



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

<b>ENQUIRY</b> <b>NOTICE INVITING TENDER</b>	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : <a href="mailto:skaruna@bheltry.co.in">skaruna@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
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<b>TWO PART BID</b> Tender to be submitted in two Parts	<b>Enquiry Number:</b> 2851400039	<b>Enquiry Date:</b> 07.07.2014	<b>Due date for submission of quotation:</b> 06.08.2014
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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
10	Rotary Screw Air Compressor (1000 CFM) with accessories (2 Sets) 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> )

**Important points to be taken care during submission of offer:-**

1. The rate of EMD for this Tender will be ( INR ) : 1,50,000/-
2. The Compliance Form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. 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**

  
Engineer/ Capital Equipment / MM

**ROTARY SCREW AIR COMPRESSOR (CAPACITY 1000 CFM)**

**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 of <b>TEN</b> Years of Continuous Experience in the Design, Manufacture & Supply of " <b>Rotary Screw Air Compressors</b> ". Vendor shall indicate the actual no. of years of experience in the field.	
1.2	Only those vendors (OEMs) , who have commissioned in the past <b>FIVE</b> years (on the original date of opening of Tender) at least <b>TWO ' Rotary Screw Air Compressors' having capacity of 1000 cfm or more at a rated pressure of 7.0 Kg /cm<sup>2</sup> (g) or above</b> <b>EITHER</b> (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity <b>OR</b> (ii) in India ; and the referred compressor is presently working satisfactorily for more than one year after commissioning (on the original date of opening of Tender) should quote. The name and contact addresses of the customers to whom the compressor has been supplied has to be furnished with details. BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.	
1.3	Vendor has to submit at least <b>ONE PERFORMANCE CERTIFICATE</b> from their customers in India or from the customers to whom the compressor was supplied outside the country of origin, for satisfactory performance the compressor as given under Clause 1.2 above, for a minimum period of one year from date of commissioning (on the original date of opening of Tender). (Original Certificate or through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.	

**PEFP, Bhandara: Screw Compressor 1000CFM - Part A**

	For obtaining the Performance certificate, a suggestive format is provided.	
1.4	BHEL reserves the right to verify the information provided by the Vendor for the referred compressor 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 and Boarding 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.	

**SECTION - 2:**

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

<b>S NO.</b>	<b>REQUIREMENTS</b>	<b>VENDOR'S RESPONSE</b>
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where Screw Air Compressor have been supplied in the past.	
2.2	Specify details of Screw Air Compressor 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.	

**PEFP, Bhandara: Screw Compressor 1000CFM - Part A**

**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 [ <b>with PART A &amp; PART B</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 certificate should be produced on **Customer's Letter Head** and submitted along with the offer.

**PERFORMANCE CERTIFICATE**

1	Screw Air Compressor Supplied by(Manufacturer's name)									
2	Make & Model number of the Screw Air Compressor									
3	Month & Year of Commissioning									
4	Application for which Screw Air Compressor is used									
5	Screw Air Compressor <b>Details</b>									
5.1	Rated Capacity									
5.2	Rated Pressure									
6	Performance of the compressor (Please tick the appropriate option)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Not Satisfactory</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">Average</td> <td></td> </tr> <tr> <td style="text-align: center;">Good</td> <td></td> </tr> <tr> <td style="text-align: center;">Satisfactory</td> <td></td> </tr> </table>	Not Satisfactory		Average		Good		Satisfactory	
Not Satisfactory										
Average										
Good										
Satisfactory										

PEFP, Bhandara: Screw Compressor 1000CFM - Part A

7	Service after sales (Please tick the appropriate option)	Not Satisfactory
		Average
		Good
		Satisfactory
8	Other remarks (if any)	
Date:		Signature & Seal of the Authority Issuing the Performance Certificate

