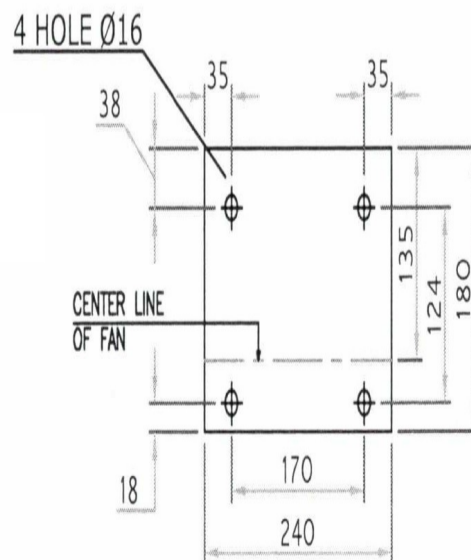
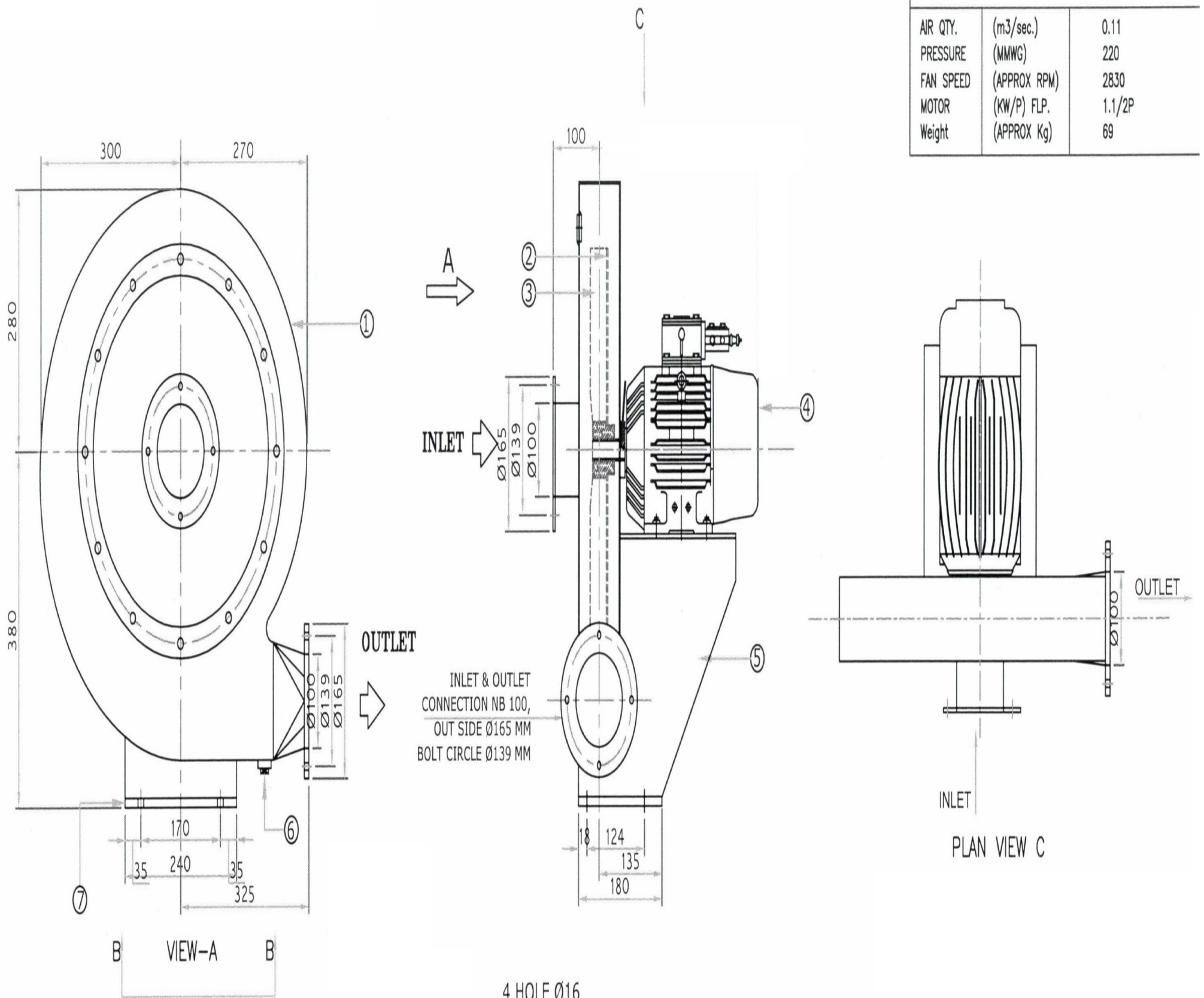


# GA DRAWING TO MATCH DIMENSIONS

## TECHNICAL DATA:- EACH

Spec. No.	ST 39004 (REV-04)	
Mat. Code no.	W 90311906010	
AIR QTY.	(m <sup>3</sup> /sec.)	0.11
PRESSURE	(MMWG)	220
FAN SPEED	(APPROX RPM)	2830
MOTOR	(KW/P) FLP.	1.1/2P
Weight	(APPROX Kg)	69



VIEW B-B

### Notes :-

1. The Impeller shall be dynamically balanced as per ISO 1940 GR.6.3.
2. D.P.T. on all welding.
3. The vibration shall as per IS:12075.
4. The noise level shall not be greater than 85 db, measured at a distance of 1M base of from the equipment, maesurment should be done as per IS:12065.
5. The minimum clearance between the impeller & casing shall be 2mm.
6. Performance test as per IS:4894 .
7. Type & routine test of motor as per IS:325 .
8. The exhauster shall be painted with two coats of epoxy primer & two coats of epoxy from inside and out side.The surface shall be cleaned and prepared for application of point by shot blasting.



# उत्पाद मानक

## PRODUCT STANDARD (STEAM TURBINE ENGINEERING)

ST- 39004

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### TECHNICAL SPECIFICATION FOR OIL VAPOUR EXHAUSTER

1.0 **INTENT OF SPECIFICATION:** - This specification is intended to cover design, manufacture, assembly testing and supply of oil vapour exhauster complete with foundation base plate, anchor bolts, lifting lugs, coupling and other accessories including motor. The exhausters should be suitable for continuous operation at an ambient temperature of 50°C & 90% humidity.

2.0 **FUNCTION:** - Oil vapour exhauster handles oil fumes generated during the running of the turbine. It shall also maintain a partial vacuum in the main oil tank and turbine bearing pedestals etc. The fumes to be handled by the exhauster contain free droplets of oil.

3.0 **OIL SPECIFICATION:** - Viscosity grade of the oil is ISO VG 46. The equivalent grades of various oil suppliers are Servo prime -46 of M/s IOC and Turbinol-47 of M/s Hindustan Petroleum Corporation Ltd.

