &	Tender terms and conditions prevail.

	21.1 21.1 For purposes of estimating the contract value of works executed forcertificate of payment, the following norms shall be followed: 1) 65 % of the BOQ contract rates on delivery of equipments at site after inspection and passing on pro-data basis. 2) 25% of BOQ contract rates on satisfactory take over certificate by client after erection and installation, testing and commissioning of equipments on pro-data basis. 3) 10 % of BOQ contract rates after successful completion of trial run of30 days from the date of handover to the client on pro-data basis. We request you to consider payment term i.e. 1. 75% on delivery. 2. 15% on installation 10% on successful trial run	
4	Technical Specification -Vol. IV, Page 1, STANDARDS STANDARDS The design & selection of items should be of international standard like NFPA 99(latest version) standard and UL listed or DIN EN (latest version) and UL listed/CE marked or HTM 02 01 (latest version) standard and CE marked. This supersedes single/multiple standards mentioned at any other places in the tender specification involving item/system/capacity etc. The products should be of one standard only. All indigenous items should be compatible to the main system. As ISO 7396 is another widely accepted standard being used successfully in many institutes in India and also included in most of the tender Specification from HSCC, we request you to include ISO 7396 Standards in this list. For Individual items ISO 7396 standards is already mentioned in most of the places but as this clause specifically mentions that standard mentioned here supersedes multiple standards elsewhere in the document which will limit potential vendors to participate.	The design & selection of items should be of international standard like NFPA 99 (latest version) standard and UL listed or DIN EN (latest version) or ISO-7396(Latest version and UL listed/CE marked or HTM 02 01 (latest version) standard and CE marked. This supersedes single/multiple standards mentioned at any other places in the tender specification involving item/system/capacity etc. The products should be of one standard only. All indigenous items should be compatible to the main system.
5	Technical Specification -Vol. IV, Page 2, 1. Oxygen Supply System 1.1 Fully Automatic Oxygen Control Panel (Imported):	Tender terms & conditions prevail

	The heavy duty control panel should be provided with a flow capacity of 1500 or more LPM at 50 to 60 psi. The Automatic Control Panel should be installed in such a way to meet the peak flow requirement of the Hospital/Institute (If the requirement is more than flow capacity requirement automatic control panel the bidders has to supply 02 numbers of Automatic Control Panel and design the system in such a way to meet the flow requirement of respective institute) To calculate the flow requirement, we need detailed floor plan of Hospital building. Are you willing that each bidder should do such critical calculations or if you've already done that request to share the copy so we can bid accordingly. Also, if as per calculation we have to quote in multiple quantities how can this be incorporated in price bid since BOQ does not allow such additions	
6	Technical Specification- Vol. IV, Page 3,1.4 Oxygen Flow meter with Humidifier Bottle I) should be BIS/CE certified/ UL Listed Please elaborate on CE certificate	Oxygen Flow Meter should be European CE/UL Listed
7	Technical Specification- Vol. IV, Page 3,1.5. LIQUID MEDICAL OXYGEN STORAGE TANK-20KL CAPACITY We request you to clarify and elaborate on your requirement. The specification is for Storage tank alone. Supplier of oxygen may be different. There might be mismatch in standards since only few suppliers are available in India	**Item Liquid Medical Oxygen Tank-20 KL is deleted**. Revised BOQ is attached.
8	Technical Specification- Vol. IV, Page 7/8,2.1 Fully Automatic Nitrous Oxide Control Panel (Imported) The Control Panel should be made to provide Heavy Duty and have a flow capacity of 500 LPM or more at 50 to 60 psi. The Automatic Control Panel should be installed in such a way to meet the peak flow requirement of the Hospital/Institute (If the requirement is more than flow capacity requirement automatic control panel the bidders has to supply 02 numbers of Automatic Control Panel and design the system in such a way to meet the flow requirement of respective institute)	Tender terms& conditions prevail

	To calculate the flow requirement, we need detailed floor plan of Hospital building. Are you willing that each bidder should do such critical calculations or if you've already done that request to share the copy so we can bid accordingly. Also, if as per calculation we have to quote in multiple quantities how can this be incorporated in price bid since BOQ does not allow such additions	
9	Technical Specification- Vol. IV, Page 8,3. MEDICAL AND SURGICAL AIR SYSTEM (Package Unit – Imported) 3.1Air Compressor Modules It should be Oil-Less Screw Compressors /Scroll Compressors to produces the plant output of {minimum Liters Per Minutes(LPM) Plant capacity } as mentioned in BOQ of respective institute with necessary standby as per relevant standard BOQ mentions" medical air plant having a minimum capacity of 5000 LPM with necessary standby as per relevant standard as per specification." Kindly elaborate and specify standby capacity.	Medical Air and Surgical Air System and standby shall be governed by the NFPA/HTM-02-01/EN DIN/ISO-7396 standards of latest version
10	Technical Specification- Vol. IV, Page 10,4. VACUUM SYSTEMS (Package unit – imported) 4.1 Vacuum Pump Module It should be Oil Sealed Rotary Vane Type to produces the plant output of {minimum Liters Per Minutes(LPM) Plant capacity } as mentioned in BOQ of respective institute with necessary standby as per relevant standard. BOQ mentions" Rotary Vane type medical vacuum plant having a minimum system capacity of 6230 PM with necessary standby as per relevant standard as per specification." Kindly elaborate and specify standby capacity.	Vacuum System and standby shall be governed by the NFPA/HTM-02-01/EN DIN/ISO-7396 standards of latest version
11	Technical Specification- Vol. IV, Page 12,7. AGSS (Anesthetic Gas Scavenging System) Plant (Package Unit – Imported) One pump working and one stand by and vice versa. The package should consist of two rotary vane vacuum pumps, a control panel, and mounted on a common base frame. As HTM 02-01 and ISO 7396 allows the use of Blower	AGSS should be governed by the standards like NFPA 99 (latest version)/ DIN EN (latest version)/ISO-7396(Latest version)/HTM 02 01 (latest version)

	technology for AGSS System, request you to include this into tender specification. Attached reference catalogs	
12	Technical Specification- Vol. IV, Page 13,8. DISTRIBUTION PIPING 8.1 Piping specifications & VOLUME – V Bill of Quantities (BOQ)- 8(i) The minimum thickness of copper pipes of 35mm and above outer diameter, should be 1.2mm and the thickness of copper pipes less than 28mm outer diameter, should be 1mm as mentioned in respective Institute's BOQ 76mm OD X 1.2mm thick 76 mm OD pipes should be 1.5 mm thick Relevant page of EN13348 attached for your reference.	The Copper pipe shall be as per BS:EN13348:2008/ASTM B819 standard
13	Technical Specification- Vol. IV, Page 15, 11.2 Medical Gas Area Alarm (Imported) & VOLUME – V Bill of Quantities (BOQ)- 11 The medical gas central alarms should be capable of monitoring up to 5 medical gas services(As specified in BOQ of respective institute) & Medical Gas Area Alarm 6 services (Oxygen, N2O, MA4 bar , SA7 bar N2O,and Vacuum) Mismatch between technical specification and BOQ. Kindly clarify. Also please confirm about alarm requirements for CO2 and AGSS.	Medical Gas Area Alarm shall be of 6 services (Oxygen, N2O, MA4 bar , SA7 bar N2O,and Vacuum). Line Isolation valves shall be fitted with CO2 and AGSS.
14	Technical Specification- Vol. IV, Page 15,12. Line Isolation Valves The Lockable line valves must European CE mark/UL listed and complies with HTM 02-01/ NFPA99C/EN/DIN/ISO 7396-1 standard It is not expressedly mentioned in tech. specs. Whether imported or indigenous is required. Other items, if imported, are mentioned in item heading. Standard alone mentions 'European', kindly clarify	Line Isolation Valves should be European CE mark/UL listed- Imported.

