



## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001  
Company

<b>ENQUIRY</b>	Phone: +91 431 257 79 38 Fax : +91 431 252 07 19 Email : <a href="mailto:tvenkat@bheltry.co.in">tvenkat@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
<b>NOTICE INVITING TENDER</b>	

<b>TWO PART BID</b> Tender to be submitted in two Parts	<b>Enquiry Number:</b> <b>2620900151</b>	<b>Enquiry Date:</b> <b>19.08.2009</b>	<b>Due date for submission of quotation:</b> <b>01.10.2009</b>
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You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both **delayed offer** and **late offers** will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of **tender opening**.

Item	Description	Quantity
10	<b>Centrifugal Air Compressor</b> as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	<b>1 No.</b>

### Important points to be taken care during submission of offer

1. Delivery required 10 months from the date of purchase order.
2. Grace period of 2 months beyond the above delivery period will be considered.
3. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2620900151".

Tenders should reach us before 14:00 hours on the due date  
Tenders will be opened at 14:30 hours on the due date  
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,  
For BHARAT HEAVY ELECTRICALS LIMITED

Manager / Capital Equipment / MM

**PART A**  
**CENTRIFUGAL AIR COMPRESSOR**

**SECTION – I : QUALIFYING CRITERIA**

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer:

S. No.	REQUIREMENTS	VENDOR'S RESPONSE
1	<p>Only those vendors (<b>OEMs</b>), who have supplied and commissioned at least <b>ONE CENTRIFUGAL AIR COMPRESSOR</b> of 3000cfm or higher and Operating pressure of 8 Kg / Cm<sup>2</sup> (g) or above in the past ten years (from the date of opening of Tender) and such equipment is presently working satisfactorily for more than one year after commissioning (from the date of opening of Tender) should quote.</p> <p>However, if such equipment had already been supplied to BHEL, then that machine should be presently working satisfactorily for more than six months after it's commissioning and acceptance (from the date of opening of Tender).</p>	
	<b>The vendor should submit following information where similar machine has been supplied for qualification of their offer.</b>	
1.1	Name and postal address of the customer or company where similar equipment is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the equipment.	
1.5	Application for which the equipment is supplied	
1.6	Along with the Technical offer, the Vendor should submit one Performance certificate from the customer for the satisfactory performance of the equipment supplied to them. For obtaining the Performance certificate, a suggestive format is provided in <b>SECTION – IV</b> .	
1.7	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	
2.0	<p><b>DELIVERY</b> - The bidder shall quote the best possible delivery. However the delivery shall not exceed 10 months with an additional grace period of 2 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry.</p> <p>The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.</p>	

**SECTION – II**

The BIDDER / VENDOR is requested to provide the following information:

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's RESPONSE</b>
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where Centrifugal air compressor similar to offered have been supplied in the past.	
4.0	Details of Centrifugal air compressor supplied to other BHEL units, if any. (Year of commissioning, Length, Width and Operating temperature)	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

**SECTION – III**

The BIDDER to note:

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR'S RESPONSE</b>
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] & commercial offer 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical <b>Specifications demanded by BHEL</b> and <b>Offer Details submitted by the Bidder</b> , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement where specific details are required may lead to disqualification of the Technical Offer.	
9.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
10.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

**SECTION – IV**

The performance certificate should be produced **on Customer's Letter Head.**

**PERFORMANCE CERTIFICATE**

1. Supplier of the Equipment		
2. Make & Model of the Equipment		
3. Month & Year of Commissioning		
4. Application for which M/C is used		
5	a) Rated Capacity  b) Rated Pressure	
6. Performance of the Equipment (Strike off whichever is not applicable)		Satisfactory / Good / Average / Not Satisfactory
7. After sales service (Strike off whichever is not applicable)		Satisfactory / Good / Average / Not Satisfactory
8. Any Other remarks		
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

