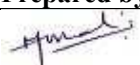
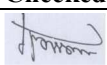
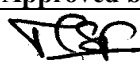


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TECHNICAL SPECIFICATION FOR AIR BLOWER for SEWAGE TREATMENT PLANT

PROJECT :	1X7.0MLD SEWAGE TREATMENT PLANT AT BHEL, HARIDWAR
OWNER :	BHARAT HEAVY ELECTRICALS LIMITED

Revisions: Refer to record of revisions	Prepared by :	Checked by :	Approved by :	Date :
	 R. MURALIDHAR	 IFTEKHAR	 M. SIVA PRASAD BABU	01.02.18



PROJECT ENGINEERING & SYSTEMS DIVISION

(Technical Specification for Decanter Centrifuge for STP)

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6.0	Spares
7.0	Conflict in specification requirements
8.0	Drawings and Documents to be submitted during Detail Engineering.
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DOCUMENTS TO BE SUBMITTED ALONG WITH BID:**A. Air Blower for SBR/ Sludge Sump**

Bidder must submit the following documents along with their bid so as to enable BHEL to evaluate their offer.

Bidder to note that in case following documents are not submitted along with offer, the offer may be liable for **Technical Rejection**.

- Equipment qualification criteria / PTR / Reference Lists
- Checklist for the offer (Annexure-4)
- Documents mentioned in checklist.
- Unpriced "price-bid format" (Annexure-3)
- Tentative GAD for Blower with Motor
- Performance curves for Air Blower with Motor
- Deviation List if Any.

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1.0 INTENT OF SPECIFICATION

- 1.1 The specification is intended to cover Design, Engineering, Fabrication, Assembly & Inspection and Testing at vendor's / sub-vendor's works, painting, proper packing and forwarding, shipment & delivery at site of **Air Blowers with drives and all accessories** as per the specifications and requirements indicated in different sections of this specification
- 1.2 Erection and Commissioning is not in the scope of bidder. However, bidder to furnish recommended Erection and Commissioning procedures along with all the drawing / documents required to facilitate Erection and Commissioning of the Skids by others.
- 1.3 The contractor shall be responsible for providing all material, equipment & services required to ensure operability, maintainability, reliability and safety of the system as covered under this specification, irrespective of whether they have been specifically indicated in this specification or not.
- 1.4 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder/vendor and customer /purchaser/ employer will mean BHEL and /or KPCL as interpreted by BHEL in the relevant context.

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PROJECT : 7 MLD Sewage Treatment Plant**PROJECT INFORMATION****General Description of the Project:**

Bharat Heavy Electricals Ltd. is setting up Sewage Treatment Plant (STP) for 1 x 7.0 MLD capacity Sewage treatment plant using Sequential Batch Reactor (SBR) Technology at BHEL, Haridwar.

Sludge generated from SBR is collected into sludge sump. Sludge sump is complete with coarse bubble diffusers grid, blowers for supplying air for sludge mixing. The sludge from sludge sump is pumped to Mechanical Dewatering Device.

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2.0 SPECIAL INSTRUCTIONS TO BIDDERS

- 2.1 This specification shall be read in conjunction with all its Annexures. In case of any discrepancy arising between this specification & its Annexures, the most stringent of all (as determined by purchaser) shall be followed. Further, if a requirement in this specification or any of the enclosures, calls for a decision from the Purchaser, it shall be bidder's sole responsibility to clearly bring out/highlight the same distinctively in his pre-bid queries, so as to enable purchaser to furnish their decision/clarification. If such issues/requirements are not duly addressed by bidder during the pre-bid stage and if such issues/requirements are observed later during order execution stage, it shall be binding on the bidder to comply with the final decision made by the purchaser subsequently, without any cost, delivery, or any other commercial implications.
- 2.2 Any additional equipment, material, services etc., which are not specifically mentioned in this specification, but required to make the System complete in all respects, in accordance with the intent of this technical specification, contractual agreement, statutory requirements, relevant/applicable codes/standards, good engineering practices, and for safe and trouble-free operation, shall be deemed to be covered under the scope of this specification.
- 2.3 Any specific hardware/software/item/ etc. required as indicated in 2.2. Above but not listed elsewhere in this specification or its enclosures, shall be deemed to be included in the basic price quoted by the bidder. Also, all mounting hardware/ accessories/fittings/conduits/etc. required for the Erection & Commissioning of the System shall be deemed to be included in the basic price quoted by the bidder. Bidder, at no point of time, shall be eligible to raise any extra claim in this regard.
- 2.4 The Bidder shall accept full responsibility for the completeness and for the reliable operation of system as a whole. These shall be executed on the basis of proven design principle. Standardization of equipment, materials etc. shall be employed in the design. Care shall be taken to ensure safe operation as well as simplicity of Erection & Commissioning of the System. Even though, the requirements are specified in detail to the extent possible, bidder to apply good engineering practices in the design, selection of equipment, manufacturing, procurement, transportation, fabrication, painting, inspection & testing, supervision of erection & commissioning of system etc., wherever same is not clearly spelt out.
- 2.5 By accepting the contract, the bidder shall be deemed to have accepted the obligation of supplying everything that is necessary for the purpose mentioned above, regardless of any omission in the specification or on the drawings for the fulfillment of complete main plant package.
- 2.6 Bidder to note that the Purchase Order for the Scope of supply shall be placed on lump sum fixed prices based as per tender specification requirements.

Bidder to further note that they shall not be permitted for any claim for additional commercial implication on any account during the detail engineering stage.



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- 2.7 Bidder shall quote strictly as per the scope of supply and requirements of this specification. Bidder offer shall be strictly as per these specification requirements. Unsolicited or alternate offers from the bidders will not be entertained.
- 2.8 In case bidder feels that it is necessary to exclude some components of scope of supply or some of the features of specification requirements due to any technical constraints, bidder shall bring the same to the notice of purchaser during pre-bid stage and take their prior approval before submission of their bid. All such clarifications required by the bidder shall be intimated to BHEL together as a single notice within a week of receipt of enquiry by bidder and clarifications on the same shall be obtained by the bidder from the purchaser. In case no such clarifications are sought during pre-bid stage, it will be assumed that bidder has no comments or observations on BHEL's specification and no deviations to the specifications will be taken by the bidder.
- 2.9 Bidder to quote strictly as per BHEL's Price Bid format (Annexure-3). Failure to do shall make their offer liable for rejection. Any tampering/modification/change of the BHEL's price format is not allowed and is liable for rejection of bidders offer.
- 2.10 In case Bidder is unable to offer due to any specific requirement of specification, Bidder shall bring out the same in their regret letter. Otherwise it will be considered that non participation by the bidder is attributable to reasons other than any specification requirements.
- 2.11 Compliance with this specification shall not relieve the bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions.
- 2.12 The design information, specifications and drawings indicate the "Minimum" requirements and are intended to enable Bidders to ascertain the extent of the work involved. Bidders are expected to supplement the information included in this specification as required and submit a comprehensive bid.
- 2.13 The intending tenderers shall be deemed to have visited the site and have studied the conditions before submitting the Bids. Non-familiarity with the site conditions will not be considered a reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications.
- 2.14 The successful bidder shall furnish design calculations(in native/original format) to BHEL during detailed engineering stage for approval along with the relevant pages of authentic supporting literature e.g. Code, Hand book, National / international Standards etc. All steps including formulas and abbreviations shall be clearly shown in the calculation. All inputs / assumptions shall be indicated in the first sheet of the calculation. Calculation shall be necessarily done in SI UNITS only for the followings: -
- 2.15 Civil works will be done by BHEL based on civil inputs furnished by the bidder during detail engineering. In case of any changes in the civil input drawing after civil work is completed,