15	The technical specifications are biased towards companies that supply items conforming NFPA standards. Hence we request you to consider minor changes in the specifications provided products being offered by different vendors are meeting critical technical requirements i.e. Flow, Pressure etc.	Same as amendment in Sl. No-04
16	We request you to clearly specify and differentiate the items that need to be imported and the items of indigenous origin to avoid confusion.	Tender terms & conditions prevail
17	We request you to clearly specify and clarify, for all items, between CE, European CE, CE with 4 digit notified body no. certifications to avoid any confusion	Tender terms & conditions prevail
18	For operations of manifold system, kindly elaborate manpower requirements with required number of +personnel, educational qualifications etc.	Manpower for operation during DLP shall be: Operator with 3-5 year experience- 2(A) + 2(B)+ 2(C) and Reliever Supervisor(5-10 experience) - 1(G) For seamless operation for 24x7 throughout DLP.
19	Request you to kindly extend the deadline for submission of tender to 23rd March 2018.	Date of submission of tender is extended to 27.03.2018 at same time and same venue mentioned in the tender.
20	Vol IV, Pg 1, Last Para – Standards The design & selection of items should be of international standard like NFPA 99(latest version) standard and UL listed or DIN EN (latest version) and UL listed/CE marked or HTM 02 01 (latest version) standard and CE marked. However, in other pages of the Tender Spec ISO 7396-1 is also mentioned ISO 7396-1 is widely followed standard for MGPS worldwide, and is more exigent then all the other local regulations. Hence, please include standard ISO 7396 – 1 & 2, to enable prospective bidders to quote.	Same as amendment in Sl. No-04
21	Vol V, Pg 2, Sl. No 3.0 Compressed air plant has no indication of the second and third source. Plant capacity mentioned is 5000 LPM. Please specify the reserve and emergency sources capacity to be requested?	Same as amendment in Sl. No-09
22	Vol V, Pg 2, Sl. No 4.0	Same as amendment in Sl. No-10

	Vacuum plant has no indication of the second and third source. Plant capacity mentioned is 6230 LPM. Please specify the reserve and emergency sources capacity to be requested?	
23	Vol 1V, Pg 12, Sl. No 7.0 AGSS pump type mentioned is Rotary Vane. AGSS system generally speaking should be designed using Side Channel Vacuum Blowers as they are more lasting and efficient. Hence, please include AGSS with Side Channel Vacuum Blowers	Same as amendment in Sl. No-11
24	Vol IV, Pg 19 Vol V, Pg 3, Sl. No 21.0 DLP mentioned is 5 Years DLP mentioned as 1 Year Please confirm the actual DLP to be considered.	Same as amendment in Sl. No-02
25	Vol V, Pg 3, Sl. No 21.0 Operation of MGMS There is no mention about the minimum number of personnel to be deputed for the Operation of MGMS. It is suggested that the number of personnel required is to be specified so that all bidders can quote in same line.	Same as amendment in Sl. No-18
26	Vol 4 1.4 Oxygen Flow meter with Humidifier Bottle 5. Ward Vacuum Units 6. Theatre Vacuum unit for OT 10. AREA VALVE SERVICE UNIT 16. Horizontal/ Vertical Bed Head Panel Please confirm if Indigenous Supply (Make in India) are accepted for Oxygen F/M, Ward Vac Unit, Theatre Vac Unit, AVSU & Horizontal Bed Head Panels.	Oxygen Flow meter with Humidifier Bottle-Imported Ward Vacuum Units-Indigenous Theatre Vacuum unit- Indigenous Area Valve Service Unit(AVSU)-Imported Horizontal/ Vertical Bed Head Panel(BHP)- Imported. AVSU and BHP should fully comply and meet with HTM 02-01/NFPA 99C/EN/DIN/ISO7396-1
27	Vol 1, Pg 3	Same as amendment in Sl. No-19

	Last date of Bid Submission – 16.03.2018 We request you to kindly extend the date of bid submission by atleast 2 weeks to enable us to prepare and submit the best Techno Commercial offer	
28	Vol 1, Pg 3 Period of work completion – 5 Months We request you to kindly amend the work completion time to minimum 9 Months	Tender Terms and conditions prevail.
29	Vol-III, Special Conditions of Contract , Page No. SCC- , Clause 39.2.4 Water Supply & Power Supply The contractor will provide water & electricity to the Consultant's office free of cost for the required quantity by the Consultant's site office. Please elaborate the scope in this regard for our review & confirmation	Tender Terms and conditions prevail.
30	Vol-II, General Conditions of Contract, Clause 47.1 & Annexure-B (Appendix To Tender) Liquidated Damages for Delay: Amount of Liquidated damages : 1% (one percent) of contract price per calender week of delay Limit of liquidated damages : 10% (Ten percent) of contract price Please consider the aggregate maximum of liquidated damages payable under clause No. 47.1 shall not exceed 0.05% of contract value per week of delay and shall be subjected to maximum amount of 5% on overall contract price.	Tender Terms and conditions prevail.
31	Vol-III, Additional Specific Conditions of Contract, Page No. SCC-, Clause21.0. Terms of Payment: For purposes of estimating the contract value of works executed for certificate of payment, the following norms shall be followed: 1) 65% of the BOQ contract rates on delivery of equipments at site after inspection and passing on pro-data basis 2) 25% of BOQ contract rates on satisfactory take over certificate by client after erection and installaltion, testing and commissioning of equipments on pro-data basis	Tender Terms and conditions prevail.

