

DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF FUMES EXTRACTION SYSTEM WITH ACCESSORIES FOR STBW's AT BAY 1, 3, 5,5A / BUILDING 107 & BAY 1/BUILDING 117 - QUANTITY: 6 Nos

PART – A

SECTION- I: Qualifying Criteria

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

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
1	Only those vendors (OEMs/Authorized Dealers), who have designed, supplied and commissioned welding fume extraction systems having fume filter unit as specified in PART B of minimum capacity 2000 CMH and such item should be working satisfactorily for a minimum period of one year after completion of commissioning as on the date of opening of this tender.	
2	The vendor should submit following details which are necessary for qualifying their offer.	
2.1	Name and contact details like email, phone number, fax no, etc. of the customer / company where the equipment commissioned.	
2.2	Along with Technical offer, the Vendor should submit performance certificate from minimum one customer for the satisfactory performance of the same, supplied to them in the customer's letter head. Suggestive Format Enclosed in SECTION – III	
3	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION – II:

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

S NO.	REQUIREMENTS	VENDOR'S COMPLIANCE
1	The BIDDER / VENDOR shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
2	The offer shall contain a comparative statement of Technical Specifications given by BHEL and the offered details submitted by the Bidder, against each clause. Merely stating 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words wherever 'Vendor to Specify' details in the technical comparative statement may lead to disqualification of the Technical Offer.	
3	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
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 of the inclusion of all the accessories, tooling's, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
5	BIDDER has to indicate the Country of Origin for the supply of equipment.	

SECTION – III

**PERFORMANCE CERTIFICATE
(On Customer's Letter Head)**

- | | |
|---|---|
| 1. Supplier of the machine | : |
| 2. Make & Model of the Equipment | : |
| 3. Month & Year of Commissioning | : |
| 4. Application for which machine is used | : |
| 5. Installed capacity (in CMH) | : |
| 6. Performance of the Machine
(Strike off whichever is not applicable) | : Satisfactory / Good / Average /
Not Satisfactory |
| 7. After Sales Service | : Satisfactory / Good / Average /
Not Satisfactory |
| 8. Any other remarks | : |

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

PART B – TECHNICAL SPECIFICATION

SPECIFICATION FOR FUMES EXTRACTION SYSTEM WITH ACCESSORIES FOR STBW's - 6 NOS AT

BAY 1, 3, 5, 5A / BUILDING 107 & BAY 1/BUILDING 117

Scope: - DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF FUMES EXTRACTION SYSTEM WITH ACCESSORIES FOR STBW's - 6 NOS AT BAY 1, 3, 5, 5A / BUILDING 107 & BAY 1/BUILDING 117

S. No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER / CONFIRMATION [with Complete Technical Details]
1	AREA OF APPLICATION	Fume extraction system suitable for handling 2500 CMH to 3500 CMH (net flow) air flow rate @ 250mm WC pressure (average). The fan operating point should be 2500 CMH - 3500 CMH (net flow) @ 250 mm WC static pressure (average). The fume extraction system shall be high efficient, silent and compact package system with blower integrated within the filtration unit suitable for extracting welding fumes from Straight tube butt welding machine (STBW)	<i>Bidder to Confirm</i>
2	SCOPE OF SUPPLY - MACHINE CONFIGURATION	1. Fume filtration system with inbuilt blower having suitable capacity of motor and accessories meeting the performance prove out criteria mentioned in SI.No.7 – 1 set 2. Connecting air ducts, hoods and accessories – 1 set	<i>Bidder to Confirm</i>
2.1	DESIGN INPUTS	BIDDER should make a site visit to BHEL/TRICHY to understand the requirements of BHEL, prior to submitting the offer. The offer submitted without site visit will not be considered for evaluation.	<i>Bidder to Confirm</i>
3	INBUILT BLOWER	Bidder to specify number of blowers based on application.	<i>Bidder to Confirm</i>
3.1	Purpose	To extract & filter welding fumes from the welding source and to discharge filtered air above the building roof.	<i>Bidder to Confirm</i>
3.2	Blower Drive	Direct/ belt	<i>Bidder to specify</i>
3.3	Temperature of fluid (air)	40 to 50 Deg C approx.	<i>Bidder to Confirm</i>
3.4	Blower Type	Backward curved centrifugal fan located in an acoustic enclosure, integrated within the filtration unit.	<i>Bidder to be specify.</i>
3.5	Efficiency of blower	Above 70%	<i>Bidder to be specify.</i>
3.6	Delivery: Direction & Outlet size	Upward discharge, suitable for duct velocity of 14-20 m/s, pl refer to the BHEL layout	<i>Bidder to be specify.</i>