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necessary prices on account of modification of the civil work shall be deducted from bidder's account.

3.0 JOB SPECIFICATION:

3.1 SCOPE OF SUPPLY:

A. Quantity of Air Blower & Drive Assembly:

(i) 3 Nos. (2W+1S) of Air Blower for SBR-1 & 2 for 1 x 7.0 MLD STP, Total: 3 Nos.

(ii) 2 Nos. (1W+1S) of Air Blower for Sludge Sump for 1 x 7.0 MLD STP, Total: 2 Nos.

B. Scope of supply for each Air Blower & motor drive assembly:

MAIN OFFER:

S. No.	Item	Qty.	Description
1	Air Blower	1 no	Tri lobe or Twin lobe type Air Blowers complete with all accessories as per specification & required accessories for smooth running of Air Blower assembly. Performance requirement, Design and construction of the pump shall be guided by the Manufacturer recommendation.
2	Motor (drive)	1 no.	- Motor shall be as per IS 325/ IEC60034. - Energy Efficient Class: IE 3 as per IS 12615. - For Motor, Supply voltage is 415 V. <u>Selection Criteria</u> The power rating of the pump motor shall be the larger of following: (a) 10% above the maximum power requirement by the blower (b) Power requirement at 110% safety valve overpressure.
3	Relief Valve at outlet of Air Blower-		1 no. of Relief Valve at outlet of Air blower to be provided for each Air Blower with drive motor assembly.
4	Inter connecting Piping & Instrumentation	1 set	BHEL Discharge Pipe Size: Refer Annexure-1 a) Necessary Reducer/expander, pipe spool along with flexible connection in order to meet BHEL discharge pipe. b) Flanges & Counter flanges with necessary gaskets & bolts at all terminal points. All counter flanges shall be of weld neck type. c) Pressure Gauge at the outlet of Air blower to be provided for each Air Blower with drive motor assembly.
7	Foundation Bolt		Necessary Foundation Bolts to be provided.



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8	Glands and lugs		Glands and lugs for power cable, control cable, Space heater cable and earthing cable (if any) suitable at Motor end has to be supplied along with the main equipment. Glands shall be weather proof (as per motor category) double compression type Nickel plated Brass (ET) shall be provided with back nut and PVC shroud. Lugs shall be tinned copper heavy duty lug Cable dimensions shall be furnished during detail engineering, accordingly glands, lugs shall be supplied
9	Accessories		1) Common Base Frame for blower and motor 2) Suction Silencer & Filter 3) Discharge silencer & Non return valve 4) Pressure Relief valve or excess pressure safety device 5) Bellows type coupling on suction and discharge 6) Acoustic Enclosure 7) P G gauge with built in snubber & Glycerine filled isolation valve 8) Set of anti-vibration pads 9) Foundation Bolts
	Special Tools and Tackles		The bidder shall furnish a complete set of all special tools, wrenches etc. with necessary tools boxes as required for operation and maintenance [disassemble, assemble, or maintaining the unit] as a part of scope of supply for each Air Blower with drive assembly.
9	Spares (Commissioning):		Supply of Spares shall be as per Price Bid-Format.
10	Supervision of Erection and commissioning		Per Diem Rates to be quoted as per Price Bid-Format.

OPTIONAL ITEMS:

- ~~10 year operational spares: Unit rates for 10 years operational spares shall be considered by the bidder and same shall be quoted as per Annexure-3.~~

EXCLUSIONS:

- All cables required to from Blower & motor assembly are excluded from bidder's scope of supply.
- Civil works of Air Blower with drive assembly are excluded from bidder's scope of supply

3.2 TECHNICAL DETAILS:

Refer Annexure-2 for Technical Datasheet for **each Air Blower & motor drive assembly.**

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Sheet **10** of **16****3.3 PRICE BID-FORMAT**

Bidder to quote price as per price bid format enclosed as **Annexure-3 without any deviations. Any clarifications/queries related to the above technical specification shall be raised by Bidder prior to the submission of Techno-Commercial Offer. These queries are to be raised vide Annexure-5**

4.0 INSPECTION AND TESTING

Bidder shall adopt standard inspecting and testing procedures internationally accepted.

- I. Bidder shall follow Quality Assurance Plan attached as **Annexure-9** as a minimum, to ensure that all equipment and material supplied meet required Quality standards and specifications.
- II. After award of contract, bidder shall submit completely filled Quality Assurance Plan attached as Annexure-9 for approval in-line with QAP guidelines enclosed as Annexure-9. The quality plan shall be submitted in BHEL quality plan format(Annexure-9), **Bidder to note that all the cost involved in any of the inspection & testing requirements as per the approved quality plan shall be deemed to be included in the price quoted by the bidder. Bidder shall not be eligible to raise any extra claim on account of any inspection & testing as per the approved quality plan.**

5.0 STORING, HANDLING, PACKING AND DISPATCH OF EQUIPMENTS / COMPONENT

Packing Suitable for domestic transport/standard seaworthy packing for equipment to be provided.

6.0 SPARES:

- a) **Commissioning spares:**
 - As per Annexure-3 (price Bid Format)
- b) **Mandatory spares: Nil.**
- c) **O & M Spares:** As per Annexure-3 (price Bid Format)

7.0 CONFLICTS IN SPECIFICATION REQUIREMENTS:

In case of any conflict between this specification and Annexures stringent of the requirement will govern.

8.0 DRAWINGS/ DOCUMENTS REQUIRED DURING DETAIL ENGINEERING



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The successful bidder shall submit as per the Master Document List enclosed vide **Annexure-7**.