	3) 10% of BOQ contract rates after successful completion of trial run of 30 days from the date of handover to teh client on pro-data basis. We would request to consider following payment terms: 1) 70% of the BOQ contract rates on delivery of equipments at site after inspection and passing on pro-data basis 2) 20% of BOQ contract rates on satisfactory take over certificate by client after erection and installaltion, testing and commissioning of equipments on pro-data basis 3) 10% of BOQ contract rates after successful completion of trial run of 30 days from the date of handover to teh client on pro-data basis. Moreover after mechanical completion if the commisioning of the MGMS system is got delayed for more than 3 months due to reasosns not attributable to Contractor then payment linked to this activities shall be released against submission of B.G. of equivalent amount.	
32	Vol-III, Additional Specific Conditions of Contract, Page No. SCC-, Clause22.0 Training of Personnel The contractor shall arrange to train the Employer's personnel on the following aspects: a) Routine maintenance of all equipments and the complete Medical Gas Manifold System b) Adjustments of settings for controls and protective devices c) Preventive maintenance d) Disassemblies and assembling of equipments including identification and replcement of worn out parts. Please specify the no. of persons & days to be considered for training programme.	Tender Terms and conditions prevail.
33	Page no. 8 of SCC, 1.5 Time for Completion We request the Delivery Schedule may please be amended as mentioned 5 months. We request this should be 6 months after approval of drawings. You would appreciate arranging such qunatity of material takes lot of time and resources. Drawing approval itself takes time and other similar factors. This is a project and not mere supply of equipments. It	Tender Terms and conditions prevail.

	involve lot of stages and most of the items like AGSS System, Air System, Vaccum System, Oxygen Control Panel, N2O Control Panel, Co2 Control Panel etc are imported for which procurement only starts after approval of final drawing which is a time consuming process. So we hereby request you to kindly increase the delivery schedule from 5 months to 6 months.	
34	Page no. 38, 39 of SCC 21.0 Terms of Payment 1) 65 % of the BOQ contract rates on delivery of equipments at site after inspection and passing on pro-data basis. 2) 25% of BOQ contract rates on satisfactory take over certificate by client after erection and installation, testing and commissioning of equipments on pro-data basis. 3) 10 % of BOQ contract rates after successful completion of trial run We request, 70% payment should be released on delivery of equipments, 20% payment should be released on erection of goods and balance 10% on Final Acceptance Certificate . You will appreciate GST has been implemented since 1st July 2017 by Govt. of India. With the implementation of this system vis-a-vis current payment structure most of the projects gets delayed or handing over not taken by the Hospital/Institute/Department because of this the balance payment gets stuck for longer duration. This way the liquidity get blocked and input credit is lost. Therefore we request to kindly Amend the payment terms.	Tender Terms and conditions prevail.
35	Page 2, Specifications no. 1.1 1.1 Fully Automatic Oxygen Control Panel The Manifold control panel should be digital/Analogue. We request Digital Control Panel should only be considered. You may appreciate there is cost difference in Digitial VS Analogue. Digital is expensive compare to Analogue. The Technology of Digital is better and advance version then Analogue system. Moreover now a days preference is given to digital system only. We request to kindly delete Analogue system.	Tender Terms and conditions prevail.
36	Page 8, Specifications no. 3.1	Air System capacity with variation of +5% allowed.

	3.1 Medical and Surgical Air System (Package Unit - Imported) - Variation of + 10%/5% is missing Please appreciate throughout the world (Indian or Imported), the Models and the Capacity (LPM) of Air System are Pre-Defined by Manufacturers. Air System is not manufactured as per the requirement. Based on the Pre-Defined Air System, the Models are selected as per the requirement. Like in every Tender such as SIX AIIMS, Kolkata Medical College, Government Medical College, Nagpur etc, + 10%/5% variation is given. This + 5% variation is mentioned for ease in procurement. We are enclosing herewith recent Tender Paper of M/s HSCC Tender for MGPS for your ready reference. We therefore request, the Air Compressor plant capacity should be defined with variation of + 5% as defined in past Tenders and same should be as per Standard.	
37	Page 9, Specification no. 3.2 3.2 Medical and Surgical Air System (Package Unit - Imported) - Verticial Air Receiver It is mentioned that air receiver capacity should be 50% of primary plant capacity. We request this should be amended and should be as per Standard. We follow NFPA-99 Standard therefore the capacity which standard recommend should be stated and supplied.	Same as amendment in Sl. No-09
38	Page 10, Specification no. 4. 3. Vacuum System (Package unit - Imported) Please appreciate throughout the world (Indian or Imported), the Models and the Capacity (LPM) of Vacuum System are Pre-Defined by Manufacturers. Vacuum System is not manufactured as per the requirement. Based on the Pre-Defined System, the Models are selected as per the requirement. Like in Tender such as Kolkata Medical College etc, 5% variation is given. This + 5% variation is mentioned for ease in procurement. We are enclosing herewith recent Tender Paper of M/s HSCC Tender for MGPS for your ready reference. We therefore request, the Air Compressor plant capacity should be defined with variation of + 5% as defined in past Tenders and same should be as per Standard.	Variation of Vacuum system +5% allowed
39	Page no. 10, Specification no. 4.2 4. Vacuum System 4.2 Vacuum Receiver It is mentioned that vacuum reservoir should have 100%	Same as amendment in Sl. No-10

	volume of plant output. We request this should be amended and should be as per Standard. We follow NFPA-99 Standard therefore the capacity which standard recommend should be stated and supplied.	
40	Page no. 14, Specificaton no. 10 AREA VALVE SERVICE UNIT (WITHOUT NIST Connection We work on the Principals of NFPA-99 Standard, wherein no NIST connection is applicable. We request NIST Connection should be deleted.	Should be governed by the standards like NFPA 99 (latest version)/ DIN EN (latest version)/ISO-7396(Latest version)/HTM 02 01 (latest version)
41	Page no. 14, Specificaton no. 11 Alarm System We request Alarm system should be Touch Screen Alarm System. Touch Screen Technology is Easy to Access and low cost due to its simple structure of touch screen and controller circuit. Touch Screen technology has no limitation for input material as long as top sheet yields by pressing. The sensor can be operated with a finger, pen, and any other tool. Analog resistive sensor has high resolution and location accuracy. Thickness of resistive touch screens can be thin due to its simple structure. Frame area (insulation area) is narrow comparing with other technologies. Because of its simple structure and sensing method, it is possible to source a touch screen and controller separately to make a touch screen unit. Resistive touch screen consumes only low power. We therefore request Alarm System should be Touch Screen.	Tender terms & Conditions prevail
42	Page no. 8, Specification no. 2.1 2.1 Fully Automatic Nitrous Oxide Control Panel (Imported) All functional components should be enclosed on fire resistant, robust synthetic polymer/SS. We request this line should be deleted as it has no relevance in the specifications.	All functional components should be enclosed on fire resistant material.
43	Page 14, Specification no. 11 Page no. 12, Specification no. 7, AGSS (Anesthetic Gas Scavenging System) Plant (Package Unit - Imported) -Plant Capacity 1400 LPM	AGSS Plant capacity shall be of suitable capacity to cater for OT-11 Nos, Cath Lab-3 Nos, Laparoscopy room-1, MRI-1, and CT Scan-1,