Kinematic viscosity at 65°C/20°C	: 16 Cs/100 Cs
Specific gravity at 65°C	: 0.8488
Flash point	: 200° C (min.)
Operational temperature	: 65°C
Pour point	: -6.6° C (max.)

#### 4.0 DATA SHEET OF OIL VAPOUR EXHAUSTER:

Type	: Centrifugal
Cont. discharge capacity	: 0.11 m <sup>3</sup> /sec.
Normal discharge pressure	: 220mm WC
Design temperature	: 100°C
Operating temperature	: 65°C
Efficiency of exhauster	: Min. 40%

5.0 **MOTOR:** - A suitable motor conforming to the exhauster requirement shall be supplied. The Motor shall also meet the following requirements broadly. The motor shall conform to IS : 4722, IS : 325, IS:- 2223, IS : 4029, IS : 4691, IS : 2148 and IS : 12615-2011 or equivalent, BS : Specification. The motor shall meet all Indian statutory requirements.

5.1 **Application:** To drive Oil Vapour Exhauster.

5.2 **Location:** Turbine oil room (indoor).

5.3 **Type of motor:** Squirrel cage, induction motor.

5.4 **KW Rating:** It shall have at least 25% and max. 40% reserve capacity over required power to drive the exhauster when it is discharging max. quantity.

दिनांक एवं हस्ताक्षर  
SIGN & DATE

सुपर्सिडेस  
INVENTORY NO.


सामग्री सूची संख्या को  
अधिकारित करता है

स्वत्वाधिकार एवं गोपनीय  
इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रचलन  
अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में है हानिकारक हो न किया  
जाए -

दिनांक एवं हस्ताक्षर  
SIGN & DATE

सुपर्सिडेस  
INVENTORY NO.

नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE
TSX	DEEPAK Deepak 22/9/15
MEMBER PSC	R.PANJA R.Panja 24-9-15 अनुवादक TRANSLATED BY
QAX	VIBHUTI SHAH Vibhuti 22/9/15 निर्माणकर्ता WORKED BY
CIE	NIRBHAY KUMAR Nirbhay Kumar 22/9/15 जांचकर्ता CHECKED BY
सहमत विभाग AGREED DEPTT.	नाम NAME दिनांक एवं हस्ताक्षर DATE & SIGNATURE पर्यवेक्षणकर्ता SUPERVISED BY
REAFFIRMED	स्वीकृति APPROVED : (R PANJA) AGM R.Panja 24-09-15
REV.NO. 06	WORKED BY Checked By 25/09/15
DATE: 25/09/15	C/A NO. STE-20-20
ISSUED : TSX	DATE: 24.06.80

<p>दिनांक एवं हस्ताक्षर SIGN &amp; DATE</p> <p>सामग्री सूची संख्या INVENTORY NO.</p> <p>सामग्री सूची संख्या को अधिकृतित करना है</p> <p><b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company</p> <p>स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाय।</p> <p>हस्ताक्षर एवं दिनांक SIGN &amp; DATE</p> <p>सामग्री सूची संख्या INVENTORY NO.</p>		<p style="text-align: center;"><b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING)</p>	<p style="text-align: right;"><b>ST- 39004</b></p> <p style="text-align: right;">पृष्ठ 15 का 02 Page 02 of 15</p>		
<p>सुपरसेडेड इन्वेंट्री नं.</p>	<p>5.5 KW actually required by driven equipment under specified operation/startup conditions at 50°C ambient. : capacity of the exhauster</p> <p>5.6 Rated voltage: 415 V</p> <p>5.7 Frequency: 50 Hz</p> <p>5.8 Permissible voltage and frequency variation under normal running condition : ± 10% Volt. : ± 5% Frequency</p> <p>5.9 Combined variation : 10% (sum of absol. value)</p> <p>5.10 Min. voltage required under starting conditions to bring driven equipment up to rated speed. : 80% rated</p> <p>5.11 No. of phases : 3ø</p> <p>5.12 Type of duty : Continuous</p> <p>5.13 Starting current : Not to exceed 600% of I-rated.</p> <p>5.14 Starting torque : 1.3 (min.) of rated torque</p> <p>5.15 Break down torque : Two times (min.) of rated value.</p> <p>5.16 Class of insulation of winding : Class-B, fungus resistant tropicalized as per IS: 3202.</p> <p>5.17 <b>Starting data :-</b></p>				
	<p>5.17.1 Starting : Direct on line</p> <p>5.17.2 Acceleration time with full load connected : 3.5 ± 0.5 secs.</p> <p>5.17.3 Permissible starting duty cycle, no. of starts : 3 Starts spread over an hour 2 Consecutive starts from hot condition without any injurious heating to the winding</p> <p>5.17.4 Overload (% of full load) that can be carried by motor without impairing over all performance and period for which this over load is applicable. : Motor shall be capable of running at full load with 80% of rated voltage for 5.0 minutes and 70% of rated voltage for 1 sec.</p> <p>5.17.5 Locked rotor with stand time under hot condition at rated voltage shall be at least 2.5 sec. more than starting time.</p>				
<p>REV. NO.</p> <p>06</p>		<p>निर्माणकर्ता WORKED BY</p> <p>V. RAWAT</p>	<p>जांचकर्ता CHECKED BY</p> <p>P.KUMAR</p>	<p><i>[Signature]</i></p>	<p>22/9/15</p> <p>22/9/15</p>

दिनांक एवं हस्ताक्षर  
SIGN & DATE



उत्पाद मानक  
PRODUCT STANDARD  
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सामग्री सूची संख्या  
को अधिकृतित करता है

- 5.18 **Mechanical construction :-**
- 5.18.1 Shaft disposition mounting : Horizontal / flange mounted.
- 5.18.2 Method of connections to driven equipment : Flange flexible coupling Directly mounted on the motor shaft.
- 5.18.3 Direction of rotation and corresponding Terminal designation : To suit exhauster
- 5.18.4 Efficiency of the motor shall be as per IS: 12615-2011.
- 5.18.5 Enclosure and ventilation: Totally enclosed fan cooled explosion proof as per IS: 2148.
- 5.18.6 Bearing: As per supplier's design, life not less than 30,000 hrs.
- 5.18.7 Grounding device: Suitable arrangement shall be provided for earthing the motor at two separate and distinct connection points. Design of earthing conductor shall be as per IS: 4722-1992.
- 5.18.8 Terminal connectors for stator: 3 terminals shall be connected externally in the terminal box. heads type and number.
- 5.19 Terminal box: -To be provided with double compression cable gland for Al cable.  
- Fault level for terminal box shall be 50KA for 0.25 sec.  
- It shall be explosion proof

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स्वत्वाधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इस्तेमाल के बिना अनुमति के बिना न किया जाए।

- 5.20 **Special requirements:**
- 5.20.1 The motor shall be suitable to operate in environment of oil fumes.
- 5.20.2 The motor shall be suitable for rewinding.
- 5.20.3 The motor shall have on line greasing facility.
- 5.20.4 The motor construction shall be suitable for easy disassembly and reassembly.
- 5.21 Documents to be supplied: - Motor data sheets with G. A. drgs. and Terminal details shall be furnished in 05 sets after award of contract/placement of order for BHEL approval.
- 5.21.1 Type and frame size
- 5.21.2 Starting time at  
i) With 100% voltage at terminal  
ii) With 85% voltage at terminal
- 5.21.3 Safe stall time at 100% rated voltage under hot condition.

