

TECHNICAL SPECIFICATION FOR JACKING OIL PUMP SET (D.C.)

1.0 INTENT OF SPECIFICATION;-

THIS SPECIFICATION IS INTENDED TO COVER DESIGN, MANUFACTURE, ASSEMBLY, TESTING AND SUPPLY OF PUMPING SETS COMPLETE WITH FOUNDATION BASE PLATE, ANCHOR BOLTS, LIFTING LUGS, COUPLING, AND OTHER ACCESSORIES INCLUDING MOTOR WITH STARTING RESISTANCES AND THEIR COMMISSIONING AT POWER STATION TO WHICH BHEL SUPPLIES THE EQUIPMENT.

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 + 90% HUMIDITY.

2.0 FUNCTION:-

JACKING OIL PUMP MES IN OPERATION IN CONJUNCTION WITH THE BARRING OPERATION OF THE TURBINE.

3.0 APPUCABLE CODE/STANDARD:- 15:4722, VDMA 24284.

4.0 OIL SPECIFICATION:-

THE MEDIUM HANDELED IS TURBINE OIL OF VISCOSITY CLASS ISO VG46. THE OIL CAN BE SERVOPRIME 46 OF INDIAN OIL CORPORATION OR TURBOL 46 OF BHARAT PETROLEUM OR SHELL TURBOL 46 OF BHARAT SHELL 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.)

भारतीय विद्युत निगम INVENTORY NO.	भारतीय विद्युत निगम AGREED DEPT.	भारतीय विद्युत निगम NAME	भारतीय विद्युत निगम DATE & SIGNATURE	भारतीय विद्युत निगम APPROVED :	भारतीय विद्युत निगम ISSUED :	भारतीय विद्युत निगम DATE :
P-5474	219156	VINOD KR	26-06-07	(A.K.JAIN) AGM	TSX	21-08-06
REV.NO. 07	(SUPERSEDES) Rev. 08	AKCHATUR	DATE & SIGNATURE	APPROVED :	ISSUED :	DATE :
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STEAMTURBINE ENGINEERING
PRODUCT STANDARD

5.0 PUMP SPECIFICATION;-

5.1 IDENTIFICATION ND. TO BE MENTIONED ON NAME PLATE AS FOLLOWS:-

: MAV 31 AP 001 AND MAV 32 AP.001

5.2 TYPE SCREW TYPE: POSITIVE DISPLACEMENT

DESIGN TEMPERATURE = 100°C , OPERATING TEMPERATURE = 65°C

VARIANT NUMBER	NORMAL DISCHARGE CAPACITY (Litre/Sec)	NORMAL DISCHARGE PRESSURE (Bar)
VAR. 1	1.26	120
VAR. 2	1.80	140
VAR. 3	1.68	189
VAR. 4	1.25	182
VAR. 5	2.25	182
VAR. 6	1.53	178
VAR. 7	1.33	182
VAR. 8	1.27	182
VAR. 9	1.84	178

VARIANT NUMBER	NORMAL DISCHARGE CAPACITY (Litre/Sec;)	NORMAL DISCHARGE PRESSURE (Bar)
VAA. 10		
VAA. 11		
VAA. 12		
VAR. 13		
VII. 14		
VAA. 15		
VAA. 16		
VAR. 17		
VAR. 1B		

PUMP SHALL BE SUITABLE FOR MOUNTING VERTICALLY ON THE OIL TANK. BASE PLATE OF PUMP SHALL MATCH THE 'COUNTER FLANGE PROVIDED ON THE TANK AS PER SKETCH ON PAGE 14. SMOOTH FUNCTIONING IS ENSURED BY MAINTAINING OIL LEVELS AS DEPICTED IN THE ARRANGEMENT ON PAGE NO. 13.

5.3 DURING INITIAL START UP IN WINTER, OIL TEMPERATURE MAY GO AS BELOW AS 20°C.

6.0 MQTQR:-

A SUITABLE MOTOR CONFORMING TO THE PUMP REQUIREMENTS SHALL BE SUPPLIED. FOR DETAILS ON MOTOR, PLEASE REFER ANNEXURE-I.

7.0 DESIGN AND CONSTRUCTION OF PUMP:-

ALL MATERIALS USED IN THE CONSTRUCTION OF THE PUMPS SHALL BE SELECTED FROM THE RANGE OF MATERIAL MOST APPROPRIATELY SUITABLE FOR THE PURPOSE AND SERVICE CONDITIONS. THE BIDDER SHALL FURNISH ALONGWITH THE OFFER, 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. THE SIZE SHALL BE STANDARDISED SO AS TO ENSURE INTERCHANGEABILITY.

