



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

Phone: +91 431 257 7653

Fax :

Email : skaruna@bheltry.co.in

Web : www.bhel.com

NOTICE INVITING TENDER

TWO PART BID

Enquiry
Number:

Enquiry
Date:

Due date for submission
of quotation:

Tender to be submitted in two Parts

2631700004

16.03.2017

17.04.2017

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	(Indigenous Vendors) Matl. will be Delivered to
10	Screw Air Compressor Capacity 500 CFM as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1.00 No.	FOR, BHEL, Stores, High Pressure Boiler Plant, Tiruchirappalli - 620014
20	Screw Air Compressor Capacity 500 CFM as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1.00 No.	FOR, BHEL, Stores Power Plant Piping Unit Thirumayam 622507, Pudukkottai Dist.

Important points to be taken care during submission of offer

1. Material shall be delivered to: Indigenous Vendors: As stated above.
Foreign Vendors: CFR Chennai Seaport / Airport
2. Delivery required 4 Months from the date of purchase order.
3. Erection & Commissioning period required 4 Weeks from the date of intimation by BHEL to vendor for deputation of their Engineers for E&C.
4. EMD for this Tender will be (INR) : 1,00,000.00
5. Compliance Form Nos.: TRY/IMP/02 & TRY/IND/02A to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
6. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM / CE / GENL / 001 - EMD) 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 above Enquiry reference.

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

DGM / Capital Equipment / MM

S.PARTHASARATHY
MANAGER
CAPITAL EQUIPMENT / MM
BHEL, TRICHY-620014.

SCREW AIR COMPRESSOR – 500CFM PART – A

SECTION- 1: Qualifying Criteria

The BIDDER has to compulsorily meet the Qualifying Criteria indicated in **Section 1** to get qualified. Otherwise the technical offer will not be considered.

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
1.1	The BIDDER / VENDOR (OEM) shall have a minimum TEN Years of Continuous Experience in Design, Manufacture & Supply of “SCREW AIR COMPRESSOR. Vendor shall indicate the actual number of years of experience in the field.	
1.2	Only those vendors (OEMs) should quote, who have commissioned in the last FIVE years (as on the original date of tender opening) at least TWO “Rotary Screw Air Compressors’ having capacity of 500 CFM or more at a rated pressure of 10.0 Kg/cm² (g) or above” EITHER (i) In at least one country other than the country of origin to establish vendor's global business activity. OR (ii) In India and the referred compressors are presently working satisfactorily for more than one year from the date of commissioning (as on the original date of tender opening). The name and contact addresses of the customers to whom the Screw Air Compressors were supplied to be furnished with details.	
1.3	Vendor has to submit at least ONE PERFORMANCE CERTIFICATE for satisfactory performance of SCREW AIR COMPRESSOR as referred under clause 1.2 above, for a minimum period of one year from the date of commissioning (as on the original date of tender opening) from their customers in India or in any other country outside the country of origin, supplied and commissioned in the last 10 years. Performance certificate as Original Certificate or E-mail directly from the customer may be submitted. The original certificate may be returned after verification by BHEL, if required. For obtaining the Performance certificate, a suggestive format is provided at the end of Part A.	
1.4	BHEL reserves the right to verify the information provided by the Vendor for the referred Screw Air Compressors at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works. The Travel, Board and Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected. BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.	

SECTION - 2:

The BIDDER / VENDOR are requested to provide the following information:-

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, Screw Air Compressors has been supplied in the past.	
2.2	Specify details of Air Screw Compressors supplied to other units of BHEL, if any Year of commissioning with details etc.	
2.3	Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.	
2.4	Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – 3:

The BIDDER to note:

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	The BIDDER / VENDOR shall submit the offer in TWO parts. 1. Technical Offer [with PART A & PART B] 2. Commercial Offer and Price bid.	
3.2	The Technical Offer shall contain complete details against all clauses of Technical Specifications given by BHEL.	
3.3	The Technical Offer shall be supported by copies of product Catalogues, DataSheets and technical details of Bought- Out-Items.	
3.4	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.	

Suggestive Format of Performance Certificate:

The Performance should be certified by the customer on **Customer's Letter Head** and submitted along with the offer.