	As per NFPA-99 Standard each operation theatre require 30 LPM. So we hereby request you to please specify no. of OTs so that we will quote system as per standard. As mentioned plant is on very very high side for e.g. if there are 15 OTs, 450 LPM is sufficient i.e. 500 LPM as primary and 500 LPM as standby. We are enclosing herewith the data sheet from M/s Powerex, USA for your ready reference and records. The capacity has been reduced in earlier tenders. We therefore request to kindly Amend the Plant capacity of Primary and Standby.	
44	Page 17, 18 Specification no. 16, Horizontal/ Vertical Bed Head Panel Lamp with flexible LED lighting – 1 and Clarification We request you to please clarify the mentioned facility per unit as under means what, whether it is part of outlet or provisional? Oxygen-2 Vacuum-2 Medical Air-1…….Monitor Bracket We also request you to kindly remove LED light from Bed Head Panel as it is no relevance with BHP.	Gas Outlets quantities of Bed Head Panel are already taken in consideration of quantities of respective outlets in BOQ. Built-in LED lighting/Flexible LED lighting should be provided.
45	Page 19 The bidder should quote rates for operation of manifold system during 5 years DLP and 5 years CMC (Optional). We request you to please delete optional word from CMC. The bidders can play with the optional word. CMC should be compulsory and while evaluating the total pricing. Whereas at the same time Sr.No. 24.0 Operation and Comprehensive Maintenanace Contract (O& CMC) it is mentioned that the rate of CMC will be added for evalaution and ranking purpose. Both the things are contradicting. Please clarify.	Same as amendment in Sl. No-02.
46	**Medical and Surgical Air System** Technical Specification is of one particular standard, i.e NFPA only. Please add technical specification of HTM 02-01 Standard as the same was published in Janakpuri Super Specialty Hospital, BHU, Varanasi & Other prestigious projects like Six AIIMS. You have mentioned Oil-Less Screw Compressors /Scroll Compressors. Please amend it to Pentaplex	Same as amendment in Sl. No-09 And Pentaplex /Quadraplex Rotary screw/scroll Continuous duty Compressed Air System with Desiccant Dryers. Air compressor with multistage air/oil filters or oil free compressor should be provided.

	/Quadraplex Rotary screw/scroll Continuous duty Compressed Air System with Desiccant Dryers. Air compressor with multistage air/oil filters or oil free compressor. For your ready reference, Complete Technical specifications mentioned in SIX AIIMS Tender is enclosed.	
47	**Medical Air System / Vacuum System** Kindly clarify No. of Vacuum Pumps as working and No. of Vacuum Pumps as standby as it is not mentioned in the tender documents.	Same as amendment in Sl. No-10
48	**Air Receiver/ Vacuum Receiver** Since complete Air and Vacuum Plant is imported, hence the standard mentioned for receiver is not applicable as these are Indian standards and being a package unit Air / Vacuum receiver is part of Plant offered. Hence we request you to kindly delete IS: 2825 / ASME / BS/ ISO standard from the specifications. In your previous tenders, you had offered alternate specifications of HTM 02-01 standard against each item, but in this tender technical specifications conforming to HTM 02-01 standard are not there. All the tender technical specifications confirm to one particular standard, i.e NFPA Standard only. Kindly give alternate specifications of HTM Standards for the following items: 1. Fully Automatic Control Panel for Oxygen, Nitrous Oxide 2. Medical and Surgical Air System 3. Vacuum System 4. Anesthetic Gas Scavenging System 5. Gas Outlet 6. Master Alarm and Medical Gas Area Alarm 7. Area Valve Service Unit For your kind perusal and ready reference we are enclosing the detailed specifications as per HTM Standard for these items.	Medical and Surgical Air System should be governed by the standards like NFPA 99 (latest version)/ DIN EN (latest version)/ISO-7396(Latest version)/HTM 02 01 (latest version)
49	**Horizontal / Vertical Bed Head Panel** In the tender specifications, you have mentioned Lamp with flexible LED Lightings. Kindly amend it to built-in LED lighting instead of lamp with flexible LED Lighting. Holder for Vacuum collection Jar should also be deleted. Please define about electrical, whether you require switch sockets or sockets only.	Horizontal/Vertical Bed Head Panel should have-5/15 Electrical switch and sockets (Antibacterial)-8 Nos. Built-in LED lighting/Flexible LED lighting should be provided.
50	**Ward Vacuum Unit** You have mentioned 1000 CC Safety jar. Please note this is a typographical error, it can be of 100 CC Jar only	Tender Terms and conditions prevail

	because the purpose of safety jar is only for protection from overflow and not for collection of vacuum. You are therefore requested to kindly amend the same.	
51	**Turnkey Work** You had mentioned about Flooring inside the manifold room and Trenching work. Kindly add both the items in the BOQ and provide quantities for the same. Please confirm who will do air conditioning work? You had put Third Party quality certificate in the scope bidder. It should be deleted and can be mentioned as inspection of installed material should be in scope of bidder. Please define Number of Manpower required for operation in each site?	Turnkey works are in the scope of contractor. Manpower for operation during DLP shall be as Sl.no-18
52	**Commercial Point** If we have NSIC / SSI Registration, please confirm are we exempted from submission of EMD?	In case of NSIC registered firms for respective works , document fee and EMD is exempted. Duly Signed copy for NSIC certificate online as well as in hard copy either by registered post or by hand for respective work is to be submitted before due date and time of submission of tender.
	Reg. Earnest Money Deposit - If we have NSIC / SSI Registration, please confirm are we exempted from submission of EMD?	
53	**Defect Liability Period**: In Special Condition of Contract of Tender Documents Defect Liability Period is mentioned as 12 Months while in the technical specification Defect Liability Period is asked for 5 Year. Please clarify about Defect Liability Period of tender.	Same as amendment in Sl. No-02.
54	**Ref. Technical Specifications** Oxygen Flow meter with Humidifier Bottle Ward Vacuum Unit Theatre Vacuum Unit Horizontal / Vertical Bed Head Panel **Please clarify whether above referred products asked in the tender are indigenous or imported?**	Same as amendment in Sl. No-26
55	Last date of submission may be extended at least seven days.	Same as amendment in Sl. No-19
	TECHNICAL SPECIFICATIONS OF MEDICAL GAS PIPELINE SYSTEM **1. Oxygen Fully Automatic Changeover Control Panel of 1500lpm :**	Specification should be governed by the standards like NFPA 99 (latest version)/ DIN EN (latest version)/ISO-7396(Latest version)/HTM 02 01 (latest version)

	It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be provided with a copy of the certificate of origin. Automatic Changeover Manifolds shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have all regulators which should be adiabatic certified. The manifold control panel shall be designed and certified for use with oxygen at 200 bar and 60°C. Auto-ignition testing shall be carried out and a copy of the test report shall be shall be provided for review. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. All components degreased for oxygen use. Mild steel powder coated enclosure with Perspex window. The manifold control system shall be powered by an extra low voltage on board supply. The controller shall include normally closed alarm connections and two sets of BMS connections for both normally open and normally closed operation. Line pressure shall be continuously monitored by an electronic pressure switch; mechanically actuated pressure switches are not acceptable. There shall be a manual changeover button to enable selection of the duty bank. 50 W cartridge heaters with thermostat control: N2O and O2/N2O manifolds. Two non-return valves, one for each bank, shall be provided within a line pressure manifold block and shall provide gas tight isolation of each bank during maintenance and ensure supply continuity in the event of any upstream component failure. In the event of a low line pressure condition, both solenoid valves shall open to enable both banks to deliver gas and restore normal pipeline pressure. A manifold status panel shall be provided with colour coded LED indication lights for the following operating and fault indications: □ Power On (Green) □ High Line Pressure (Red) □ Low Line Pressure (Red) □ Reserve Low (Amber) □ Left Bank Running (Green) □ Left Bank Low (Amber) □ Left Bank Empty (Amber) □ Right Bank Running (Green) □ Right Bank Low (Amber) □ Right Bank Empty (Amber)	

