

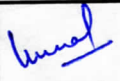
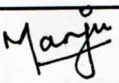

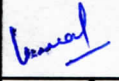
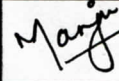

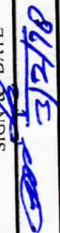
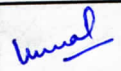
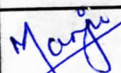
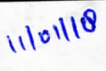
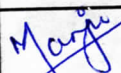
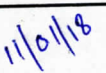


दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद क्रय विनिर्देश</b> <b>PRODUCT PURCHASE SPECIFICATION</b>	<b>TG60432</b>  पृष्ठ 8 का 1 <b>Page 1 of 8</b>																																										
SUPERSEDES INVENTORY NO.		Based on BHEL's own experience																																											
COPYRIGHT AND CONFIDENTIAL The information on this document 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.		<b><u>VAPOUR EXHAUSTER</u></b>																																											
स्वत्व अधिकार एवं गोपनीयता इस दस्तावेज में दी गई सूचना भारत भारती एलक्ट्रिकल लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रसारण केवल केवल के निर्देशों के बिना ही किया जायेगा।		<b>1.0 SCOPE AND APPLICATION:</b> This specification intended to cover design, manufacture, assembly testing & delivery of vapour exhauster, complete with motor, coupling, base plate and other accessories. The vapour exhauster is required to handle mixture of turbine oil vapours, air & H <sub>2</sub> and for creating partial vacuum in generator bearing chamber & oil tanks of Turbo-generators.																																											
सामग्री सूची संख्या INVENTORY NO.		<b>2.0 DESIGNATION:</b> The Vapour exhauster shall be designated as below: -																																											
दिनांक एवं हस्ताक्षर SIGN & DATE		<b>2.1 ON DRAWINGS INDENTS:</b> (1) Material specification column : TG-60432 (2) Description Column : Vapour Exhauster (3) Material Code Column : W 96415000578																																											
दिनांक एवं हस्ताक्षर SIGN & DATE		<b>2.2 ON ENQUIRES AND PURCHASE ORDER:-</b> In addition to incorporating the above details, a copy of the standard shall be enclosed along with enquiry.																																											
दिनांक एवं हस्ताक्षर SIGN & DATE		<b>3.0 TECHNICAL REQUIREMENTS:</b>																																											
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दिनांक एवं हस्ताक्षर SIGN & DATE		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:20%;"></td> <td style="width:20%;"></td> <td style="width:20%;"></td> <td style="width:20%;"></td> <td style="width:20%;">नाम NAME</td> <td style="width:20%;">दिनांक एवं हस्ताक्षर SIGNATURE &amp; DATE</td> </tr> <tr> <td>TSX</td> <td>D. CANGWAH</td> <td>अनुवादक TRANSLATED BY</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PSC Member</td> <td>R. K. SHARMA</td> <td>निर्माणकर्ता WORKED BY</td> <td>Kunal Mishra</td> <td></td> <td></td> </tr> <tr> <td>QAX</td> <td>PRETI</td> <td>जांचकर्ता CHECKED BY</td> <td>Manju Azad</td> <td></td> <td></td> </tr> <tr> <td>सहमत विभाग AGREED DEPT.</td> <td>नाम NAME</td> <td>पर्यवेक्षणकर्ता SUPERVISED BY</td> <td>R. L. VYAS</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center;">           SUPERSEDES            REV.NO. 04            Date 11.01.18            CHANGE ADVICE NO. TGE-18- 02         </td> <td colspan="2">           स्वीकृति            APPROVED : Rakesh Kumar (AGM/EME)            30-1-2018         </td> <td>           Gr. NO.            8.10         </td> </tr> <tr> <td colspan="3"></td> <td>निर्माणकर्ता PREPARED : EME</td> <td>जारीकर्ता ISSUED : TSX</td> <td>दिनांक DATE : 09.09.92</td> </tr> </table>						नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE	TSX	D. CANGWAH	अनुवादक TRANSLATED BY				PSC Member	R. K. SHARMA	निर्माणकर्ता WORKED BY	Kunal Mishra			QAX	PRETI	जांचकर्ता CHECKED BY	Manju Azad			सहमत विभाग AGREED DEPT.	नाम NAME	पर्यवेक्षणकर्ता SUPERVISED BY	R. L. VYAS			SUPERSEDES REV.NO. 04 Date 11.01.18 CHANGE ADVICE NO. TGE-18- 02			स्वीकृति APPROVED : Rakesh Kumar (AGM/EME) 30-1-2018		Gr. NO. 8.10				निर्माणकर्ता PREPARED : EME	जारीकर्ता ISSUED : TSX	दिनांक DATE : 09.09.92