**PART-B: SPECIFICATIONS FOR INTERGRALLY GEARED 3000 CFM  
CONTRIFUGAL COMPRESSORS**

<b>S. No.</b>	<b>PARTICULARS AND BHEL SPECIFICATION</b>		<b>BIDDER'S OFFER (with complete Technical Details)</b>
<b>1.0</b>	<b>SCOPE</b>		
	The scope of supply includes Design, Manufacture, Supply, Erection and Commissioning of 3000 CFM Centrifugal Air Compressor with complete accessories at Specified Location in Bharat Heavy Electricals Limited, Tiruchirappalli. The Centrifugal Compressor, including inter-coolers and after-coolers, lube system etc. shall be a complete packaged machine consistent with good accessibility for maintenance. All equipment furnished is to be heavy-duty Industrial design for long operating life. The compressor shall be the integral gear-type, directly connected at low speed bull gear to its driver		
<b>1.1</b>	International standard followed for design and testing of compressor	Vendor to specify	
<b>2.0</b>	<b>AIR COMPRESSOR</b>		
<b>2.1</b>	Type	Centrifugal, with Vertical or Horizontal split gear box	
<b>2.2</b>	Rating	Continuous	
<b>2.3</b>	Delivered flow(at Site condition)- Minimum	3000 CFM	
<b>2.4</b>	Rated Pressure	8 Kg / Cm <sup>2</sup> (g)	
<b>2.5</b>	Pressure Setting Range	6 to 8 Kg / Cm <sup>2</sup>	
<b>2.6</b>	Inlet Guide Vane	Vendor to specify	
<b>2.7</b>	Compressor Shaft Power (Kw)	Vendor to specify	
<b>2.8</b>	Specific Power consumption (Kw / 100 CFM)	Vendor to specify	
<b>2.9</b>	Tolerance on specific power consumption	Vendor to specify	
<b>2.10</b>	Turn down ratio at rated pressure	Vendor to specify	
<b>2.11</b>	No. Of Stages of the Compressor	Vendor to specify	
<b>3.0</b>	<b>CONSTRUCTION</b>		
3.1	Gear Box (Direct driven horizontally /vertically split)	Vendor to specify	
3.2	All internal parts should have good accessibility of inspection and maintenance. The casing components shall be equipped with lifting lugs, guide bolts to facilitate maintenance. It should be possible to inspect all internal components without having to dismantle other major components / major external connections	Vendor to confirm	

<b>S. No.</b>	<b>PARTICULARS AND BHEL SPECIFICATION</b>		<b>BIDDER'S OFFER (with complete Technical Details)</b>
3.2	Impellor (Construction features, material and mounting details to be enclosed)	Vendor to specify	
3.3	High speed gears: Type/ material/ AGMA class to be specified	Vendor to specify	
3.4	Radial bearings	Vendor to specify	
3.5	Thrust bearings	Vendor to specify	
3.6	Air and Oil Seals (type & material along with details)	Vendor to specify	
3.7	Stainless Steel expansion bellows to be provided	Vendor to confirm	
3.8	Inlet & Outlet Cooling Water Manifold to be integrated in the compressor package	Vendor to confirm	
3.9	Required cooling water flow for compressor package, including air cooler and oil cooler (liters / minute)	Vendor to specify	
3.10	Intercoolers and after coolers Should be mounted and be part of the packaged compressor-Water in tube	Vendor to specify with details	
3.11	Moisture separator with drain trap & condensate piping should be provided for each inter and after cooler	Vendor to confirm	
3.12	Inter stage air piping to intercoolers and after coolers	Vendor to confirm	
4.0	<b>SITE CONDITIONS</b>		
4.1	Design Inlet condition a. Ambient Temp 40°C b. Relative Humidity 70% (Non-condensing) c. Altitude: 78 Mtr. Above MSL d. Cooling water inlet temperature 30°C.		
4.2	11 Kv, 50 Hz 3 phase 3 wire supply & 415V, 3 phases, 3 wire supply will be provided at one point in / near the compressor house. Control voltage requirements shall be derived by the supplier by providing suitable transformers in the starter / control panels (the power supply may fluctuate + or - 10% from specified voltage and + or - 3% from specified frequency		

