

Annexure-C to tender 2751271E/OT-26

BHEL : BAP : M&S : RANIPET

BAP:M&S:GS:SCP

Date : 31.12.2015

Sub : Procurement of Screw Air Compressor along with VVVF Drive under capital investment – Reg.

Ref.No:AA:CMT&IP:2015-16:BAP:A374, Dated:10.12.2015.

SPECIFICATION FOR SCREW AIR COMPRESSOR

SL NO	DESCRIPTION	SPECIFIED
1.0	SCOPE OF SUPPLY :	
1.1	Design, manufacture, supply, erection and commissioning of 1500 CFM capacity@7.5 BAR G. Air cooled / oil lubricated SCREW AIR COMPRESSOR along with complete accessories at specified location in Bharat Heavy Electrical Limited, Ranipet, Tamil Nadu, India.	Vendor to confirm
1.2	The Compressor with inbuilt inter-coolers, lube system, control panel, moisture separator etc., shall be a complete packaged machine consistent with good accessibility for maintenance.	Vendor to confirm
1.3	All equipment furnished is to be heavy – duty, continuous, designed for 46 Deg.C ambient temperature.	Vendor to confirm
1.4	Quantity : 1 No (1500CFM delivery shall be from single unit of compressor only. More than one unit of compressor with split up delivery is not acceptable)	Vendor to confirm
2.0	SITE CONDITIONS :	
2.1	Design inlet conditions: Suction at atmosphere	Vendor to note
	a)Ambient temperature 46 Deg.C	Vendor to note
	b)Relative humidity 70% (Non-condensing)	Vendor to note
	c)Altitude:200Mtr. Above MSL	Vendor to note
3.0	TECHNICAL SPECIFICATION :	
3.1	Type of compressor: Air cooled – Oil lubricated SCREW AIR COMPRESSOR (Maximum allowable oil carry over in compressed air is restricted to 3 PPM only)	Vendor to confirm
3.2	Rating :	Continuous
3.3	Free Air Delivery - Capacity	1500 CFM
3.4	Rated pressure (Min)	7.5 BAR.G
3.5	Pressure Setting Range	5.0 to 8.2 BAR.G
3.6	Compressor Shaft Power (KW)	Vendor to specify
3.7	No. of Stages of the Compressor	Vendor to specify
4.0	DRIVE MOTOR :	
4.1	The motor is to be specially designed and suitable for the torque speed and horse power characteristics of the compressor.	Vendor to confirm

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4.2	The motor shall be of asynchronous type and TEFC design and shall be compatible for use with VVVF.		Vendor to confirm
4.3	The motor is to be operated by a 3 Phase 415V +/- 10%, 50HZ +/-3% Power source.		Vendor to confirm
4.4	The starting current of the motor shall not exceed 600% (inclusive of Tolerance) of Full Load Current.		Vendor to confirm
4.5	Vendor shall indicate the capacity of the motor selected, type, make and frame size.		Vendor to indicate
4.6	Vendor shall indicate the size of the cable required between the VVVF and motor terminal box. The motor terminal box shall be suitable to receive the cable size and fitted with cable gland for the specified cable.		Vendor to confirm
5.0	Variable Voltage, Variable Frequency Drive(VVVF)		
5.1	Torque and Power	The output Torque and power of VVVF Drives must drive the above specified main motor with suitable variable speed control and the temperature must be within the limits. The torque that can be continuously taken from the motor must not exceed the full load torque.	Vendor to confirm
5.2	De-rating Factor	To ensure that the temperature will not rise above the original drive specification. Contractor has to specify	Vendor to confirm
5.3	Output Protection	The VVVF-Drive should have Current limiting when the motor is over loaded	Vendor to confirm
5.4	Thermal Limiting	Motor Temperature is to be limited by VVVF drive to protect the motor from over heating	Vendor to confirm
5.5	Equipment Protection	The VVVF Drive Must have internal protections against Over Voltage, under Voltage, Surge, etc.	Vendor to confirm
5.6	Indications	The VVVF drive should Indicate the output parameters like Freq, Voltage, current, speed, etc.	Vendor to confirm
5.7	Alarms	The Drive Should Give Proper Alarms in case of failures	Vendor to confirm
5.8	Make	ABB / Siemens / Kirloshkar / AMTECH or any other reputed make.	Vendor to confirm
5.9	Braking system	A suitable Braking arrangement shall be offered by vendor. Submit full details.	Vendor to confirm
5.10	The compressor package shall include a VVVF Drive, for starting and running the compressor shall be mounted on its own enclosures.		Vendor to confirm
5.11	The VVVF Drive shall be mounted, wired and tested as part of the complete compressor package prior to shipment		Vendor to confirm
5.12	415V, 3 Phase, 50Hz 3 wire supply will be provided with an isolator near to the compressor usage point. Control voltage requirements shall be derived by the supplier by providing suitable transformers in the starter / control panels		Vendor to confirm