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3.7	Suitable Vibration absorber	1 SET per blower	<i>Bidder to be specify</i>
3.8	Blower Makes	Nederman/Donaldson/Flakt (earlier known as Denco Happel)/Kemper or other equivalent makes acceptable to BHEL meeting the technical specifications.	<i>Bidder to be specify</i>
4	BLOWER MOTOR, VFD & CONTROL PANEL		
4.1	Motor Type	Three Phase Squirrel cage Induction motor with totally enclosed fan cooled.	<i>Bidder to Confirm</i>
4.2	Degree of protection (Motor)	IP55	<i>Bidder to Confirm</i>
4.3	Duty	S1 continuous	<i>Bidder to Confirm</i>
4.4	Class of insulation	Class F	<i>Bidder to Confirm</i>
4.5	Motor Details	HP / kW, RPM shall be decided by the vendor. Motor to comply for IE3 standard	<i>Bidder to Confirm & specify</i>
4.6	Motor make	Any make, acceptable to BHEL based on IE3 test reports as per IS 12615 / IEC 60034	<i>Bidder to specify</i>
4.7	Motor Contactor	Make and Rating.	<i>Bidder to Specify</i>
4.8	Power supply	415V $\pm$ 10%, 50HZ $\pm$ 3 Hz, 3 Phase AC [3 wire system without neutral] power supply will be provided by BHEL at a single point near the system. All cables, connections, circuit breakers etc. required for connecting BHEL's power supply to the system shall be in the scope of vendor.	<i>Bidder to note</i>
4.9	Control voltage	Control voltage shall be of 24V DC.	<i>Bidder to Confirm</i>
4.10	Blower motor control	Through variable frequency drive (VFD) with input and output chokes	<i>Bidder to specify power</i>
4.10.1	Automatic On/Off system	Automatic On/Off system based on welding On/Off operation – Provision to be incorporated in the control panel.	<i>Bidder to specify</i>
4.10.2	VFD control	Fan Inverter (Auto mode VFD) for reducing and increasing air flow	<i>Bidder to specify</i>
4.10.3	VFD specification and make	VFD unit shall be 3-Ph, 6/12 pulse Rectifier Bridge, D.C. link with reactor/ capacitors, Inverter Bridge, microprocessor based control system. The VFD shall be pulse width modulation (PWM) type with flux vector control. The VFD unit shall have cooling fan and this shall be controlled based on heat sink temperature. Converter transformer/input reactor and output reactor, shall be integral part of drive panel. Harmonic current distortion values shall be according to IEEE 519. Any make, acceptable to BHEL, based on test reports as per IS/IEC standards.	<i>Bidder to confirm & specify make and model</i>
4.11	Control panels	All control cabinets & panels should be dust and vermin proof.	<i>Bidder to Confirm</i>
4.12	Earthing	Vendor should ensure the proper earthing for the machine and its peripherals.	<i>Bidder to Confirm</i>
4.13	Tropicalization	All electrical / electronic equipment shall be tropicalized.	<i>Bidder to Confirm</i>