PERFORMANCE CERTIFICATE

1.0	Screw Air Compressors Supplied by : (Manufacturer's name)	
2.0	Make & Model number of the Compressor	
3.0	Month & Year of Commissioning	
4.0	Application for which the compressor is used	
5.0	Screw Air Compressor Details	
5.1	Rated Capacity	
5.2	Rated Pressure	
6.0	Performance of the Compressor (Please tick the appropriate option)	Satisfactory
		Not Satisfactory
7.0	Service after sales (Please tick the appropriate option)	Satisfactory
		Not Satisfactory
8.0	Other remarks (if any)	
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

Part - B**TECHNICAL SPECIFICATION for SCREW AIR COMPRESSOR****Note:-**

1. The Column "Vendor's offer with Technical details & Remarks" of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.
2. The offer and all documents enclosed with offer should be in English language only.
3. Any deviation from the specification must be brought-out clearly by the supplier in the technical offer

Scope: - Design, Manufacture, Supply, Erection & Commissioning of 1 No. of **Screw Air Compressor of capacity 500 CFM at 10 Kg/cm² (g) with variable speed regulation** complying with specification mentioned as below.

S.NO.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	OFFERED	DEVIATION
1.0	PURPOSE:			
1.1	"Screw air Compressor Unit" consisting of Screw Type Air Compressor, Air Filters, Air Dryer as per the following specifications is required to supply dry and clean compressed air to operate the Test Facilities at Coal Research Centre of BHEL, Trichy.	Vendor to offer		
2.0	SPECIFICATIONS: "Screw Type Air Compressor Unit" consists of following with specifications given against each.	Vendor to offer		
2.1	SCREW TYPE AIR COMPRESSOR:			
2.1.1	Air delivery (minimum) 10.0 kg/cm ² pressure	500 CFM (14.1 m ³ /min)		
2.1.2	Maximum Pressure at outlet of compressor	10.0 kg /sq.cm (g)		
2.1.3	Working Pressure (adjustable)	5.5 to 10.0 kg./sq.cm (g)		

2.1.4	No of stages	One (or more). Vendor to specify		
2.1.5	Type of cooling	Air cooled		
2.1.6	Motor power	Vendor to specify		
2.1.7	Operating Voltage	3 phase, 415 V		
2.1.8	Electric Motor should be energy efficient (EFF-1) and IP-55 Class F with complete VFD system. VFD make: ABB/ SIEMENS or any other reputed make acceptable to BHEL	Vendor to confirm		
2.1.9	Suitable for continuous duty	Vendor to confirm		
2.1.10	Motor make : ABB/SIEMENS/KIRLOSKAR/CGL /INGERSOLL RAND or reputed make acceptable to BHEL	Vendor to confirm		
2.2	QUALITY OF DELIVERED AIR: Compressor unit should deliver compressed air according to ISO - 8573-1, having the following parameters of compressed air.	Vendor to confirm		
2.2.1	Pressure Dew Point	3 - 4 °C		
2.2.2	Solid Particle / Dust	Class - I		
2.2.3	Humidity	Class - IV		
2.2.4	Oil Content	Class - I		
2.2.5	Delivery air temperature	Should not be more than 10 °C from ambient temperature.		
2.3	AIR & OIL FILTERS: Set of suitable Air Filters consisting of Pre Filter, Fine Filter for application of the above Compressor to deliver dry and clean compressed air of the required quality. Oil levels as specified in section 2.2.4	Vendor to offer and submit details.		

2.4	AIR RECEIVER: To be connected to ALREADY AVAILABLE air receiver at BHEL-Trichy	Vendor to note & confirm		
2.5	VALVES / FITTINGS :			
2.5.1	Compressor outlet connection should be terminated to connect our existing line of 2.5" air duct. Necessary Hoses and Pipes in required length and size, Connecters and Valves required between Compressor, Air Dryer and Filters to be supplied with the equipment. Connection from screw compressor unit exit to existing air receiver is under the scope of BHEL-Trichy.	Vendor to offer		
2.6	AIR DRYER:	Vendor to offer and submit details.		
2.6.1	Refrigerated type Air Dryer , suitable for application of the above compressor to deliver dry compressed air of the class-IV required quality.	Vendor to confirm & specify.		
2.6.2	Zero Air Loss Automatic Drain Valve for draining condensed air from the Dryer.	Vendor to confirm & specify		
2.7	ACOUSTIC ENCLOSURE			
2.7.1	Size and details of Canopy	Vendor to specify		
2.7.2	Suitable Anti vibration pads to be provided.	Vendor to confirm and specify.		
2.7.3	Maximum noise level shall be 80 dB(A) at normal load condition, 1 meter away from the Compressor Unit. This will be measured as per international standards like DIN 45635-16, if	Vendor to confirm		