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6.0	LUB SYSTEM :	
6.1	Initial fill of biodegradable oil should be supplied along with the compressor.	Vendor to confirm
7.0	OPERATION & CONTROL : Vendor to indicate in their offer the controls provided by them.	Vendor to indicate
7.1	Display Parameters	Vendor to indicate
7.2	Adjustable Operating Parameters	Vendor to indicate
7.3	Fault warnings.	Vendor to indicate
7.4	Fault shutdowns	Vendor to indicate
7.5	The compressor package should have noise level less than 85 DB (A) at 1M distance.	Vendor to confirm
7.6	Necessary safety interlocks for the operation of the compressor shall be incorporated.	Vendor to confirm
8.0	GENERAL POINTS :	
8.1	The vendor shall submit detailed client list (Name of the customer, supplied Model No. and contact details etc.,	Vendor to submit
8.2	The offer shall include the catalogue for offered equipment and a complete technical description of all parts of the compressor as also the materials of construction of the major parts. Full description of compressor protection features should be included.	Vendor to confirm
8.3	GA drawing, Schematic & Foundation Diagram showing the Layout and interconnections shall be submitted along with the offer.	Vendor to submit
8.4	In case any foundation requirement for the compressor same shall be clearly brought out in the offer and supply of all foundation material like bolts and nuts, washers, leveling plates etc., required for total installation shall be in vendor's scope. Only civil works will be in BHEL Scope.	Vendor to confirm
8.5	Motor shall be any of the following makes : M/s BHEL, ABB, Siemens or any other reputed make.	Vendor to confirm
8.6	All Electrical Devices, Contactors, Relays, Limit Switches, Push Buttons, etc., shall be from Siemens / L&T / Alstom / BCH / Telemecanique or any other reputed make.	Vendor to confirm
9.0	SPARES :	
9.1	Itemized breakup of mechanical, electrical and electronic spares used in the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on continuous running basis shall be offered by vendor. Spares price shall be quoted separately and shall not constitute part of main offer. (Unit price for each item of spare shall be offered in the price bid.)	Vendor to offer.
9.2	All types of spares for total machines and accessories shall be available for at least ten years after supply of the machine. If machine is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required.	Vendor to offer
9.3	Vendor to confirm that complete list of spares for machine and accessories, along with item Part No./ specification / type / model, and name and address of the spare supplier shall be furnished along with	Vendor to confirm

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	documentation to be supplied with the machine.	
10.0	DOCUMENTATION :	
10.1	Five sets of following documents (5 Hard copies) in English language should be supplied along with the Compressor.	Vendor to confirm
10.2	Operation & Maintenance Instructions	Vendor to confirm
10.3	Spares Parts Manual	Vendor to confirm
10.4	GA drawing	Vendor to confirm
10.5	Electrical Wiring Drawings Power & Control Circuits	Vendor to confirm
10.6	Pressure Test Certificate for coolers. (Hydrostatic Test, Ultrasonic Test etc.)	Vendor to confirm
10.7	One additional set of all the above documentation shall be given in the form of CD.	Vendor to confirm
11.0	TRAINING :	
11.1	The vendor shall impart one week training to BHEL's Machine Operators and Maintenance Crew in Operation and Maintenance after the commissioning of the Machine at BHEL works.	Vendor to confirm
12.0	ERECTION & COMMISSIONING :	
12.1	Vendor to take full responsibility for erection, start up, test the compressor, it's control & all types of other supplied equipments. Service requirement like power, interconnecting piping, civil works shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings.	Details of these requirements should be informed by Vendor in advance
12.2	Tools, Tackles, instruments and other necessary equipment required to carryout all above activities should be brought by the Vendor.	Vendor to confirm
12.3	All spares, required for commissioning of the machine shall be brought by the Vendor.	Vendor to note.
12.4	Schedule of Erection and Commissioning shall be submitted with the offer	Vendor to submit
12.5	Charges, duration, terms and conditions for Erection & Commissioning should be furnished in detail separated by Vendor along with offer. Erection and Commissioning Charges shall be on lump sum basis and no per diem rate will be acceptable..	Vendor to furnish
13.0	TESTING & ACCEPTANCE :	
13.1	The equipment shall be offered for inspection by BHEL Engineers at suppliers works prior to dispatch.	Vendor to confirm
13.2	Testing: Compressor shall be fully tested at the supplier's works to determine its mechanical and electrical characteristics. Compressor air capacity, pressures and temperatures shall be measured and recorded and shall confirm to ISO 1217 Appendix-C.	Vendor to confirm
14.0	GURANTEE :	
14.1	The equipment and accessories shall be guaranteed for proper operation and shall have guarantee for all parts for a period of 24 months from the date of commissioning.	Vendor to confirm

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