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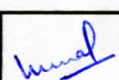
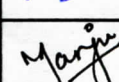
SIGN & DATE SUPERSEDES INVENTORY सामग्री सूची संख्या को अप्रतिबिम्बित करना है		उत्पाद क्रय विनिर्देश <b>PRODUCT PURCHASE SPECIFICATION</b>		<b>TG60432</b>	
				पृष्ठ 8 का 2 Page 2 of 8	
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	<b>3.2 DESIGN AND CONSTRUCTION OF VAPOUR EXHAUSTER</b>				
	<p> <b>3.2.1</b> The material of the exhauster shall be such as to resist corrosion and shall give long trouble free service.  <b>3.2.2</b> The design shall be such as to keep the friction and wear minimum caused by end thrust. Wear in mechanical seals bearings shall be minimum. The rotor of the exhauster shall be dynamically balanced as per ISO 1940, so that vibration of the exhauster is not greater than 25 micron peak to peak as per IEC 60034-14. The noise level shall not be greater than 85dB when measured at a distance of 1 meter from the base of the equipment, measurement should be done as per IEC 60034-9.  <b>3.2.3</b> Seals must comply with the following: -            (a) Easy access for maintenance work.            (b) No contamination of the medium from materials abraded from the seals.            (c) No seepage of lubricants into the flow medium.            (d) No leakage of gases outside in the atmosphere            (e) No seepage of oil toward, motor and outside along with the shaft.            (f) Shaft shall be sealed with grease lubricated axial seal as shown in the figure.  <b>3.2.4</b> Exhauster bearing shall be designed so as to ensure 50000 hours of continuous service.  <b>3.2.5</b> The exhauster shall be provided with a drain plug.  <b>3.2.6</b> Fan impeller is to be directly mounted onto rotor shaft as shown in the figure at page 8.  <b>3.2.7</b> The critical speed of the exhauster shall not lie within <math>\pm 30\%</math> of the operating speed (2820 rpm) of the exhauster.  <b>3.2.8</b> Minimum clearance between impeller &amp; casing shall be 2mm to ensure that there is no rubbing.  <b>3.2.9</b> The construction, mounting and base frame dimensions shall be generally as per figure at page 8.  <b>3.2.10 Materials of Construction:-</b>            (1) Casing : Carbon Steel as per IS:2062 E250 BR            (2) Impeller : Carbon Steel as per IS:2062 E250 BR            (3) Base Frame : Carbon Steel as per IS:2062 E250 BR            (4) Sleeve : Brass            (5) 'O' ring : Neoprene         </p>				
स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी एलिक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि सम्पत्ति के हित में हितकारक हो न किता जाय।	<b>3.3 MOTOR SPECIFICATIONS</b>				
	<p> <b>3.3.1 TYPE</b> : TEFC squirrel cage induction motor to IEC 60034-1  <b>3.3.2 KW rating</b> : 0.75kW  <b>3.3.3 Rated voltage</b> : 415 Volts, 3 phase, 50Hz  <b>3.3.4 Type of duty</b> : S1 (Continuous) as per IEC 60034-1  <b>3.3.5 Efficiency class</b> : Refer Variant Table as below         </p>				
SIGN & DATE सामग्री सूची संख्या P-5094	REV. NO. 04	निर्माणकर्ता WORKED BY Kunal Mishra	जांचकर्ता CHECKED BY Manju Azad		11/01/18
					11/01/18