TECHNICAL SPECIFICATIONS OF 2x1000 CFM SCREW AIR COMPRESSOR UNIT				
SCOPE:	SUPPLY, ERECTION & COMMISSIONING OF 2 X 1000 CFM CAPACITY LUBRICATED ROTARY SCREW AIR COMPRESSOR UNIT WITH ACCESSORIES	REQUIRED	VENDOR'S OFFER	VENDOR TO MENTION DEVIATION IF ANY.
SL. NO.	DESCRIPTION OF BHEL REQUIREMENT			
1.0	<b>PURPOSE :</b> "Screw Air Compressor Unit" consisting of Screw Type Air Compressor, VFD, Air Dryer, Air Filters, Air Receiver and Valves etc. as per the following specifications is required to supply dry and clean compressed air in manufacturing shop, for the operation of different equipments at BHEL unit, Bhandara ,Maharashtra-state.	Vendor to confirm		
1.1	<b>SPECIFICATIONS FOR LUBRICATED ROTARY SCREW AIR COMPRESSOR UNIT WITH ACCESSORIES :</b>			
1.1.1	QUANTITY REQUIRED	2 SETS		
2.0	<b>One set of Lubricated screw air compressor unit with accessories consists of following with specification against each item.</b>			
2.1.0	<b>LUBRICATED ROTARY SCREW AIR COMPRESSOR</b>			
2.1.1	Quantity	1 No.		
2.1.2	Free Air delivery-capacity per compressor	1000 CFM minimum.		
2.1.3	Continuous Rating	Vendor to confirm		
2.1.4	Rated Pressure	7.0 Kg. / Sq. Cm. (g)		
2.1.5	Pressure Setting range	4.5 to 7.0 Kg /Sq. Cm. (g)		
2.1.6	No. of stages	Vendor to specify		
2.1.7	Compressor shaft Power (Kw)	Vendor to specify		
2.1.8	Maximum allowable oil carry over in compressed air is restricted to 3PPM only.	Vendor to confirm		
2.1.9	Specific Power consumption inclusive of fan motor	0.18 Kw/cfm (Max.)		
2.2.0	<b>DRIVE MOTOR</b>			
2.2.1	The motor is to be specifically designed and suitable for the torque, speed and horsepower characteristics of the compressor.	Vendor to specify		
2.2.2	The motor shall be of asynchronous type and TEFC design and shall be compatible for use with Soft starter and shall confirm to IEC standard.	Vendor to confirm		
2.2.3	The motor shall work on 3 phase 415V +/- 10%, 50Hz +/- 3% Power source.	Vendor to confirm		
2.2.4	Starting current of the motor (inclusive of Tolerance)	Vendor to specify		
2.2.5	The motor shall be of Sq. cage Induction motor with suitable rating and suitable for variable speed with VFD.	Vendor to confirm		
2.2.6	Electric Motor should be EFF-1, IP-55,S1 and Class F	Vendor to confirm		
2.2.7	Vendor to specify the service factor	Vendor to specify		
2.2.8	Motor should confirm to IS standard IS : 12615(2011)	Vendor to confirm		

