

















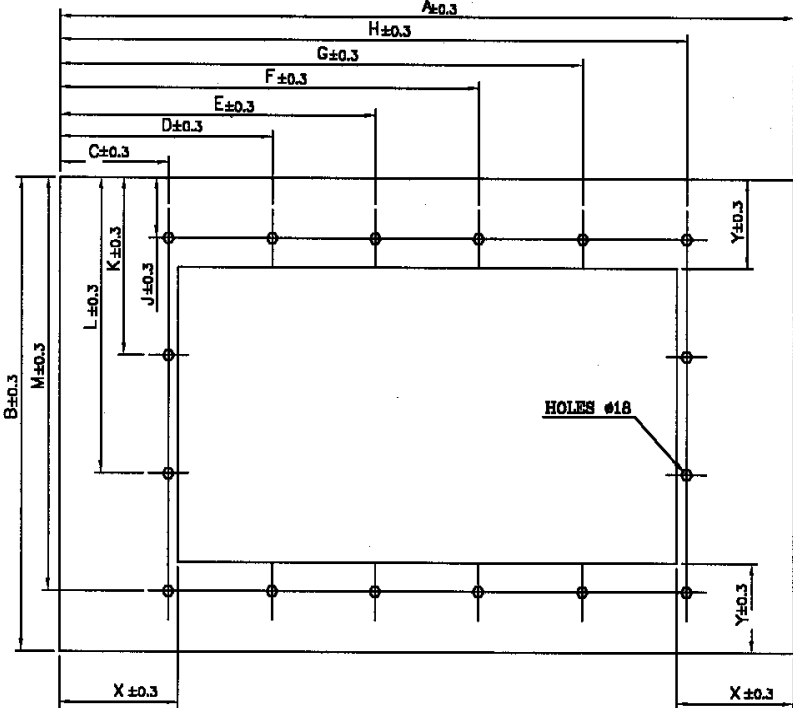
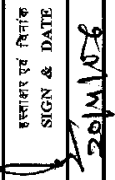


ध्वजांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक		ST- 39014																																											
		PRODUCT STANDARD ( STEAM TURBINE ENGINEERING )		पृष्ठ 6 का 1 Page 1 of 6																																											
SUPERSEDES INVENTORY NO.	TECHNICAL SPECIFICATION FOR AUXILIARY OIL PUMP SET ( CENTRIFUGAL PUMP )																																														
सामग्री सूची संख्या को अधिकृतित करना है	1.0 INTENT OF SPECIFICATION:- THIS SPECIFICATION IS INTENDED TO COVER DESIGN, MANUFACTURE, ASSEMBLY, TESTING AND DELIVERY OF PUMP SET COMPLETE WITH BASE PLATE, LIFTING LUGS, COUPLING, MOTOR AND OTHER ACCESSORIES IF FELT NECESSARY BY SUPPLIER. THE PUMPING SETS ARE INTENDED FOR OPERATION IN CONJUNCTION WITH STEAM TURBINES AND SHOULD BE SUITABLE FOR CONTINUOUS OPERATION AT AN AMBIENT TEMPERATURE OF 50°C + AVERAGE HUMIDITY 90% AND MAXIMUM HUMIDITY 100%.																																														
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	2.0 FUNCTION:- A.O.P. COMES IN OPERATION WHEN THE TURBINE IS INITIALLY STARTED AND WHENEVER PRESSURE IN THE LINE IS BELOW SET POINT, GOVERNING SYSTEM IS TO BE CHARGED AND LUBE OIL SUPPLY IS NEEDED FOR THE BEARING. THESE ARE TWO IN QUANTITY / SET. ONE PUMP IS KEPT AS STANDBY PUMP.																																														
स्वस्थितिधर एवं गोपनीय इस दस्तावेज में की गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी रूप में प्रयोग, जो कि कंपनी के हित में कारगरिक्त न किया जाए	3.0 APPLICABLE CODE/STANDARD:- IS:4722, IS:325, IS:2253, IS:2254, IS:3202, IS:4029.																																														
सामग्री सूची संख्या INVENTORY NO.	4.0 OIL SPECIFICATION:- THE OIL TO BE HANDLED BY THE PUMP IS SERVOPRIME-46 OR IOC 46 OF IOC BRAND AND TURBINOL-47 OF M/S HINDUSTAN PETROLEUM CORPORATION LTD. ( ISO VG 46 ). 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.)																																														
हस्ताक्षर एवं दिनांक SIGN & DATE	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td>नाम NAME</td> <td>दिनांक एवं हस्ताक्षर SIGNATURE &amp; DATE</td> </tr> <tr> <td></td> <td></td> <td></td> <td>अनुवादक TRANSLATED BY</td> <td>-</td> <td></td> </tr> <tr> <td>TSX</td> <td>AKCHATURVEDI</td> <td></td> <td>निर्माणकर्ता WORKED BY</td> <td>DHARAMPAL</td> <td>27/03/06</td> </tr> <tr> <td>QAX</td> <td>S.S. Chauhan</td> <td></td> <td>जांचकर्ता CHECKED BY</td> <td>ANUJ JAIN</td> <td>27/3/06</td> </tr> <tr> <td>सहमत विभाग AGREED DEPTT.