	required. Supplier to demonstrate compliance to noise level.			
2.7.4	Acoustic enclosure should be designed such that it does not create any pressure drop at suction filter and avoids entry of foreign particles.	Vendor to confirm		
2.8	FIRST FILLING OF OILS			
2.8.1	First filling of all required Oil, Grease etc. required for the Compressor and other items like Air Filter to be supplied by vendor. Makes of such items / codes to be submitted by the vendor.	Vendor to confirm & quote		
2.8.2	Subsequent oil change at an interval of not less than 4000 operating hours	Vendor to confirm & quote		
3.0	ELECTRICAL REQUIREMENT:			
3.1	Voltage = 415V +10%, Frequency = 50HZ +3/-3, No. of phases = 3 with neutral. Power Supply source, as above, will be provided by BHEL at a single point near the machine, as per the layout recommended by the vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine / control cabinets including Voltage Stabilizer, Transformer & Air- Compressor etc. shall be the responsibility of vendor.	Vendor to confirm		
3.2	All Electrical devices, Contactors, Relays, Limits, Switches, Push buttons, etc. shall be from Siemens /L&T/ Alstom/BCH/ Telemechanique or any other reputed make.	Vendor to confirm		

3.3	Vendor should ensure the proper earthing for the machine and its peripherals. Earth electrode with connecting conductors with suitable earth resistance value (preferably less than 1.5 ohm) shall be supplied with the machine. The location for earth pit shall be indicated in the machine foundation drawing. Accordingly Earth pit will be provided by BHEL. Earth Electrode maintenance shall be mentioned in the O&M manual.	Vendor confirm to		
4.0	POWER CONTROL PANEL			
4.1	Power panel incorporating: 1. Suitable Star-Delta starter with contactors, relays etc. 2. Single phasing preventer ensures safety of compressor by tripping in case of single phasing and phase sequence relay to avoid reverse rotation 3. Emergency stop button 4. Should be supplied according to the motor capacity.	Vendor to offer		
5.0	COMPRESSOR CONTROL			
5.1	Electronic microprocessor for surveillance, management and monitoring of compressors	Vendor to offer		
5.2	Functions of electronic microprocessor system:			
	1. Load unload control 2. Accurate pressure control 3. Programmable start stop	Vendor to confirm & specify		

	4. Delayed second stop 5. Dual pressure band setting 6. Multi logic control 7. Multi-mode control (local / remote / LAN) 8. Intelligence shutdown protections			
5.3	Keys			
	1. Start 2. Stop 3. Cancel	Vendor to confirm & specify		
5.4	Luminous indications			
	1. Power supply indications 2. Automatic function mode 3. Error	Vendor to confirm & specify		
5.5	LCD display			
	1. Delivery air pressure 2. Air/oil Temperature 3. Hour meter 4. Total running hours 5. Total loaded hours 6. Start/stop, load/unload, Emergency stop & test conditions 7. Reason for trip Maintenance schedule (No. of Hours indication) 1. Replace Air Filter Element 2. Replace Oil Filter Element 3. Replace Air/Oil Separator Element 4. Change of Lube oil	Vendor to confirm & specify		

5.6	Compressor warning and shut down indications			
	1. Emergency stop 2. Air outlet temperature 3. Main motor overload 4. Fan motor overload 5. General fault indication 6. High decibel audible external buzzer with 360° red alarm light for trip indication	Vendor to confirm & specify		
6.0	ENVIRONMENTAL PERFORMANCE: The Machine should conform to following factors related to environment			
6.1	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm		
6.2	Paint of the machine should be oil / coolant resistant and should not get peeled off and mixed up with coolant.	Vendor to confirm		
6.3	There should not be any emissions or effluent from the machine. No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm		
7.0	AMBIENT CONDITION			
7.1	The machine should be suitable for operation in the following conditions: – Power : 415 V +15% / -15%, 3 phase, 50Hz +/- 3% – Ambient Temp.: 20 °C to 45 °C – Relative humidity: 95% max – Other conditions are similar to tropical country. – Dust laden atmosphere during some part of the year.	Vendor confirm to		

8.0	SPACE REQUIRED / FOUNDATION DETAILS			
8.1	ANCHORING MATERIAL: Complete set of anchoring materials including foundation bolts, nuts, washers and levelling shoes etc. for fixing of Compressor including other items like Air Filter, Air Drier etc. to the foundation should be supplied.	Vendor to offer		
8.2	Foundation Plan: Drawing with loading data at various points is to be submitted by supplier within 4 weeks of placement of LOI / PO whichever is earlier. BHEL shall carry-out the design and construction of foundation as per foundation plan drawing & loading data.	Vendor to accept & offer		
8.3	Total space required (Length, Width and Height) for complete Compressor including all items like Filter should be sent along with the offer.	Vendor to provide details.		
9.0	SPARES			
9.1	Item wise breakup of mechanical, hydraulic, electrical and electronic spares used on the compressor and other items like Air filters 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. The list to include following, in addition to BHEL recommended spares: (Unit Price of each item of spare should be offered) 1. Suction filters - 2 sets	Vendor to offer		