S. No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)	
<b>5.0</b>	<b>LUBE OIL SYSTEM</b>		
5.1	Total lube oil system to be mounted on the base frame of the compressor package	Vendor to specify	
5.2	Total lube oil system to be suitably sized so that incase of electric power failure it provides sufficient lubrication to allow the compressor to coast to a standstill without damage	Vendor to specify	
5.3	Lube oil tank capacity	Vendor to specify	
5.4	Lube oil specification	Vendor to specify	
5.5	Main oil pump (Shaft driven)	Vendor to specify	
5.6	Oil Pressure	Vendor to specify	
5.7	Auxiliary oil pump (Electrically driven)	Vendor to specify	
5.8	Oil cooler	Vendor to specify	
5.9	Suction strainer	Vendor to specify	
5.10	Filter	Vendor to specify	
5.11	Lube oil filter differential pressure switch	Vendor to specify	
5.12	Lube oil pressure switch	Vendor to specify	
5.13	Oil level indicator	Vendor to specify	
5.14	Necessary valves and safety valves	Vendor to specify	
5.15	Interconnecting piping suitably terminated	Vendor to specify	
5.16	Initial oil fill is in the scope of vendor	Vendor to confirm	
<b>6.0</b>	<b>DRIVE MOTOR</b>		
6.1	Type: Electrical Motor Suitable for 11 KV – 50Hz Continuous Rating, Induction type Class F insulation, with IP 23 protection. Motor shall be mounted on Compressor base	Vendor to specify	
6.2	Motor Bearing & Motor Cooling	Vendor to specify	
6.3	Motor Power Rating	Vendor to specify	
6.4	Suitable HT Motor Starter in the form of VCB along with Motor Protection Controls to be included	Vendor to specify	
6.5	Power source 11 KV 3 Ph up to the breaker input is in the scope of BHEL.	Vendor to confirm	
6.6	11KV ,3 Core Cable of suitable size to connect motor terminal to the starter panel up to a maximum length of 25M is in the scope of Vendor	Vendor to Confirm	



S. No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>7.0</b>	<b>ACCESSARIES</b>	
7.1	Air Intake Filter with Silencer (Piping between intake to suction & necessary supports is in vendor's scope)	Vendor to specify
7.2	Accessories Not Mentioned But Considered Essential Shall also be included in Technical offer	Vendor to specify
7.3	Blow off valves with actuator and silencer (Piping between intake to suction & necessary supports is in vendor's scope)	Vendor to specify
7.4	Mounted discharge check valve	Vendor to specify
<b>8.0</b>	<b>OPERATION &amp; CONTROL</b>	
8.1	Bidder to explain the need, if any for separate instrument air (Flow, pressure and line size should also be mentioned)	Vendor to specify
8.2	Microprocessor based Auto Dual mode for controlling Pressure and flow. Should have interface for interconnection to remote PC	Vendor to specify
8.3	Protection / Display / Alarm / Trip for 1. For equipment protection 2. Operator's Control 3. Operation details	Vendor to specify
8.4	The compressor package should have noise level less than 85 dB at 1M distances.	Vendor to specify
<b>9.0</b>	<b>GENERAL POINTS</b>	
9.1	The offer shall include the catalog for offered equipment and a complete technical description of all parts of the compressor as also the materials of construction of the major parts. The bearings and seals used shall be described. Full description of compressor protection features should be included	Vendor to confirm
9.2	GA Drawing, Schematic & Foundation Diagram Showing the Layout and Interconnections, P&I diagram shall be submitted along with the offer.	Vendor to confirm
9.3	Motor shall be any reputed make acceptable to BHEL.	Vendor to specify