हस्ताक्षर एवं दिनांक  
SIGN & DATE

22/9/15

सामग्री सूची संख्या  
INVENTORY NO.

P-5135

REV. NO.

06

निर्माणकर्ता  
WORKED BY

V. RAWAT

*V. Rawat*




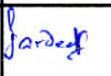
22/09/15


जांचकर्ता  
CHECKED BY

P KUMAR

*P. Kumar*

22/9/15

दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;"><b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING)</p>	<b>ST- 39004</b>			
SUPERSEDES INVENTORY NO.  सामग्री सूची संख्या का अधिकारिता करता है	5.21.4 Motor GD <sup>2</sup> value.  5.21.5 Weight of motor  5.21.6 I) Type and routine test certificates as per IS: 4722. II) In addition to type and routine test as per IS: 4722, following test shall also be carried out:- - Degree of protection test as type test. (In case test is already carried out and is not more than five years old then only Test Certificates to be furnished).			पृष्ठ 15 का 04	Page 04 of 15	
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	6.0 <u>DESIGN &amp; CONSTRUCTION OF OIL VAPOUR EXHAUSTER:</u>  6.1 All materials used in the construction of the exhauster shall be selected from the range of materials most appropriately suitable for the purpose and service conditions. The bidder shall furnish along with the bid the material specification for all the components to BHEL for their review and acceptance by BHEL/Owner. BHEL/Owner reserves the right to ask for changes in material.  6.2 The supplier shall also furnish the method and frequency of lubrication of the bearings and quantity and type of lubricant required for normal operation.  6.3 The design shall be such as to keep the friction loss and wear caused by end thrust, wear in mechanical seals and bearings to the minimum. It should ensure long and trouble free service. The rotor of the exhauster should be balanced dynamically so that the vibration of the exhauster is not greater than 25µm peak to peak in accordance with IS: 12075. The noise level should not be greater than 85 dBA when measured at a distance of 1.5 meters above floor level and one meter horizontally from the base of the equipment.					
<b>स्वत्वाधिकार एवं गोपनीय</b> इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रलेख एवं अप्रलेख रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए	6.4 Seals must comply with the following properties :- a) Ready access and amenability for maintenance work. b) No contamination of the medium from material abraded from the seals. c) No seepage of lubricants into the flow medium. d) No leakage of gases (oil fumes) outside in the atmosphere. e) No seepage of oil towards motor and outside along with the shaft.  6.5 At suitable points on the components erection eyes or lifting hooks shall be fitted for transport and erection. Their locations must be shown on the dimensional drawing.  6.6 Exhauster bearings shall be designed so as to assure 50,000 hours continuous service for friction bearings and 25,000 hours for ball and roller bearings.  6.7 The mechanical design shall allow easy access to the parts for maintenance work to be carried out.					
हस्ताक्षर एवं दिनांक SIGN & DATE 	6.8 The exhauster shall be provided with drainage devices.					
सामग्री सूची संख्या INVENTORY NO. P-5735	REV. NO. 06		निर्माणकर्ता WORKED BY V. RAWAT		22/09/15	
			जांचकर्ता CHECKED BY P.KUMAR		22/9/15	

दिनांक एवं दिनांक SIGN & DATE		<p style="text-align: center;"><b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING)</p>	<b>ST- 39004</b>	
सामग्री सूची संख्या INVENTORY NO.	6.9 All system parts shall be of oil tight construction. Compression-type fittings are not permissible.  6.10 For exhauster running at sub critical speeds, it shall be demonstrated that the critical speed lies above the maximum speed attainable during operation. For exhauster running at super critical speeds, it shall be demonstrated that there is a difference of sufficient magnitude (not less than 15%) between the operating speed and the bordering critical speeds. Allowance shall be made for the type of coupling between the exhauster and motor when calculating the critical bending speed.		पृष्ठ 15 का 05 Page 05 of 15	
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	6.11 <b>COUPLING:-</b> Suitable coupling with guards shall be provided for coupling exhauster with motor and shall be designed to facilitate easy alignment. One set of coupling pins/bolts shall be supplied in spare. Common shaft for exhauster and motor shall be preferred.  6.12 <b>FOUNDATION:-</b> The exhauster shall be mounted on the oil tank top. Frame of exhauster shall be sturdy to limit the vibration level as mentioned in the clause 6.3. For mounting Dimensions. Refer sketch at Annexure -3 or Annexure -4.  6.13 <b>ORIENTATION:-</b> Orientation of motor w.r.t. inlet/outlet connections shall be as per Annexure-3 for var.01 and Annexure -4 for variant 02.  6.14 <b>SPECIAL TOOLS &amp; TACKLES:-</b> One set of tools required for erection, operation and maintenance of the sets shall be supplied together with each set comprising of two numbers of exhauster with motor. List of these tools shall be submitted along with the offer.	7.0 <b>QUALITY ASSURANCE, INSPECTION AND TESTING :-</b>  a) The manufacturer shall conduct all tests required to ensure all the component parts of the oil vapour exhauster offered confirm to the requirements of applicable codes and standards.  b) The bidder shall submit along with his offer quality plan in the BHEL format /customer format as required.	7.1 The material shall be dispatched only after inspection and clearance of material by BHEL / Owner and approval of test certificates by BHEL/Owner.  7.2 The minimum tests/checks to be carried out on oil vapour exhauster as envisaged by BHEL are given below. This is however not intended to form a comprehensive testing programme as it is suppliers responsibility to prepare the detailed quality plan, which should also include tests/ checks carried out by supplier as a part of their normal practice. This quality plan is subject to the approval of BHEL/ its customer and BHEL/ its customer reserves the right to ask for any more checks at the time of quality plan finalization.	7.2.1 Testing of materials :- The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties Viz YS, TS, % age elongation shall be carried out.
	स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रस्ताव एवं अनुमति के बिना किसी भी प्रकार प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	7.2.1 Testing of materials :- The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties Viz YS, TS, % age elongation shall be carried out.	7.2.1 Testing of materials :- The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties Viz YS, TS, % age elongation shall be carried out.	7.2.1 Testing of materials :- The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties Viz YS, TS, % age elongation shall be carried out.
दिनांक एवं दिनांक SIGN & DATE	26/9/15	26/9/15	26/9/15	26/9/15
सामग्री सूची संख्या INVENTORY NO.	REV. NO. 06	निर्माणकर्ता WORKED BY V. RAWAT	जांचकर्ता CHECKED BY P. KUMAR	22/09/15 21/9/15