</td> <td>नाम NAME</td> <td>दिनांक एवं हस्ताक्षर DATE &amp; SIGNATURE</td> <td>पर्यवेक्षणकर्ता SUPERVISED BY</td> <td>S.C.AGRawal</td> <td>27/3/06</td> </tr> <tr> <td colspan="3">         स्वीकृति APPROVED : (A.K.JAIN) AGM       </td> <td colspan="3">         जारी ISSUED :       </td> </tr> <tr> <td colspan="3">         REV.NO. 06 (SUPERSEDES) Dt. 07-04-06       </td> <td colspan="3">         निर्माण PREPARED : STE       </td> </tr> </table>									नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE				अनुवादक TRANSLATED BY	-		TSX	AKCHATURVEDI		निर्माणकर्ता WORKED BY	DHARAMPAL	27/03/06	QAX	S.S. Chauhan		जांचकर्ता CHECKED BY	ANUJ JAIN	27/3/06	सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	S.C.AGRawal	27/3/06	स्वीकृति APPROVED : (A.K.JAIN) AGM			जारी ISSUED :			REV.NO. 06 (SUPERSEDES) Dt. 07-04-06			निर्माण PREPARED : STE		
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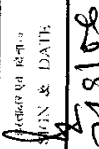
निर्माण एवं स्वीकृति SIGN & DATE			उत्पाद मानक <b>PRODUCT STANDARD</b> (STEAM TURBINE ENGINEERING)		<b>ST- 39014</b>	
					पृष्ठ 6 का 3 Page 3 Of 6	
SUPERSEDES INVENTORY NO.	6.4 KW ACTUALLY REQUIRED BY DRIVEN EQUIPMENT UNDER SPECIFIED OPERATION/ STARTUP CONDITIONS. : PUMP CAPACITY					
संपूर्ण सूची संख्या को प्रतिबिम्बित करता है	6.5 RATED VOTAGE : 415V FREQUENCY : 50 Hz					
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	6.6 PERMISSIBLE VOLTAGE AND FREQUENCY VARIATION UNDER NORMAL RUNNING CONDITIONS. : $\pm 10\%$ VOLT. $\pm 5\%$ FREQUENCY					
	6.7 COMBINED VARIATION : 10% (SUM OF ABSOLUTE VALUES)					
	6.8 MINIMUM VOLTAGE REQUIRED UNDER STARTING CONDITION TO BRING DRIVEN EQUIPEMENT UPTO RATED SPEED. : 80% RATED					
	6.9 NO. OF PHASES : 3 $\phi$					
	6.10 TYPE OF DUTY : CONTINUOUS					
	6.11 FULL LOAD SPEED : IT SHALL BE COMMENSURATE WITH PUMP SPEED AS PER DESIGN.					
	6.12 FULL LOAD CURRENT : AS PER DESIGN.					
	6.13 STARTING CURRENT : NOT TO EXCEED 600% OF RATED CURRENT (EXCLUSIVE OF IS TOLERANCES)					
	6.14 STARTING TORQUE : 1.3 (MIN.) OF RATED TORQUE.					
	6.15 BREAK DOWN TORQUE : 2.05 TIMES (MIN.) OF RATED VALUE.					
स्वतंत्राधिकार एवं गोपनीय यह प्रलेख में की गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रलेख एवं प्रलेखक को संपत्ति की सुरक्षा प्रयोग, जो कि कंपनी के हित में अधिकार रखे न किया जाए	6.16 EFFICIENCY AT FULL LOAD : 90% (MIN.)					
	6.17 POWER FACTOR AT FULL LOAD : 0.85% MINIMUM					
	6.18 MOTOR SHALL BE DESIGNED TO WITH STAND THE VOLTAGE AND TORQUE STRESSES DEVELOPED DUE TO THE DIFFERENCE BETWEEN THE MOTOR RESIDUAL VOLTAGE AND INCOMING SUPPLY VOLTAGE EQUAL TO 150% OF THE RATED MOTOR VOLTAGE DURING FAST CHANGEOVER OF BUSES.					