	The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications: □ Normal (Green) □ Duty Bank Empty (Amber) □ Standby Low (Amber) □ Reserve Bank Low (Amber) □ Pipeline Pressure Fault (Red) □ System Fault (Red) In the event of a power supply failure, both solenoid valves shall open to enable gas to be supplied from both cylinder banks simultaneously until restoration of the power supply. **2. N2O Fully Automatic Changeover Control Panel of 500lpm :** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have all regulators which should be adiabatic certified. The manifold control panel shall be designed and certified for use with oxygen at 200 bar and 60°C. Auto-ignition testing shall be carried out and a copy of the test report shall be shall be provided for review. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. All components degreased for oxygen use. Mild steel powder coated enclosure with Perspex window. The manifold control system shall be powered by an extra low voltage on board supply. The controller shall include normally closed alarm connections and two sets of BMS connections for both normally open and normally closed operation. Line pressure shall be continuously monitored by an electronic pressure switch; mechanically actuated pressure switches are not acceptable. There shall be a manual changeover button to enable selection of the duty bank. 50 W cartridge heaters with thermostat control: N2O and O2/N2O manifolds. Two non-return valves, one for each bank, shall be provided within a line pressure manifold block and shall provide gas tight isolation of each bank during maintenance and ensure supply continuity in the event of any upstream component failure. In the event of a low line pressure condition, both solenoid valves shall open to enable both banks to deliver gas and restore normal pipeline	

	pressure. A manifold status panel shall be provided with colour coded LED indication lights for the following operating and fault indications: Power On (Green) High Line Pressure (Red) Low Line Pressure (Red) Reserve Low (Amber) Left Bank Running (Green) Left Bank Low (Amber) Left Bank Empty (Amber) Right Bank Running (Green) Right Bank Low (Amber) Right Bank Empty (Amber) The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications: Normal (Green) Duty Bank Empty (Amber) Standby Low (Amber) Reserve Bank Low (Amber) Pipeline Pressure Fault (Red) System Fault (Red) In the event of a power supply failure, both solenoid valves shall open to enable gas to be supplied from both cylinder banks simultaneously until restoration of the power supply. **3. CO2 Fully Automatic Changeover Control Panel of 500lpm :** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have all regulators which should be adiabatic certified. The manifold control panel shall be designed and certified for use with oxygen at 200 bar and 60°C. Auto-ignition testing shall be carried out and a copy of the test report shall be shall be provided for review. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. All components degreased for oxygen use. Mild steel powder coated enclosure with Perspex window. The manifold control system shall be powered by an extra low voltage on board supply. The controller shall include normally closed alarm connections and two sets of BMS connections for both	

	normally open and normally closed operation. Line pressure shall be continuously monitored by an electronic pressure switch; mechanically actuated pressure switches are not acceptable. There shall be a manual changeover button to enable selection of the duty bank. 50 W cartridge heaters with thermostat control: N2O and O2/N2O manifolds. Two non-return valves, one for each bank, shall be provided within a line pressure manifold block and shall provide gas tight isolation of each bank during maintenance and ensure supply continuity in the event of any upstream component failure. In the event of a low line pressure condition, both solenoid valves shall open to enable both banks to deliver gas and restore normal pipeline pressure. A manifold status panel shall be provided with colour coded LED indication lights for the following operating and fault indications: □ Power On (Green) □ High Line Pressure (Red) □ Low Line Pressure (Red) □ Reserve Low (Amber) □ Left Bank Running (Green) □ Left Bank Low (Amber) □ Left Bank Empty (Amber) □ Right Bank Running (Green) □ Right Bank Low (Amber) □ Right Bank Empty (Amber) The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications: □ Normal (Green) □ Duty Bank Empty (Amber) □ Standby Low (Amber) □ Reserve Bank Low (Amber) □ Pipeline Pressure Fault (Red) □ System Fault (Red) In the event of a power supply failure, both solenoid valves shall open to enable gas to be supplied from both cylinder banks simultaneously until restoration of the power supply. **4. Imported Area Valve Service Unit (Single Service Unit separate for each services)** (Oxygen/N2O/MA4 Air/SA7/CO2/Vacuum). It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. The Area Valve Service Unit (AVSU) should incorporate a ball value with NIST connectors	

	either side, mounted in a lockable box with emergency access. The value should be complete with copper stub pipes that extend to the outside of the box to enable easy connections to the Medical Gas Pipeline System (MGPS). The value should operate from fully closed to fully open with a quarter turn of the handle. The spades should be injection molded and color coded to show through or blank identification. Should be full bore values for minimum pressure loss and should have lockable in open or closed position. The Lockable Line Values shall comprise full-bore ball value complete with copper stub pipes for ease of installation. The valves shall be connected to the copper stub pipes by means of flat faced unions fitted with nitrile O-ring seals, allowing removal of the value without the need to distort the pipe work. Stub pipes for values up to 54 mm will be connected to the value body using screwed connectors, whist value above this size will use flanged connectors. The value will have a brass body, end cap and stem, with a full –bore chrome plated brass ball. The value shall operate from fully closed to fully open with a quarter turn of the handle. All line values will be supplied with a mechanism to enable the unit to be locked in the fully closed or fully open position. The stub pipes should have the appropriate coded NIST connectors fitted each side of the value. The NIST check values should have a metal seal, thus avoiding the possibility of digression over time. The value box should have a universal back plate for first fix mounting and an injection molded, cover which fits over the installed value. A color coded service identity label will be fitted behind the value handle . The door should also be injection molded and will be common for all services. The door should incorporate a 'Break Glass' window or an optional quick release mechanism for emergency access to the value. Should be reliable and easy to operate and must have NIST connectors facilitate easy purge, sample and pressure testing, and emergency, supply system. Should be easy site installation with pre-fitted stub pipes. All break access glass should be approved safety glass and not float glass. The should have break glass emergency access fitted as standard. Should have optional quick release emergency access system. The Area Value Service Unit (AVSU) should incorporate a ball valvewith NIST connectors either side, mounted in a lockable box with emergency access. The value should be complete with copper stub pipes that extend to the outside of the box to enable easy connections to the Medical Gas Pipeline System (MGPS). **5. Imported Medical Gas Area Line Pressure Alarm** **(6 Service : Oxygen, N2O, MA4 Air, SA7 , CO2 and Vacuum)** **(5 Service : Oxygen, N2O, MA4 Air, SA7 , and Vacuum)**	