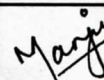


नमूना नं. SIGN & DATE		उत्पाद क्रय विनिर्देश <b>PRODUCT PURCHASE SPECIFICATION</b>		<b>TG60432</b>										
				पृष्ठ 8 का 3 Page 3 of 8										
SUPERSEDES INVENTORY	सामग्री नुमा नं. अतिरिक्त नं.	<table border="1"> <tr> <th>MATERIAL CODE OF VAPOUR EXHAUSTER ASSEMBLY</th> <th>EFFICIENCY CLASS OF MOTOR AS PER IEC- 60034-30</th> <th>STARTING CURRENT (IN % OF FULL LOAD CURRENT) + 20% (Tolerance as per IEC: 60034-1)</th> </tr> <tr> <td>W96415000578</td> <td>IE-2</td> <td>650</td> </tr> <tr> <td>W96415003127</td> <td>IE-3</td> <td>700</td> </tr> </table>				MATERIAL CODE OF VAPOUR EXHAUSTER ASSEMBLY	EFFICIENCY CLASS OF MOTOR AS PER IEC- 60034-30	STARTING CURRENT (IN % OF FULL LOAD CURRENT) + 20% (Tolerance as per IEC: 60034-1)	W96415000578	IE-2	650	W96415003127	IE-3	700
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bhuwal Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company		<p> <b>3.3.6</b> Permissible voltage variation : <math>\pm 10\%</math>  <b>3.3.7</b> Permissible Frequency variation : <math>\pm 5\%</math>  <b>3.3.8</b> Combined voltage &amp; frequency variation : <math>+ 10\%</math>  <b>3.3.9</b> Min. voltage required under starting : <math>85\%</math>  <b>3.3.10</b> Conditions to bring driven equipment to rated speed  <b>3.3.11</b> Starting Torque : Min. 1.3 times the rated torque.  <b>3.3.12</b> Breakdown torque : Min. 2 times the rated torque.  <b>3.3.13</b> Starting : DOL  <b>3.3.14</b> Acceleration time with full load connected: <math>3.5 + 0.5</math> sec.  <b>3.3.15</b> Starting duty : 3 starts spread over on hour and 2 consecutive          starts from hot  <b>3.3.16</b> Condition without injurious heating to the winding.  <b>3.3.17</b> Overload capacity : Motor shall be capable of running at full load          with 80% of rated  <b>3.3.18</b> Voltage for 10min. and 70% of rated voltage for 1 min.  <b>3.3.19</b> Class of insulation : 'F' with temperature limited to Class B (<math>70^\circ\text{C}</math>)  <b>3.3.20</b> Ventilation : Totally enclosed &amp; fan cooled  <b>3.3.21</b> Enclosure protection : IP 55 as per IEC 60034-5  <b>3.3.22</b> Explosion proof : Group II T4 as per IEC 60079  <b>3.3.23</b> Bearing : as per suppliers design. Life not less than 50000hrs.  <b>3.3.24</b> Earthing : Suitable arrangement to be provided at 2 places.  <b>3.3.25</b> Terminal box : Terminal box shall be explosion proof as per Group II T4          IEC 60079.  <b>3.3.26</b> Cable gland also to be provided in terminal box for 3 core Aluminium          cable.  <b>3.3.27</b> Fault level : 50 KA for 1 sec.       </p>												
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है। इसका उपयोग एवं प्रसारण बिना इस विनिर्देश के बिना की जाने वाली है। इससे नुकसान हो न किता होगा।		<p> <b>4.0 PUMP DATA SHEET (TO BE FURNISHED ALONGWITH OFFER :</b>  <b>4.1</b> Capacity M3 / Sec. :  <b>4.2</b> Head MWC :  <b>4.3</b> Efficiency :  <b>4.4</b> Rated speed :  <b>4.5</b> Exhauster B.H.P. / kw at Rated Capacity :  <b>4.6</b> Material: Casing Impeller base Frame 'o' ring :  <b>4.7</b> Type of bearing used :  <b>4.8</b> Type of coupling :  <b>4.9</b> Type of Sealing :  <b>4.10</b> Suction size :  <b>4.11</b> Discharging size :       </p>												
सामग्री नुमा नं. INVENTORY NO.	REV. NO. 04	निर्माणकर्ता WORKED BY	Kunal Mishra		11/01/18									
P-5894		जांचकर्ता CHECKED BY	Manju Azad		11/01/18									