	7.0 <u>STARTING DATA:</u>					
	7.1 STARTING : SUITABLE FOR DOL STARTING.					
	7.2 ACCELERATION TIME WITH FULL LOAD : 3.5 $\pm$ 0.5 SECS.					
	7.3 LOCKED ROTOR WITHSTAND TIME UNDER HOT CONDITION AT RATED VOLTAGE SHALL BE AT LEAST 2.5 SEC. MORE THAN STARTING TIME.					
	7.4 PERMISSIBLE STARTING DUTY CYCLE : 3 STARTS EQUALLY SPREAD OVER NO. OF STARTS. HOUR AND 2 CONSECUTIVE STARTS FROM HOT CONDITION WITHOUT ANY INJURIOUS HEATING TO THE WINDING.					
	7.5 OVER LOAD ( % OF FULL LOAD ) THAT CAN BE CARRIED BY THE MOTOR WITHOUT IMPAIRING, OVERALL PERFORMANCE AND PERIOD FOR WHICH THIS OVERLOAD IS APPLICABLE. : MOTOR SHALL BE CAPABLE OF RUNNING AT FULL LOAD AT 80% OF RATED VOLTAGE FOR FIVE MINUTES AND 70% OF RATED VOLTAGE FOR 1 SEC.					
	7.6 LOCATION : INDOOR					
निर्माण एवं स्वीकृति SIGN & DATE 26/11/06	7.7 CLASS OF INSULATION : CLASS-F, FUNGUS RESISTANT, TROPICALISED AS PER IS:3202 WITH TEMP. RISE LIMITED TO THAT OF CLASS B.					
संपूर्ण सूची संख्या INVENTORY NO. P-5541	REV. NO. 06			निर्माणकर्ता WORKED BY DHARAMPAL		27/09/06
				जांचकर्ता CHECKED BY ANUJ JAIN		27/3/06

निम्नलिखित एवं दिनांक SIGN & DATE		<b>उत्पाद मानक</b> <b>PRODUCT STANDARD</b> <b>(STEAM TURBINE ENGINEERING)</b>		<b>ST- 39014</b> पृष्ठ 6 का 4 <b>Page 4 Of 6</b>	
		SUPERSEDES INVENTORY NO. 5541			
सभी सूची संख्या को अधिकारित करती है		7.8 SHAFT DISPOSITION MOUNTING : VERTICAL / FLANGE MOUNTED 7.9 METHOD OF CONNECTION DRIVEN EQUIPEMENT. : FLANGE FLEXIBLE COUPLING. 7.10 DIRECTION OF ROTATION AND CORRESPONDING TERMINAL DESIGNATION. : TO SUIT PUMP 7.11 ENCLOSURE AND VENTILATION : TOTALLY ENCLOSED FAN COOLED IP-55 7.12 BEARING : THRUST BEARING MIN. STANDARD LIFE OF NOT LESS THAN 30,000 WORKING HOURS. 7.13 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. 7.14 TERMINAL CONNECTORS FOR STATOR HEADS TYPE AND NUMBER. : 6 NEUTRAL SHALL BE CONNECTED EXTERNALLY IN THE TERMINAL BOX. 7.15 TERMINAL BOX : TERMINAL BOX SHALL BE PROVIDED WITH DOUBLE COMPRESSION TYPE BRASS CABLE GLANDS AND COPPER CABLE LUGS TO MATCH OWNER'S ALUMINIUM CABLES, THE SIZE OF WHICH WILL BE INTIMATED AT THE TIME OF ORDERING. TERMINAL BOX SHALL BE CAPABLE OF BEING ROTATED THROUGH 180° IN STEPS OF 90° AND IT SHALL HAVE A DEGREE OF PROTECTION OF IP:55. IT SHALL ALSO BE SUITABLE TO WITHSTAND THE FAULT LEVEL OF 50 KA FOR 0.25 SEC. 7.16 WHETHER PHASES SEGREGATED : NO 7.17 SPACE HEATER : TO BE PROVIDED 7.18 RATED VOLTAGE FOR SPACE HEATERS : 240 VOLTS 8.0 <u>SPECIAL REQUIREMENTS</u> 8.01 THE MOTOR SHALL BE RE-WOUNDABLE. 8.02 THE MOTOR SHALL HAVE ON LINE GREASING FACILITY. 8.03 THE MOTOR CONSTRUCTION SHALL BE SUITABLE FOR EASY DIASSEMBLY AND REASSEMBLY. 8.04 THE MOTOR SHALL BE SUITABLE FOR WORKING IN AN ENVIRONMENT OF OIL FUMES WITHOUT ANY HAZARD. 8.05 SEPARATE TERMINAL BOX FOR SPACE HEATERS SHALL BE PROVIDED. 8.06 MOTOR SHALL BE PAINTED WITH PAINT SUITABLE FOR WORKING CONDITION AND ITS COLOUR SHALL BE INTIMATED AT THE TIME OF ORDERING. 9.0 <u>TESTS AT MANUFACTURE'S WORKS:</u> (i) MOTOR AFTER COMPLETE ASSEMBLY SHALL BE SUBJECTED TO BOTH TYPE AND ROUTINE TESTS AS PER IS: 4722. (ii) IN ADDITION THE FOLLOWING TESTS SHALL ALSO BE CARRIED OUT:			