2.2.9	Motor make : ABB/SIEMENS/KIRLOSKAR/CGL /INGERSOLL RAND or Reputed make acceptable to BHEL	Vendor to specify	
2.3.0	<b>VARIABLE SPEED DRIVE (VFD):</b>		
2.3.1	Quantity	1 No.	
2.3.2	Separate Unit(External type) with floor mounting from the compressor module.	Vendor to confirm	
2.3.3	Continuous duty	Vendor to confirm	
2.3.4	Enclosure: IP 55	Vendor to confirm	
2.3.5	Cooling Arrangement	Vendor to specify	
2.3.6	Make: Danfoss/ Kirlosker/ Siemens/ ABB / Ingersoll or any Reputed make acceptable to BHEL	Vendor to specify	
2.3.7	Compressor should meet air demand variation from 50 % to 100 % of capacity with this VFD arrangement.	Vendor to confirm	
2.3.8	Operating parameters & other details	Vendor to specify	
3.1.0	<b>REFRIGERATED TYPE AIR DRYER:</b>		
3.1.1	Quantity	1 No.	
3.1.2	Capacity of Dryer (min 20% excess capacity)	Vendor to specify	
3.1.3	Operating pressure Range	Vendor to specify	
3.1.4	Pressure Dew Point Temperature : + 3 degree celcius	Vendor to confirm	
3.1.5	Working Pressure	Vendor to specify	
3.1.6	Pressure Drop at rated capacity ( maximum 0.2 Kg/ Cm2)	Vendor to confirm	
3.1.7	Power consumption	Vendor to specify	
3.1.8	Refrigrant: R407C	Vendor to confirm	
3.1.9	Zero Air Loss Automatic Drain Valves	Vendor to specify	
3.1.10	Complete package, stand alone Air dryer mounted on a common platform.	Vendor to specify the details	
3.2.0	<b>PRE-AIR FILTER:</b>		
3.2.1	Quantity	1 No.	
3.2.2	Capacity (min 20% excess capacity)	Vendor to specify	
3.2.3	Air quality as per class ISO: 8573.1, Quality class 1 with particulate size of less than 3 micron	Vendor to confirm	
3.2.4	Pressure Drop at rated capacity ( maximum 0.05 Kg/ Cm2)	Vendor to specify	
3.3.0	<b>POST AIR FILTER:</b>		
3.3.1	Quantity	1 No.	
3.3.2	Capacity (min 20% excess capacity)	Vendor to specify	
3.3.3	Air quality as per class ISO: 8573.1, Quality class 1 with particulate size of less than 1 micron with oil carry over filtration of less than 0.1 mg/m3	Vendor to confirm	
3.3.4	Pressure Drop at rated capacity ( maximum 0.05 Kg/ Cm2)	Vendor to confirm	
4.0	<b>AIR RECEIVER:</b>		

4.1.1	Quantity	1 No.	
4.1.2	Vertical type	Vendor to confirm	
4.1.3	Size of vessel (Diameter x Height)	Vendor to specify	
4.1.4	Capacity	5000 Litres	
4.1.5	Working Pressure	10 Kg / Sq. Cm. (g)	
4.1.6	Design pressure	Vendor to specify	
4.1.7	Hydro test pressure	Vendor to specify	
4.1.8	Shell thickness & Dish end thickness	Vendor to specify	
4.1.9	Code of Construction Confirming to ASME Section VIII, Div.1 / IS 2825/ BS 5169	Vendor to confirm	
4.1.10	Material of construction	IS: 2062	
4.1.11	Corrosion allowance	Vendor to specify	
4.1.12	Required approval / licence from concerned authorities as per statutory requirement shall be obtained by the vendor for operation/ usage of air receiver for which no separate payment/ licence fee will be made by BHEL.	Vendor to confirm	
4.1.13	Accessories like Auto drain valve, isolation inlet valve, isolation outlet valve, safety valve, pressure gauge with isolation valve each one no. to be provided.	Vendor to confirm	
5.0	<b>ACOUSTIC ENCLOSURE</b>		
5.1.1	Suitable Acoustic Enclosure to cover Air Compressor to be provided so that the <b>maximum noise level shall not exceed 75 db at a distance of 1m.</b>	Vendor to confirm	
5.1.2	Acoustic enclosure should be designed such that no pressure drop at suction filter and avoids entry of dust particles.	Vendor to offer	
5.1.3	Suitable Anti vibration mounts to be provided.	Vendor to confirm	
5.1.4	Size and details of Acoustic Enclosure	Vendor to submit details	
6.0	<b>FIRST FILLING OF OILS / REFRIGERANT</b>		
6.1.1	First filling of all required Oil, Grease and Refrigerant etc. required for the Compressor and Air Drier, to be supplied by vendor.	Vendor to offer	
7.0	<b>OTHER ITEMS:</b>		
7.1.1	Necessary Hoses and Pipes in required length and size, Connectors and Valves required between Compressor, Air Drier, Air Filters and Air Receivers to be supplied with the equipment	Vendor to offer	

