

BHARAT HEAVY ELECTRICALS LIMITED

RAMACHANDRAPURAM : HYDERABAD-32

MEDICAL DEPARTMENT

SCOPE OF SUPPLY & INSTALLATION FOR THE WORKS OF " Extension of existing oxygen pipe line and replacement of O2 control panel (existing 6 + 6 manifold)"

SL.No.	Description of work	Unit	Qty
	Pre Qualification Requirement: Contractor should have supplied and Installed Oxygen Pipe Line system in at least 3 Govt. Hospitals / Blood Banks / UN Agencies or any other reputed Health care establishment in last 3 years. Completion Certificate in support of the same should be provided. Scope of supply & Installation: The scope of work includes supply, laying, erection of pipe lines, pipe fittings, Equipments, etc and fabrication and erection of required support structures. Pipelines are to be aligned and joined by brazing/welding/flange joints etc as applicable as per the layout given by BHEL officials. The Joints are to be brazed except for mechanical joints used for components. The rates quoted includes all the above work with contractor's welding electrodes,consumables and equipments. The Contractor has to arrange own transportation for material . Manpower, tools, tackles, welding rods, clamps , equipment etc required for completing works are in the contractor's scope. All necessary safety precautions have to be taken care off by the contractor.		
1	CONTROL PANEL: Supply and Fixing of Oxygen semi Automatic Control Panel(For 6 + 6 manifold) to maintain continuous supply of medical oxygen gas. Dismantling of old panel and installation of new semi automatic control panel in same place is in the scope of contractor. Spec : 1. Make : Azad or Anesthetic 2. Semi Automatic 3. ∴ Dual Line Pressure Regulator; 100 mm dia low pressure gauge 100 mm dia two high pressure gauge, NRV avoider back flow; Warning Anagram. 4. Dual line pressure regulator 5. Audiovisual low pressure alarm 6. Failure alarm - warning alarm when pressure falls 25kg/cm2=H10 7. High flow regulator. 8. 100 diameter two high pressure (0-250kg/cm2) electrical contact gauge to indicate Lt.and Rt. Bank pressure. 9. 100mm diameter low pressure guage(0-16kg/cm2)to indicate outlet pressure. 10. NRV avoid back flow .. - warning alarm when pressure falls 25kg/cm2=H10	Nos.	1

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2	PIPE LINE : Supply Laying and joining of Oxygen suitable Copper Pipes and pipe fittings as per the directions of BHEL officials . Specs: 1. The chemical composition of copper pipes and pipe fittings should confirm to BS EN13348:2008 or equivalent standard. Manufacturer should be ISO certified. The lot no of the manufacturer should be laser embossed on the copper tubes. All pipes and pipe fittings should be phosphorous deoxidized, non arsenic de-greased individually packed and identified for medical use only. The items should be supplied sealed in protective polythene bags and capped at both ends. 2. The copper pipe and pipe fittings should have third party inspection certificate from Lloyd's register services. 3. The test certificate from the manufacturing firm indicating physical properties and chemical composition should be submitted during supply of material. 4. Contractor also has to disconnect of existing pipeline from Manifold and reconnecting existing and new pipeline via T joint. 5. The scope of work includes supply and installation of all required pipe fittings and clamps and support structures required for completing the pipeline. 6. The supplied and installed pipe fittings should be of same copper grade compatible with the pipes and suitably joined by brazing/ welding/ flange joints etc. to avoid leakage and maintain the working pressure of 50 psi. The method employed for joining shall allow the joints to maintain their mechanical characteristics up to 600 degree C. 7. Pipeline should be supported by installing Pipe clamps at equal lengths of 1.5 m along the pipe length. The pipe clamp should be non reactive to copper and be of non ferrous or non deteriorating plastic suitable for the pipe diameter. 8. Any support structure required shall be in the scope of contractor. Adequate supports should be provided to avoid sagging of pipes. 9. Pipeline passage through walls and floors shall be made employing suitable sleeves. 10. All exposed pipe and pipe fittings to be painted with two coats of synthetic enamel paint colour coded as per IS : 2379 or equivalent. All required paints and painting material shall be in the scope of contractor 11. Marking with name/symbol and-Color Coding to be done for indicating type of gas and direction of flow in locations/points indicated by BHEL officials. 12. Installation of piping shall be carried out with utmost cleanliness. <i>13. A schematic layout of the planned piping system is attached</i>	Mts.	65
a	12 mm x 0.7 mm thick	Mts.	140
b	15mm X 0.9mm thick	Mts.	240
c	28mm x 0.9 mm thick		