	(4 Service : Oxygen, N2O, MA4 Air, and Vacuum) **(3 Services : Oxygen, MA4 Air and Vacuum)** **(2 Services : Oxygen, and Vacuum)** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have anti microbial coating labels for touch control. It should be capable of monitoring up to 6 gas services by means of pressure sensors that detect deviations from the normal operating limits.. The cover, backbox and bezel (if required) shall be polyester powder. It should have antimicrobial coating. A single tamperproof fastener shall be used to gain access to the hinged door. The hinge shall operate through a minimum of 120° to provide adequate access. It should have each gas service shall be displayed by coloured LED's to show 'Normal' (green), 'Low' and 'High' pressure (red) conditions. Medical vacuum systems shall be displayed in the 'Normal' (green) and 'Low' vacuum (red) conditions. Failure indicators shall be displayed by flashing lights and normal indications shall be steady. Each LED block indicator shall be a plug-in component with individual long life LED's connected in parallel in two banks to provide duplex circuits. An audible warning shall sound simultaneously with any failure indication and a mute facility shall be provided. Following a mute selection the audible will resound after approximately 15 minutes, or shall operate simultaneously should a further alarm condition occur. A "Mute" switch shall be provided inside the panel for use during any maintenance resulting in prolonged pipeline or plant shutdown. This facility shall automatically reset when the gas service returns to normal. The alarm panel shall have a 'Test' facility to prove the integrity of the internal circuits, LED's and audible warning. The alarm panel shall incorporate a volt free normally closed relay to allow for interconnection to either a medical gas central alarm system or an event recording circuit of a building management system. Each alarm shall provide a green LED to indicate that electrical power is available at the panel and a red LED to indicate 'System Alarm'. In the event of an electrical power supply failure the 'System Alarm' LED shall illuminate (flashing) and the audible warning shall be delayed for 30 seconds to enable standby generator tests. Line continuity monitoring circuits shall be provided to constantly monitor the integrity of the input sensors and interconnecting wiring. In the event of any fault the line continuity monitoring circuits shall initiate the specific gas service failure indication, a 'System Alarm' indication and an audible warning. Further aids to fault diagnosis shall be	

	provided by means of varying flashing rates whilst operating the 'Test' switch. A simple data connection shall be provided to allow connection of up to 5 repeater panels, enabling the visual and audible alarm signals to be repeated at other locations within a department. It should be connected through Pressure and Vacuum Switches: Pressure and vacuum switches shall be manufactured with brass wetted parts and house a PCBA with line continuity monitoring resistors. Electrical connectors shall be designed for frequent disassembly. Spade connectors are not acceptable. Pressure switches shall include both high and low pressure settings in the same switch, using only a single ¼" BSPP threaded pipeline connection to minimise the number of sealed joints. The body and housing of the pressure switch shall be manufactured from impact resistance, rigid and inherently corrosion proof materials. Coating or plating of mild steel is not acceptable. Pressure switches shall connect directly to the area alarm panel. It is not acceptable to fit a separate connection box to convert switch signals to a data signal. **6. Master Alarm Panel for 6 Services : Oxygen, N2O, MA4 Air, SA7 , CO2 and Vacuum** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have anti microbial coating labels for touch control. The Central Alarm should be flexible, customisable medical gas central alarm system, capable of carrying up to fifteen gas services and can consist of up to thirty two panels, including any BMS alarm interfaces. The cover, back box and bezel (if required) shall be finished in a polyester powder coat. A single tamperproof fastener shall be used to gain access to the hinged door. The hinge shall operate through a minimum of 120° to provide adequate access. The Configuration of the Medical Gas Central Alarm panels shall be done via switches within the panel, allowing easy and flexible configuration. Each panel shall display and/or input up to five gas services or up to twenty point alarms. Each gas service shall consist of a bank of five dual circuit LED indicators, one green (for a 'Normal' indication) and three yellow and one red (for four input conditions) as standard, although panels shall be customisable for individual requirements. The gas service inputs shall be connected to a five way connector block. The alarm shall monitor the cable connection from the source equipment, and provide a	

	fault alarm in the event of a short circuit or open circuit fault. This shall be distingishable from a source equipment fault. There shall be a test facility to check the integrity of all the LED indicators on the panel, and the audible alarm. The test facility shall also provide diagnostic information to aid in fault finding. An adjustable volume audible alarm shall be fitted to the panel to allow installation in all environments, and there shall be a facility to connect the alarm to a remote sounding unit to repeat the audible alarm at other locations, for example a nurse base at the other end of a ward. There shall be a mute facility which silences the audible alarm for a period of fifteen minutes, or until another alarm condition occurs. There shall be a selectable option to indicate to other repeater panels around the system that an alarm condition has been acknowledged and appropriate action is being taken A volt-free contact shall be provided to output normal/fault status for the panel. It should be wired on to a dedicated data transmission cable and shall be permanently connected to the “Essential Supply” within the hospital via a 3A fused spur. Each gas service will display a green ‘Normal’ indication when all four conditions are not in a fault condition. When an input condition faults, the respective LED shall indicate the type of failure. Any data communication errors shall cause a ‘System Fault’ alarm. A rechargeable battery shall provide a ‘System Fault’ alarm in the event of a power failure. Source equipment shall connect directly to the input alarm panel. It is not acceptable to install a separate connection box to convert switch signals to a data signal. It should have BMS Alarm Interface : The BMS Alarm Interface is an optional add-on accessory for the Medical Gas Alarm System. The cover, backbox and bezel (if required) shall be finished in a polyester powder coat. A single tamperproof fastener shall be used to gain access to the hinged door. The hinge shall operate through a minimum of 120° to provide adequate access. Each gas service shall consist of a bank of four relays. The gas service outputs shall be presented on a five way connector block. A rechargeable battery shall provide a ‘System Alarm’ indication in the event of a power failure. Each panel shall be wired into the data cable for the alarm system and shall be permanently connected to the Essential Supply within the hospital via a 3A fused spur. Each relay is energised when the respective condition is ‘Normal’, and de-energises on an alarm condition. A failure of a relay will cause an alarm condition to present on the connected system. Any data communication errors shall cause an alarm condition and a ‘System Fault’ alarm. **7. Imported Pentaplex 7400lpm Medical Vacuum Plant 3 Phase 50 Hz (Package Unit)**	

	It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. Three identical vacuum pumps should be working and two standby. Comprising of Pentaplex rotary vane vacuum pumps (5 x 11kw 2400kpm each), 3 x 2400lpm each working as duty and 2 x 2400lpm as standby. 5 x 11KW rotary vane vacuum pump base/floor mounted (2400 lpm flow rates of each pump). 3 x 2700 liters capacity vertical vacuum receiver tanks. 77 dBA sound pressure level. 76mm OD pipe work and 42mm is exhaust pipe. The Medical Vacuum Plant shall be fully tested. A test certificate shall be provided showing the results of the tests, including the free-air flow rate obtained at an inlet vacuum of 450 mmHg. Type testing of plant flows or testing in component form is not acceptable. 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 475 mmHg and 650 mmHg. Rotors shall be driven by directly coupled totally enclosed fan-cooled 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 be provided with an oil mist eliminator delivering a virtually oil-free exhaust. Each pump shall be fitted with anti-vibration pads between the pump foot and mounting frame and an oil level sight glass. A pressure switch shall be included to provide an indication that the pump is operating normally once it has been called into service. Vacuum Pump Starter Units : Pump starter units shall be provided with Direct-On-Line (DOL) motor starters for nominal motor powers up to 7.5 kW and Star-Delta (Wye-Delta) motor starters for motors above 7.5 kW. Each motor shall be protected by a thermal overload relay. The incoming supply shall terminate at a door interlock isolator. An ammeter shall be fitted to each starter panel indicating the current drawn by the motor. Each pump starter unit shall incorporate a 24V transformer that provides power to the Plant Control Unit such that complete control of the plant is maintained in the event of a single power supply failure. The pump starter unit shall provide LED indication lights for the following operating and fault conditions: • Mains Supply On (Green) • Selected (Green) • Called For (Green)	