ब. हस्ताक्षर SIGN & DATE				उत्पाद क्रय विनिर्देश PRODUCT PURCHASE SPECIFICATION		TG60432	
SUPERSEDES INVENTORY		सामग्री सूची संख्या को अतिरिक्तित्व करता है		पृष्ठ 8 का 4 Page 4 of 8			
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.		4.12 Wt. of exhauster with motors base frame 4.13 Wt. of exhauster 4.14 General assy. & cross sectionals drawing enclosed with offer 4.15 Capacity Vs discharge pressure curve enclosed 4.16 Power consumption Vs discharge pressure curve enclosed 4.17 Capacity Vs efficiency curve enclosed  <b>5.0 MOTOR DATA SHEET (TO BE FURNISHED ALONG WITH OFFER)</b> 5.1 Manufacturer 5.2 Type 5.3 Frame size 5.4 Power absorbed by exhauster at duty point (kW) 5.5 Rated power (kW) 5.6 Duty cycle 5.7 Rated voltage 5.8 No. of phase 5.9 Frequency 5.10 Allowable voltage variation 5.11 Allowable frequency variation 5.12 Allowable voltage & frequency variation 5.13 Current 5.14 Rated speed (RPM) 5.15 Full load efficiency 5.16 Full load power factor 5.17 Method of starting 5.18 Max. starting current 5.19 Class of insulation 5.20 Starting torque 5.21 Max. torque 5.22 Safe stall time a. Under hot condition b. Under cold condition 5.23 Type of enclosure 5.24 Enclosure protection 5.25 Frequency of starting 5.26 Temp. rise above 500C 5.27 By resistance method By thermometer method 5.28 Type & no. of terminals brought out 5.29 Type of connection during continuous running 5.30 Type and size of cable for when gland is provided in the terminal box. 5.31 Guaranteed min. voltage read at non terminals 5.32 System of earthing					
स्वीकृतिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है. इसका प्रयोग एवं प्रसारण केवल केवल के लिए ही किया जाना है. अन्य किसी भी उद्देश्य के लिए इसका उपयोग नहीं किया जा सकता.		निम्न पर हस्ताक्षर SIGN & DATE 		REV. NO. 04			
सामग्री सूची संख्या INVENTORY NO. 		निर्माणकर्ता WORKED BY Kunal Mishra					
		जांचकर्ता CHECKED BY Manju Azad					



