

SUPERSEDES  
 INVENTORY NO.  
 धनांक एवं तारीख का  
 अधिकाधिक बरतना है

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स्वत्वधिकार एवं गोपनीय  
 इस दस्तावेज में की गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रस्ताव एवं प्रसारण तथा से विक्रय की परम इजाजत, जो कि कंपनी के हित में हानिकारक हो न किया जाए

धनांक एवं तारीख  
 SIGN & DATE  
 P-5540  
 29/08

**TECHNICAL SPECIFICATION FOR  
 EMERGENCY OIL PUMP SET  
 ( CENTRIFUGAL PUMP )**

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%.

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.)

CIE	VINOD Kumar		अनुवादक	TRANSLATED BY		नाम	दिनांक एवं हस्ताक्षर
TSX	AKCHATURVEDI		निर्माणकर्ता	WORKED BY	DHARAMPAL		
QAX	S S Chauhan		जांचकर्ता	CHECKED BY	ANUJ JAIN		
सहमत विभाग	नाम	दिनांक एवं हस्ताक्षर	पर्यवेक्षणकर्ता	SUPERVISED BY	S.C.AGRAWAL		
AGREED DEPT:	NAME	DATE & SIGNATURE					
स्वीकृति APPROVED : (A.K.JAIN) AGM				दिनांक 21.08.06			
REV.NO. 04	LSUPERSEDES			जारी	75X	दिनांक	
DI. 31.08.06				PREPARED :	STE (TL/TA)	ISSUED :	DATE : 03-08-84

संकेत एवं तिथि  
SIGN & DATE



उत्पाद मानक

ST39015

STEAM TURBINE ENGINEERING  
PRODUCT STANDARD

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सुपरसेडिस  
INVENTORY NO

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स्वाधिकार एवं गोपनीय  
समस्त अधिकार सुरक्षित हैं। यह दस्तावेज़ कंपनी की संपत्ति है। इसका उपयोग केवल कंपनी के लिए ही किया जा सकता है। अन्य किसी भी उद्देश्य के लिए इसका उपयोग नहीं किया जा सकता है।

संकेत एवं तिथि  
SIGN & DATE

सुपरसेडिस  
INVENTORY NO

- 5.0 PUMP SPECIFICATION:-
- 5.1 IDENTIFICATION NO. TO BE MENTIONED ON NAME PLATE MAV24AP001
- 5.2 TYPE CENTRIFUGAL TYPE  
DESIGN TEMPERATURE = 100°C  
OPERATING TEMPERATURE = 65°C  
NORMAL SUCTION PRESSURE = 0.05 Bar  
MINIMUM SUCTION PRESSURE = 0.025 Bar








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		




- 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 MOTOR:-  
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 APPLICATION:-  
TO DRIVE OIL PUMP FOR SUPPLYING OIL TO BEARINGS IN THE EVENT OF A.C.
- 6.2 TYPE OF MOTOR:-  
SEPARATELY EXCITED OR COMPOUND MOTOR WITH 10% COMPOUNDING .
- 6.3 KW RATING:-  
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.

REV. NO  
04

निर्माणकर्ता WORKED BY	DHARAMPAL	<i>Dhal</i>	14/06/06
जांचकर्ता CHECKED BY	ANUJ JAIN	<i>Anu</i>	14/6/06



क्रमांक व दिनांक SIGN & DATE		<b>उत्पाद मानक</b>  <b>STEAM TURBINE ENGINEERING PRODUCT STANDARD</b>	<b>ST39015</b>  पृष्ठ 6 का 4  Page 4 of 6								
क्रमांक व दिनांक SIGN & DATE	क्रमांक व दिनांक SIGN & DATE	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.									
<b>COPYRIGHT AND CONFIDENTIAL.</b> 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.		8.0 <u>SPECIAL REQUIREMENTS</u> 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 <u>TESTS AT MANUFACTURER'S WORKS:</u> (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. <u>ADDITIONAL TYPE TESTS:</u> (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.									
<b>स्वत्वाधिकार एवं गोपनीय</b> यह प्रस्तावना की गई है कि इस दस्तावेज़ में सम्बन्धित है इसका प्रसारण केवल ही स्वत्वाधिकार के अन्तर्गत ही होना चाहिए।											
क्रमांक व दिनांक SIGN & DATE	क्रमांक व दिनांक SIGN & DATE 21/9/06										
क्रमांक व दिनांक INVENTOR NO	REV. NO. 04		<table border="1"> <tr> <td>निर्माणाकर्ता WORKED BY</td> <td>DHARAMPAL</td> <td></td> <td>14/06/06</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>ANUJ JAIN</td> <td></td> <td>14/06/06</td> </tr> </table>	निर्माणाकर्ता WORKED BY	DHARAMPAL		14/06/06	जांचकर्ता CHECKED BY	ANUJ JAIN		14/06/06
निर्माणाकर्ता WORKED BY	DHARAMPAL		14/06/06								
जांचकर्ता CHECKED BY	ANUJ JAIN		14/06/06								