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		स्वतंत्राधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारी इलेक्ट्रिकल्स लि. की संपत्ति है। इसका प्रयोग एवं प्रसारण के बिना भारत भारी इलेक्ट्रिकल्स लि. की स्वीकृति के बिना नहीं किया जाये			
निम्नलिखित एवं दिनांक SIGN & DATE 20/11/06	REV. NO. 06				
सभी सूची संख्या INVENTORY NO. P-5541	निर्माणकर्ता WORKED BY DHARAMPAL	जांचकर्ता CHECKED BY ANUJ JAIN	27/03/08	27/3/08	




निर्माक एवं तिनांक SIGN & DATE		उत्पाद मानक <b>PRODUCT STANDARD</b> (STEAM TURBINE ENGINEERING)		<b>ST- 39014</b> पृष्ठ 6 का 5 Page 5 Of 6	
निर्माक एवं तिनांक SIGN & DATE	SUPERSEDES INVENTORY NO.	(a) <u>ADDITIONAL TYPE TEST:</u> DEGREE OF PROTECTION TEST TO CONFORM TO THE SPECIFIED DEGREE OF PROTECTION. (b) MEASUREMENT OF NOISE LEVEL AS PER IS: 12065. MOTOR NOISE LEVEL SHALL BE LIMITED SO AS TO ACHIEVE COMBINED PUMP MOTOR NOISE LEVEL AS PER CLAUSE 1.4 OF ST38013. <u>ADDITIONAL ROUTINE TESTS:</u> (a) 20% OVERSPEED TEST FOR 2 MINUTES. (b) MEASUREMENT OF VIBRATION AS PER IS: 12075.			
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		स्वत्वधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं प्रसारण के बिना या इसके बिना किसी भी रूप में प्रतिकारक हो न किया जाए	10.0 <u>DOCUMENTS TO BE SUPPLIED WITH OFFER:-</u> THE OFFER SHOULD BE ACCOMPANIED WITH FOLLOWING DOCUMENTS IN TWO COPIES. THE OFFER WILL NOT BE CONSIDERED IF ALL THESE DOCUMENTS ARE NOT SUPPLIED. 10.1 CHARACTERISTICS AT 80%, 100% AND 110% VOLTAGES. 10.1.1 STARTING CURRENT V/S TIME. 10.1.2 TORQUE V/S SLIP. 10.1.3 THERMAL WITHSTAND CHARACTERISTIC FOR HOT AND COLD CONDITION. 10.2 TYPE AND FRAME SIZE. 10.3 <u>STARTING TIME</u> 10.3.1 WITH 100% VOLTAGE AT TERMINAL. 10.3.2 WITH 80 % VOLTAGE AT TERMINAL. 10.4 SAFE STALL TIME AT 110% VOLTAGE UNDER HOT CONDITION. . 10.5 POWER (Kw) RATING CALCULATION W.R.T. PUMP REQUIREMENT. 10.6 EXPECTED LIFE OF BEARING. 11.0 <u>DOCUMENTS TO BE FURNISHED WITHIN FOUR WEEKS OF PLACEMENT OF ORDER (FOR BHEL OR THEIR CUSTOMER'S APPROVAL):-</u> 11.1 SIX HARD COPIES AND ONE SOFT COPY (IN PDF FORMAT) OF MOTOR DATA SHEET AND G.A. DRAWING. 11.2 DRAWING SHOWING TERMINAL DETAIL OF ALL TERMINALS AND LOCATION AND DIMENSION OF TERMINAL BOXES. 11.3 ROTOR WEIGHT AND TOTAL MOTOR WEIGHT. 11.4 CHARACTERISTIC CURVES OF THE MOTOR. 12.0 SIX COPIES OF TESTS CARRIED OUT AS PER CLAUSE NO. 9.0 ON EACH MOTOR SHALL BE FURNISHED TO BHEL FOR SCRUTINY AND APPROVAL. ONLY ON ACCEPTANCE FROM BHEL SIDE, MOTOR CAN BE CONSIDERED SUITABLE FOR DISPATCH. 13.0 FOR TECHNICAL DELIVERY CONDITON AND GENERAL FEATURES OF PUMP, PLEASE REFER ST38013. 14.0 <u>CROSS REFERRED STANDARDS:</u> IS:325, IS:4722, IS:2253, IS:2254, IS:3202, IS:4029, IS:12065, IS:12075, ST38013.		