8.0	<b>REQUIREMENT FOR ELECTRICAL EQUIPMENT</b>			
8.1.1	Voltage = 415V +10% / -10%, Frequency = 50Hz +3/ -3, No. of phases = 3 phase with neutral. Power Supply source, as above, will be provided by BHEL at a single point near the machine. The machine should be terminated with suitable capacity Electrical Isolator, as part of the machine . 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 Transformer & Air-Compressor etc. shall be the responsibility of vendor.	Vendor to confirm		
9.0	<b>Power Control Panel</b>			
9.1.1	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	Vendor to offer		
10.0	<b>Control Panel</b>			
10.1.1	Electronic microprocessor for surveillance, management and monitoring of compressors	Vendor to offer		
10.1.2	Functions of electronic microprocessor system: 1. Load unload control 2. Accurate pressure control 3. Programmable start stop 4. Delayed second stop 5. Dual pressure band setting 6. Multi logic control 7. Multi mode control (local / remote/ LAN) 8. Intelligence shutdown protections 9. Automatic restart after voltage failure	Vendor to offer		
10.1.3	Keys 1. Start 2. Stop 3. Cancel	Vendor to offer		
10.1.4	Luminous indications 1. Power supply indications 2. Automatic function mode 3. Error	Vendor to offer		

10.1.5	LCD display			
	<ol style="list-style-type: none"> <li>1. Operational status at a given instance</li> <li>2. Maintenance messages(alarms and faults)</li> <li>3. Setting parameters of the compressor</li> </ol>	Vendor to offer		
10.1.6	Compressor warning and shut down indications			
	<ol style="list-style-type: none"> <li>1. Emergency stop</li> <li>2. Air outlet temperature</li> <li>3. Main motor overload</li> <li>4. Fan motor overload</li> <li>5. General fault indication</li> </ol>	Vendor to offer		
10.1.7	ENVIRONMENTAL PERFORMANCE OF THE MACHINE: The Machine should conform to following factors related to environment			
10.1.8	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm		
10.1.9	Paint of the machine should be oil / coolant resistant and should not get peeled off and mixed up with coolant.	Vendor to confirm		
11.0	<b>ENVIRONMENT CONDITION</b>			
11.1.1.1	The machine should be suitable for operation in the following conditions: Ambient Temperature range : 5 deg celsius to 45 deg celsius - Relative humidity: 95 % max. - Other conditions: Similar to tropical country. - Dust laden atmosphere during some part of the year.	Vendor to confirm		
12.0	<b>SPARES :</b>			
12.1.1	Vendor to offer their recommended mechanical, electrical and hydraulic spares for 2 years of trouble free operation of Compressor and other items like Air Filter, Air Drier and Air Receiver etc. Itemised breakup of the offered spares should be offered by vendor. Unit Price of each item of spare should be offered.	Vendor to offer		
12.1.2	<b>O &amp; M MANUALS:</b>			
12.1.3	Three 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 to offer		
12.1.4	Operating manuals of Compressor including other items like Air Filter, Air Drier and Air Receiver etc.	Vendor to offer		
12.1.5	Detailed Maintenance manual of Compressor including other items like Air Filter, Air Drier and Air Receiver etc. With the help of drawings of main assemblies/sub-assemblies/parts including Electronic/Electrical / Coolant / Hydraulic circuit diagrams.	Vendor to offer		
12.1.6	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vendor to offer		
12.1.7	3 copies of spare parts manual to be supplied along with O&M manual	Vendor to offer		