क्रमांक व दिनांक SKIN & DATE		<b>उत्पाद मानक</b> <b>STEAM TURBINE ENGINEERING</b> <b>PRODUCT STANDARD</b>	<b>ST39015</b> पृष्ठ 6 का 5 Page 5 of 6		
प्रोत्साहन संख्या SUPPERSEDES INVENTORY NO.	<b>ADDITIONAL ROUTINE TESTS:</b> (a) 20% OVERSPEED TEST FOR 2 MINUTES. (b) MEASUREMENT OF VIBRATION AS PER IS: 12075.				
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	<b>10.1 CHARACTERISTICS</b> 10.1.1 STARTING CURRENT V/S TIME. 10.2 TYPE AND FRAME SIZE. 10.3 STARTING TIME IN SECOND. 10.3.1 WITH 100% VOLTAGE AT TERMINALS. 10.3.1 WITH 85 % VOLTAGE AT TERMINALS. 10.3.2 WITH 80 % VOLTAGE AT TERMINALS. 10.4 SAFE STALL TIME AT 100% VOLTAGE UNDER HOT CONDITIONS. 10.5 POWER (Kw) RATING CALCULATIONS W.R.T. PUMP REQUIREMENT. 10.6 EXPECTED LIFE OF BEARING. <b>11.0 DOCUMENTS TO BE FURNISHED WITHIN FOUR WEEKS OF PLACEMENT OF ORDER:-</b> 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 CONDITION AND GENERAL FEATURES OF PUMP. PLEASE REFER ST38013. 14.0 CROSS REFERRED STANDARDS: IS:2253, IS:2254, IS:3202, IS:4691 IS:4722 AND IS:4729.				
<b>स्वत्वधिकार एवं गोपनीय</b> यह प्रस्ताव कि यह सूचना भारत भारती इ. लि. की संपत्ति है। इसका उपयोग बिना भारत भारती इ. लि. की लिखित अनुमति के बिना नहीं किया जा सकता है।					
क्रमांक व दिनांक SKIN & DATE 19/06					
प्रोत्साहन संख्या INVENTORY NO. P-5540	REV. NO. 04		निर्माणकर्ता WORKED BY DHARAMPAL		14/6/06
			जांचकर्ता CHECKED BY ANUJ JAIN		14/6/06

हस्ताक्षर एवं तारीख  
SIGN & DATE



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

**ST- 39015**  
पृष्ठ 6 का 6  
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संशोधन एवं संशोधन  
अधिकार प्राप्त है।

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स्वयंपादिकाएँ एवं गोपनीय  
यह दस्तावेज़ में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है। इसका उपयोग एवं प्रसारण के बिना या बिना अनुमति के किसी भी तरह से गलत, जो कि कंपनी के हित में हानिकारक हो, न किया जाए।

हस्ताक्षर एवं तारीख  
SIGN & DATE

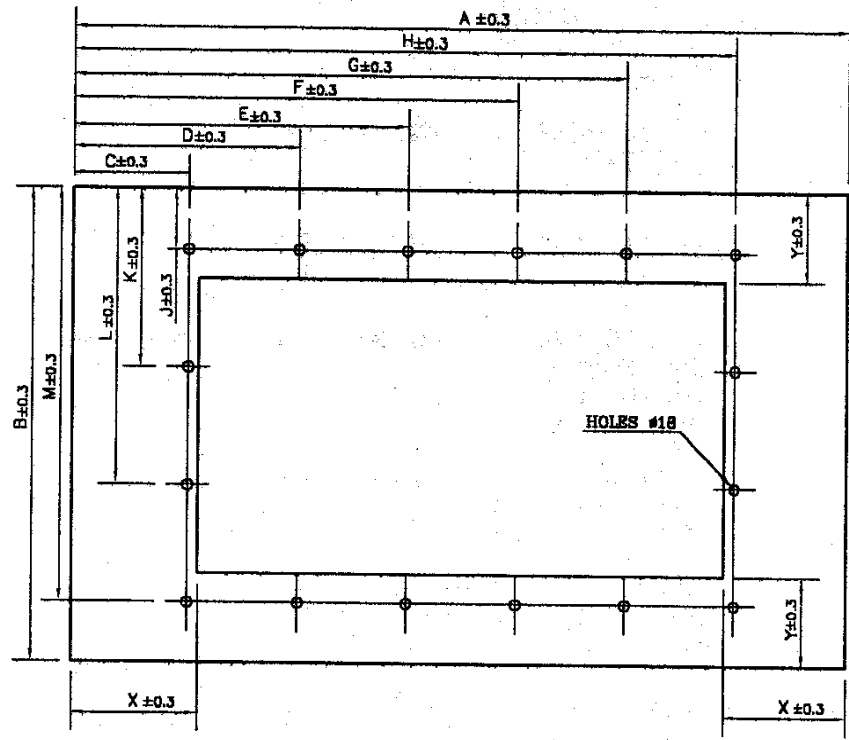
29/06

संशोधन संख्या  
INVENTORY NO.

P-55 40

REV. NO.  
04

BED PLATE EXISTING ON OIL TANK



BED PLATE TYPE	A ± 0.3	B ± 0.3	C ± 0.3	D ± 0.3	E ± 0.3	F ± 0.3	G ± 0.3	H ± 0.3	J ± 0.3	K ± 0.3	L ± 0.3	M ± 0.3	X ± 0.3	Y ± 0.3	NO. OFF HOLES
AA	1500	900	220	432	644	858	1068	1280	115	338.3	561.8	784.9	240	170	18

निर्माणकर्ता WORKED BY	DHARAMPAL	<i>Dha</i>	14/06/06
जांचकर्ता CHECKED BY	ANUJ JAIN	<i>Anu</i>	14/06/06