निर्माक एवं तिनांक SIGN & DATE 26/11/06	REV. NO. 06		निर्माककर्ता WORKED BY DHARAMPAL		27/11/06
निर्माक एवं तिनांक SIGN & DATE P-5541			जांचकर्ता CHECKED BY ANUJ JAIN		27/11/06


निर्माक एवं प्रमाणित SIGN & DATE		उत्पाद मानक <b>PRODUCT STANDARD</b> (STEAM TURBINE ENGINEERING)		<b>ST- 39014</b>																																																																																																																																																																	
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धनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक 		ST-39015 पृष्ठ 6 का 1 Page 1 of 6	
सामग्री सूची संख्या को INVENTORY NO.		SUPERSEDES INVENTORY NO.		TECHNICAL SPECIFICATION FOR EMERGENCY OIL PUMP SET ( CENTRIFUGAL PUMP )	
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		1.0 INTENT OF SPECIFICATION:- THIS SPECIFICATION IS INTENDED TO COVER DESIGN, MANUFACTURE, ASSEMBLY, TESTING AND SUPPLY OF PUMP SETS COMPLETE WITH BASE PLATE, LIFTING LUGS, COUPLING, MOTOR WITH STARTING RESISTANCE AND OTHER ACCESSORIES IF FELT NECESSARY BY THE SUPPLIER. THE PUMPING SETS ARE INTENDED FOR OPERATION IN CONJUNCTION WITH STEAM TURBINES AND SHOULD BE SUITABLE FOR CONTINUOUS OPERATION AT AN AMBIENT TEMPERATURE 50°C & AVERAGE HUMIDITY 90% AND MAXIMUM HUMIDITY 100%.			
स्वत्वधिकार एवं गोपनीय इस दस्तावेज में की गई सूचना भारत की इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी प्रकार का उपयोग, जो कि कंपनी के हित में हानिकारक हो, न किया जाए		2.0 FUNCTION:- WHEN THERE IS AC POWER FAILURE, THIS PUMP COMES IN OPERATION WITH DC POWER SUPPLY. MAINLY THE FUNCTION OF THIS PUMP IS TO SUPPLY OIL TO BEARINGS SO AS TO SAVE THESE FROM STARVATION DURING EMERGENCY. THIS IS ONE IN QUANTITY/SET.			
		3.0 APPLICABLE CODE/STANDARD:- IS:2253, IS:2254, IS:3202, IS:4691, IS:4722 AND IS:4729.			
		4.0 OIL SPECIFICATION:- THE OIL TO BE HANDELED BY THE PUMP IS SERVOPRIME-46 OR IOC-46 OF IOC BRAND AND TURBINOL-47 OF M/S HINDUSTAN PETROLEUM CORPORATION LTD. (ISO VG-46). 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.)			
धनांक एवं दिनांक SIGN & DATE 21/08/06		CIE VINOD KUMAR		नाम NAME धनांक एवं हस्ताक्षर SIGNATURE & DATE	
INVENTORY NO. P-5540		TSX AKCHATURVEDI		अनुवादक TRANSLATED BY	
QAX S S Chauhan		निर्माणकर्ता WORKED BY		DHARAMPAL	
सहमत विभाग AGREED DEPTT.		जांचकर्ता CHECKED BY		ANUJ JAIN	
नाम NAME		पर्यवेक्षणकर्ता SUPERVISED BY		S.C. AGRAWAL	
दिनांक एवं हस्ताक्षर DATE & SIGNATURE		स्वीकृति APPROVED : (A.K.JAIN) AGM		दिनांक DATE : 03-08-84	
REV.NO. 04 (SUPERSEDES) DI. 31-08-06		निर्माण PREPARED : STE (TL/TA)		जारी ISSUED : TSX	

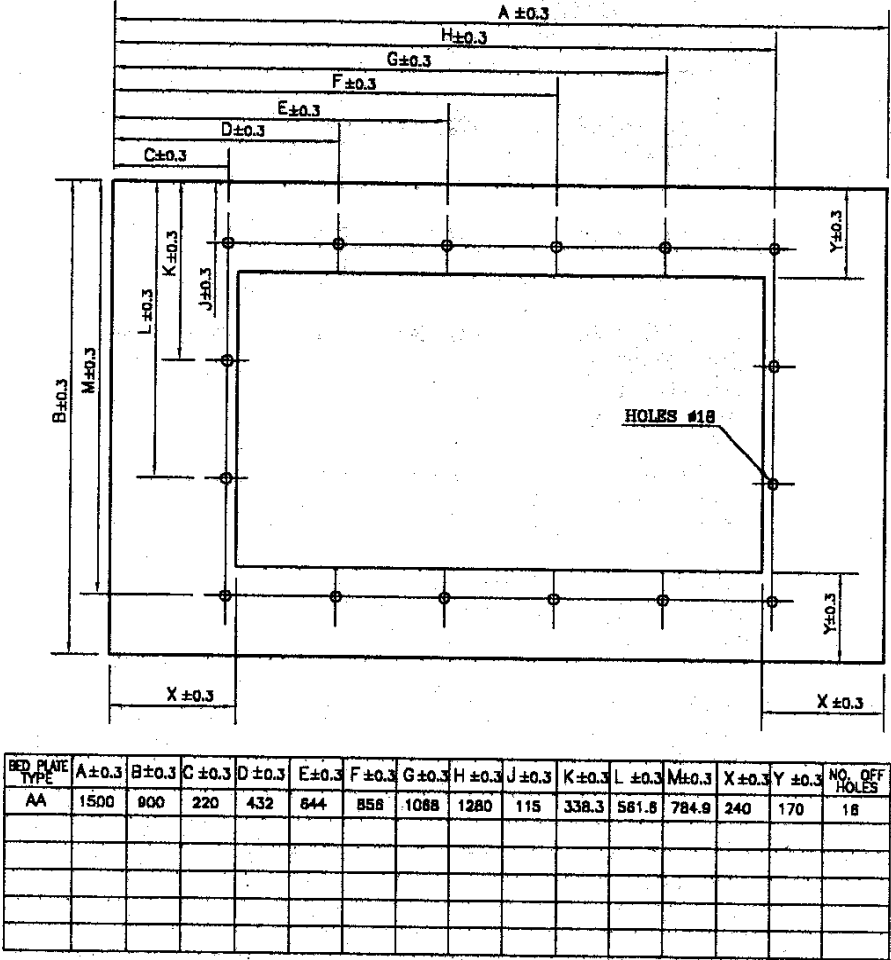