	2. Oil filter – 2 sets 3. Air Oil separator – 2 no's 4. Oil – 250 litres 5. O rings/seals as available in the complete system – 2 sets.			
9.2	All types of spares for total compressor and accessories should be available for at least seven years after supply of the machine. If machine or control 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 confirm	to	
10.0	GUARANTEE PERIOD			
10.1	The manufacturer shall warrant the entire supply including the drive motor, VFD, Air Dryer against deficiency in performance and failure due to defects in material and workmanship for a period of at least 12 months from the date of commissioning Or 18 month from the date of dispatch, whichever is earlier.	Vendor confirm	to	
11.0	O & M MANUALS			
11.1	Two sets of Operation & Maintenance Manuals in English language and its soft copies in CD should be supplied along with the equipment. Manuals should contain the following information in it.	Vendor confirm	to	
11.1.1	Operating manuals of Compressor including motor and other items like Air Filter, Air dryer etc.	Vendor to confirm		
11.1.2	Detailed Maintenance manual of Compressor including other items like Air Filter, Air dryer with the help of drawings of main assemblies sub-	Vendor to confirm		

	assemblies/parts including Electrical / Coolant / Hydraulic circuit diagrams.			
11.1.3	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm		
12.0	QUALITY PLAN			
12.1	Vendor to submit quality plan for BHEL approval after placement of order.	Vendor to confirm		
13.0	PRE DISPATCH INSPECTION:			
13.1	Pre dispatch inspection will be carried out by BHEL representative at vendor's works (if required). Vendor should arrange for complete run test during the inspection at vendor's works. Compressor shall be fully tested at the supplier's works to determine its Mechanical and electrical characteristics. Compressor air capacity, pressure and temperatures shall be measured and recorded and shall confirm to ISO 1217. Final acceptance will be done at BHEL, High pressure boiler plant (HPBP) during the commissioning and performance demonstration of the compressor at BHEL-Trichy.	Vendor to confirm		
14.0	ERECTION & COMMISSIONING AT BHEL WORKS			
14.1	Supplier to take full responsibility for carrying out the assembly and commissioning of Compressor along with its all accessories at BHEL, HPBP- CRC . 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.	Vendor to confirm		

	During commissioning, vendor will have to demonstrate proper operation of the compressor and all other items like air filter, air dryer. All civil works shall be provided by BHEL as indicated by Vendor in their foundation/ layout drawings.			
14.2	The charges for Erection & Commissioning (if any) should be inclusive of offer.	Vendor to confirm		
14.3	The vendor shall bring special tools, tackles, instruments and equipment required for erection and commissioning the machine. Necessary tools like Torque Wrench, Spanners, Keys, Grease guns etc. for operation & maintenance of the machine should be supplied. List of such tools shall be submitted with offer.	Vendor to confirm		
14.4	All spares/consumables, required for commissioning of the machine shall be brought by the Vendor.	Vendor to confirm		
14.5	Schedule of Erection and Commissioning shall be submitted after ordering.	Vendor to confirm		
14.6	Initial fill of oil should be supplied along with the compressor.	Vendor to confirm		
15.0	TRAINING:			
15.1	The vendor shall impart 2 days training to BHEL's Machine operation and maintenance (Mechanical, electrical & electronics) crew in Operation and Maintenance after the commissioning of the Compressor at BHEL works.	Vendor to confirm		

16.0	GENERAL POINTS:			
16.1	The supplier is to submit a clause wise deviation statement against each clause of this technical specification along with the offer.	Vendor to provide details.		
16.2	Make and Model of the machine to be mentioned. Detailed original catalogs of the machine to be sent with the offer.	Vendor to specify		
16.3	Complete description of all systems & sub-systems shall form part of the technical bid.	Vendor to specify		
16.4	A schematic diagram showing the layout of the compressor & associated systems with salient dimensions shall be submitted along with the offer.	Vendor to specify		
16.5	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify		
16.6	Total connected load in kVA	Vendor to specify		
16.7	Total weight of the compressor	Vendor to specify		
17.0	ANNUAL MAINTENANCE CONTRACT (OPTIONAL)			
17.1	The BIDDER HAS TO QUOTE in a separate sealed cover for AMC UNDER THE PATTERNS GIVEN BELOW, for a period of THREE YEARS after the Guarantee period.			
17.1.1	Technical Service for Preventive Maintenance & Trouble Shooting of the compressors & accessories INCLUDING the Cost of SPARES and Consumables [BHEL will not be responsible for the timely availability of Spares & Consumables]			

SCREW AIR COMPRESSOR – 500CFM PART – A

SECTION- 1: Qualifying Criteria

*The BIDDER has to compulsorily meet the Qualifying Criteria indicated in **Section 1** to get qualified. Otherwise the technical offer will not be considered.*