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SIGN & DATE



उत्पाद मानक  
**PRODUCT STANDARD**  
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को अधिकतम करता है

7.2.2 Following tests shall be carried out during various stages of manufacture at manufacturer s' works.

- a) Check for dimensions of all the component parts including finish.
- b) Non-destructive Examination –DPT/MPT for welds to ensure freedom from subsurface defects.
- c) Dynamic balancing of rotor as per ISO: 1940 or equivalent, Gr. =6.3.
- d) Check for direction of rotation of exhaustor and its working as per clause 6.10 of spec.
- e) Performance testing e.g. discharge V/S pressure, power consumption.
- f) Noise as per clause 6.3
- g) Vibration as per clause 6.3

7.2.3 Test certificates indicating the actual test results of material testing , NDT, dynamic balancing, performance test, strip down examination shall be furnished.

8.0 **DOCUMENT TO BE SUPPLIED AFTER THE PLACEMENT OF ORDER:-** These shall be supplied in 10 copies each or two copies and a set of reproducible.

- 1) Contractual drawings i.e. pre approval drgs /documents in final shape after incorporating BHEL's comments if there are any. 8 weeks
- 2) O & M manual 12 weeks

9.0 **PRE-APPROVAL DOCUMENTS AT THE TIME OF OFFER :-** (4 Sets)

- 1) Assembly drawing with part lists, inlet/outlet connection sizes and their coordinates, base plate details and cross sectional arrangement along with static and dynamic loading.
- 2) Calculations with necessary drawings (Torque/speed characteristics etc.), power requirement.
- 3) Quality plan in the specified format.
- 4) Filled in Annexure-1 & Annexure-2
- 5) The supplier shall quote item wise price of recommended spares for 3 years and 5 years respectively.

9.1 Examination of the pre approval documents by BHEL shall not release the manufacturer and his subcontractors of their responsibilities.

9.2 The pre approval documents shall form the basis for the order. No changes shall be made without approval from BHEL.

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**स्वत्वाधिकार एवं गोपनीय**  
इस प्रलेख में की गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।

हस्ताक्षर एवं दिनांक  
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सामग्री सूची संख्या  
INVENTORY NO.

REV. NO.  06	निर्माणकर्ता WORKED BY	V. RAWAT	<i>V. Rawat</i>	22/09/15
	जांचकर्ता CHECKED BY	P.KUMAR	<i>P. Kumar</i>	22/9/15

*22/09/15*

*P-5135*

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उत्पाद मानक  
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**10.0 NAME PLATE IDENTIFICATION MARKS SHOULD BE AS FOLLOWS:-**

- 1) Type/ Designation
- 2) Manufacturer
- 3) Year of Manufacturing
- 4) Purchaser's order no.
- 5) Volumetric flow (M<sup>3</sup>/S)
- 6) Discharge pressure ( MM WC)
- 7) Operating temperature ( °c)
- 8) Speed
- 9) Flow medium

**11.0 CLEANING, PAINTING, CONSERVATION & PACKING:-** The surface shall be cleaned & prepared for the application of the coatings by blasting with non-silicatic abrasive agents. The protective coating should be oil resistant to prevent contamination of oil specified & to prevent the deterioration of the coating itself. The supplier shall give exact and precise details about the measures envisaged by him for surface protection, which may be commented by BHEL.

After testing the exhauster, its internals shall be thoroughly cleaned, dried and conserved before packing it. The exhauster packing shall be sufficiently strong to safeguard against any damage during transit. It should be packed such that it is safe at least for 2 years in a very damp atmosphere. Instructions should be issued Regarding reconservation, deconservation and storage of package.

**12.0 GENERAL:-** The tenderer can make suitable offers even if there are minor deviations which do not affect the efficient functioning of the equipment. However, the deviations must be clearly spelt out. Supplier shall also fill in the blank data sheet (Annexure-1) and submit the same along with the offer. The offer may not be considered if all the technical particulars and information called for in the specifications are not submitted along with the offer.

**13.0 GUARANTEE:-**

- 13.1 The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 18 months after delivery or 12 months after commissioning whichever is earlier.
- 13.2 The supplier shall guarantee the capacity, head and efficiency of the exhauster as per the tested characteristics with oil fumes.
- 13.3 If during erection at site any deficiency in a part is detected, BHEL site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace/rectify the concerned items free of charge. The supplier if he so desires may depute his representatives to site at his own cost otherwise the finding of BHEL representative shall be final and binding on the supplier.
- 13.4 The supplier shall repair/replace the defective parts at his own cost during the guarantee period.

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**स्वाधिकार एवं गोपनीय**  
इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इस्का प्रलेख एवं अप्रलेख रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।

हस्ताक्षर एवं  
SIGN & DATE  
22/09/15

सामग्री सूची संख्या  
INVENTORY NO.  
P-5/35

REV. NO.

06

निर्माणकर्ता  
WORKED BY

V. RAWAT

*[Signature]*  
22/09/15

जांचकर्ता  
CHECKED BY

P.KUMAR

*[Signature]*  
22/9/15

दिनांक एवं हस्ताक्षर  
SIGN & DATE

**उत्पाद मानक**  
**PRODUCT STANDARD**  
( STEAM TURBINE ENGINEERING)

ST- 39004

पृष्ठ 15 का 08

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SUPERSEDES  
INVENTORY  
NO.सामग्री सूची संख्या  
का अधिकतम संख्या

ANNEXURE-1

**DATA TO BE FURNISHED BY BIDDER ALONG WITH OFFER****1.0 Equipment and Services offered :-**

Please state whether the following equipment service as specified in the data sheets are offered or not.

1.1 Exhauster as per specification Yes/No

1.2 Motor/Make M/s.....

1.3 Necessary instruments, Test connections Yes/No

1.4 Base plate as per Annexure-3/4 Yes/No

1.5 Companion flanges Yes/No

1.6 Maintenance and special erection tools Yes/No

1.7 No. of exhausters offered Nos.

**2.0 Design and performance :-**2.1 Designed capacity of each exhauster m<sup>3</sup>/sec

2.2 Normal discharge pressure

2.3 Efficiency

2.4 Rated speed

2.5 Performance guaranteed when installed as per given arrangement Yes/No

2.6 Exhauster b. h. p. / KW at rated capacity

**3.0 Material of construction**

3.1 Casing

3.2 Rotor and blades

3.3 Base plate

3.4 Wearing rings

3.5 Type of bearings used

3.6 Type of coupling

3.7 Type Of Packing

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हस्ताक्षर एवं दिनांक  
SIGN & DATEसामग्री सूची संख्या  
INVENTORY NO.

REV. NO.