Master Document List:

- a) Documentation shall be submitted by bidder during detailed engineering stage, as per the Master Document List (Annexure-7).
- b) Bidder shall ensure submission of all documentation as per approved Master Document List.
- c) Bidder to note that the dates of submission of all the documents shall be finalized by him considering the time required for approval of various documents at Purchaser's end. It shall be solely bidder's responsibility to get approval on the entire document from purchaser to meet project schedule.

8.2 Drawing approval category:

1) The master document list shall clearly identify the class of review to be performed against each document.

2) Following classes of review shall be followed for all the documents engineered by the bidder

- **APPROVAL (A)**

Approval is mandatory and bidder cannot proceed without obtaining Purchaser's approval.

- **INFORMATION / RECORDS (I)**

This type of documents shall be submitted to Purchaser for his information. Bidder can proceed if Purchaser's comments are not received within 14 working days of receipt in Purchaser's office.

However, if any deviation to contract specification for any design deficiency is detected in the course of review after stipulated period, it shall be the responsibility of the bidder to see that such deviations and deficiencies are corrected to ensure compliance to contract without any cost and time implication to purchaser

Drawings Review & Approvals:

Bidder to understand that efficient handling of drawings and documents to be prepared by him under the contract is the key to the timely completion of the centrifuge package. By accepting the contract the bidder undertakes to ensure that all drawings and documents to be submitted by him to the Purchaser / End Customer shall be of professional quality and conforming to the contractual requirements.

Bidder to note that the dates of submission of all the documents shall be finalized by him considering the time required for approval of various documents at Purchaser's end. It shall be solely bidder's responsibility to get approval on the entire document from purchaser to meet project schedule.

Each drawing submitted by the bidder shall be clearly marked with the name of the Owner, the unit designation, the specifications, title, the specification number and the name of the



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Project with revision No. and date. If standards, catalogue pages are submitted the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawings shall be in English.

The approval and /or review by the Purchaser /End customer shall not be construed by the bidder as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and drawings.

The sole responsibility of the correctness of Design, Engineering shall lie with the bidder, irrespective of the fact that the Drawings / Documents submitted are reviewed or not by the Purchaser /End customer.

The bidder shall correct all faulty designs & constructions detected at any stage of work (irrespective of the fact whether drawings related to such faulty designs & or constructions are approved by purchaser), without any cost and time implication to the Purchaser.

Revisions in drawings/documents shall be clearly marked within clouds. No revision without clouding shall be recognized and the same shall not be considered reviewed and approved.

All revised drawings / documents shall be associated with comments compliance report,

During detailed Engineering stage, bidder to furnish list of drawings as per Master Document format (Annexure-7).

NO. OF COPIES OF EACH DOCUMENT TO BE FURNISHED:

SL NO	DESCRIPTION	NO OF COPIES/ PIECES TO BE SUBMITTED	WHEN TO SUBMIT
1	Initial drawings/documents under approval and information category.	Soft copy only	Within 2 weeks of placement of order.
2	BHEL shall furnish their observation on submitted documents	Soft copy only	Within 2 weeks of document submission.
3	Revised drawings/documents incorporating BHEL's comments.	Soft copy only	Within 1 week of receipt of commented Drawings from BHEL
4	BHEL shall furnish their observation on submitted documents	Soft copy only	Within 2 weeks of document submission.
5	Final Drawings/documents	05	Within 2 months of placement of order.
6	Erection Documentation	5	2 Months before dispatch of equipment, The list of documents identified



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			under master document list for erection to be furnished in 5 nos. of folders.
7	Draft O & M Manuals with out test certificates	2	2 months before the delivery date of equipment
8	Revised O & M Manuals with Test Certificates to be submitted to BHEL (Hyderabad)	17	Within one month after dispatch of equipment
9	PO status of bought out items		Status to be furnished by vendor every 15 days.
10	Final O&M Manuals in a CD	05	Within one month after dispatch of equipment

NOTES:

- 1) The above schedule for drawing approval is only indicative. Bidder to furnish a bar chart for dispatch of centrifuge as per the agreed delivery requirement of project. This schedule also shall indicate drawing submission and approval schedules meeting the delivery schedule of the equipment. Bidder and BHEL shall put all the efforts to meet the planned schedules.

- 2) The O&M manuals shall contain the following as minimum.

- The identification details of the equipment like BHEL P.O. No., Vendor's Job Identification No., and full contact address with telephone, fax, & e-mail details.
- Brief description of the system.
- System unloading, storage, erection, startup, commissioning, shut down requirements.
- System operating and maintenance requirements.
- Operational & Environmental safety instructions.
- Final data sheets and drawings.
- O&M Manuals, Catalogues of the equipment (like pump, motor, etc.) & instrumentation
- Recommended 2 years operational spares
- i) Test reports & certificates. The draft O&M manual can be submitted without test reports.

9.0 PRE-BID CLARIFICATIONS AND DEVIATIONS

- a) Bidders shall comply with various requirements of this specification. It may please be noted that the requirements specified here in this specification are the standard practices being followed by the bidders. However, same things are presented in a structured form so that it can be ensured that the requirements of ultimate customer are complied with.
- b) Bidders can bring out only those deviations which are impractical to meet, for our review in pre bid clarification only as per **Annexure-5 before submission of techno-commercial offer.**



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- c) Bidders may also please note that the data sheets for, valves, instruments etc., submitted along with the offer will be considered as indicative only, as the requirements specified in the specification are standard in nature. These will not be reviewed by BHEL before award of contract. Same will be reviewed during order execution stage in line with the requirements of specification and agreed deviations.

10.0 SUB VENDOR LIST

- a) Sub-vendor list shall be as per Annexure-8.

Note: Any item which are not figuring in the vendor list, bidder may follow their own standard list. However all the credentials of such vendors shall be submitted for BHEL review and approval.

~~11.0 EQUIPMENT QUALIFICATION CRITERIA~~

~~The bidder shall be an established manufacturer of Centrifuge (Decanter Type) for Sewage Water Treatment applications & having adequate engineering, manufacturing & testing facilities for centrifuge confirming to the relevant applicable codes and standards. The centrifuge model offered shall be from the existing regular manufacturing range of bidder.~~

~~The offered centrifuge model shall meet the minimum service & manufacturing experience specified as below:~~

~~Centrifuge shall be identical or validly similar in terms of~~

- ~~• Type i.e Decanter Type for Sewage Water Treatment Plant with sludge as a feed~~
- ~~• Capacity/Flow Rate~~
- ~~• Materials etc.~~
- ~~• Application.~~

~~as compared to at least 10 Units of the proposed model designed, manufactured, tested and supplied from the proposed manufacturing plant in the last 7(seven) years from the date of Technical bid opening and at least Five of these units shall have successfully operated in the field for at least 8000 hours individually without any major problem as on the date of issue of enquiry in the last three years. As a proof for the same, Date of Supply/ Commissioning report/Customer Satisfaction report will be considered and same to be provided by bidder.~~

~~Accordingly, Bidder to furnish reference list for the Centrifuge (Decanter Type) consisting of year of supply, application, Customer Name, Quantity etc. as a minimum.~~

12.0 PAINTING

As per Manufacturer standard practice. However standard quality paint to be used. However, following as a minimum is required.