<b>S. No.</b>	<b>PARTICULARS AND BHEL SPECIFICATION )</b>	<b>BIDDER'S OFFER (with complete Technical Details)</b>	
9.4	Earthing of the starter panel & motor is in the scope of Vendor. Necessary pit can be provided by BHEL	Vendor to confirm	
9.5	All Electrical devices, Contactors, Relays, Limit, Switches, Push buttons, etc. shall be from Siemens / L&T / Alstom / Cuttler Hammer / Telemecanique	Vendor to confirm	
<b>10.0</b>	<b>SPARES</b>		
<b>10.1</b>	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 three shifts continuous running basis shall be offered by vendor. <b>(Unit Price for each item of spare shall be offered)</b>	Vendor to confirm	
<b>10.2</b>	<b>The following spares to be quoted compulsorily.</b> 1. Inlet air filter element-primary-2 sets 2. Inlet air filter element-secondary-2 sets 3. Oil filter element-2 sets. 4. Intercooler gaskets-1 set. 5. Oil cooler gasket-1 set 6. Oil seals-1set. 7. Air seals-1 set	Vendor to confirm	
<b>10.3</b>	All types of spares for total machine 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 confirm	
<b>10.4</b>	Vendor to confirm that complete list of spares for machine and accessories, along with item part no / specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm	

S. No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>11.0</b>	<b>DOCUMENTATION:</b>	
<b>11.1</b>	Three sets of following documents (3 Hard copies,) in English language should be supplied along with the Compressor	Vendor to confirm
	a. Operation & Maintenance Instructions	Vendor to confirm
	b. Spare Parts Manual	Vendor to confirm
	c. GA Drawing	Vendor to confirm
	d. Electrical Wiring Drawings Power & Control circuits	Vendor to confirm
	e. Assembly drawings	Vendor to confirm
	f. Test curves related to guarantee condition	
<b>11.6</b>	One additional set of all the above documentation shall be given in the form of CD.	Vendor to confirm
<b>12.0</b>	<b>TRAINING</b>	
<b>12.1</b>	The Vendor shall train Two BHEL's Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics System) of the compressor at Vendor's works, for not less than 5 working days.	Vendor to confirm
<b>12.2</b>	The Vendor shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance after the commissioning of the Machine at BHEL works for not less than 5 working days	Vendor to confirm
<b>12.3</b>	Airfare, boarding & lodging for the BHEL Trainees shall be borne by BHEL.	Vendor o Confirm
<b>12.4</b>	Vendor to quote for training on per man per day basis for training at vendor's work	Vendor to confirm

S. No.	PARTICULARS AND BHEL SPECIFICATION		BIDDER'S OFFER (with complete Technical Details)
<b>13.0</b>	<b>ERECTION &amp; COMMISSIONING</b>		
<b>13.1</b>	Vendor to take full responsibility for supervision of the erection, vendor shall start up, test the compressor, it's control & all types of other supplied equipment, and prove the output Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL.	Details of these requirements should be informed by Vendor in advance	
<b>13.2</b>	Tools, Tackles, Test Mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by the Vendor.	Vendor to confirm	
<b>13.3</b>	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the Vendor on returnable basis.	Vendor to confirm	
<b>13.4</b>	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm	
<b>13.5</b>	Charges, duration, terms & conditions for E&C should be furnished in detail separately by Vendor along with offer.	Vendor to confirm	
<b>14.0</b>	<b>TESTING &amp; ACCEPTANCE</b>		
<b>14.1</b>	The equipments shall be offered for inspection by BHEL Engineers at suppliers works prior to dispatch	Vendor to confirm	
<b>14.2</b>	Testing: - Compressor shall be fully tested at the supplier's works to determine its mechanical and aerodynamic characteristics. Compressor air capacity, pressures and temperatures shall be measured and recorded Compressor surge point and stonewall condition shall be demonstrated during the test. A test curve related to guarantee conditions should be submitted to the purchaser	Vendor to confirm	

<b>S. No.</b>	<b>PARTICULARS AND BHEL SPECIFICATION</b>		<b>BIDDER'S OFFER (with complete Technical Details)</b>
<b>15.0</b>	G.A drawing, P&I diagram etc to be submitted along with offer	Vendor to confirm	
<b>16.0</b>	The civil foundation drawings with layout of cable trench etc to be submitted within ONE month of Purchase order release.	Vendor to confirm	
<b>17.0</b>	<b>GAURANTEE</b>		
	The equipment and accessories to be guaranteed for a period of 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier	Vendor to confirm	