06

निर्माणकर्ता  
WORKED BY

V. RAWAT

जांचकर्ता  
CHECKED BY

P.KUMAR

22/9/15

22/9/15

दिनांक एवं हस्ताक्षर  
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PRODUCT STANDARD  
( STEAM TURBINE ENGINEERING)

ST- 39004

पृष्ठ 15 का 09

Page 09 of 15

सामग्री सूची संख्या  
को अधिकतम करता है

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हस्ताक्षर एवं दिनांक  
SIGN & DATE

- 4.0 **Connections:-**
- 4.1 Suction size
- 4.2 Discharge size
- 5.0 **Drawings:** - General arrangement and sectional drgs. Enclosed with offer Yes/No
- 6.0 **Weight schedule:-**
- 6.1 Weight of exhauster
- 6.2 Weight of motor
- 6.3 Weight of exhauster with motor and base frame
- 7.0 **Characteristic curves :-**
- 7.1 Power consumption / Discharge pressure
- 7.2 Discharge quantity / pressure
- 7.3 Discharge / efficiency
- 8.0 Any deviation taken against specification Yes/No
- 9.0 Deviations taken as mentioned here


सामग्री सूची संख्या  
INVENTORY NO.  
P-5135

REV. NO.  
06

निर्माणकर्ता  
WORKED BY  
V. RAWAT

जांचकर्ता  
CHECKED BY  
P.KUMAR

22/09/15  
22/9/15

दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना		<p style="text-align: center;"><b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING )</p>	<p style="text-align: right;"><b>ST- 39004</b></p> <p style="text-align: right;">पृष्ठ 15 का 10 Page 10 of 15</p>
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	SUPERSEDES INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना		<p style="text-align: right;">ANNEXURE-2</p> <p><b><u>MOTOR DATA SHEET TO BE FURNISHED AFTER PLACEMENT OF PO FOR APPROVAL</u></b></p> <p><b>1. GENERAL</b></p> <p>i) Vendor document no. and revision no./date :-----</p> <p>ii) Project :-----</p> <p>iii) Customer :-----</p> <p>iv) BHEL- P.O. no. and date :-----</p> <p>v) Manufacturer :-----</p> <p>vi) Equipment driven by motor :-----</p> <p>vii) Motor type :-----</p> <p><b>2. DESIGN AND PERFORMANCE DATA</b></p> <p>i) Frame size :-----</p> <p>ii) Type of duty :-----</p> <p>iii) Type of enclosure :-----</p> <p>iv) Type of cooling ( IC ) :-----</p> <p>v) Applicable standard to which motor conforms :-----</p> <p>vi) Enclosure degree of protection ( IP ) :-----</p> <p>vii) Type of mounting :-----</p> <p>viii) Direction of rotation as viewed from non-driving end :-----</p> <p>ix) KW rating at 50<sup>0</sup>c of ambient temp. :-----</p> <p>x) Rated voltage ( volts ) :-----</p> <p>xi) Rated frequency ( Hz ) :-----</p> <p>xii) Permissible variation of :</p> <p>a) Voltage ( Volts ) :-----</p> <p>b) Frequency ( Hz ) :-----</p> <p>c) Combind voltage and frequency ( absolute value ) :-----</p> <p>xiii) Minimum permissible starting voltage ( volts ) :-----</p>
दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।			
दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना			
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दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना			
दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना			
दिनांक एवं हस्ताक्षर SIGN & DATE  सामग्री सूची संख्या INVENTORY NO.  सामग्री सूची संख्या को अधिकृतित करना			

**उत्पाद मानक**  
**PRODUCT STANDARD**  
**( STEAM TURBINE ENGINEERING )**

**ST- 39004**

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सामग्री सूची संख्या को अधिकृतित कराया है

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हस्ताक्षर एवं दिनांक  
 SIGN & DATE

- xiv) Rated speed at rated voltage and frequency ( RPM ) :-----
- xv) At rated voltage and frequency:
  - a. Full load current :-----
  - b. No load current :-----
- xvi) Power factor at :
  - a. 100% load
  - b. 75% load
- xvii) Efficiency at rated voltage and frequency at
  - a. 100% load :-----
  - b. 75% load :-----
- xviii) Starting current ( amps ) at
  - a. 100% voltage :-----
  - b. 80% voltage :-----
- xix) Starting time at 100% and 80% of rated voltage :-----
- xx) Safe stall time with 110% of rated voltage :
  - a. from hot condition :-----
  - b. from cold condition :-----
- xxi) Torques :
  - a. starting ( Kg-meter ) at 80% voltage :-----
  - b. pull up ( Kg-meter ) :-----
  - c. pull out ( Kg-meter ) :-----
  - d. rated torque ( Kg-meter ) :-----
- xxii) Stator winding resistance per phase ( ohms ) :-----
- xxiii) Flywheel moment ( GD<sup>2</sup> ) of motor ( Kg-m<sup>2</sup> ) :-----

सामग्री सूची संख्या  
 INVENTORY NO.  
 P- 5135




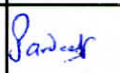
REV. NO.  
 06

निर्माणकर्ता  
 WORKED BY  
 V. RAWAT

जांचकर्ता  
 CHECKED BY  
 P.KUMAR

*(Signature)*  
 22/09/15

*(Signature)*  
 22/9/15

दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING )		<b>ST- 39004</b> पृष्ठ 15 का 12 Page 12 of 15		
SUPERSEDES INVENTORY NO.  सामग्री सूची संख्या को अधिकतम करता क	<b>3. CONSTRUCTIONAL FEATURE :</b> i) <u>STATOR WINDING INSULATION:</u> a. Class :----- b. Tropicalised ( yes / no ) :----- c. Temperature rise over specified ambient of 50 <sup>0</sup> c, max 70 <sup>0</sup> c ( yes / no ) :----- d. Method of temp. measurement :----- e. Stator winding connection :----- f. Number of terminals brought out :----- ii) <u>FOR SPACE HEATER:</u> a. Type of terminal box and degree of protection :----- b. No. of space heaters :----- c. Location :----- d. Rated voltage & power :----- e. Double compression cable glands with lugs provided ( yes / no ) :----- f. Suitable for cable size :----- iii) <u>FOR MAIN TERMINAL BOX :</u> a. Type of terminal box & degree of protection :----- b. Double compression cable glands & lugs provided ( yes / no ) :----- c. Suitable for cable size :----- d. Terminal box capable of being rotated through 180 <sup>0</sup> in steps of 90 <sup>0</sup> ( yes / no ) :----- e. Fault level (KA, sec.) :-----					
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<b>स्वाधिकार एवं गोपनीय</b> इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आरक्षण अन्य से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए						
दिनांक एवं हस्ताक्षर SIGN & DATE 						
सामग्री सूची संख्या INVENTORY NO. <b>P 5135</b>	<b>REV. NO.</b> <b>06</b>		निर्माणकर्ता WORKED BY	V. RAWAT		22/09/15
			जांचकर्ता CHECKED BY	P.KUMAR		22/09/15

दिनांक एवं हस्ताक्षर  
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**उत्पाद मानक**  
**PRODUCT STANDARD**  
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SUPERSEDES  
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NO.