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
1.1	<i>The BIDDER / VENDOR (OEM) shall have a minimum TEN Years of Continuous Experience in Design, Manufacture & Supply of “SCREW AIR COMPRESSOR. Vendor shall indicate the actual number of years of experience in the field.</i>	
1.2	<i>Only those vendors (OEMs) should quote, who have commissioned in the last FIVE years (as on the original date of tender opening) at least TWO “Rotary Screw Air Compressors’ having capacity of 500 CFM or more at a rated pressure of 7.5 Kg/cm² (g) or above”</i> <i>EITHER (i) In at least one country other than the country of origin to establish vendor's global business activity.</i> <i>OR (ii) In India and the referred compressors are presently working satisfactorily for more than one year from the date of commissioning (as on the original date of tender opening).</i> <i>The name and contact addresses of the customers to whom the Screw Air Compressors were supplied to be furnished with details.</i>	
1.3	<i>Vendor has to submit at least ONE PERFORMANCE CERTIFICATE for satisfactory performance of SCREW AIR COMPRESSOR as referred under clause 1.2 above, for a minimum period of one year from the date of commissioning (as on the original date of tender opening) from their customers in India or in any other country outside the country of origin, supplied and commissioned in the last 10 years.</i> <i>Performance certificate as Original Certificate or E-mail directly from the customer may be submitted. The original certificate may be returned after verification by BHEL, if required.</i> <i>For obtaining the Performance certificate, a suggestive format is provided at the end of Part A.</i>	
1.4	<i>BHEL reserves the right to verify the information provided by the Vendor for the referred Screw Air Compressors at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works. The Travel, Board and Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.</i> <i>BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.</i>	

SECTION - 2:

The BIDDER / VENDOR are requested to provide the following information:-

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
2.1	<i>The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, Screw Air Compressors has been supplied in the past.</i>	
2.2	<i>Specify details of Air Screw Compressors supplied to other units of BHEL, if any Year of commissioning with details etc.</i>	
2.3	<i>Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.</i>	
2.4	<i>Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.</i>	

SECTION – 3:

The BIDDER to note:

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	<i>The BIDDER / VENDOR shall submit the offer in TWO parts. 1. Technical Offer [with PART A & PART B] 2. Commercial Offer and Price bid.</i>	
3.2	<i>The Technical Offer shall contain complete details against all clauses of Technical Specifications given by BHEL.</i>	
3.3	<i>The Technical Offer shall be supported by copies of product Catalogues, DataSheets and technical details of Bought- Out-Items.</i>	
3.4	<i>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.</i>	

Suggestive Format of Performance Certificate:

*The Performance should be certified by the customer on **Customer's Letter Head** and submitted along with the offer.*

PERFORMANCE CERTIFICATE

1.0	Screw Air Compressors Supplied by : (Manufacturer's name)	
2.0	Make & Model number of the Compressor	
3.0	Month & Year of Commissioning	
4.0	Application for which the compressor is used	
5.0	Screw Air Compressor Details	
5.1	Rated Capacity	
5.2	Rated Pressure	
6.0	Performance of the Compressor (Please tick the appropriate option)	Satisfactory
		Not Satisfactory
7.0	Service after sales (Please tick the appropriate option)	Satisfactory
		Not Satisfactory
8.0	Other remarks (if any)	
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

Part - B**TECHNICAL SPECIFICATION for SCREW AIR COMPRESSOR****Note:-**

1. The Column "Vendor's offer with Technical details & Remarks" of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.
2. The offer and all documents enclosed with offer should be in English language only.
3. Any deviation from the specification must be brought-out clearly by the supplier in the technical offer

Scope: - Design, Manufacture, Supply, Erection & Commissioning of 1 No. of **Screw Air Compressor of capacity 500 CFM at 7.5 Kg/cm² (g) with variable speed regulation** complying with specification mentioned as below.

S.NO.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	OFFERED	DEVIATION
1.0	PURPOSE:			
1.1	"Screw air Compressor Unit" consisting of Screw Type Air Compressor, Air Filters, Air Dryer, Air Receiver and valves as per the following specifications is required to supply dry and clean compressed air at PPPU, BHEL – Thirumayam - 622507.	Vendor to offer		
2.0	SPECIFICATIONS: "Screw Type Air Compressor Unit" consists of following with specifications given against each.	Vendor to offer		
2.1	SCREW TYPE AIR COMPRESSOR:			
2.1.1	Air delivery (minimum) at 7.5 kg/cm ² pressure	500 CFM (14.1 m ³ /min)		
2.1.2	Maximum Pressure at outlet of compressor	7.5 kg /sq.cm (g)		