S. No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER / CONFIRMATION [with Complete Technical Details]
5	FUME FILTER UNIT WITH ACCESSORIES	The machine parts are to be heat-treated (wherever necessary) after fabrication (including castings and forgings) and painted with One coat of Primer and Two coats of synthetic Enamel Paint (Color – Apple Green – IS281/Blue RAL 5007) Control Panel to be painted with Two coats of IS 281 Synthetic Enamel Apple Green Color Paint	<i>Bidder to Confirm</i>
5.1	Size of the Filtration unit	The size of the filtering unit to be selected w.r.to BHEL reference layout. The L x W x H shall not exceed 2 meter x 2.5 meter x 3 meter respectively. <u>The L x W x H size of the filtration units to be specified.</u>	<i>Bidder to confirm & specify</i>
5.2	Number of filtration units	The no. of the filtration units to be selected w.r.to BHEL reference layout.	<i>Bidder to confirm & specify</i>
5.3	Type of filter cartridges	Vertical mounted type filters	<i>Bidder to confirm</i>
5.4	Number of filter cartridges	Bidder to specify	<i>Bidder to specify</i>
5.5	Total filtration surface area in m ²	Minimum 44 m ²	<i>Bidder to specify.</i>
5.6	Filter type	Each Filters shall be of pleated cartridge type PTFE treated/laminated for handling fumes, filtration efficiency more than 99% for particle size of 0.1- 0.4 micron with filtering area around 10 to 12 m ²	<i>Bidder to Specify</i>
5.7	Filter and flexible hose Make	Same as that of blower.	<i>Bidder to Confirm</i>
5.8	Dust collector bin	Dust container kit with easy disposal (Wheel/Hand trolley)	<i>Bidder to Specify</i>
5.9	Air inlet	To be confirmed w.r.to BHEL reference layout	<i>Bidder to Specify</i>
5.10	Air outlet	To be confirmed w.r.to BHEL reference layout	<i>Bidder to Specify</i>
5.11	Weight of the unit		<i>Bidder to specify</i>
5.12	Filter Unit pressure drop	Operating around 25-175 mm WC., Max 180 mm WC	<i>Bidder to specify suitably based on function.</i>
5.13	Filtration efficiency	more than 99% for particle size of 0.1- 0.4 micron complying to OHSAS standard with filtering area around 10 to 12 m ²	<i>Bidder to specify</i>
5.14	Noise Level	Less than 75 db. at 1 metre. The same shall be measured after successful commissioning at site.	<i>Bidder to Confirm</i>
5.15	Monitoring unit:	1 no each of digital monitoring unit for fume outflow (preferred portable anemometer), static pressure (preferred manometer). Pressure gauges shall be used to measure/monitor its performance.(To be included in the scope of supply)	<i>Bidder to confirm</i>
5.15	Compressed air pressure for Purging/Self-cleaning mechanism of filters in Bar.	BHEL will provide in 1" line at one point near machine around 4.5 Bar.	<i>Bidder to note</i>

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5.16	Compressed air consumption	Compressed air utilization/consumption for the unit in liters/min.	<i>Bidder to specify</i>
6	CONNECTING AIR DUCTS		
6.1	Ducting arrangement	Ducting arrangement - inlet & outlet to filtration units should be made w.r.to BHEL reference layout	<i>Bidder to confirm</i>
6.2	Extraction hoods & ducts	Extraction air hoods + connecting air ducts in galvanized sheet steel fabricated construction complete with its flanges, flange packing / gasket and the fasteners of minimum grade 10.9. Minimum GI 20G (1 mm) ducting works joined with ISA (40 x 40 x 3) mm angle frames with four or five feet interval (or) To suit site requirement	<i>Bidder to confirm</i>
6.3	Fasteners & Angles	Standard MS angles, galvanized bolt/nuts of minimum grade 10.9/12.6 etc., are to be used.	<i>Bidder to confirm</i>
6.4	Suction hood -wire mesh	All suction hoods shall have bolted construction wire mesh to prevent foreign materials entry and are to be made minimum 1mm thick SS – 304 materials.	<i>Bidder to confirm</i>
7	Performance Prove-Out Details		
	To effectively remove the generated fumes from the source without affecting desired pre-function while running at rated blower capacity as specified elsewhere in the specification.	With the filter system in operation, the average concentration of the SPM within 1 meter of the fume generation area shall either be less than 1.5 mg/m ³ or 80% reduction of SPM concentration prior to installation. (Test kit for measurement of SPM level before and after installation of fume extraction system is in vendor scope).	<i>Bidder to Confirm</i>
8	TECHNICAL OFFER		
	The Technical Offer shall contain the following :		
8.1	Complete Scope of Supply, including Main Equipment, All Accessories and Attachments, etc.		<i>Bidder to Confirm</i>
8.2	List of Operating Spares, Commissioning Spares, Foundation / Anchoring Materials		<i>Bidder to Specify/Confirm</i>
8.3	Erection, Commissioning and Performance Prove-Out Details.		<i>Bidder to Confirm</i>
8.4	A schematic diagram showing the layout of the fume extraction system & associated systems with salient dimensions shall be submitted		<i>Bidder to Confirm</i>