7.1 SPECIAL TOOLS AND TACKLES

ONE SET OF TOOLS REQUIRED FOR ERECTION, OPERATION AND MAINTENANCE OF THE PUMPING SETS SHALL BE SUPPLIED TOGETHER WITH EACH PUMP. LIST OF THESE TOOLS SHALL BE SUBMITTED ALONGWITH THE OFFER,

7.2 THE MATERIALS OF CONSTRUCTION OF THE PUMPS SHALL BE SUCH AS TO RESIST CORROSION AND EROSION AND SHALL GIVE A LONG TROUBLE FREE SERVICE.

REV NO. 07

f.r.furn(l)
WORKED BY

DHARAMPAL

Checked by

ANUJ JAIN

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भारतीय कंपनी संस्था को अधिकारित करवाया है	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.	<p>7.2 THE MATERIALS OF CONSTRUCTION OF THE PUMPS SHALL BE SUCH AS TO RESIST CORROSION AND EROSION AND SHALL GIVE A LONG TROUBLE FREE SERVICE.</p> <p>7.3 THE SUPPLIER SHALL ALSO FURNISH THE METHOD AND FREQUENCY OF LUBRICATION OF THE BEARINGS AND QUANTITY AND TYPE OF LUBRICANT REQUIRED FOR NORMAL OPERATION. BUT LUBRICATION OF BEARINGS WITH THE OIL BEING HANDLED IS PREFERRED.</p> <p>7.4 THE DESIGN SHALL BE SUCH AS TO KEEP THE FRICTIONAL LOSS AND WEAR CAUSED BY END THRUST TO THE MINIMUM. IT WILL ALSO ENSURE MINIMUM WEAR AND CAVITATION IN MECHANICAL SEALS AND BEARINGS. LONG AND TROUBLE FREE SERVICE SHALL BE ENSURED. THE ROTORS OF THE PUMP SHOULD BE DESIGNED IN SUCH A WAY SO THAT MINIMUM VIBRATIONS ARE EXPERIENCED. THE SOUND PRESSURE LEVEL OF PUMP MOTOR SET SHOULD NOT BE GREATER THAN 85 dBA TO A REFERENCE OF 0.0002 MICRO BAR WHEN MEASURED AT A DISTANCE OF 1.5 METERS ABOVE FLOOR LEVEL AND ONE METRE HORIZONTALLY FROM THE BASE OF EQUIPMENT AND VIBRATIONS ARE IN THE PERMISSIBLE RANGE AS PER VDI 2056.</p> <p>7.5 SEALS MUST COMPLY WITH THE FOLLOWING PROPERTIES -</p> <ul style="list-style-type: none"> (a) READY ACCESS AND AMENABILITY FOR MAINTENANCE WORK (b) NO CONTAMINATION OF THE MEDIUM FROM MATERIAL ABRASION FROM THE SEALS. (c) NO SEEPAGE OF LUBRICANTS INTO THE FLDV MEDIUM, (d) MINIMUM LEAKAGE LOSSES WITH THEIR CONTROLLED REMOVAL. <p>7.6 TO FACILITATE TRANSPORT AND ERECTION, LIFTING HOOKS OR ERECTION EYES SHALL BE FITTED AT SUITABLE POINTS ON THE COMPONENTS. THEIR LOCATIONS MUST BE SHOWN ON THE DIMENSIONAL DRAWING.</p> <p>7.7 PUMP BEARINGS SHALL BE DESIGNED SO AS TO ASSURE 50,000 hrs CONTINUOUS SERVICE FOR FRICTION BEARINGS & 30,000 hrs FOR BALL & ROLLER BEARINGS.</p> <p>7.8 THE MECHANICAL DESIGN SHALL ALLOW EASY ACCESS TO VARIOUS PARTS OF CARRYING OUT MAINTENANCE WORK.</p> <p>7.9 THE DISCHARGE BRANCH OF THE PUMP SHALL BE TAKEN OUT ABOVE THE BASE PLATE BY THE SUPPLIER.</p> <p>7.10 THE PUMPS SHALL BE PROVIDED WITH DRAINAGE AND VENTING DEVICES.</p> <p>7.11 ALL SYSTEM PARTS CARRYING OIL SHALL BE OF OIL TIGHT CONSTRUCTION COMPRESSION-TYPE FITTINGS ARE NOT PERMISSIBLE.</p> <p>7.12 FOR SCREW PUMPS RUNNING AT SUBCRITICAL SPEEDS, IT SHALL BE ENSURED THAT THE CRITICAL SPEED LIES ABOVE THE MAXIMUM SPEED ATTAINABLE DURING OPERATION WITH A MINIMUM MARGIN ON 15% OF RATED SPEED. FOR PUMPS RUNNING AT SUPER CRITICAL SPEEDS, IT SHALL BE ENSURED THAT THERE IS DIFFERENCE OF SUFFICIENT MAGNITUDE (NOT LESS THAN 20%) BETWEEN THE OPERATING SPEED AND THE BORDER IN CRITICAL SPEEDS. ALLOWANCES SHALL BE MADE FOR THE TYPE OF COUPLING BETWEEN THE PUMP AND MOTOR WHILE CALCULATING THE CRITICAL SPEEDS.</p>
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PRODUCT STANDARD
(STEAM TURBINE ENGINEERING)