सामग्री सूची संख्या  
को अधिकतम करता है

iv) BEARINGS :

- a. Type ( at DE / NDE ) :-----
- b. Make :-----
- c. Recommended lubricant :-----
- d. Life :-----

v) STARTING SUITABLE FOR :

- a. DOL only ( yes / no ) :-----
- b. DOL as well as star-delta ( yes / no ) :-----

vi) TOTAL WEIGHT OF MOTOR ( KG ): :-----

- 4. i) Noise level :-----
- ii) Vibration level :-----
- iii) Paint materials, thickness, color :-----

Note : Supplier / vendor shall get the confirmation about paint from BHEL before manufacturing of motor.

5. DOCUMENTS :

- i) Motor GA / dimensional drawings including terminal boxes :----- drg.no. :- -----
- ii) CURVES AT RATED VOLTAGE :
  - a. Starting current –vs- time curve :----- drg. no. :- -----
  - b. Speed –vs- starting time curve :----- drg.no. :- -----
  - c. Torque –vs- speed curve :----- drg.no. :- -----
  - d. Speed –vs- current curve :----- drg.no. :- -----
  - e. Thermal withstand curve for hot and cold conditions. :----- drg. no. :- -----

**CROSS REFERRED STANDARDS:- ISO VG 46**

- IS : 4722, IS : 325, IS: 2223, IS: 4029, IS: 4691
- IS : 2148, IS : 3202, IS : 12075, ISO: 1940, IS: 12615-2011

दिनांक एवं हस्ताक्षर  
SIGN & DATE

*[Signature]*  
22/09/15

सामग्री सूची संख्या  
INVENTORY NO.

*P. 5135*

REV. NO.  
**06**

निर्माणकर्ता WORKED BY	V. RAWAT	<i>[Signature]</i>	22/09/15
जांचकर्ता CHECKED BY	P.KUMAR	<i>[Signature]</i>	24/9/15

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उत्पाद मानक  
**PRODUCT STANDARD**  
( STEAM TURBINE ENGINEERING)

ST- 39004

पृष्ठ 15 का 14

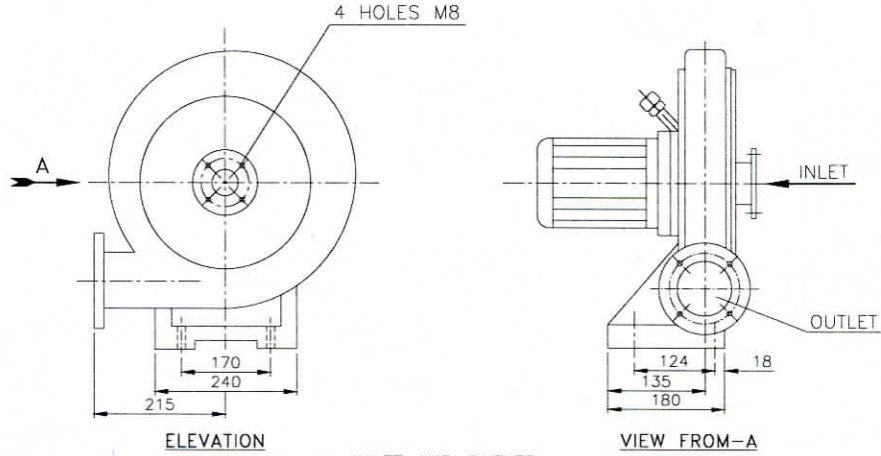
Page 14 of 15

SUPERSEDES  
INVENTORY  
NO.

सामग्री सूची संख्या  
को अधिकृतित करता है

ANNEXURE-3

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INLET AND OUTLET  
CONNECTION NB100  
OUT SIDE DIA 165  
BOLT CIRCLE DIA 139

VAR. 01

स्वाधिकार एवं गोपनीय  
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हस्ताक्षर एवं दिनांक  
SIGN & DATE

सामग्री सूची संख्या  
INVENTORY NO.  
A. 5135

REV. NO.  
06

निर्माणकर्ता WORKED BY	V. RAWAT
जांचकर्ता CHECKED BY	P. KUMAR

*Handwritten signatures and dates:*  
V. Rawat 22/09/15  
P. Kumar 24/9/15

दिनांक एवं हस्ताक्षर  
SIGN & DATE



# उत्पाद मानक PRODUCT STANDARD ( STEAM TURBINE ENGINEERING )

ST- 39004

पृष्ठ 15 का 15

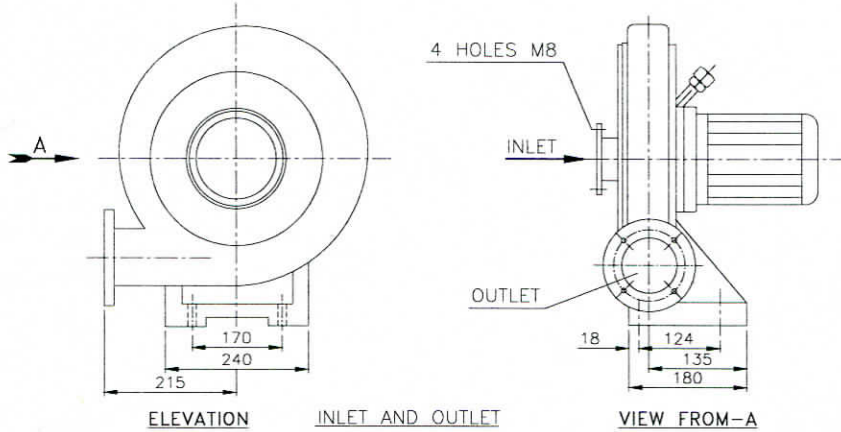
Page 15 of 15

SUPERSEDES  
INVENTORY  
NO.

सामग्री सूची संख्या  
को अधिकृतित करता  
है

ANNEXURE-4

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INLET AND OUTLET  
CONNECTION NB100  
OUT SIDE DIA 165  
BOLT CIRCLE DIA 139

VAR.02

**स्वत्वाधिकार एवं गोपनीय**  
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हस्ताक्षर एवं दिनांक  
SIGN & DATE

*[Handwritten signature]*  
26/9/15

सामग्री सूची संख्या  
INVENTORY NO.

P-5135

REV. NO.