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3	GAS OUTLETS: Supply and fixing Gas Outlet Points for Oxygen with S Brackets, self ceiling Schrader type with nut and cap and it should be 100% self sealing type, so that at the time of removal of adaptor, it should stop gas flow automatically, out let should be single hand insertion, non inter changeable for specific gas, it should accept only correct medical gas adapter. with down tube of the specific gas should be brazed with brass bracket of the outlet, there after brass bracket should be fixed in wall with the help of the steel screw, with self sealing valve and there after it should be covered by plastic cover duly colour coded as per specific gas. 1. Body shall be of one piece brass construction. 2. All outlets shall be cleaned and degreased for medical gas service, factory assembled and tested. 3. Make : Azad, Anesthetic or equivalent. Manufacturer should be ISO 13485 certified. The equipment should be in compliance to NFPA-99 and 99EN 737 pressure test standard 4. The medical gas outlets should be of quick connecting nature 5. Schrader type outlet point fitted with down drop 1.5 m safe-ceiling valve & flow meter. 6. Inlet : copper stubs around 175 mm long , 12mm Copper pipe 7. Front Plate Color Coded	No.s	36
a	GAS OUTLETS Points Schrader type	No.s	36
b	Emergency (back up) oxygen point	No.s	1
4	ISOLATION VALVES: Supply and fixing of following Isolation Valves with necessary end fittings 1. Ball Type Valve 2. Working temp -30 to 180. 3. Full bore valves for minimum pressure loss. 4. Non Ferrous Non-lubricated with 90 degree turn ball valve with Polytetrafluoroethylene(PTFE) seals suitable for oxygen service. 5. The valve should be factory degreased before supply. 6. Certificate from the manufacturer should be attached. 7. Tested for double working pressure [120 PSI]. Test certificate should be attached 8. Hand lever operated 9. Make : Conex/Pex, TBS, Azad 10. Manufacturer should be ISO certified 11. Products should be NFPA 99/HTM compliant with CE/BIS approval.		
a	15 mm	No.s	7
b	28mm	Nos.	3


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work

5	B P C Flow meter : Supply and fixing of BPC Flow meter with Humidifier bottle, L adapter .Flow meter body made of brass material and should be back pressure compensated suitable for accurate gas flow measurement flow tube and components should be made of clear impact resistant polycarbonate 1. The Flow Meter must be accompanied by equivalent and compatible Oxygen adapter Schrader type 2. Humidifier should have built in safety valve and should be made of unbreakable polycarbonate material and autoclavable at 134 degrees centigrade. 3. Control range:0- 10 lit 4. Product should be CE/ BIS approved 5. Make : Anaesthetics, Azad or Equivalent . Manufacturer should be ISO 13485 certified. 6. The equipment should meet strict precision and durability standards 7. Inlet filter of stainless steel wire mesh to be provided to prevent entry of foreign particle.	No.s 36
6	NRV for existing manifold: Supply and fixing of NRV for existing manifold. The NRV should be compatible with the system and suitable of Medical usage and Oxygen. Make Azad or equivalent	No.s 12
7	Pig Tail Pipe Supply and fixing of Pig Tail Pipe. The item should be compatible with the system and suitable of Medical usage and Oxygen. Make Azad or equivalent	No.s 12
8	Emergency Kit: Supply and installation of Emergency Kit with Oxygen Regulator. The kit shall be compatible with the system and to be provided with MOX dual regulator, extension tubing and nipple for self sealing valve. Nipple should be compatible with Schrader	SET 2
9	Oxygen Failure Alarm sytem: Supply and installation of Oxygen failure Alarm System with following features : 1. Digital Display of Line Pressure for all the services with factory calibrated pressure sensors. 2. Individual LED indicator-showing NORMAL, HIGH and LOW conditions for each service. 3. Audio alarm for high and low pressure condition 4. Low voltage internal operation with input power supply of 220V AC. 5. Battery Back up 6. Easy wall mounting facility. 7. It should be compliant to ISO7396-1/NFPA 99/HTM standards. 8. The product should be BIS/ CE Certified.	No.s 2
10	Upgradation/ repair in existing manifold: Vendor to review any required upgradation/required in the existing manifold and take up the same. Flushing of the existing manifold to be carried out	LS