2.1.3	Working Pressure (adjustable)	4.5 to 7.5 kg./sq.cm (g)		
2.1.4	No of stages	One (or more). Vendor to specify		
2.1.5	Type of cooling	Air cooled		
2.1.6	Motor power	Vendor to specify		
2.1.7	Operating Voltage	3 phase, 415 V		
2.1.8	Electric Motor should be energy efficient (EFF-1) and IP-55 Class F with complete VFD system. VFD make: ABB/ SIEMENS or any other reputed make acceptable to BHEL	Vendor to confirm & specify		
2.1.9	Suitable for continuous duty	Vendor to confirm		
2.1.10	Motor make : ABB/SIEMENS/KIRLOSKAR/CGL /INGERSOLL RAND or reputed make acceptable to BHEL	Vendor to confirm		
2.2	QUALITY OF DELIVERED AIR: Compressor unit should deliver compressed air according to ISO - 8573-1, having the following parameters of compressed air.	Vendor to confirm		
2.2.1	Pressure Dew Point	3 - 4 °C		
2.2.2	Solid Particle / Dust	Class - I		
2.2.3	Humidity	Class - IV		
2.2.4	Oil Content	Class - I		
2.2.5	Delivery air temperature	Should not be more than 10 °C from ambient temperature.		
2.3	AIR & OIL FILTERS: Set of suitable Air Filters consisting of Pre Filter, Fine Filter and carbon filter for application of the above Compressor to deliver	Vendor to offer and submit details.		

	<i>dry and clean compressed air of the required quality. Oil levels as specified in section 2.2.4</i>			
2.4	AIR RECEIVER:	<i>Vendor to note & offer</i>		
2.4.1	<i>Capacity (Minimum)</i>	<i>1000 Liters</i>		
2.4.2	<i>Max. Working Pressure</i>	<i>10 Kg/sq.cm</i>		
2.4.3	<i>Confirming to ASME Section VIII, Div.1 / IS 2625 Norms or equivalent</i>	<i>Vendor to specify</i>		
2.5	VALVES / FITTINGS :			
2.5.1	<i>Necessary Hoses and Pipes in required length and size, Connecters and Valves required between Compressor, Air Dryer and Filters to be supplied with the equipment.</i>	<i>Vendor to note & confirm</i>		
2.6	AIR DRYER:	<i>Vendor to offer and submit details.</i>		
2.6.1	<i>Refrigerated type Air Dryer, suitable for application of the above compressor to deliver dry compressed air of the class-IV required quality.</i>	<i>Vendor to confirm & specify.</i>		
2.6.2	<i>Zero Air Loss Automatic Drain Valve for draining condensed air from the Dryer.</i>	<i>Vendor to confirm & specify</i>		
2.7	ACOUSTIC ENCLOSURE			
2.7.1	<i>Size and details of Canopy</i>	<i>Vendor to specify</i>		
2.7.2	<i>Suitable Anti vibration pads to be provided.</i>	<i>Vendor to confirm and specify.</i>		
2.7.3	<i>Maximum noise level shall be 80 dB(A) at normal load condition, 1 meter away from the Compressor Unit. This will be measured as per international standards like DIN 45635-16, if</i>	<i>Vendor to confirm</i>		

	<i>required. Supplier to demonstrate compliance to noise level.</i>			
2.7.4	<i>Acoustic enclosure should be designed such that it does not create any pressure drop at suction filter and avoids entry of foreign particles.</i>	<i>Vendor to confirm</i>		
2.8	FIRST FILLING OF OILS			
2.8.1	<i>First filling of all required Oil, Grease etc. required for the Compressor and other items like Air Filter to be supplied by vendor. Makes of such items / codes to be submitted by the vendor.</i>	<i>Vendor to confirm & quote</i>		
2.8.2	<i>Subsequent oil change at an interval of not less than 4000 operating hours</i>	<i>Vendor to confirm & quote</i>		
3.0	ELECTRICAL REQUIREMENT:			
3.1	<i>Voltage = 415V +10%, Frequency = 50HZ +3/-3, No. of phases = 3 with neutral. Power Supply source, as above, will be provided by BHEL at a single point near the machine, as per the layout recommended by the vendor.</i> <i>All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine / control cabinets including Voltage Stabilizer, Transformer & Air- Compressor etc. shall be the responsibility of vendor.</i>	<i>Vendor to confirm</i>		
3.2	<i>All Electrical devices, Contactors, Relays, Limits, Switches, Push buttons, etc. shall be from Siemens /L&T/ Alstom/BCH/ Telemecanique or any other reputed make.</i>	<i>Vendor to confirm</i>		