06

निर्माणकर्ता  
WORKED BY

V. RAWAT

*[Handwritten signature]*

22/09/15

जांचकर्ता  
CHECKED BY

P.KUMAR

*[Handwritten signature]*

24/9/15

डॉक्यूमेंट सरवर पर मौजिद कर दी गई है।  
DOCUMENT RELEASED FROM SERVER/ CTA

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SIGN & DATE

डॉक्यूमेंट सरवर पर जमा कर दी गई है।  
DOCUMENT DEPOSITED IN SERVER

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SIGN & DATE

संशोधन प्रपत्र  
CHANGE ADVICE FORM



संशोधन सूचना संख्या  
CHANGE ADVICE NO.

जारीकर्ता विभाग  
ISSUING DEPTT.

उत्पाद का प्रकार  
TYPE OF PRODUCT

जीएमएस/जीआर  
रएसपी/सीबीएम सं  
GMS / GRSP  
/CBOM No.

मुद्रण दिनांक  
PRINT  
DELIVERY DATE

स्वीकृतिकर्ता  
APPROVED BY

592-20-20

TSX

Product STANDARD

13/02/2020

12/12/2020

19.8.5

अभिकल्प  
रचनाकर्ता सं.  
DESIGNATION  
(DRAWING  
No.etc) (7)

संशोधित  
पृष्ठ संख्या  
REV. NO.

संशोधन का  
कारण कोड  
CODE FOR  
REASON  
OF CHANGE

संशोधन का विवरण  
DETAILS OF REVISION

प्रकार मरद संख्या  
CHARGABLE  
HEAD NO.

सौभाग्य जीएमएस/  
जीआरएसपी को  
प्रकारांतर सं  
VARIANT NO. OF  
CBOM/GMS/GRSP

अन्य सौभाग्य  
जीएमएस/जीआरएसपी  
REMARKS

ROUTE  
(7a)

संशोधित  
पृष्ठ संख्या  
REV. NO.

संशोधन का  
कारण कोड  
CODE FOR  
REASON  
OF CHANGE

संशोधन का विवरण  
DETAILS OF REVISION

प्रकार मरद संख्या  
CHARGABLE  
HEAD NO.

सौभाग्य जीएमएस/  
जीआरएसपी को  
प्रकारांतर सं  
VARIANT NO. OF  
CBOM/GMS/GRSP

अन्य सौभाग्य  
जीएमएस/जीआरएसपी  
REMARKS

ST-39004

ALL

05

Standard Reaffirmed without change.

09

09

09

CODES FOR REASON OF CHANGES:- 01- ENGINEERING ERROR INCLUDING ADDITION OF VARIANT),03- DESIGN UPGRADATION (INCLUDING ADDITION OF VARIANT),04- TO MEET MANUFACTURING REQUIREMENTS, 05- TO MEET TECHNOLOGICAL MODIFICATIONS, 06- TO SUIT CUSTOMER DEMANDS, 07 TO SUIT STATUTORY REQUIREMENTS, 08 TO REPLACE DAMAGED/ TURN OUT ORIGINALS BY A FRESH ORIGINALS ,09- ANY OTHER

AGREED सहमति

(20)

नाम  
NAME

हस्ताक्षर  
SIGN

दिनांक  
DATE

अभिचारिकी  
ENG.

संशोधन  
TECHNOLO-  
GY

स्वास्थ्य  
QUALITY

विभाग एवं दूर  
विभाग  
J & T DEPTT.

निर्माणाधीन  
WORKED BY

नाम  
NAME

हस्ताक्षर  
SIGN

दिनांक  
DATE

अभिचारिकी  
ENG.

संशोधन  
TECHNOLO-  
GY

स्वास्थ्य  
QUALITY

जांचकर्ता  
CHECKED BY

नाम  
NAME

हस्ताक्षर  
SIGN

दिनांक  
DATE

अभिचारिकी  
ENG.

संशोधन  
TECHNOLO-  
GY

स्वास्थ्य  
QUALITY

मानक नियंत्रण  
STD CONTROL

नाम  
NAME

हस्ताक्षर  
SIGN

दिनांक  
DATE

अभिचारिकी  
ENG.

संशोधन  
TECHNOLO-  
GY

स्वास्थ्य  
QUALITY

जांचकर्ता  
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ENG.

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DATE

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ENG.

संशोधन  
TECHNOLO-  
GY

स्वास्थ्य  
QUALITY

**BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR**

Steam Turbine Engineering- Turbine Layout

**PRE-QUALIFICATION REQUIREMENT  
Lube Oil vapour Exhauster**DOCUMENT NO.  
TL/OVE/PQR/20240423  
Rev:00 Dt:23.04.24

3. In support of Clause No.1, vendor shall furnish their credential list, as per the following format.

S. No.	Detail of Item supplied	Name & address of customer	Contact Details of the customer (email & phone number etc.)	Purchase order reference no. and issue date	Continuous discharge capacity (m3/sec)	Discharge pressure (mmWC)	Type & rating of motor used
1	Oil Vapor Exhauster						
2	Oil Vapor Exhauster						

4. With reference to the projects executed as mentioned above in the table at Sl.no.3, Vendor to furnish following documents:

- Copy of Un-Priced Purchase Order executed.
- Approved GA drg.
- Unpriced dispatch documents e.g .LR, SRV, Invoice etc.
- Motor data sheet, wiring diagram, motor characteristics curve and GA drawing.

**Note** - BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.

---End of PQR---

Page 2 of 2

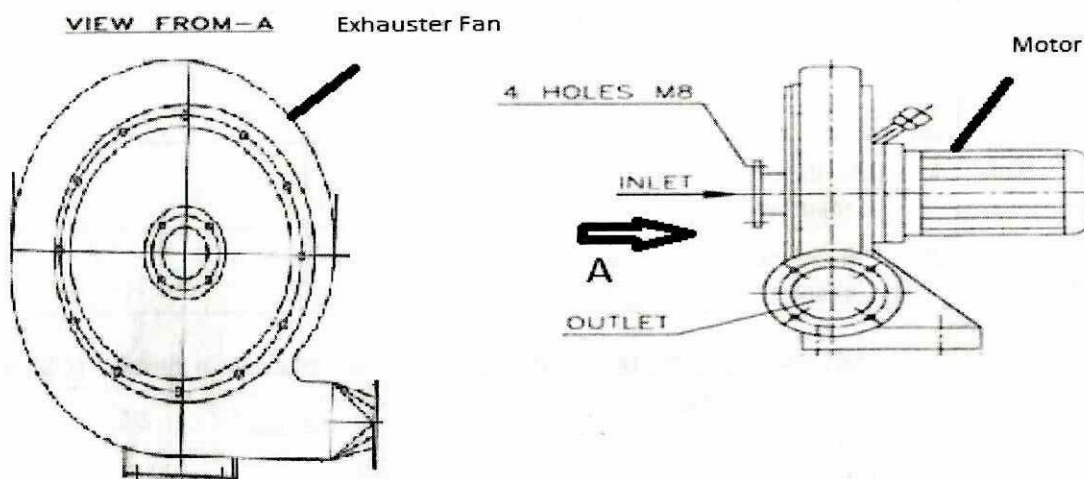
Deptt	Worked By	Checked By	Approved By
STE	H Gupta <i>H Gupta</i>	HSDOGRA <i>H Singh</i>	ANUJ JAIN <i>ANUJ</i>
CIE	L K MISHRA <i>L K Mishra</i>	SATISH KUMAR <i>Satish</i>	VINOD KUMAR <i>Vinod</i>



