



**BHARAT HEAVY ELECTRICALS LIMITED**  
**Industrial Valves Plant**  
Goindwal –143422 (TARN TARAN)



<b>ENQUIRY</b>	Phone:+91 1859 223381(Direct), 222002 Extn.117 Fax :+91 1859 222 061 Email :srk@ivp.bhel.co.in
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	<b>Enquiry No:</b> <b>78039</b>	<b>Enquiry Date:</b> <b>12.10.2007</b>	<b>Due date for submission of quotation:</b> <b>13.11.2007</b>
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You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

<b>Item</b>	<b>Description</b>	<b>Quantity</b>	<b>Delivery (Item required at BHEL on)</b>
<b>1.0</b>	The scope of supply include design, manufacture , supply , erection and commissioning of 800CFM or higher Screw Type rotary compressor with complete essential accessories at specified location in Bharat Heavy Electricals Ltd, Goindwal. The compressor shall be a complete package with good accessibility for maintenance. All equipment furnished is to be heavy duty industrial design for long operating life.	1 No	Within 90 days from issue of Letter of Intent

**BHEL Commercial terms & conditions with Price bid and Bank Guarantee formats along with Technical specifications can be downloaded form BHEL web site <http://www.bhel.com>**

Tenders should reach us before 15:00 hours on the due date  
Tenders will be opened at 15:30 hours on the due date  
Tenders would be opened in the presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully  
For **BHARAT HEAVY ELECTRICAL LTD**

Manager / MM

**TECHNICAL SPECIFICATIONS FOR SCREW TYPE ROTARY COMPRESSOR**  
**800CFM MINIMUM @ 7.5 bar g.**

Sr No	Particulars and BHEL Specifications		Bidders Offer (with complete technical details)	Compliance Yes/No and deviation if any
<b>1.0</b>	<b>Scope</b>			
	The scope of supply include design, manufacture , supply , erection and commissioning of 800CFM or higher Screw Type rotary compressor with complete essential accessories at specified location in Bharat Heavy Electricals Ltd, Goindwal. The compressor shall be a complete package with good accessibility for maintenance. All equipment furnished is to be heavy duty industrial design for long operating life.			
<b>2.0</b>	<b>Air Compressor</b>			
2.1	Type	Screw type rotary compressor , oil filled		
2.2	Mode of Operation	Electric		
2.3	Number of Stages	Single		
2.4	Capacity(Free Air Delivery)	800 CFM or higher		
2.5	Max operating Pressure	7.5 kg/cm2		
2.6	Normal Working Pressure	7 kg/cm2		
2.7	Cooling Type	Water Cooled		
2.8	Specific Power Consumption(Kw/100CFM)	Vendor to		
2.9	Tolerance on specific power consumption	Vendor to specify		
<b>3.0</b>	<b>Construction</b>			
3.1	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		
3.2	Screws (Construction, features, material and mounting details to be enclosed)	Vendor to specify		
3.3	Transmission Drive between Screws and Prime Mover	Vendor to specify		
3.4	Air End(Construction details to be enclosed)	Vendor to specify		
3.5	Inlet Air Filtration system( with details )	Vendor to specify		
3.6	Lubrication system to be integral part of compressor package	Vendor to confirm		