SIGN & DATE 		उत्पाद मानक <b>STEAM TURBINE ENGINEERING PRODUCT STANDARD</b>		<b>ST39015</b> पृष्ठ 6 का 2 Page 2 of 6																			
SUPERSEDES INVENTORY NO ग्राहक सूची सं. 501 (a) 501 (a) 501 (a)	5.0 <u>PUMP SPECIFICATION:-</u> 5.1 IDENTIFICATION NO. TO BE MENTIONED ON NAME PLATE MAV24AP001 5.2 <u>TYPE</u> <u>CENTRIFUGAL TYPE</u> DESIGN TEMPERATURE = 100°C OPERATING TEMPERATURE = 65°C NORMAL SUCTION PRESSURE = 0.05 Bar MINIMUM SUCTION PRESSURE = 0.025 Bar																						
<table border="1"> <thead> <tr> <th>VARIANT NUMBER</th> <th>NORMAL DISCHARGE CAPACITY ( Litre/Min. )</th> <th>NORMAL DISCHARGE PRESSURE ( Bar )</th> </tr> </thead> <tbody> <tr> <td>VAR. 1</td> <td>1800.00</td> <td>2.3</td> </tr> <tr> <td>VAR. 2</td> <td>1920.00</td> <td>1.7</td> </tr> <tr> <td>VAR. 3</td> <td>1200.00</td> <td>2.0</td> </tr> <tr> <td>VAR. 4</td> <td></td> <td></td> </tr> <tr> <td>VAR. 5</td> <td></td> <td></td> </tr> </tbody> </table>						VARIANT NUMBER	NORMAL DISCHARGE CAPACITY ( Litre/Min. )	NORMAL DISCHARGE PRESSURE ( Bar )	VAR. 1	1800.00	2.3	VAR. 2	1920.00	1.7	VAR. 3	1200.00	2.0	VAR. 4			VAR. 5		
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5.3 DURING INITIAL STARTUP IN WINTER OIL TEMPERATURE MAY GO AS BELOW AS 20°C. MOTOR SHALL BE CAPABLE OF STARTING AND CONTINUOUS RUNNING OF THE PUMPING SET AT THIS SPECIFIED VALUE OF TEMPERATURE . 5.4 PUMP WITH DROOPING CHARACTERSTIC SHALL NOT BE ACCEPTABLE. 5.5 PUMP SHALL BE SUITABLE FOR MOUNTING VERTICALLY ON THE OIL TANK AND PUMP BED PLATE SHALL MATCH THE COUNTER FLANGE PROVIDED ON THE TANK AS PER SKETCH ON SHEET NO. 6. 5.6 PUMP SUPPLIER SHALL FURNISH THE PERMISSIBLE TIME FOR THE OPERATION OF PUMP AT SHUT OFF LOAD. 6.0 <u>MOTOR:-</u> A SUITABLE MOTOR CONFORMING TO THE PUMP REQUIREMENT SHALL BE SUPPLIED. THE MOTOR SHALL ALSO MEET THE FOLLOWING SPECIFICATIONS BROADLY. THE MOTOR SHALL CONFIRM TO IS:2253, IS:2254, IS:3202 AND IS:4722 OR EQUIVALENT BS: SPECIFICATIONS. THE MOTOR SHALL MEET ALL INDIAN STATUTORY REQUIREMENTS. 6.1 <u>APPLICATION:-</u> TO DRIVE OIL PUMP FOR SUPPLYING OIL TO BEARINGS IN THE EVENT OF A.C. 6.2 <u>TYPE OF MOTOR:-</u> SEPARATELY EXCITED OR COMPOUND MOTOR WITH 10% COMPOUNDING . 6.3 <u>KW RATING:-</u> IT SHALL HAVE AT LEAST 25% RESERVE CAPACITY THAN REQUIRED TO DRIVE THE PUMP WHEN IT IS DISCHARGING MAX. QUANTITY, AT VISCOSITY CORRESPONDING TO 65°C. FINALLY SUPPLIER SHALL MENTION KW RATING AT AN AMBIENT TEMP. OF 50°C. 6.4 KW ACTUALLY REQUIRED BY DRIVE : PUMP CAPACITY EQUIPMENT UNDER SPECIFIED OPERATING AND START UP CONDITION. 6.5 RATED VOLTAGE : 220 V D.C. 220 V D.C.FIELD.																							