**PRE-QUALIFICATION REQUIREMENT**  
**Lube Oil vapour Exhauster**

DOCUMENT NO.  
**TL/OVE/PQR/20240423**  
Rev:00 Dt:23.04.24

**Description:** - Oil Vapor exhauster handles oil fumes generated during the running of the turbine. It shall also maintain a partial vacuum in the main oil tank and turbine bearing pedestal etc. The fumes to be handled by the exhauster contain free droplets of oil. Viscosity grade of the oil is ISO VG046. The vapour exhauster used in system is along with motor, coupling, base plate and other accessories. The Oil Vapour exhauster should be of very reliable and proven design to maintain the required parameters in line with system requirements under all conditions.



**Figure 1**

**Acceptance Criteria:-**

- Vendor or its principal should have manufactured, tested and supplied at least 2 nos. Oil vapor exhausters Fan along with electric motor in last 10 years from the date of issuance of enquiry (i.e. P.O. on or after 01.01.2014) with minimum following details – **Yes/No**.

Sl No.	Parameter	Value Range
1.	Continuous discharge capacity at operating point	0.05 to 0.20 m3/sec
2.	Nominal discharge pressure at operating point	Minimum 220 mmWC

- Vendor (Main pump supplier) or Sub vendor (Motor supplier) should have commissioned the Exhauster Fan with AC motor (squirrel cage induction motor suitable for direct-on-line starting with continuous duty type (S1)) of 415V-AC, (+/-10%), 50Hz (+/-5%) & absolute sum variation 10% with starting current limited to 600% + (tolerances) as per IS: 12615-2011/ IEC 60034... **Yes/No**.

Deptt	Worked By	Checked By	Approved By
STE	H Gupta <i>H Gupta 15/12/24</i>	HSDOGRA <i>H Singh</i>	ANUJ JAIN <i>anuj</i>
CIE	L K MISHRA <i>L K Mishra 15/12/24</i>	SATISH KUMAR <i>Satish</i>	VINOD KUMAR <i>Vinod 01/12/2024</i>

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	OIL VAPOUR EXHAUSTER		QP NO.	QA/BE/QP/307		ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
					DATED & REV	08.05.2024 00				M	B	N	
		DRG. NO.	AS PER PO										
		SPEC.	ST39004										
REV	AS PER PO			Page 1 of 2									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT							
1	2	3	4	5	6	7	8	9	D	10	11		

1.0	RAW MATERIAL												
1.1	CASING, IMPELLER, BLADES & BASE FRAME/ PLATE, SLEEVE, O-RING	CHEMICAL, MECHANICAL PROPERTIES & SIZE	MAJOR	TEST & MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	MTC	✓	P	V	V	
1.2	NUTS & BOLTS, LIFTING LUG & COUPLING	TRADE MARK & PRPERTY CLASS	MAJOR	VISUAL	100%	AS PER VENDOR'S PROCEDURE	AS PER VENDOR'S PROCEDURE	IR	✓	P	V	-	
1.3	AC INDUCTION MOTOR (Please specify make, degree of protection and rating)	ROUTINE & TYPE TESTS CERTIFICATE INCLUDING DEGREE OF PROTECTION AND EXPLOSION PROOFNESS	MAJOR	REVIEW	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	TC	✓	P	V	V	From BHEL Approved Sources
2.0	INPROCESS INSPECTION												
2.1	ALL WELDS	QUALITY OF WELDS	MAJOR	DPT/MPT	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	IR	✓	P	V	-	NOTE:1
2.2	IMPELLER	DIMENSIONS	MAJOR	MEASUREMENT	100%	ORDERING DWG	ORDERING DWG	IR	-	P	-	-	
		DIMENSIONS AFTER MACHINING	MAJOR	MEASUREMENT	100%	ORDERING DWG	ORDERING DWG	IR	-	P	-	-	
		DYNAMIC BALANCING	MAJOR	MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	TC	✓	P	V	V	
2.3	ASSEMBLY OF FAN	INTERNAL CLEARANCE BETWEEN IMPELLER & CASING	MAJOR	MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	IR	✓	P	V	-	
3.0	FINAL INSPECTION ON THE COMPLETE ASSEMBLY												
3.1		OVERALL DIMENSIONS	MAJOR	MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	TC	✓	P	W	W	

MANUFACTURER/ SUBCONTRACTOR		LEGEND: RECORDS IDENTIFIED WITH '✓' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.	FOR CUSTOMER USE	APPROVED BY
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION		
		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	OIL VAPOUR EXHAUSTER		QP NO.	QA/BE/QP/307							
			DATED & REV	08.05.2024 00									
		DRG. NO.	AS PER PO										
		SPEC.	ST39004										
REV	AS PER PO			Page 2 of 2									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS	
1	2	3	4	5	6	7	8	9	D	10		11	

3.2		PERFORMANCE (INCLUDING AIR DELIVERY, PRESSURE & POWER CONSUMPTION) & STRIP TEST	MAJOR	PERFORMANCE	100%	IS:4894/ ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IS:4894/ ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	TC	✓	P	W	W	
3.4		FAN SPEED, SMOOTH RUNNING, DIRECTION OF ROTATION	MAJOR	VISUAL	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IR	✓	P	W	V	
3.5		NOISE LEVEL	MAJOR	MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IR	✓	P	W	V	
3.6		VIBRATION	MAJOR	MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IR	✓	P	W	V	
3.7		APPEARANCE INCLUDING PAINT THICKNESS (DFT)	MAJOR	VISUAL & MEASUREMENT	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IR/TC		P	V	V	
3.8		COMPLIANCE OF TECHNICAL REQUIREMENTS	MAJOR	--	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	COC		P	V	-	
3.9		COMPLETION OF DOCUMENTS	MAJOR	PHYSICAL	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	DOCUMENTS	✓	P	V	-	
4.0	PACKING												
4.1		SOUNDNESS OF PACKING AGAINST TRANSIT DAMAGE	MAJOR	PHYSICAL	100%	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	INTERNAL RECORDS		P	-	-	

NOTE 1: WELDING TO BE DONE BY QUALIFIED WELDER AS PER ASME IX WPS AND PQR TO BE CHECKED BY INSPECTING AGENCY.  
NOTE 2: STRIP TEST SHALL BE CARRIED OUT IF ABNORMAL SOUND OBSERVED DURING PERFORMANCE TEST

		LEGEND: RECORDS IDENTIFIED WITH '✓' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE
MANUFACTURER/ SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	APPROVED BY