3.7	Air oil separation system( with details )	Vendor to specify		
3.8	Load/unload Regulating control system ( with details ))	Vendor to specify		
3.9	After coolers / Intercoolers (oil cooling and air cooling system with details)	Vendor to specify		
3.10	Required cooling water flow for compressor package, including air cooler and oil cooler(Ltrs/Minute)	Vendor to specify		
3.11	All Bearings details	Vendor to specify		
3.12	Air and oil seals (Type and material along with details)	Vendor to specify		
3.13	Inlet and outlet cooling water manifold to be integrated in the compressor package	Vendor to confirm		
3.14	Moisture separator with drain trap and condensate piping should be provided for each cooler.	Vendor to confirm		
3.15	Canopy: Compressor package is to be enclosed in a powder coated acoustic canopy with sound absorbing material for limiting the noise level.	Vendor to confirm		
<b>4.0</b>	<b>Site Conditions</b>			
4.1	Design Inlet condition <ul style="list-style-type: none"> <li>a. Ambient Temperature: 0 deg C to + 46 deg C</li> <li>b. Relative Humidity: 75% except in driest summer season when it comes below 25%</li> <li>c. Altitude : 700 to 900 feet above sea level</li> <li>d. Cooling water inlet temperature: 32 deg C</li> </ul>			
4.2	11Kv, 50 Hz, 3 Phase wire supply & 415V, 3 Phase, 3 wire supply will be provided at one point in /near compressor house. Control voltage requirements shall be derived by the supplier by providing suitable transformer in the starter /control panels( the power supply may fluctuate + or – 10% from specified voltage and + or – 3% from specified frequency)			
4.3	Compressor size L x B x H to be specified by supplier.			
<b>5.0</b>	<b>Lube Oil System</b>			
5.1	Lube oil system with complete details	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	Oil Pressure	Vendor to specify		
5.6	Oil circulation system details	Vendor to specify		

5.7	Oil Cooler	Vendor to specify		
5.8	Filter	Vendor to specify		
5.9	Oil level Indicator	Vendor to specify		
5.10	Necessary valves and safety valves	Vendor to specify		
5.11	Lubricating oil consumption in Ltrs per 1000 hrs of continuous working	Vendor to specify		
5.12	Interconnecting piping suitably terminated	Vendor to specify		
5.13	Initial oil fill is in the scope of vendor	Vendor to confirm		
<b>6.0</b>	<b>Drive Motor</b>			
6.1	Electric Motor suitable for 11Kv-50Hz continuous rating, induction type, Class F insulation and protection IP55.	Vendor to specify		
6.2	Motor Bearing and Motor cooling	Vendor to specify		
6.3	Motor Power Rating	Vendor to specify		
6.4	Cable from power substation to starter is in BHEL scope. Vendor to give specifications of cable suitable for this. Cable from starter to motor is in vendor's scope .	Vendor to specify & confirm		
6.5	Suitable HT motor star delta starter with motor protection controls to be included	Vendor to specify		
<b>7.0</b>	<b>Accessories</b>			
7.1	Air Intake Filter with silencer(Piping between intake to suction is in vendor's scope)	Vendor to specify		
7.2	Accessories not mentioned but considered essential shall also be included in the offer.	Vendor to specify		
7.3	Discharge Check Valve	Vendor to specify		
7.4	Details of safety relief valves provided to be given	Vendor to specify		
<b>8.0</b>	<b>Operation/Control &amp; Safety</b>			
8.1	Microprocessor based Auto dual mode for controlling pressure and flow and should have interface for inter connection to remote PC.	Vendor to specify		
8.2	Protection/Display/Alarm/Trip for 1. Equipment 2. Operator's control 3. Operation details	Vendor to specify		
8.3	The compressor package should have noise level less than 85dB at 1Mtr distance.	Vendor to specify		
8.4	Bidder to give full details reg. safety features provided by designer.	Vendor to specify		
8.5	Trip signals are to be provided to protect the machine	Vendor to		