12.1.8	Pressure test Certificate for Air receiver to be supplied along with O&M manual	Vendor to offer	
13.0	<b>Quality plan</b>	Vendor to offer	
13.1.1	Vendor to submit quality plan for BHEL approval after placement of order.	Vendor to confirm	
14.0	<b>TESTING AND ACCEPTANCE :</b>		
14.1.1	The equipments shall be offered for inspection by BHEL Engineers at supplier works prior to dispatch as per Standard	Vendor to confirm	
14.1.2	Testing -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 conform to ISO 1217	Vendor to confirm	
15.0	<b>ERECTION &amp; COMMISSIONING</b>		
15.1.1	Vendor to make full responsibility for erection, start up, test the compressor, its control and all types of other supplied equipments at BHEL,Bhandara site, Maharashtra. Performance prove out at site is the responsibility of the vendor. All civil works shall be provided by BHEL as indicated by Vendor in their foundation/layout drawings.	Vendor to confirm	
15.1.2	Tools, Tackles, instruments and other necessary equipment required to carry out all above activities should be brought by the vendor.	Vendor to confirm	
15.1.3	All spares, required for commissioning of the machine shall be brought by the Vendor.	Vendor to confirm	
15.1.4	Schedule of Erection and Commissioning shall be submitted after ordering .	Vendor to confirm	
15.1.5	Initial fill of biodegradable oil should be supplied along with the compressor.	Vendor to confirm	
16	<b>GURANTEE &amp; WARRENTY:</b>		
16.1.1	The equipment and accessories shall be guranteed for proper operation and shall have gurantee and warrenty for all equipment for a period of 24 months from the date of commissioning.	Vendor to confirm	
17.0	<b>GENERAL POINTS :</b>		
17.1.1	GA Drawing, Schematic & Foundtion Diagram Showing the Layout and Interconnections shall be submitted after ordering.	Vendor to confirm	
17.1.2	Supply of all foundation material like bolts and nuts, washers, levelling plates etc. required for total installation shall be in vendor's scope. Only civil works will be in BHEL Scope.	Vendor to confirm	
17.1.3	All Electrical devices, Contactors, Relays, Limits, Switches, Push bottons, etc. shall be from Siemens /L&T/ Alstom/BCH/ Telemechanique or any other reputed make.	Vendor to confirm	
17.1.4	Total Space required (Length, Width, Height) for complete Compressor including all items like Filter and Drier etc. should be sent along with the offer.	Vendor to provide details.	

17.1.5	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.	
18.0	<b>TRAINING :</b>		
18.1	The Vendor shall impart 5 days 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	

Supply, installation and commissioning of Vortex type Inline Flow meter with Digital LCD Indicator with flow rate cum Totaliser for compressed air application at the common outlet line of the air compressor station.			
Sl. No	Description	BHEL specification	Vendor's offer
1	Scope	Supply, installation and commissioning of Vortex Type Inline Flow meter with Digital LCD Indicator with flow rate cum Totaliser in compressed air Line application	
1.1	Specification:		
1.1.1	Type of Flow meter	<b>Vortex Type Inline Flow meter</b>	
1.1.2	Quantity	1 No.	
1.1.3	Make	Reputed makes only acceptable to BHEL.	
1.1.4	Measurable Flow Range	0 to 6000 Nm <sup>3</sup> /Hr	
1.1.5	Working Pressure	0 to 8.5 Kg/cm <sup>2</sup> (g)	
1.1.6	Working Temperature	0 to 60 °C	
1.1.7	Material of Construction shall be Stainless steel	Vendor to specify the grade	
1.1.8	Accuracy	± 1 % of the Reading approx.	
1.1.9	Mounting	Mounting to be on either Horizontal/vertical piping and flow meter shall have flanged end connection.	
1.1.10	Fluid	Compressed air	
1.2.1	Diameter of pipe in which flow meter to be installed and location to be installed	Flow meter is to be installed in 8 inch diameter pipeline present at the outlet of the air compressor station.	
1.2.2	Unit of Flow rate	Unit of flow rate and total flow shall be indicated in Nm <sup>3</sup> /Hr in the flow indicator unit.	
1.2.3	Type	<b>Micro Processor based Digital LCD Indicator with Flow rate and Totaliser</b>	
1.2.4	Indication	Indication shall be in terms of Rate of Flow and total flow	
1.2.5	Display	Vendor to specify	
1.2.6	Programmable Keypad	Vendor to specify	
			Deviations if any, Vendor to specify