	□ Operating (Green) □ Control Circuit Failed (Amber) □ Overload Tripped (Amber) □ Over Temperature, if fitted (Amber) □ Pump Fault (Amber) □ Pump Failed (Amber) Plant Control Unit : The Plant Control Unit shall incorporate an intuitive menu driven display for access to operational information and service functions. A securely protected engineer's mode shall also be provided that can only be accessed by authorised personnel to modify operational parameters. The Plant Control Unit central control system shall operate at extra low voltage and include BMS connections for plant fault, plant emergency, reserve fault and pressure fault. A mechanical backup pressure switch shall ensure continued system operation in the event of a control system or transducer malfunction. The Plant Control Unit shall incorporate an intuitive menu driven LCD display, providing easy access to system operational information and alarm resets. The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications: □ Normal (Green) □ Plant Fault (Amber) □ Plant Emergency (Amber) □ Check Status (Amber) □ Pipeline Pressure Fault (Red) □ System Fault (Red) Vacuum Vessel(s) : 3 x 2700ltrs Vacuum vessels shall comply with BS 5169:1992 and be manufactured from heavy gauge fusion welded steel with a minimum wall thickness of 5 mm and dished ends with a minimum wall thickness of 6 mm. Total vacuum vessel volume shall be at least 100% of the plant capacity in 1 minute in terms of free air aspired at normal working pressure. Where only a single vessel is supplied it shall be connected to the bacteria filters in parallel with the pumps such that operation of the system can continue during receiver isolation for periodic internal inspection. The vessel shall include a drain valve and a 100 mm nominal diameter vacuum gauge complete with isolating valve. Bacteria Filters : Quaduplex arrangement of bacteria filters shall be provided, incorporating high efficiency filter elements. Each filter shall be generously sized to carry the full plant design flow capacity with a pressure drop not exceeding 22 mbar (16.5 mmHg). Bacteria Filter elements shall have penetration levels not exceeding 0.005% when tested by the sodium flame method in accordance with BS 3928:1969 utilising	

	particles in the 0.02 to 2 micron size range. Each filter shall be provided with a differential pressure gauge. A drain flask 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. **8.Imported 7200lpm Pentaplex 11 Bar Medical Air Plant 3 Phase 50 Hz (Package Unit)** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. Medical Air Plant of 11bar for both 4bar MA4 Air supply and SA7 Air supply. Pentaplex (5 x 22kw SCREW compressors), with duplex drier and filtration, • 3 x 22KW (2400lpm) each screw air compressor will always be running to produce 7200lpm. • 3 x 22KW (2400lpm) each screw air compressor will be stand by. • 5 x 22KW each screw air compressor base frame mounted. • 2 x 3000 liters capacity vertical air receiver. • 3 x air dryer. • 72 dBA sound pressure level. • 54mm OD pipe work. Each base frame mounted screw compressor will provide 2400 lpm air flow. EMC certificate copy must be submitted. Compressors shall be directly driven by EFC IP55 energy saving CEMEP Class EFF1 high efficiency electric motor. Medical Air Plants are intended to provide a continuous supply of medical quality air conforming to the European Pharmacopoeia medicinal air monograph (ref. 1238), for respiratory use in healthcare facilities. The system shall be duplex such that the supply is maintained in single fault condition. Standby compressors shall be provided such that the specified volumetric flow is achieved with either one reserve compressor on standby where an automatic backup manifold of sufficient capacity is provided, or two compressors not running if the backup manifold is unable to deliver the medical air system design flow. Medical Air Plants shall be supplied fully tested and comply with the United Kingdom Department of Health (DoH) publication HTM 02-01 and NHS Model Engineering Specification C11. The entire Medical Air	

	Plant shall be factory tested. A test certificate shall be provided showing the results of the tests, including the free-air flow rate obtained at normal working pressure. Type testing of plant flows or testing in component form is not acceptable. Penlon Medical Gas Solutions Medical Air Plants are CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (Lloyd's). Under this directive, Medical Air Plants are classified as Class IIb Medical Devices. **Medical Air Compressors** Compressors shall be oil injected rotary screw compressors suitable for both continuous and frequent start/stop operation at a nominal outlet pressure of 1100 kPa (11 bar). 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. 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. Compressor shall be provided with Star-Delta (Wye-Delta) motor starters and each motor shall be protected by a thermal overload relay. The incoming supply shall terminate at a door interlock isolator. An ammeter shall be fitted to each starter panel indicating the current drawn by the motor. **Purification Module** The duplexed filter and dryer module shall incorporate high efficiency oil filters, heatless regenerative desiccant dryers, impregnated activated carbon filters and bacteria filters. Contaminants in the delivered air downstream of the bacteria filters. Each dryer tower shall have the water concentration in the delivered air continuously monitored by a dedicated sensor providing an alarm indication for high dew point on the respective dryer as backup to the alarm provided by the hygrometer with digital display. The outlet air pressure shall be regulated through a duplex arrangement of non-relieving pressure regulators and protected from over-pressure by duplex pressure safety valves. The output of the both dryers shall be joined to a common pipe prior to entering the pressure regulators to allow either pressure regulator to be used with either dryer. **Plant Control Unit** 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 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. **Digital Dew Point Display** The purification module shall incorporate a ceramic dew point hygrometer with an accuracy of □1□C in the range -20 to -80□C atmospheric dew point and 4-20 mA 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□C atmospheric (67 ppm v/v) set point. Volt-free contacts shall be included to enable the dew point alarm signal (Plant Emergency) to be connected to a central medical gas alarm system and/or building management system (BMS). **Air Receiver(s)** Air receivers shall comply with BS EN 286-1;+A2 2005 and be manufactured from heavy gauge fusion welded steel with a minimum wall thickness of 5 mm and dished ends with a minimum wall thickness of 6 mm. Total air receiver volume shall be at least 50% of the plant capacity in 1 minute in terms of free air delivered at normal working pressure. Air receiver shall be connected to the dryer in parallel such that operation of the system can continue during receiver isolation for periodic internal inspection. The receiver assembly shall be fitted with a pressure safety valve set at 11 bar. The receiver shall be further protected by a fusible plug and include a 100 mm nominal diameter pressure gauge complete with isolating valve. Each air receiver shall be fitted with an electrically actuated drain valve with integral solid-state timer providing user adjustable opening time and actuation frequency. The valve shall be fitted with a manual test button and LED indication lights to show operating status. The drain shall be protected from blockage by debris with a strainer. Float type mechanically actuated drain valves are not acceptable. Drain valves to be connected locally to a single phase supply. **9. Imported Duplex AGSS System 2920lpm 3 Phase 50Hz.** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be CE marked with	