3.3	<i>Vendor should ensure the proper earthing for the machine and its peripherals. Earth electrode with connecting conductors with suitable earth resistance value (preferably less than 1.5 ohm) shall be supplied with the machine. The location for earth pit shall be indicated in the machine foundation drawing. Accordingly Earth pit will be provided by BHEL. Earth Electrode maintenance shall be mentioned in the O&M manual.</i>	<i>Vendor to confirm</i>		
4.0	POWER CONTROL PANEL			
4.1	<i>Power panel incorporating: 1. Suitable Star-Delta starter with contactors, relays etc. 2. Single phasing preventer ensures safety of compressor by tripping in case of single phasing and phase sequence relay to avoid reverse rotation 3. Emergency stop button 4. Should be supplied according to the motor capacity.</i>	<i>Vendor to offer</i>		
5.0	COMPRESSOR CONTROL			
5.1	<i>Electronic microprocessor for surveillance, management and monitoring of compressors</i>	<i>Vendor to offer</i>		
5.2	<i>Functions of electronic microprocessor system:</i>			
	<i>1. Load unload control 2. Accurate pressure control 3. Programmable start stop</i>	<i>Vendor to confirm & specify</i>		

	4. <i>Delayed second stop</i> 5. <i>Dual pressure band setting</i> 6. <i>Multi logic control</i> 7. <i>Multi-mode control (local / remote / LAN)</i> 8. <i>Intelligence shutdown protections</i>			
5.3	Keys			
	1. <i>Start</i> 2. <i>Stop</i> 3. <i>Cancel</i>	Vendor to confirm & specify		
5.4	Luminous indications			
	1. <i>Power supply indications</i> 2. <i>Automatic function mode</i> 3. <i>Error</i>	Vendor to confirm & specify		
5.5	LCD display			
	1. <i>Delivery air pressure</i> 2. <i>Air/oil Temperature</i> 3. <i>Hour meter</i> 4. <i>Total running hours</i> 5. <i>Total loaded hours</i> 6. <i>Start/stop, load/unload, Emergency stop & test conditions</i> 7. <i>Reason for trip</i> Maintenance schedule (No. of Hours indication) 1. <i>Replace Air Filter Element</i> 2. <i>Replace Oil Filter Element</i> 3. <i>Replace Air/Oil Separator Element</i> 4. <i>Change of Lube oil</i>	Vendor to confirm & specify		
5.6	Compressor warning and shut down indications			
	1. <i>Emergency stop</i> 2. <i>Air outlet temperature</i> 3. <i>Main motor overload</i>	Vendor to confirm & specify		

	4. Fan motor overload 5. General fault indication 6. High decibel audible external buzzer with 360° red alarm light for trip indication			
6.0	ENVIRONMENTAL PERFORMANCE: The Machine should conform to following factors related to environment			
6.1	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm		
6.2	Paint of the machine should be oil / coolant resistant and should not get peeled off and mixed up with coolant.	Vendor to confirm		
6.3	There should not be any emissions or effluent from the machine. No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm		
7.0	POWER SUPPLY / AMBIENT CONDITION			
7.1	The machine should be suitable for operation in the following conditions: – Power : 415 V +15% / -15%, 3 phase, 50Hz +/- 3% – Ambient Temp.: 5 °C to 45 °C – Relative humidity: 95% max – Other conditions are similar to tropical country. – Dust laden atmosphere during some part of the year.	Vendor to confirm		
8.0	SPACE REQUIRED / FOUNDATION DETAILS			
8.1	ANCHORING MATERIAL: Complete set of anchoring materials including foundation bolts, nuts, washers and levelling shoes etc. for fixing of	Vendor to offer		

	<i>Compressor including other items like Air Filter, Air Drier etc. to the foundation should be supplied.</i>			
8.2	<i>Foundation Plan: Drawing with loading data at various points is to be submitted by supplier within 4 weeks of placement of LOI / PO whichever is earlier. BHEL shall carry-out the design and construction of foundation as per foundation plan drawing & loading data.</i>	<i>Vendor to accept & offer</i>		
8.3	<i>Total space required (Length, Width and Height) for complete Compressor including all items like Filter should be sent along with the offer.</i>	<i>Vendor to provide details.</i>		
9.0	SPARES			
9.1	<i>Item wise breakup of mechanical, hydraulic, electrical and electronic spares used on the compressor and other items like Air filters 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.</i> <i>The list to include following, in addition to BHEL recommended spares: (Unit Price of each item of spare should be offered)</i> <i>1. Suction filters - 2 sets</i> <i>2. Oil filter – 2 sets</i> <i>3. Air Oil separator – 2 no's</i> <i>4. Oil – 250 litres</i>	<i>Vendor to offer</i>		