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11	Set of Basic Tools: for operation of the system to be provided by the vendor. The list of tools offered by vendor to be quoted along with the offer	set	1
12	Testing and Demonstration: Contractor has to carry out testing and demonstration of the system after completion of works. All required tools, consumables etc required for testing are in the scope of the contractor: 1. After erection, the pipes are to be flushed and purged clean 2. Pressure and leak testing of the system to be carried out with at a pressure equal to 1.5 times of the working Pressure for atleast 24 hours. 3. Contractor has to demonstrate the availability of working pressure of 50- 60 psi at all oxygen points. 4. Contractor has to demonstrate suitability and integrity of the system. 5. All problems/ defects/contradictions and problems found while testing and review by BHEL officials are to be suitably rectified/repared by the contractor and the testing has to be done again. Costs for rectification/ defect repair and retesting has to be borne by the contractor. 6. After the successful installation & proveout, training to be provided on the operation of the system to designated BHEL officials	LS	
Note: 1. GST is extra. 2. The agencies are advised to visit the site to understand the nature of work/quantum of work in its true perspective to avoid any complications. 3. Payment will be based on actual measurements post completion of the work 4. All associated Electrical and mechanical works for completion of the project shall in be in scope of the vendor 5. Only electricity required for installation will be provided by BHEL free of cost. Rest all costs for completing the projects shall be borne by the contractor. No tools, tackles, manpower etc shall be provided by BHEL 6. Time Schedule for works completion will be 25 days from the awardal of the contract 7. Painting of pipes & outlet points must be colour coded according to standard. 8. Contractor to indicate the specifications and make of the equipments along with their offer 9. Contractor shall provide Guarantee/Maintenance for 2 years from the date of completion of the works. 10. At the time of replacement of control panel ,emergency O2 backup must be maintained by emergency outlet in manifold room 11. Care of existing structures, equipments etc shall be responsibility of the contractor. Any damage done by contractor or his associates will be recovered from the due contract payment. 12. Contractor shall be responsible for cleaning of the work areas of waste, debris, garbage etc resulting out of the execution of the works. 13. BHEL will have no liability of any sorts with reagrd to persons deployed by contractor for the execution of the works. 14. The contractor should follow all site safety terms and use all Mandatory PPEs like Safety helmet with face shield, electrical insulated gloves, electrical insulate Safety shoes while executing the works. 15. Contractor must fill all drilling point in walls with white cement.			

List of Items

SI No.	Item	Unit	Quantity
1	Control panel	Nos	1
2	Pipe		
	12 mm x 0.7 mm thick	Mts.	65
	15mm X 0.9mm thick	Mts.	140
	28mm x 0.9 mm thick	Mts.	240
3	GAS OUTLETS Points	No.s	36
4	Emergency (back up) oxygen point	No.s	1
5	Isolation Valves		
	15 mm	No.s	7
	28mm	Nos.	3
6	BPC Flowmeter with regulator	No.s	36
7	Oxygen adaptor	No.s	36
8	NRV for existing manifold:	No.s	12
9	Pig Tail Pipe	No.s	12
10	Emergency Kit	SET	2
11	Oxygen Failure Alarm sytem:	No.s	2
12	Set of Basic Tools	Set	1



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AMC
(5 OUTLETS)

CHW (9 OUTLETS)
FMW (9 OUTLETS)
MMW (9 outlets)

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EXISTING O2
LINE

PANEL
CONTROL

PROPOSED PIPE
LINE

Casualty
(4 outlets)