- **VARIANT TABLE:**

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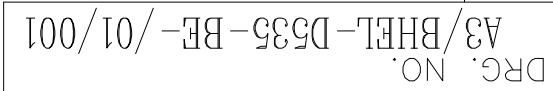
Variant	Item	Material Code
01	Air Blower for SBR-Supply	PY9751327016
02	Air Blower for Sludge Sump-Supply	PY9751327024
03	Air Blower -Supevision of E&C	PY9851327034

[illegible]

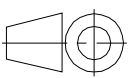
ESP-001-2A Rev.00		PROJECT ENGINEERING & SYSTEMS DIVISION	Std. / Doc. Number	
			Annexure-1 to Doc. No. PY51327	
			Rev. No.	00

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Revisions: Refer to record of revisions	Prepared by :	Checked by :	Approved by :	Date :
	MURALI	IFTEKHAR	Siva Prasad Babu	13.03.18



INSTRUMENT LIST				LINE LEGEND
PI	100.1	PRESSURE GAUGES	BOURDON TYPE	— RAS LINE
PI	100.2	PRESSURE GAUGES	DIAPHRAGM TYPE	— SAS LINE
DO	100.4	DISSOLVED OXYGEN METER	IMMERSION TYPE	----- AIR LINE
LT	100.5	LEVEL TRANSMITTER	HYDROSTATIC TYPE	----- INSTRUMENT SIGNAL
VFD	100.6	VARIABLE FREQUENCY DRIVE	FOR BLOWERS	— DRAIN LINE
VFD	100.7	VARIABLE FREQUENCY DRIVE	FOR DECATERS	— RCC CHANNEL
ST	100.8	SOFT STARTER	FOR BLOWER	LEGEND
DELS	100.9	DECATER LEVEL SENSOR	CAPACITIVE SWITCH	 NON-RETURN VALVE
DEPS	100.10	DECATER POSITION SENSOR	MAGNETIC LIMIT SWITCH	 BUTTERFLY VALVE
LT	100.11	LEVEL TRANSMITTER	ULTRASONIC TYPE	 MOTORISED KNIFE GATE VALVE
DLT	100.12	LEVEL TRANSMITTER DIFFERENTIAL	ULTRASONIC TYPE	 MOTORISED BUTTERFLY VALVE
LS	100.15	LEVEL SWITCH	CAPACITANCE TYPE	 CHANNEL MOUNTED MOTORISED GATE
FT	100.13	FLOW METER	ULTRASONIC TYPE	 KNIFE GATE VALVE
TERMINATION POINT				 BALL VALVE
				 NEEDLE VALVE
				 VARIABLE FREQUENCY DRIVE
				 SOFT STARTER
				 MOTOR
				 AIR BLOWER
				 SILENCER
				 FILTER

- | | | | | | | | | | | | | | | | |
|-------------------------------------|--|---|--|--|--|--|--|-------------------------|--|------------------------------|--|--------------------|--|---------------------------|--|
| CUSTOMER: | | BHARAT HEAVY ELECTRICALS LTD.
HARIDWAR | | | | | | | | | | | | | |
| EPC CONTRACTOR: | | BHARAT HEAVY ELECTRICALS LTD.
PE&SD, HYDERABAD | | | | | | | | | | | | | |
| PROJECT: | | 7.0 MLD STP AT BHEL HARIDWAR | | | | | | | | | | | | | |
| TECHNOLOGY PROVIDER | |  | | SFC ENVIRONMENTAL TECHNOLOGIES PVT. LTD.
ADVANCED TECHNOLOGIES WATER, WASTE WATER, SOLID WASTE, ENERGY
(Indian Operations) The Ambience Court, Hi-Tech Business Park,
The Floor, Sector 19-D, Plot No. 2, Vashi, Near Mumbai 400 705, INDIA.
(Abroad Operations) A-5022 Subargh, Jodhpur/Washpur (Rt. 1), Osmania, Andhra Pradesh | | DRN. 23.01.18
CHD. 23.01.18
APPD. 23.01.18 | | NAME
SIGN.
DATE | | NO. OF
VAR.
N.A. | | | | | |
| DEPT. PE&SD
CODE 450 | | UNTOL. DIMS.
GR. E/W/F | |  | | SCALE
NTS | | WEIGHT (KG)
-N.A.- | | REF. TO ASSY. DRG.
-N.A.- | | ITEM NO.
-N.A.- | | NO. OF
ITEMS
-N.A.- | |
| TITLE | | | | | | | | BHEL DRAWING NO. | | | | H | | | |
| PIPING &
INSTRUMENTATION DIAGRAM | | | | | | | | PY-DP-1-M098-1040-01 | | | | | | | |
| | | | | | | | | VENDOR DRAWING NO. | | | | REV. | | | |
| | | | | | | | | A3/BHEL-D535-BE-/01/001 | | | | 2 | | | |
| | | | | | | | | Size | | | | NO. OF SHT. | | | |
| 10 | | | | | | | | 11 | | | | 12 | | | |
| | | | | | | | | 1 SHT. No 1 | | | | 1 | | | |

ESP-001-2A Rev.00		PROJECT ENGINEERING & SYSTEMS DIVISION	Std. / Doc. Number	
			Annexure-3 to Doc. No. PY51327	
			Rev. No.	00

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED , It must not be used directly or indirectly in any way detrimental to the interest of the company.	Annexure-2			
	DATA SHEET OF AIR BLOWER-MOTOR ASSEMBLY Annexure 2A – Technical Datasheet for Air Blower for SBR-1 &2 Annexure 2B – Technical Datasheet for Air Blower for Sludge Sump			

Revisions: Refer to record of revisions	Prepared by :	Checked by :	Approved by :	Date :
	MURALI	IFTEKHAR	Siva Prasad Babu	13.03.18