दिनांक एवं तिथि SIGN & DATE		उत्पाद क्रय विनिर्देश <b>PRODUCT PURCHASE SPECIFICATION</b>	<b>TG60432</b>	
			पृष्ठ 8 का 5 Page 5 of 8	
सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY	5.33 Relevant standard : 5.34 Motor GD2 Valve : 5.35 Type of bearings (DE) : 5.36 Type of bearings (NDE) : 5.37 Type of lubricant : 5.38 Frequency of lubrication : 5.39 Wt. of motor : 5.40 Insulation class :		
स्वत्वाधिकार एवं गोपनीय The information on this document 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.	<b>6.0 QUALITY ASSURANCE, INSPECTION AND TESTING.</b> 6.1 The manufacture shall conduct all tests required to ensure that the exhaustor conforms to the requirements of application codes and standards. 6.2 The bidder shall submit the particulars of proposed shop tests along with procedures for information. 6.3 The equipment shall be dispatched only after inspection and clearance by BHEL / owner. 6.4 The min. tests checks to be carried out on vapour exhaustor, as envisaged by BHEL are given below:-   6.4.1 The material of Casing, Impeller, Base frame, Sleeve & O Ring shall be tested as per relevant standard for the chemical composition and mechanical properties.   6.4.2 <b>TESTS DURING VARIOUS STAGE OF MANUFACTURING</b> 1) Check for dimension and finish of the components. 2) D.P.T on all welding as per ASME section VIII. 3) Dynamic balancing of impeller as per ISO 1940 Gr. 6.3.   6.4.3 <b>FINAL TESTS:</b> - Following tests shall be carried out:- 1) Flow rate of air 2) Vibration test as per IEC 60034-14. 3) Noise : shall not be greater than 85dB when measured at a distance of 1 meter from the base of the equipment, measurement should be done as per IEC 60034-9 4) Speed 5) Dimensional check 6) Smooth running 7) Performance test as per ISO:5801   6.4.4 Type & Routine tests on motor as per IEC:60034-1   6.4.5 Vendor to furnish the test certificates for the following 1) Motor Enclosure certificate as per IP 55 as per IEC 60034-5 2) Explosion proof certificate for motor for Group II T4 as per IEC60079 3) Certificate for enclosure of Terminal box for explosion proof as per Group II T4 IEC 60079. 4) Certificate for minimum clearance of 2mm between impeller & casing.			
सामग्री सूची संख्या INVENTORY NO.	REV. NO. 04	निर्माणकर्ता WORKED BY	Kunal Mishra	
सामग्री सूची संख्या INVENTORY NO.		जांचकर्ता CHECKED BY	Manju Azad	

न संख्या SIGN & DATE		उत्पाद क्रय विनिर्देश <b>PRODUCT PURCHASE SPECIFICATION</b>		<b>TG60432</b>	
				पृष्ठ 8 का 6 Page 6 of 8	
SUPERSEDES INVENTORY	<p>6.4.6 After testing the exhauster, all the surface and internal shall be thoroughly cleaned, dried and conserved. All the metallic surface except bright parts exposed to weather shall be given suitable primary coating.</p> <p><b>7.0 DOCUMENTS TO BE FURNISHED AT THE TIME OF OFFER</b></p> <p>7.1 Assembly drawings part list, nozzle size, their coordinates base plate details etc.</p> <p>7.2 Technical data sheet of pump as per clause 4.</p> <p>7.3 Technical data sheet of motor as per clause 5.</p> <p>7.4 Performance curves.</p> <p>7.5 Quality plan in BHEL format, incorporating checks/tests at material stages, in process &amp; final testing.</p> <p>7.6 Clause wise confirmations of specification TG60432.</p> <p><b>8.0 DOCUMENT TO BE SUPPLIED</b></p> <p><b>8.1 AFTER PLACEMENT OF ORDER</b></p> <p>8.1.1 G.A. drawing with parts list &amp; material details.</p> <p>8.1.2 Final quality plan.</p> <p><b>8.2 DOCUMENT FOR FINAL SUBMISSION</b></p> <p>8.2.1 Performance curves.</p> <p>8.2.2 Test certificates for all test checks in clause 6.4 shall be furnished.</p> <p><b>9.0 CLEANING, PAINTING, CONSERVATION AND PACKING</b></p> <p>The surface shall be cleaned and prepared for application of paint by shot blasting. The protective coating should be oil resistant. After testing the exhauster, its internals shall be thoroughly cleaned, dried and conserved before packing. The exhauster packing shall be strong enough to safeguard against any damage during transit. The exhauster shall be packed such that it is safe for at least 2 year of storage in damp atmosphere.</p> <p><b>10.0 GUARANTEE</b></p> <p>10.1 The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 12 months after commissioning at site or 18 months from the date of dispatch, whichever is earlier.</p> <p>10.2 The supplier shall guarantee the tested capacity head and capacity of the exhauster.</p> <p>10.3 The supplier shall repair /replace the defective parts at his own cost during the guarantee period.</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.	स्वामित्विकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती लिमिटेड की संपत्ति है। इसका प्रयोग एवं प्रसारण केवल इसी उद्देश्य के लिए ही किया जा सकता है। इस दस्तावेज में दी गई सूचना को किसी भी तरह से बिना अनुमति के प्रसारित नहीं किया जा सकता।				
न संख्या SIGN & DATE					
न संख्या INVENTORY NO.	REV. NO. 04	निर्माणकर्ता WORKED BY	Kunal Mishra		11/01/18
न संख्या INVENTORY NO.	25894	जांचकर्ता CHECKED BY	Manju Azad		11/01/18