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SIGN & DATE 	REV. NO 04																						
INVENTORY NO P-5540			निर्माणकर्ता WORKED BY धरामपाल	निर्माणकर्ता CHECKED BY ANUJ JAIN	14/6/06 14/6/06																		



दिनांक एवं हस्ताक्षर SIGN & DATE			उत्पाद मानक <b>PRODUCT STANDARD</b> (STEAM TURBINE ENGINEERING)		<b>ST-39015</b> पृष्ठ 6 का 3 Page 3 Of 6	
सुपरसेडिज INVENTORY NO.		संपत्ति सूची संख्या का अतिरिक्तित करण है	6.6 PERMISSIBLE VOLTAGE VARIATIONS UNDER NORMAL RUNING CONDITIONS. : -15% +10% 6.7 MINIMUM VOLTAGE REQUIRED UNDER STARTING CONDITION TO BRING DRIVEN EQUIPEMENT UPTO RATED SPEED. : 80% RATED CURRENT 6.8 TYPE OF DUTY : CONTINUOUS 6.9 FULL LOAD SPEED : IT SHALL BE COMENSURATE WITH PUMP SPEED AS PER DESIGN. 6.10 FULL LOAD CURRENT : AS PER DESIGN. 6.11 STARTING CURRENT : 3 TO 3.5 TIMES. I RATED 6.12 STARTING TORQUE : 3 TO 3.5 TIMES. TORQUE 6.13 EFFICIENCY AT FULL LOAD : 85% MINIMUM 7.0 <u>STARTING DATA</u> 7.1 <u>STARTING</u> SUITABLE FOR DIRECT ON LINE STARTING WITH A PERMANENT RESISTANCE CONNECTED IN THE ARMATURE CIRCUIT. UNDER THIS CONDITION MOTOR SHALL BE CAPABLE OF DRIVING THE PUMP AT 100% LOAD. THE MOTOR SHALL ACCELRATE TO FULL SPEED WITH FULL LOAD CONNECTED WITHIN 3±0.5 SECONDS. SUCH RESISTANCE SHALL ALSO BE INCLUDED IN THE OFFER. THE RESISTANCE SHALL BE FOR CONTINUOUS DUTY. THE RESISTANCE BOX ENCLOSURE TEMP. RISE OVER AMBIENT SHOULD NOT EXCEED 70°C AND IT IS OF FeCr-AI OR CUPRO-NICKLE TYPE SHOULD HAVE IP21 (MIN.) DEGREE OF PROTECTION. 7.2 STARTING RESISTANCE BOX/PANEL SHALL BE IN VENDOR SCOPE OF SUPPLY. 7.3 <u>PERMISSIBLE STARTING DUTY CYCLE/NO. OF STARTS:-</u> THREE STARTS SPREAD OVER AN HOUR AND TWO CONSECUTIVE STARTS FROM HOT CONDITION WITHOUT ANY INJURIOUS HEATING TO THE WINDING. 7.4 OVER LOAD ( % OF FULL LOAD ) THAT CAN BE CARRIED BY THE MOTOR WITHOUT IMPAIRING, OVERALL PERFORMANCE AND PERIOD FOR WHICH THIS OVERLOAD IS APPLICABLE. : 25% FOR 5 MINUTES. 7.5 LOCATION : INDOOR 7.6 CLASS OF INSULATION : CLASS-F, FUNGUS RESISITANT, TROPICALISED AS PER IS:3202 WITH TEMP. RISE LIMITED TO THAT OF CLASS B. 7.7 SHAFT DISPOSITION/MOUNTING : VERTICAL / FLANGE MOUNTED 7.8 METHOD OF CONNECTION TO DRIVEN EQUIPEMENT. : FLANGE FLEXIBLE COUPLING. 7.9 DIRECTION OF ROTATION AND CORRESPONDING TERMINAL DESIGNATION. : TO SUIT PUMP 7.10 ENCLOSURE AND VENTILATION : TOTALLY ENCLOSED FAN COOLED IP-55			
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दिनांक एवं हस्ताक्षर SIGN & DATE	29/10/06					
संपत्ति सूची संख्या INVENTORY NO.	P-5540	REV. NO. <b>04</b>		निर्माणकर्ता WORKED BY	DHARAMPAL	 14/6/06
			जांचकर्ता CHECKED BY	ANUJ JAIN	 14/6/06	