	the notified body number specified. It shall be provided with a copy of the certificate of origin. Duplex AGSS System - Twin stand alone AGSS pumps of 3 phase 2920l/min capacity each with built in flow indication and pressure regulation valve. Mounted on single frame with control panel and separate warning label. One pump will be standby with the other in operation. • 2 x 3KW Nominal Motar per blower • 1 x DOl starter. • 54mm service connection. • Weight 120Kg Anaesthetic Gas Scavenging (AGS) Plants are intended to provide a continuous low level vacuum supply to pipeline systems in healthcare facilities for the removal of waste anaesthetic gases captured from patient breathing circuits via AGS receivers. The plant shall be a duplex configuration such that the vacuum supply is maintained in single fault condition. The stated volumetric flow rate shall be delivered with one blower on standby. AGS Plants shall comply with BS EN ISO 7396-2 and United Kingdom Department of Health (DoH) publications HTM 02-01, HTM 2022 and NHS Model Engineering Specification C11. The entire AGS Plant shall be skid mounted, fully assembled and factory tested as a complete system. A test certificate shall be provided showing the results of all tests, which shall include the free-air flow rate obtained with the system delivering a working pressure of -125 mbar gauge. Type testing or testing in component form is not acceptable. Regenerative Blowers : Two equally sized regenerative blowers shall be provided. Blowers shall be oil-less, air cooled side channel regenerative type, suitable for both continuous operation and frequent start/stop. The motor shall be directly coupled to a fully enclosed impeller with contact free operation. All bearings shall be sealed and greased for life, requiring no further lubrication in service. Each pump shall be provided with a ‘Mode Select’ switch incorporated into the plant control unit to enable the pump to be run continuously (in hand operation) or automatically as and when required by the plant control unit. Each motor shall also be afforded protection by means of a thermal overload relay with a manually reset function. Plant Control Unit : The plant control unit shall incorporate a transformer to provide a nominal 24 V a.c. electrical supply to all internal controls and remote start switches and an interlock isolator shall be integrated into control panel door. The plant control unit shall be provided with neon indicator lights for the following operating and fault conditions: □ Power On (Green) □ Standby Run (Amber) □ Pump Failed (Red)	

	The plant control panel shall include a switch to enable manual selection of the duty pump; the other thereby being designated as standby. Pressure at the pipeline interface shall be continuously monitored by a pressure switch with diaphragm sensing element and shall be adjustable between -25 and -100 mbar gauge pressure and shall be factory set to -65 mbar gauge pressure. If the duty blower fails or is unable to cope with the system demand, the standby blower shall be called to operate and a 'Standby Run/Duty Failed' indication shall illuminate on the plant control panel and each remote start switch. If both blowers fail or the system is otherwise unable to maintain a pipeline vacuum level above the pressure switch set point, a 'System Failed' indication shall be initiated. The vacuum level at the plant inlet shall be displayed on 63 mm nominal diameter pressure gauge mounted on the plant control unit. The pressure gauge shall have a scale range of 0 to -400 mbar gauge pressure and have an accuracy of +/-2% or better across the middle half of the scale range. Swing type check valves shall be installed in the pipes connected to the blower inlet ports. At the pump outlets, each exhaust pipe shall be provided with a polymer coated autoclavable Pyrex drain flask at the lowest point. **10.Imported AGSS Plastic Remote Indicator** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be CE marked with the notified body number specified. It shall be provided with a copy of the certificate of origin. It shall be provided with a copy of the certificate of origin. It should be flush mounted, white ABS 24 volt on/off room controller indicating 'red' plant failed, 'amber' duty pump failed and 'green' mains airflow on. **11.Imported AGSS Reservoir** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards. It shall be CE marked with the notified body number specified It shall be provided with a copy of the certificate of origin. The AGSS Receiver is the practical solution for waste anaesthetic gas discharges and is designed as an integral part of any waste anaesthetic gas system..The receiver comes complete with a transfer system, outlet hose assembly, and user instructions, making it ready for immediate use. Transfer system- connects to the patient circuit or anaesthetic machine and comprises a 1.5 metre length of 30 mm clear disposable tube with a male 30 mm taper for connection to the side of the receiver, and a 30 mm female tapered breathing circuit connector. It should have air break which prevents suction from the disposal system being transferred to the patient -flow	

	indicator. Under normal operating conditions the indicator should be visible. -gauze filter built into the top of the vessel to prevent gown fluff and other solid material from reaching and blocking the fixed extraction system. Receiver vessel for active anaesthetic gas scavenging systems body - anodised aluminium, powder coated Collar and Cap - anodised aluminium Indicator Window - clear acrylic Indicator Float - low density polyethylene. It should have flow indicator. **12.Imported AGSS outlet hose assembly** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be CE marked with the notified body number specified. It shall be provided with a copy of the certificate of origin. It shall be provided with a copy of the certificate of origin. It conducts the waste gases to the fixed system outlet point and comprises a 4 metre length of reinforced clear tube (colour coded yellow and blue as per the standard). This is fixed to the top of the vessel allowing the tube unimpaired 360o motion to reduce strain on the unit, and tube occlusion. The other end of the tube terminates in an AGSS probe. **13.Imported Medical Gas Terminal Units (Gas Outlet Points) Oxygen, N2O, MA4 Air, SA7 Air, CO2, AGSS and Vacuum :** It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be CE marked with the notified body number specified on it. It shall be provided with a copy of the certificate of origin. Terrminal units shall have gas indexing geometry. Other gas specific indexing geometries are not acceptable. Terminal unit front fascia should be metal and it should be hundred percent metal. Gas specific components comprising the terminal unit second fix shall be manufactured from die-cast zinc alloy or similar hard wearing metal. Plastic components are not acceptable. Terminal units socket castings shall be permanently coated with a low friction fluoro polymer for maximum reliability and service life. The terminal unit socket die-casting shall incorporate a gas indexing pin to overcome the risk of loosening due to rough handling or abuse. The second fix socket shall incorporate a sheer-plane to safeguard the first fix and pipeline in the event of accidental damage or bed jacking. Gas specific components shall incorporate the gas identity marking permanently stamped or cast into the component surface. The first fix shall be all metal construction, with a brass base block and copper stub pipe. The first fix shall incorporate an integral check valve to enable servicing of the second fix and valve seals without isolation of the gas supply. Probe roller pins shall be manufactured from stainless steel. Wall mounted terminal units shall be provided with white ABS	

	mounting box with matching fascia. The mounting box shall have smooth rounded corners to avoid the possibility of injury. A bezel shall be available to cover the plaster edge, provide a neat and easily to clean finish.	
	we would like to request you that to change the sub point no (iv) of point no 2.2 as per your Pre-qualification criteria where you have mentioned that "The company should have positive Net Worth and should not have incurred loss in more than Two years in last Five years ending 31st March 2017 duly certified by the Chartered Account" and change this point as "The company should have positive Net Worth and should not have incurred loss in more than Three years in last Five/Six years ending 31st March 2017 duly certified by the Chartered Account".	Tender terms & conditions prevail.
	We are also request you to change the sub point no (ii) of point no 2.2 that "similar nature of works means successful completion of supply, installation, testing and commissioning of Gas Manifold System" instead of "similar nature of works means successful completion of supply, installation, testing and commissioning of Medical Gas Manifold System"	Tender terms & condition prevail.

The revised BOQ is attached.

The bid submission date is extended from 23.03.2018 to 27.03.2018 and bid security should be valid for 180 days from the date of original bid submission ie. from 16.03.2018.

All other terms & conditions remain unchanged.

Chief General Manager, HSCC (I) Ltd.
For and behalf of Director, IIT, Kharagpur