Technical Datasheet for Air Blower for SBR-1 &2

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(a)	General:			
	(i)	Manufacturer		*
	(ii)	Type		Positive displacement Rotary Twin Lobe
	(iii)	Cooling		Air Cooled
	(iv)	No. of stages		Single
	(v)	Duty		Continuous
(b)	Process details:			
	(i)	Inlet pressure	Kg/cm2	Atmospheric
	(ii)	Suction temperature	Degree C	45 max
	(iii)	Fluid handled		Air
	(iv)	Performance curve		Provide min safe flow and operating flow condition on same curve.
	(v)	Blower speed	rpm	As per manufacturing standard
(c)	Operating details:			
	(i)	Discharge Air Capacity	Nm3/hr.	800
	(ii)	Discharge Air Capacity	m3/hr.	*
	(iii)	Differential pressure	Kg/cm2	0.6
	(iv)	Discharge pressure	Kg/cm2	0.6 + ATM. press.
	(v)	Head, water	m	5.0
	(vi)	Discharge temp.	Degree C	*
	(vii)	Quantity	Nos.	3 (2W+1SB)
	(viii)	Safe minimum flow	Nm3/hr	*
	(ix)	Volumetric Efficiency	%	*

Technical Datasheet for Air Blower for SBR-1 &2

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
	(x)	Mechanical Efficiency	%	*
	(xi)	Suction nozzle size	NB	*
	(xii)	Discharge nozzle Size	NB	*
	(xiii)	Motor rating / rpm	kW / rpm	*
	(xiv)	Motor frame size		*
	(xv)	Shut off head	Kg/cm2	*
	(xvi)	BKW at duty point	kW	*
	(xvii)	GD2 value		*
	(xviii)	Recommended motor	kW	*
(d)	CONSTRUCTIONAL FEATURES			
	(i)	Noise level at Duty Point in dB(A) at 1 m from the unit	dB(A)	< 85
	(ii)	With Acoustic Hood	dB(A)	*
	(iii)	Without Acoustic Hood	dB(A)	*
	(iv)	Vibration	mm/sec	*
	(v)	Max Start/Stop per hour	Nos.	*
	(vi)	End Connection		*
	(vii)	Bearing Type / No		*
	(viii)	Bearing Lubrication		*
	(ix)	Drive arrangement		Direct Drive
	(x)	Type of seal		Labyrinth Seal
	(xi)	Acoustic hood		Required (if Noise level at Duty Point in dB(A) at 1 m from the unit is >= 85)
	(xii)	Type of Silencer		Reactive Type

Technical Datasheet for Air Blower for SBR-1 &2

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(e)	Other details:			
	(i)	Acoustic Hood quantity	Nos.	*
	(ii)	Acoustic Hood Dimensions (L x W x H)	m x m x m	*
	(iii)	Outlet Silencer quantity	Nos.	*
	(iv)	Outlet Silencer Mean air velocity	m/s	*
	(v)	PRV quantity	Nos.	*
	(vi)	PRV size (dia.)	mm	*
	(vii)	PRV Set Pressure	Kg/cm2	*
	(viii)	NRV quantity	Nos.	*
	(ix)	NRV size (dia.)	mm	*
(f)	TESTS STANDARDS			
	(i)	Hydrostatic test		2 x Max. working pressure
	(ii)	Performance test		BS:1571, Part - II
	(iii)	Mechanical balancing		ISO 1940 Gr.6.3 or better
	(iv)	Strip Test		*
(g)	MOTOR DETAILS			
	(i)	Motor type		TEFC Squirrel Cage Induction Motor Suitable for VFD Operation
	(ii)	Insulation		Class F
	(iii)	Enclosure		IP55
	(iv)	Voltage / frequency/phase		415 +/- 10% / 3 / 50 +/- 5%
	(v)	Ambient temperature	Degree C	45 max
	(vi)	Location		Blower Room

Technical Datasheet for Air Blower for SBR-1 &2

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(h)	PERFORMANCE			
	(i)	Design / Hydro test pressure		*
	(ii)	Head Loss in Suction Filter	mm	*
	(iii)	Head Loss in Suction Silencer	mm	*
	(iv)	Head Loss in Discharge Silencer	mm	*
	(v)	Direction of rotation		*
(i)	Material of construction:			
	(i)	Casing		CI FG 260, Gr. IS 210
	(ii)	Rotor		Alloy Steel
	(iii)	Shaft		Carbon Steel C 40 / EN 24 / 19
	(iv)	Timing Gears		Cast Alloy Steel
	(v)	Pulley/Gear side plates & cover		CI FG 260, Gr. IS 210
	(vi)	Foundation Bolts		EN8
	(vii)	Base Frame (Common)		*
	(viii)	Belt Guard		*
	(ix)	Silencers		*
(j)	Acoustics Hood:			
	(i)	Type		*
	(ii)	Fill Material of Construction		*
	(iii)	Thickness of Acoustic Pads		*
	(iv)	MOC of Metal Sheet		*
	(v)	Noise (DB) level Reduction		*

Technical Datasheet for Air Blower for SBR-1 &2

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
	(vi)	Inside Temp. during operation		*
(k)	Outlet silencer			
	(i)	Type		*
	(ii)	Manufacturer		*
	(iii)	Filter media		*
ACCESSORIES				
1) Common Base Frame for blower and motor				
2) Suction Silencer & Filter				
3) Discharge silencer & Non return valve				
4) Pressure Relief valve or excess pressure safety device				
5) Bellows type coupling on suction and discharge				
6) Acoustic Enclosure- Required (if Noise level at Duty Point in dB(A) at 1 m from the unit is >= 85)				
7) P G gauge with built in snubber & Glycerine filled isolation valve				
8) Set of anti-vibration pads				
9) Foundation Bolts				
10) Chocking Indicator for Suction Filter				

Technical Datasheet for Air Blower for Sludge Sump

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(a)	General:			
	(i)	Manufacturer		*
	(ii)	Type		Positive displacement Rotary Twin Lobe
	(iii)	Cooling		Air Cooled
	(iv)	No. of stages		Single
	(v)	Duty		Continuous
(b)	Process details:			
	(i)	Inlet pressure	Kg/cm2	Atmospheric
	(ii)	Suction temperature	Degree C	45 max
	(iii)	Fluid handled		Air
	(iv)	Performance curve		Provide min safe flow and operating flow condition on same curve.
	(v)	Blower speed	rpm	As per manufacturing standard
(c)	Operating details:			
	(i)	Discharge Air Capacity	Nm3/hr.	40
	(ii)	Discharge Air Capacity	m3/hr.	*
	(iii)	Differential pressure	Kg/cm2	0.25
	(iv)	Discharge pressure	Kg/cm2	0.25 + ATM. press.
	(v)	Head, water	m	5.0
	(vi)	Discharge temp.	Degree C	*
	(vii)	Quantity	Nos.	2 (1W+1SB)
	(viii)	Safe minimum flow	Nm3/hr	*
(ix)	Volumetric Efficiency	%	*	