SIGN & DATE 	<b>उत्पाद मानक</b> <b>STEAM TURBINE ENGINEERING</b> <b>PRODUCT STANDARD</b>		<b>ST39015</b>	
			पृष्ठ 6 का 4 Page 4 of 6	
INVENTOR NO P-5540	REV. NO. 04	7.11 BEARING : THRUST BEARING WITH A MINIMUM STANDARD LIFE OF NOT LESS THAN 30,000 WORKING HOURS. 7.12 GROUNDING DEVICE : SUITABLE ARRANGEMENT SHALL BE PROVIDED FOR EARTHING THE MOTOR AT TWO SEPARATE & DISTINCT CONNECTION POINTS. DESIGNATION OF EARTHING CONDUCTOR SHALL BE AS PER IS:4722-1992. 7.13 TERMINAL CONNECTORS : 2 FOR ARMATURE SUITABLE FOR ALUMINIUM CABLE. 2 FOR FIELD. SUITABLE FOR 2C-10 mm ALUMINIUM CABLE. 7.14 CABLE FOR GROUNDING POINTS : TO BE PROVIDED 7.15 TERMINAL BOX : TERMINAL BOX SHALL BE PROVIDED WITH DOUBLE COMPRESSION TYPE BRASS CABLE GLANDS (Nickel Chromium PLATED HEAVY DUTY, CONFIRMING TO BS:6121) AND COPPER CABLE LUGS TO MATCH OWNER'S ALUMINIUM CABLES, THE SIZE OF WHICH SHALL BE INTIMATED LATER. TERMINAL BOX SHALL BE CAPABLE OF BEING ROTATED THROUGH 180° IN STEPS OF 90°. IT SHALL HAVE A DEGREE OF PROTECTION OF IP-55. 8.0 SPECIAL REQUIREMENTS 8.1 THE MOTOR SHALL BE RE-WOUNDABLE. 8.2 THE MOTOR SHALL HAVE ON LINE GREASING FACILITY. 8.3 THE MOTOR CONSTRUCTION SHALL BE SUITABLE FOR EASY DIASSEMBLY AND REASSEMBLY. 8.4 THE MOTOR SHALL BE SUITABLE FOR WORKING IN AN ENVIRONMENT OF OIL FUMES WITHOUT ANY HAZARD. 8.5 THE MOTOR SHALL BE PAINTED WITH PAINT SUITABLE FOR WORKING CONDITION AND ITS COLOUR SHALL BE INTIMATED LATER ON. 9.0 TESTS AT MANUFACTURER'S WORKS: (i) MOTOR AFTER COMPLETE ASSEMBLY SHALL BE SUBJECTED TO BOTH TYPE AND ROUTINE TESTS AS PER IS:4722. TYPE TEST SHOULD NOT BE MORE THAN 5 YEARS OLD w.r.t. DATE OF ORDERING. (ii) IN ADDITION THE FOLLOWING TESTS SHALL ALSO BE CARRIED OUT. ADDITIONAL TYPE TESTS: (a) DEGREE OF PROTECTION TEST TO CONFORM TO THE SPECIFIED DEGREE OF PROTECTION. (b) MEASUREMENT OF NOISE LEVEL AS PER IS: 12065. MOTOR NOISE LEVEL SHALL BE LIMITED SO AS TO ACHIEVE COMBINED PUMP MOTOR NOISE LEVEL AS PER CLAUSE 1.4 OF ST38013.		
INVENTOR P-5540	REV. NO. 04	WORKED BY DHARAMPAL	CHECKED BY ANUJ JAIN	DATE 14/06/06

[illegible]

निर्माता की संख्या INVENTORY NO. <b>P-55-40</b>	हस्ताक्षर एवं तिथि SIGN & DATE <b>29/10/06</b>	स्वामित्व अधिकार 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.	संपत्ति सूची संख्या को उपदिष्ट करें।	पृष्ठ 6 का 6 Page 6 Of 6	उत्पाद मानक <b>PRODUCT STANDARD</b> (STEAM TURBINE ENGINEERING)	<b>ST-39015</b>																																																																																																																																																																																
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