SIGN & DATE 11/01/18		उत्पाद क्रय विनिर्देश <b>PRODUCT PURCHASE SPECIFICATION</b>		<b>TG60432</b> पृष्ठ 8 का 7 Page 7 of 8	
SUPERSEDES INVENTORY सामग्री सूची संख्या को अधिस्थान करता है	<b>11.0 IDENTIFICATION</b> A name plate of stainless steel with following information engraved on it, shall be affixed to the equipment at appropriate location – <ul style="list-style-type: none"> <li>- Item description</li> <li>- Manufacturer's name</li> <li>- Year of manufacturing</li> <li>- Sl. No.</li> <li>- Main technical parameters i.e. Flow rate, Discharge pressure, Speed, Flow Medium, operating temperature, Motor KW Rating.</li> <li>- BHEL specification no.</li> <li>- BHEL material code.</li> <li>- BHEL P.O. No.</li> </ul>				
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.	<b>12.0 GENERAL</b> Bidder shall furnish all the documents as per clause 7 of the specification along with offer. Any deviation shall be clearly spelled out. The offer may not be considered if all the technical particulars and information called for in the specification are not submitted along with the offer.				
स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है। इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह उपयोग ओ कि कंपनी के हित में हानिकारक हो न सिका जाए।	<b>13.0 CROSS REFERRED STANDARD</b> ISO 1940, ISO 5801 IEC 60034-14, IEC 60034-9, IEC 60034-1, IEC 60034-5, IEC 60079 IS:2062				
SIGN & DATE 11/01/18					
सामग्री सूची संख्या INVENTORY NO. P-5896	REV. NO. 04		निर्माणकर्ता WORKED BY Kunal Mishra	जांचकर्ता CHECKED BY Manju Azad	11/01/18 11/01/18

## PRODUCT PURCHASE SPECIFICATION



बं हस्ताक्षर  
SIGN & DATE

**SUPERSEDES  
INVENTORY**

सामग्री मूची संख्या को अधिकमित करता है

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स्वत्वाधिकार एवं गोपनीय

इस प्रवेश में ही गई सूचना भारत हेवी एलस्ट्रिकल्स की मरम्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाय।

दिनांक एवं हस्ताक्षर

SIGN &amp; DATE

सामग्री सूची संख्या  
INVENTORY NO.