	<i>5. O rings/seals as available in the complete system – 2 sets.</i>			
9.2	<i>All types of spares for total compressor and accessories should be available for at least seven years after supply of the machine. If machine or control 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</i>	<i>Vendor confirm to</i>		
10.0	GUARANTEE PERIOD			
10.1	<i>The manufacturer shall warrant the entire supply including the drive motor, VFD ,Air dryer against deficiency in performance and failure due to defects in material and workmanship for a period of at least 12 months from the date of commissioning Or 18 month from the date of dispatch, whichever is earlier.</i>	<i>Vendor confirm to</i>		
11.0	O & M MANUALS			
11.1	<i>Two sets of Operation & Maintenance Manuals in English language and its soft copies in CD should be supplied along with the equipment. Manuals should contain the following information in it.</i>	<i>Vendor confirm to</i>		
11.1.1	<i>Operating manuals of Compressor including motor and other items like Air Filter, Air dryer etc.</i>	<i>Vendor to confirm</i>		
11.1.2	<i>Detailed Maintenance manual of Compressor including other items like Air Filter, Air dryer with the help of drawings of main assemblies sub-</i>	<i>Vendor to confirm</i>		

	<i>assemblies/parts including Electrical / Coolant / Hydraulic circuit diagrams.</i>			
11.1.3	<i>Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.</i>	Vendor to confirm		
12.0	QUALITY PLAN			
12.1	<i>Vendor to submit quality plan for BHEL approval after placement of order.</i>	Vendor to confirm		
13.0	PRE DISPATCH INSPECTION:			
13.1	<i>Pre dispatch inspection will be carried out by BHEL representative at vendor's works (if required). Vendor should arrange for complete run test during the inspection at vendor's works. Compressor shall be fully tested at the supplier's works to determine its Mechanical and electrical characteristics. Compressor air capacity, pressure and temperatures shall be measured and recorded and shall confirm to ISO 1217.</i> <i>Final acceptance will be done at BHEL, Power Plant Piping Unit (PPPU) during the commissioning and performance demonstration of the compressor at BHEL-Thirumayam.</i>	Vendor to confirm		
14.0	ERECTION & COMMISSIONING AT BHEL WORKS			
14.1	<i>Supplier to take full responsibility for carrying out the assembly and commissioning of Compressor along with its all accessories at BHEL, PPPU, Thirumayam – 622507 (T.N.). Service requirement like power, air & water shall be provided by BHEL at only one point to be</i>	Vendor to confirm		

	<i>indicated by vendor in their foundation / layout drawings.</i> <i>During commissioning, vendor will have to demonstrate proper operation of the compressor and all other items like air filter, air dryer.</i> <i>All civil works shall be provided by BHEL as indicated by Vendor in their foundation/ layout drawings.</i>			
14.2	<i>The charges for Erection & Commissioning (if any) should be inclusive of offer.</i>	Vendor to confirm		
14.3	<i>The vendor shall bring special tools, tackles, instruments and equipment required for erection and commissioning the machine.</i> <i>Necessary tools like Torque Wrench, Spanners, Keys, Grease guns etc. for operation & maintenance of the machine should be supplied. List of such tools shall be submitted with offer.</i>	Vendor to confirm		
14.4	<i>All spares/consumables, required for commissioning of the machine shall be brought by the Vendor.</i>	Vendor to confirm		
14.5	<i>Schedule of Erection and Commissioning shall be submitted after ordering.</i>	Vendor to confirm		
14.6	<i>Initial fill of oil should be supplied along with the compressor.</i>	Vendor to confirm		
15.0	TRAINING:			
15.1	<i>The vendor shall impart 2 days training to BHEL's Machine operation and maintenance (Mechanical, electrical & electronics) crew in Operation and Maintenance after the commissioning of the Compressor at BHEL works.</i>	Vendor to confirm		
16.0	GENERAL POINTS:			

16.1	<i>The supplier is to submit a clause wise deviation statement against each clause of this technical specification along with the offer.</i>	<i>Vendor to provide details.</i>		
16.2	Make and Model of the machine to be mentioned. Detailed original catalogs of the machine to be sent with the offer.	<i>Vendor to specify</i>		
16.3	<i>Complete description of all systems & sub-systems shall form part of the technical bid.</i>	<i>Vendor to specify</i>		
16.4	<i>A schematic diagram showing the layout of the compressor & associated systems with salient dimensions shall be submitted along with the offer.</i>	<i>Vendor to specify</i>		
16.5	<i>Floor area required (Length, Width, Height) for complete machine & accessories</i>	<i>Vendor to specify</i>		
16.6	<i>Total connected load in kVA</i>	<i>Vendor to specify</i>		
16.7	<i>Total weight of the compressor</i>	<i>Vendor to specify</i>		