1.2.7	Dimensions	Vendor to specify	
1.2.8	Power Supply	230 VAC, ± 10%	
1.2.9	Wattage	Vendor to specify	
1.2.10	Memory	Memory shall be Non Volatile RAM for retaining data of last totalizer reading after failure till power regains.	
1.2.11	Flow indicator unit	The flow indicator unit shall be installed separately from the flow sensor/transmitter. The flow indicator shall be at a distance of approximately 25 metres from the flow sensor/transmitter.	
1.2.12	PC connectivity facility to be provided in the flow indicator unit.	Vendor to confirm	
1.2.13	Flow meter body and flow indicator housing	The flow meter and its indicator unit will be installed in the open yard.Hence suitable housing for protecting it water,dust,weld fumes etc shall be provided.	
<b>2</b>	<b>Features</b>		
2.1	Accuracy	a)The accuracy of the flow meter should be better than ±1 % of the measured value. B)Accuracy of the flow meter must be independent of fluid parameters like pressure, temperature, density & viscosity	
2.2	Repeatability	The repeatability of this Flow meter must be ±0.1% of the reading	
2.3	Turn Down Ratio	The Turn down ratio shall be 10:1.	
2.4	Over range Protection	Flow meters should not be damaged by over range	

3	General Points			
3.1	All technical specifications, product catalogue, data sheets to be submitted with offer, else the offer will not be considered.	Vendor to provide		
3.2	Calibration certificate shall be provided along with delivery.	Vendor to confirm		
3.3	GA Drawings/Assembly drawings showing the flowmeter in the existing BHEL pipings is to be submitted along with the offer.	Vendor to confirm		
3.4	Pre-despatch inspection shall be offered to BHEL engineer at supplier's works	Vendor to confirm		
3.5	Installation	Installation of the Flow meter is to be done by the vendor		
3.6	Mountings and accessories	Necessary Reducer, Expander, pipelines, Flanges, bolts, nuts, gaskets etc required for installation of the flow meter is to be arranged by the vendor.		
3.7	Prove out test shall be conducted at BHEL after installation by vendor .	Vendor to confirm		
3.8	Commissioning of flowmeter is to be carried out by the vendor.	Vendor to confirm		

3.9	The supply of required cables,routing and connecting of cables between flow sensor/transmitter and flow indicator unit is to be done by the vendor.	Vendor to confirm		
3.10	Warranty of 12 Months from Date of Commissioning or 18 Months from Date of Supply is to be provided for all the components supplied by the vendor	Vendor to confirm		

**COMMON NOTE:**

	<b>BHEL DESCRIPTION</b>	<b>Vendor's offer</b>	<b>Deviations if any, Vendor to specify</b>
<b>A)</b>	<b>SCOPE OF BHEL</b>		
a	BHEL will supply the following materials at free of cost. Electric Power and Water will be given at free of cost at the erection site/BHEL Bhandara.Electrical Points will be provided at a location within 200m in circumference from work site, it will be in the vendor's scope to make arrangements for necessary cabling.		
b	Required civil works will be done by BHEL.		
<b>B)</b>	<b>SCOPE OF CONTRACTOR</b>		
a	Welding consumable, oxy-acetylene gas /cutting gas,fasteners and paint for the entire work.		
b	All the structural steel raw materials,pipes,plates,channels etc required for work.		

Rotary Screw Air Compressor with Accessories ( 2 Sets)

c	<p>It will be in the scope of contractor to move the required materials (raw materials and consumables) to the fabrication and erection spot for execution of work. The contractor shall arrange his own trolleys /trailers for material shifting, Crane with Lifting Tackles and required Manpower/riggers for the movement and lifting of materials to the fabrication and erection spot within plant.</p>		
d	<p>The contractor should bring in their own tools and lifting tackles including three phase welding machine with electrode holder, cutting torch, Welding cable, oxy-acetylene regulators with rubber hoses, wire brushes, paint brushes , ladders,supports,clamping materials,flanges,bends, hydraulic testing pump, LPI test kit, scaffolding materials,valves,teflon tapes,pipe thread cutting machine etc required for the execution of the work.</p>		
e	<p>The Contractor should bring all the necessary personal protective equipments like safety shoes, hand gloves, goggles, welding shield, mask, safety belts,helmetsetc and it is the responsibility of the contractor to ensure the usage of all the PPEs by their work force.</p>		
f	<p>It is responsibility of contractor to obtain work permit to work at height in BHEL formats as per BHEL procedure.</p>		