	from abnormal operating conditions e.g. 1. High Temp of air/oil 2. High Discharge Pressure 3. Over load protection 4. Low oil Pressure 5. Cooling water supply failure	specify		
8.6	Emergency Stop to be provided	Vendor to specify		
8.7	Display for all essential warning indications , shut down indications and service requirement indications to be provided.	Vendor to specify		
8.8	All pressure gauges used shall be duly calibrated, calibration certificates to be supplied along with them.	Vendor to confirm		
<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 and also the materials of construction of major parts. The bearings and seals used shall be described. Full details of compressor protection features to be included.	Vendor to confirm		
9.2	Drawing of compressor package, Schematic and Foundation diagram showing the layout and interconnections shall be submitted along with the offer.	Vendor to confirm		
9.3	Motor shall be any of following makes. BHEL/ NGEF/KIRLOSKAR/SIEMENS/L&T/ALSTOM/BHARA T BIJLEE/GE	Vendor to confirm		
9.4	All electrical devices, contactors, relays, limit switches, push buttons etc. shall be from Siemens/L&T/Alstom/Cuttler Hammer/Telemecanique	Vendor to confirm		
9.5	Any other information/features the bidder want to furnish w.r.t. design features of compressor.	Vendor to specify		
<b>10.0</b>	<b>Spares</b>			
10.1	Itemized breakup of mechanical, electrical and electronic spares used in the machine in sufficient quantity as per recommendation of the vendor for 2 years of trouble free operation on three shifts continuous running basis shall be offered by vendor. (Unit Price for each item of the spare shall be offered)	Vendor to confirm		
10.2	All types of spares for total machine and accessories shall be available for at least ten years after supply of machine. If the machine is likely to become obsolete in this period, 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		
10.3	Vendor to confirm that complete list of spares for machine and accessories , along with item, part no/ specification, type/ model, name and address of spare supplier shall be furnished along with documentation to be supplied with the	Vendor to confirm		

	machine.			
<b>11.0</b>	<b>Documentation</b>			
11.1	Three sets of following documents (3 hard copies), in English language should be supplied along with the compressor a) Operation & Maintenance Instructions b) Spare parts manual c) Assembly Drawing d) Electrical wiring drawings, power & control circuits.	Vendor to confirm		
11.2	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>			
12.1	The vendor shall train two BHEL Engineers/Supervisors for operation, maintenance (Mechanical/Electrical/Electronics system) of the compressor at vendor's works for not less than two mandays each.	Vendor to confirm		
12.2	The vendor shall impart training to BHEL 's operators and maintenance crew in operation and maintenance after commissioning of the machine at BHEL works for not less than total six working days.	Vendor to confirm		
12.3	Travelling fare/ boarding & lodging for BHEL trainees shall be borne by BHEL.	Vendor to confirm		
12.4	Vendor to quote for training on per manday basis for training at vendor's works.	Vendor to specify		
<b>13.0</b>	<b>Erection and commissioning</b>			
13.1	Vendor to take full responsibility for supervision of the erection, vendor shall start up, test the compressor, its control & all types of other supplied equipment, and prove the output. Service requirement like power, air & water shall be provided by BHEL only at 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.	Vendor to confirm and details of these requirements should be informed by vendor in advance.		
13.2	Tools, tackles, test mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by vendor.	Vendor to confirm		
13.3	Commissioning spares, required for commissioning of machine within stipulated time shall be brought by vendor on returnable basis.	Vendor to confirm		
13.4	Schedule of erection and commissioning shall be submitted along with the offer.	Vendor to confirm		
13.5	Charges, duration, terms & conditions for erection and commissioning should be furnished in detail separately by vendor along with the offer.	Vendor to confirm		

<b>14.0</b>	<b>Testing &amp; Acceptance</b>			
14.1	The equipment shall be offered for inspection by BHEL at supplier's works before dispatch.	Vendor to confirm		
<b>15.0</b>	<b>Guarantee</b>			
15.1	The equipment and accessories shall be guaranteed for proper operation and shall have warranty for all parts for a period of 24 months from the date of commissioning.	Vendor to confirm		

Note:

1. The bidder shall submit the offer in two parts. Technical offer and Price Bid.
2. The offer should contain a comparative statement of technical specifications given in BHEL format and offer details submitted by Bidder. A just "confirmed" or "complies" or "yes" or "no" or "no deviation" or similar words should be accompanied by details of the features offered by them.
3. The bidder to furnish reference list of customers with full address, details of contact person where screw type rotary compressor, FAD 800CFM or higher @ 7.5 bar has been supplied in the past. Performance certificate from the customers regarding satisfactory performance of the machine supplied to them to be enclosed along with the technical offer.