Technical Datasheet for Air Blower for Sludge Sump

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
	(x)	Mechanical Efficiency	%	*
	(xi)	Suction nozzle size	NB	*
	(xii)	Discharge nozzle Size	NB	*
	(xiii)	Motor rating / rpm	kW / rpm	*
	(xiv)	Motor frame size		*
	(xv)	Shut off head	Kg/cm2	*
	(xvi)	BKW at duty point	kW	*
	(xvii)	GD2 value		*
	(xviii)	Recommended motor	kW	*
(d)	CONSTRUCTIONAL FEATURES			
	(i)	Noise level at Duty Point in dB(A) at 1 m from the unit	dB(A)	< 85
	(ii)	With Acoustic Hood	dB(A)	*
	(iii)	Without Acoustic Hood	dB(A)	*
	(iv)	Vibration	mm/sec	*
	(v)	Max Start/Stop per hour	Nos.	*
	(vi)	End Connection		*
	(vii)	Bearing Type / No		*
	(viii)	Bearing Lubrication		*
	(ix)	Drive arrangement		Direct Drive
	(x)	Type of seal		Labyrinth Seal
	(xi)	Acoustic hood		Required (if Noise level at Duty Point in dB(A) at 1 m from the unit is >= 85)
	(xii)	Type of Silencer		Reactive Type

Technical Datasheet for Air Blower for Sludge Sump

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(e)	Other details:			
	(i)	Acoustic Hood quantity	Nos.	*
	(ii)	Acoustic Hood Dimensions (L x W x H)	m x m x m	*
	(iii)	Outlet Silencer quantity	Nos.	*
	(iv)	Outlet Silencer Mean air velocity	m/s	*
	(v)	PRV quantity	Nos.	*
	(vi)	PRV size (dia.)	mm	*
	(vii)	PRV Set Pressure	Kg/cm ²	*
	(viii)	NRV quantity	Nos.	*
	(ix)	NRV size (dia.)	mm	*
(f)	TESTS STANDARDS			
	(i)	Hydrostatic test		2 x Max. working pressure
	(ii)	Performance test		BS:1571, Part - II
	(iii)	Mechanical balancing		ISO 1940 Gr.6.3 or better
	(iv)	Strip Test		*
(g)	MOTOR DETAILS			
	(i)	Motor type		TEFC Squirrel Cage Induction Motor
	(ii)	Insulation		Class F
	(iii)	Enclosure		IP55
	(iv)	Voltage / frequency/phase		415 +/- 10% / 3 / 50 +/- 5%
	(v)	Ambient temperature	Degree C	45 max
	(vi)	Location		Blower Room

Technical Datasheet for Air Blower for Sludge Sump

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
(h)	PERFORMANCE			
	(i)	Design / Hydro test pressure		*
	(ii)	Head Loss in Suction Filter	mm	*
	(iii)	Head Loss in Suction Silencer	mm	*
	(iv)	Head Loss in Discharge Silencer	mm	*
	(v)	Direction of rotation		*
(i)	Material of construction:			
	(i)	Casing		CI FG 260, Gr. IS 210
	(ii)	Rotor		Alloy Steel
	(iii)	Shaft		Carbon Steel C 40 / EN 24 / 19
	(iv)	Timing Gears		Cast Alloy Steel
	(v)	Pulley/Gear side plates & cover		CI FG 260, Gr. IS 210
	(vi)	Foundation Bolts		EN8
	(vii)	Base Frame (Common)		*
	(viii)	Belt Guard		*
	(ix)	Silencers		*
(j)	Acoustics Hood:			
	(i)	Type		*
	(ii)	Fill Material of Construction		*
	(iii)	Thickness of Acoustic Pads		*
	(iv)	MOC of Metal Sheet		*
	(v)	Noise (DB) level Reduction		*

Technical Datasheet for Air Blower for Sludge Sump

Air Blowers				[*Vendor to fill the details.]
S. No.	Item	Description	Unit	Particulars
	(vi)	Inside Temp. during operation		*
(k)	Outlet silencer			
	(i)	Type		*
	(ii)	Manufacturer		*
	(iii)	Filter media		*
ACCESSORIES				
1) Common Base Frame for blower and motor				
2) Suction Silencer & Filter				
3) Discharge silencer & Non return valve				
4) Pressure Relief valve or excess pressure safety device				
5) Bellows type coupling on suction and discharge				
6) Acoustic Enclosure- Required (if Noise level at Duty Point in dB(A) at 1 m from the unit is >= 85)				
7) P G gauge with built in snubber & Glycerine filled isolation valve				
8) Set of anti-vibration pads				
9) Foundation Bolts				
10) Chocking Indicator for Suction Filter				

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			Annexure-3 to Doc. No. PY51327	
			Rev. No.	00

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.	Annexure-3 PRICE BID FORMAT FOR AIR BLOWER
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Revisions:	Prepared by :	Checked by :	Approved by :	Date :
Refer to record of revisions	MURALI	IFTEKHAR	Siva Prasad Babu	13.03.18

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032			
PROJECT ENGINEERING & SYSTEMS DIVISION					
ANNEXURE-3					
PRICE FORMAT (R00) FOR TWIN LOBE TYPE AIR BLOWER WITH ELECTRIC MOTOR DRIVE FOR CUSTOMER : BHEL HARIDWAR PROJECT : 7 MLD STP AT BHEL HARIDWAR,					
SL NO	ITEM DESCRIPTION	QTY	UNIT	UNIT RATE (RS.)	TOTAL (RS.)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. :<Bidder to indicate> BHEL Enq. No. & date :<Bidder to indicate>					
I	MAIN OFFER				
A	Twin Lobe type Air Blower with Drive Assembly:[Flow:800 Nm3/hr,Discharge Pressure:0.6 kg/cm2(g)] for 7.0 MLD AT BHEL HARIDWAR				
A.1.	Material Supply-Twin Lobe type Air Blower with Drive Assembly				
	Twin Lobe type Air Blower:[Flow:800 Nm3/hr,Discharge Pressure:0.6 kg/cm2(g)] with Drive Assembly with required accessories as mentioned in specification	3	Set		
A.2	Commissioning spares				
	Commissioning spares as per Manufacturer Recommendation (Refer Note-12)	3	Set		
A.3	Special Tools & tackles				
	One set of Tools and tackles as per manufacturer's recommendation.	1	Set		
B	Twin Lobe type Air Blower with Drive Assembly:[Flow:40 Nm3/hr,Discharge Pressure:0.25 kg/cm2(g)] for 7.0 MLD AT BHEL HARIDWAR				
B.1	Material Supply-Twin Lobe type Air Blower with Drive Assembly				
	Twin Lobe type Air Blower:[Flow:40 Nm3/hr,Discharge Pressure:0.25 kg/cm2(g)] with Drive Assembly with required accessories as mentioned in specification	2	Set		
B.2	Commissioning spares				
	Commissioning spares as per Manufacturer Recommendation (Refer Note-12)	2	Set		
B.3	Special Tools & tackles				
	One set of Tools and tackles as per manufacturer's recommendation.	1	Set		
C	Supervision charges for erection & commissioning at site				
i)	Travel expenses from vendor works to site and back per visit /person	--			
ii)	Per day charges per person for supervision of erection & commissioning at site including boarding, lodging, local transportation etc., except for travel expenses as above.	--			
II	Optional Items				
A.1	2 Years Recommended Spares				
	Recommended spares list for 2 Years normal operation along with unit price breakup for Air Blower, Drive & other accessories.(List with price break up to be enclosed) (1 set stands for quantity required for the replacement of one airblower, drive (or) accessories).	As per List	Set		
TOTAL					
Notes:					
1) Bidder to quote strictly as per BHEL's NIT requirements.					

	BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION					
ANNEXURE-3					
PRICE FORMAT (R00) FOR TWIN LOBE TYPE AIR BLOWER WITH ELECTRIC MOTOR DRIVE FOR CUSTOMER : BHEL HARIDWAR PROJECT : 7 MLD STP AT BHEL HARIDWAR,					
SL NO	ITEM DESCRIPTION	QTY	UNIT	UNIT RATE (RS.)	TOTAL (RS.)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. : <Bidder to indicate> BHEL Enq. No. & date : <Bidder to indicate>					
2) Bidder to note that this is a LUMP SUM Turn-Key Order. However (a) Changes to the tender specification during execution of the project for successful operation of the system need to be carried out by bidder and commercial implications if any will be settled suitably. (b) Unit rates quoted by bidder shall be applicable for any changes in BOQ during detailed engineering stage.					
3) Main offer consists of those items which will be part of main order after successful bidder is identified. Optional Items consists of those items which need to be quoted by bidder but may or may not be ordered by BHEL. Bidders are instructed to provide the pricing details listed under Main offer and Optional items as per the prescribed format.					
4) Prices quoted by bidders for items under main offer : SI. No.IA(A.1+A.2+A.3), IB(B.1+B.2+B.3) and IC will be considered for evaluation of lowest bidder. For the purpose of tender (L1 bidder evaluation): For Supervision of E&C, total no of 2 Man days to be covered in 1 Visit have been considered. However, either or both of the number of man days or no of visits may change on either side based on the actual site requirement. However, BHEL reserves the right (a) To include any of the optional items in scope of supply (as per customer contract requirements) and accordingly consider the same in evaluation. Any such scope increase and change in evaluation will be intimated to vendor during technical evaluation (before price bid opening). (b) To place PO for any of the Optional items with in the contract period. Hence bidders need to mandatorily quote reasonable prices for all optional items considering such requirement and keep the validity of the prices till the end of contract period.					
5.a) For all items including Optional items, prices to be furnished in this prescribed price bid format only for each individual item. No combined prices, common prices or any other format will be accepted and such bids may be liable for rejection. 5.b) Bidder must not change the indicated item description, quantity & units in the price bid format. Bidder should only fill the unit rates & total price. 5.c) Bidder to quote for all the items as per price bid format. Incomplete/partial offer may be liable for rejection.					
6) Bidder to quote the base rates only. All other commercial charges for packing, freight, transportation, insurance, taxes & duties etc., shall be indicated separately.					
7 a.) Commissioning spares are those spares which are required at the time of commissioning and shall be recommended (as per bidders experience) and quoted by bidder. However commissioning spares indicated in the price bid format shall be quoted as minimum.					
8) With respect to Mandatory Spares; A) If any of above items indicated by the specified name are not applicable, bidder to offer alternative item serving the same function as per equipment's design and indicate below the item being replaced. B) If bidder is not able to meet the above note, then bidder may mention "Not Applicable". However, if found applicable during detailed engg. stage or alternative item as per equipment design can serve the same function, bidder to supply the specified quantity with out any delivery and commercial implications to BHEL.					
9) Reference document: PY51327 R00 & annexures.					
10) Unpriced price bid format indicating as quoted against each applicable item shall be submitted duly signed & stamped along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.					
11) In case the systems are being supplied from outside India, reputed Third Party Inspection like Llyods or equivalent has to be considered and the charges should be included in the Main offer. For those bidders who are supplying from India, such third party inspection charges need not be considered and same will be arranged by BHEL/BHEL nominated inspection agency.					

	BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION					
ANNEXURE-3					
PRICE FORMAT (R00) FOR TWIN LOBE TYPE AIR BLOWER WITH ELECTRIC MOTOR DRIVE FOR CUSTOMER : BHEL HARIDWAR PROJECT : 7 MLD STP AT BHEL HARIDWAR,					
SL NO	ITEM DESCRIPTION	QTY	UNIT	UNIT RATE (RS.)	TOTAL (RS.)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. :<Bidder to indicate> BHEL Enq. No. & date :<Bidder to indicate>					
12) Any commissioning spare consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the equipment vendor.					
13) 1 Sets stands for complete requirement for replacement of particular item for Each Blower.					

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			Annexure-3 to Doc. No. PY51327	
			Rev. No.	00

COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.	Annexure-4 CHECKLIST FOR AIR BLOWER			

Revisions: Refer to record of revisions	Prepared by :	Checked by :	Approved by :	Date :
	MURALI	IFTEKHAR	Siva Prasad Babu	13.03.18

ANNEXURE-4 : CHECKLIST FOR THE OFFER
[For Technical Specification, PY 51327, Rev00]

Sl.No:	Description	Enclosed(Yes/No)
1.	Bidder to confirm that offered Items (as per Annexure-3, Price-Bid format) are in line with BHEL tender specification PY-51327 & its Annexures.	
2.	Documents submitted duly filled up with bidder's signature & stamp along with the offer a) Signed and stamped copy of Job spec. b) Completely filled Checklist for the offer (Annexure-4) along with the documents mentioned in checklist. c) Unpriced "price-bid format" (Annexure-3)	
3.	Special requirements: <u>Bidder to furnish confirmation against each point.</u> a) Bidder to conform compliance with Annexure-2A & 2B: <u>Technical datasheet for Air blowers for SBR & Sludge Sump</u> enclosed with Technical specification, Doc. No. PY 51327. Following are considered in bidders scope of supply: • Air Blower • Motor (drive) • Relief Valve at outlet of Pump • Inter connecting Piping & Instrumentation • Bellows type coupling on suction and discharge • Acoustic Enclosure-if noise level at duty point in dB(A) at 1 m from the unit is ≥ 85) • Foundation Bolts • Commissioning Spares list • Special Tools and Tackles • Motor Cable Glands and lugs • Chocking indicator for Suction Filter • Out of three Air Blowers for SBR, one blower motor shall be compatible for VFD operation.` • First Fill of lubricants b) Functional test shall be carried out at vendor works	
4.	Bidder shall ensure that any other requirements not specified in Technical Specification, however the same are required for process shall be considered by bidder in their offer. Additional price during details engineering shall not be entertained. Bidder to confirm.	
5.	Bidder has raised pre-bid clarifications in Annexure-5 enclosed with BHEL tender specification PY-51320. Bidder to confirm	
6.	All other requirements except for the deviation brought out under	