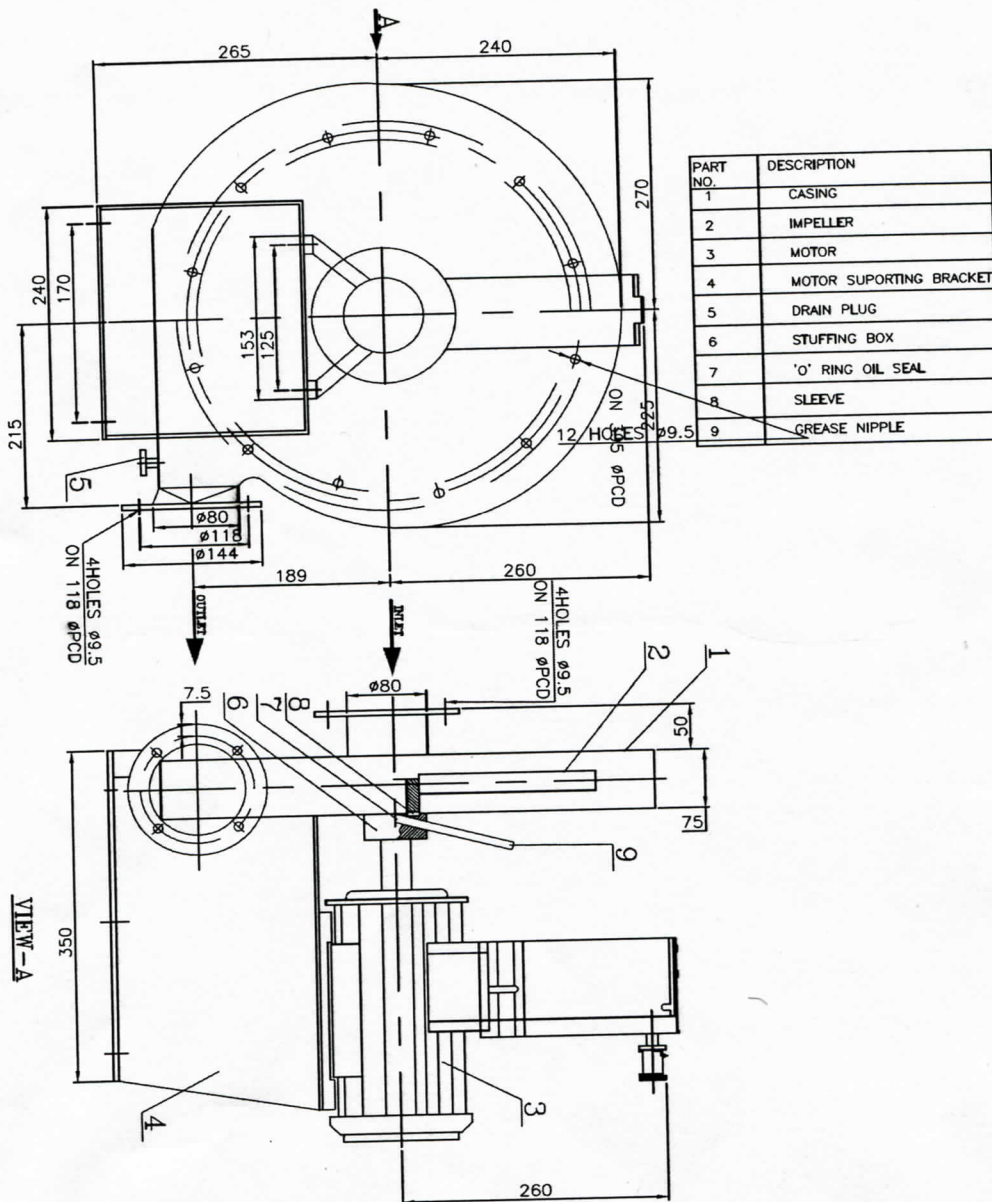
REV. NO. 04

निर्माणकर्ता  
WORKED BY

**Kunal Mishra**

जांचकर्ता  
CHECKED BY

**Manju Azad**





MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	VAPOUR EXHAUSTER	QP NO.	QA/BE/QP/306								
				DATED & REV	29.08.2013 03								
		DRG. NO.	AS PER PO										
		SPEC.	TG 60432										
		REV	AS PER PO		Page 1 of 2								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
									D	M	B	N	
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	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
2.0	INPROCESS INSPECTION											
2.1	ALL WELDS	QUALITY OF WELDS	MAJOR	DPT	100%	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	ORDERING SPEC. / BHEL APPD. DRG. / DATA SHEET	IR	✓	P	V	-
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	V