S. No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR'S OFFER / CONFIRMATION [with Complete Technical Details]
9	Set of Documents to be submitted after placement of order for approval / verification before manufacturing within 4 weeks from PO/LOI:		<i>Bidder to Confirm</i>
9.1	General Lay-out of the extraction system with major and critical dimensions including bill of materials in line with the specification and Preliminary Foundation drawing.		<i>Bidder to Confirm</i>
9.2	Electrical Circuit with Bill of Materials giving specification and make of components used.		<i>Bidder to Confirm</i>
9.3	Schedule of Erection and Commissioning in weeks shall be submitted with the offer.		<i>Bidder to Confirm</i>
10	CERTIFICATIONS TO BE SUBMITTED AT THE TIME OF SUPPLY		
10.1	Impeller shall be balanced to ISO1940-1973 (e) class g 6.3 or its equivalent. Dynamic balancing certificate shall be produced along with supply.		<i>Bidder to Confirm</i>
10.2	Performance test curve shall be supplied after testing in Vendors work.		<i>Bidder to Confirm</i>
10.3	Blower Test certificate shall be supplied by the vendor while dispatch as per standards		<i>Bidder to Confirm</i>
11	O&M and Service Manuals:		<i>Bidder to Confirm</i>
	1 set of detailed manual with detailed assembly drawings(Soft copy - CD format) along with bought out items complete details for the blowers shall supplied by the vendor while dispatch (In English language)		
12	Leveling & Anchoring System:		<i>Bidder to Confirm</i>
	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc. should be supplied along with scope.		
13	Packing:		<i>Bidder to Confirm</i>
	Sea worthy & rigid packing for all items and other supplied items to avoid any damage/loss in transit. When it is dispatched in containers, all small loose items shall be suitably packed in boxes.		
14	Warranty:		<i>Bidder to Confirm</i>
	12 Months from the day of commissioning of system for workman ship, mechanical and electrical stability at BHEL or 18 months from dispatch whichever is earlier.		
15	Standards for Design and Manufacture :		<i>Bidder to Confirm</i>
	Standards for design and manufacture of the extraction system shall be in accordance with ISO or JIS or DIN Or ACGIH .Any other standards shall be approved by BHEL before manufacturing. Anything unspecified but necessary for function shall be indicated by the supplier.		<i>Bidder to Confirm</i>

S. No.	BHEL SPECIFICATIONS	VENDOR'S OFFER / CONFIRMATION [with Complete Technical Details]
16	BHEL WILL only supply consumables like power, water, oil, cotton waste, service air, welding rod, welding machine etc., at free of cost required for erection and commissioning of the system, rest all are in vendor's scope	<i>Bidder to Confirm</i>
17	Utility at BHEL Input Voltage: AC 415 V+/-10%, 50 Hz+/-3%, 3-Phase, 3 Wire system. Control Voltage: DC 24 V Shop Air Pressure: Around 4.5 Bar in 1" line.	<i>Bidder to Confirm</i>
18	Supplier has to ensure that entire assembly shall be compact in design aspect without compromising the required function.	<i>Bidder to Confirm</i>
19	Payment shall be made 100% after complete Erection & Commissioning.	<i>Bidder to Confirm</i>
20	Materials of constructions as follows Complete unit should be strong and stable welded completely in steel construction. Exhaust ducting's shall have Rain water cowl, Bird screen, leak proof gaskets, provision for measuring fumes gases tapping.	<i>Bidder to Confirm</i>
21	Scope of supply: Filtration unit with inbuilt blower Blower motor and VFD Control panel with necessary cables/wires Digital monitoring unit and pressure gauges/meters Duct, hood, hoses and accessories Dust collection bin Erection and commissioning accessories Spare Filter cartridges – 4 numbers per STBW machine Spare Flexible hoses with clamps – 5 meters per STBW machine Spare Solenoid valve for purging/self-cleaning – 1 number per STBW machine O&M manuals including test certificates.	<i>Bidder to Confirm</i>