	deviation list, have been taken into consideration.	
7.	Bidder to confirm that all the Suitable reducers/expanders & counter flanges along with gaskets & stud nuts at all the terminal point, shall be in their scope inline sl. No.6 of clause 3.1. Bidder to Confirm.	
8.	Nil	
9.	As per (Annexure-2) of Tender Specification, Motor Shall be of IE-3 Energy Efficiency. Bidder to Confirm.	
10.	Un priced “price bid format” submitted:- Un priced “price bid format”, clearly indicating all the applicable items are quoted, and not applicable items are not quoted.	
11.	Inspection & testing:- All the inspection and testing requirements shall be as per approved Quality Assurance Plan. Bidder to Confirm.	
12.	Vendor list: For sub vendor items, Bidder to confirm compliance with vendor list enclosed as per Annexure-8.	
13.	Master Document List (MDL): Bidder to confirm that all the documents figuring in MDL as per Annexure- 7 of Technical Specification PY 51320 shall be submitted during detailed engineering.	
14.	Deviation list Attached (Yes/No) along with Bidders Offer.	
15.	Completely filled Technical Datasheet for Air Blowers (Annexure-2) is submitted along with bidders offer. Bidder to confirm.	
16.	Bidder in their offer has considered standard painting specification. Bidder to confirm.	
17.	Bidder to confirm compliance with Quality Assurance Plan enclosed as Annexure-9 with Technical Specification, Doc. No. PY 51327.	
18.	If items is supplied from outside India, Seaworthy packing shall be considered by Bidder and the same is in Bidders scope. Bidder to confirm.	
19.	If Pump assembly is supplied from outside India, inspection charges for TPI (Third Party Inspection) shall be in Bidders Scope. However, it is supplied within India, TPI charges shall be in Purchaser's scope. This is as per Annexure-3, Price Bid Format enclosed with Technical Specification, Doc. No. PY 51320. Bidder to confirm.	

SIGNATURE: _____

NAME : _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

ANNEXURE-5: PRE-BID QUERIES FORMAT
[For Technical Specification, PY 51327, Rev00]

Sl. No.	Section / Part/Subsection	Page No.	Clause No.	Bid Specification	Bidder's Query	Purchaser's Reply

Note: During Preparation of Pre-Bid Queries, Complete Tender Specification Doc. No. PY-51327(along with all Annexures) shall also be referred.

MASTER DOCUMENT LIST - Air Blower[illegible]

	SYSTEM/PACKAGE:	Air Blower				TODAY-DATE	14-Mar-18								
SLNo	DRG/DOC. NAME	DRG/ DOC NO.	NO. OF SHTS.	CAT	CRITICAL FOR MFG?	REQD.FOR CUSTOMER SUBMISSION?	Plan date of submission	Count of DUE as on DL	STATUS	Rev-0			Rev-1		
			NO.	(A / I)	(Y/N)	(Y/N)	dd-mmm-yyyy		" *PV/PB /PC/AA	SD	AD	APP.CAT	SD	AD	APP.CAT

1.0 Mechanical

[illegible]

MASTER DOCUMENT LIST - Air Blower

Vendor Name:				PROJECT:											
Vendor Contact Person:				BHEL PO No.		PO date:		PO Dly. Date:							
Vendor contact No.				Supplier's Job No.											
	SYSTEM/PACKAGE:	Air Blower				TODAY-DATE	14-Mar-18								
Sl.No	DRG/DOC. NAME	DRG/DOC NO.	NO. OF SHTS.	CAT	CRITICAL FOR MFG?	REQD.FOR CUSTOMER SUBMISSION?	Plan date of submission	Count of DUE as on Dt.	STATUS	Rev-0			Rev-1		
			NO.	(A / I)	(Y/N)	(Y/N)	dd-mmm-yyyy		" *PV/PB /PC/AA	SD	AD	APP.CAT	SD	AD	APP.CAT
10	BILL OF MATERIAL			A	N	N									
11	BILLING BREAKUP			A	N	N									
12	QUALITY ASSURANCE PLAN			A	N	Y									
13	SUB VENDOR LIST			I	N	N									
14	COMMISSIONING SPARES LIST			A	N	N									
15	Mandatory Spares List			A	N	N									
16	LUBE OIL SCHEDULE			I	N	N									
17	STARTUP PROCEDURE			I	N	N									
18	ERECTION PROCEDURE & Comissioing procedure			I	N	N									
19	INSPECTION/TESTS REPORTS/CERTIFICATE			I	N	N									
20	O& M Manuals(Soft Copies)			A	N	N									
21	O& M Manuals(Hard Copies)** ** hard copy shall be furnished after getting concurrence on soft copy.			I	N	N									
							TOTAL	0		*APP.CAT					
A-Approval Category		PV-Commented and pending with vendor					TOTAL "PV"		0	A1-'Approved					
I-Information Category		PB- Pending with BHEL					TOTAL "PB"		0	A2-'Mfg. Clearance given subject incorporation of comments					
		PC- Pending with Customer					TOTAL "PC"		0	A3-Commented.Revision & resubmission required.					
		AA- Approved					TOTAL "AA"		0	A4- Retained for info.					
		** - Not yet Due.													
		OD-Overdue					TOTAL "OD"		0						
		** - Not yet Due.													

Vendor documentation status									
Total No of Docs	Due as on Date	Submitted by vendor as on Dt.	Approved by BHEL as on Dt.	Commented by BHEL as on Dt.	Pending with BHEL/CUSTOMER as on date	%age of Dos Approved	%age of critical Dos Approved	Is Mfg. Clearance given?	Status/Remarks
(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	% age	% age	(Y/N)/ (If Y) put Dt.	
0	0	0	0	0	0	#DIV/0!	0.00%	Y	

Annexure-8: Sub Vendor List		
	Item	Vendor Name
1	LT MOTORS(SAFE AREA)	SIEMENS INDIA LTD SECBAD.
		ABB INDIA LIMITED, HYD
		KIRLOSKAR ELEC.CO.LTD
		LAXMI HYDRAULICS PVT. LTD.
		BHARAT BIJLEE LTD, MUMBAI
		CROMPTON GREAVES

Note: Any item which are not figuring in the vendor list, bidder may follow their own standard list.

However all the credentials of such vendors shall be submitted for BHEL review and approval.