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

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	VAPOUR EXHAUSTER	QP NO.	QA/BE/QP/306								
				DATED & REV	29.08.2013 03								
		DRG. NO.	AS PER PO										
		SPEC.	TG 60432										
		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
									D	M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11

3.2		PERFORMANCE (INCLUDING AIR DELIVERY, PRESSURE & POWER CONSUMPTION)	MAJOR	PERFORMANCE	100%	IS:4894/ ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	IS:4894/ ORDERING SPEC. / BHEL APPD. DRG. & DATA SHEET	TC	✓	P	W	V	
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: All pages of the inspection documents shall be numbered in chronology with the QAP clauses, duly mentioning the corresponding QAP clause no. at the top of each page.

Note 3: One 'index' page containing the document descriptions, their page no's & QAP cl no. shall be attached upfront the inspection documents.

Note 4: For any spares item, apart from 'visual inspection' the 'interchangeability fitment certificate' or 'material TC' are to be submitted, with specific mentioning of the 'pert no/ item no of the approved GA/ x-sec drg.'.

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



**Mandatory Pre-Qualification requirements for Vapour Exhauster****Description**

The Vapour Exhauster is required to handle mixture of turbine oil vapours, air & H<sub>2</sub> and for creating partial vacuum in generator bearing chamber & oil tanks of Tubogenerators. Vapour exhauster shall comprise of Centrifugal fan, Squirrel cage induction motor, base frame for mounting and motor terminal box.

**Mandatory requirement for Pre-Qualification****1.0 Experience Requirement -**

The Vendor should be a regular manufacturer of such Vapour exhauster & should source motor set from regular manufacturer. Vendor should have supplied at least Three (3) nos. of vapour exhauster with motor in last Ten (10) years (from the date of issuance of enquiry) with following technical details –

Si No.	Parameter	Value
(i)	Exhauster & Motor Type	Centrifugal fan with squirrel cage 3 phase induction motor
(ii)	Flow medium	Mixture of Oil, Gases and Air.
(iii)	Material	Carbon Steel or Stainless steel
(iv)	Discharge Pressure	96 mmWC & above
(v)	Discharge Capacity	350 M3/Hr & above
(vi)	Motor Rating	0.75 KW & above
(vii)	Rated Speed	2820 RPM (approx)
(viii)	Rated Voltage	415V AC

In support of above, vendor to furnish information, as per the following format for previous supplied Vapour exhauster meeting the above technical requirement for the past Ten (10) years from the date of issuance of enquiry.

Si. No.	Purchase order reference no.	Purchase order issue date	QTY.	Motor KW rating	Discharge Pressure (mmWC)	Discharge Capacity (M3/Hr)

Vendor to submit the following documents as an evidence of acceptance of supplied Vapour exhauster, for the above mentioned successfully executed order -

- Vendor to furnish copy of Un-Priced Purchase Orders executed for supply of at least Three (3) nos. of vapour exhauster with motor in last Ten (10) years (from the date of issuance of enquiry).
- Vendor to furnish the test certificate for Exhauster fan & motor set as per relevant standard for any one of the PO submitted. The submitted test certificates should have co-relation with PO.
- Vendor to furnish supporting document for the evidence of final acceptance from End customer/Third Party of supplied vapour exhauster with motor for any one of the submitted PO's. Acceptance certificate should contain information like item details, Quantity accepted and should also have correlation with PO reference no.

**2.0** Vendor shall submit the proof of manufacturer i.e. Factory license, NSIC certificate

**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.

31/07/23  
Kunal Mishra  
(Manager-EME)

31.7.23  
K.C. Panda  
(SDGM-EME)