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स्वतंत्राधिकार एवं गोपनीय
एक प्रतिका में ही यह सूचना मात्र है की सूची संख्या की संख्या/दिनांक & इसका प्रयुक्त एवं प्रयुक्त रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न अधिक मात्रा

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ALLOWANCES SHALL BE MADE FOR THE TYPE OF COUPLING BETWEEN THE PUMP AND MOTOR WHILE CALCULATING THE CRITICAL SPEEDS.

7.13 COUPLING

SUITABLE COUPLING WITH GUARDS SHALL BE PROVIDED FOR COUPLING PUMP WITH MOTOR. IT SHALL BE DESIGNED TO FACIUTATE EASY ALIGNMENT. ONE SET OF COUPLING BOLTS SHALL BE SUPPLIED IN SPARE.

7.14 FOUNDATION

THE PUMP SHALL BE MOUNTED ON THE OIL TANK AND HUNG FROM BED PLATE AT THE TANK TOP UNTO THE TANK. FOR FURTHER DETAILS PLEASE REFER PAGE NO. 12 AND 13. ALL THE SEATING MACHINED SURFACES OF BED PLATE TO BE MAINTAINED FOR 0.5 mm FLATNESS.

8.0 QUALITY ASSURANCE, -INSPECTION AND TESTING

(o) THE MANUFACTURER SHALL CONDUCT ALL TESTS REQUIRED TO ENSURE ALL THE COMPONENTS PART OF THE JACKING OL PUMP OFFERED, CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION AND IN COMPLIANCE WITH REQUIREMENTS OF APPLICABLE CODES AND STANDARDS.

(b) THE BIDDER SHALL SUBMIT ALONGWITH HIS OFFER QUALITY PLAN.

8.1 THE PARTICUIARS OF THE PROPOSED SHOP TESTS AND PROCEDURES FOR THE TESTS SHALL BE SUBMITTED TO BHEL/ITS CUSTOMER FOR APPROVAL ALONGWITH QUALIY PLAN.

8.2 THE MATERIAL SHALL BE DESPATCHED ONLY AFTER INSPECTION AND CLEARANCE OF MATERIAL BY BHEL OR ITS CUSTOMER AND APPROVAL OF TEST CERTIFICATE BY BHEL/ITS CUSTOMER.

8.3 THE MINIMUM TESTS/CHECKS TO BE CARRIED OUT ON THE JACKING OIL PUMP AS ENVISAGED BY BHEL ARE GVEN BELOW. THIS IS, HOWEVER, NOT INTENDED TO FORM A COMPREHENSIVE TESTING PROGRAMME AS IT IS SUPPLIERS RESPONSIBUTY JO PREPARE THE DETAILED QUALITY PLAN, WHICH SHOULD ALSO INCLUDE TESTS/CHECKS CARRIED OUT BY SUPPLIER AS A PART OF THEIR NORMAL PARACTICE • 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 FINALISATION.

8.3.1 TESTING OF MATERIALS

THE MATERIAL OF EACH COMPONENT SHALL BE TESTED AS PER RELEVENT SPECJFICATION FOR ITS CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES, VIZ. YS, UTS, IMPACT, " ELONGATION ::(RA ETC. AND NOT, UT ON SHAFT. MPF O.N. SCREWS AND CASING ETC. TO ENSURE FREEDOM FROM SURFACE AND SUB-SURFACE DEFECTS SHALL BE CARRIED OUT.

8 3.2 FOLLOWING TESTS SHALL BE CARRIED OUT DURING VARIOUS STAGES OF MANUFACTURE AT MANUFACTURER WOR(S).


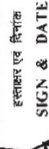

(o) CHECK FOR DIMENSIONS OF ALL COMPONENT PARTS INCLUDING SURFACE FINISH, AXIAL AND RADIAL RUN OUT OF SHAFT ETC.


(b) NONDESTRUCTIVE EXAMINATION :- UT FOR SCREW B N15S & DPT/MPI ON SCREWS TO BE CARRIED OUT TO ENSURE SURFACE / SU SURFACE DEFECIS.

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सामग्री सूची संख्या को दर्शाएगा	<p>(c) CHECK THE CONDITION OF THE OIL SEALS AND ANY SEEPAGE OF OIL THROUGH SEALS ETC.</p> <p>(d) HYDRAULIC TESTING OF THE CASING AND OTHER PRESSURE PARTS SHALL BE AS PER VDMA 24284.</p> <p>(e) CHECK FOR DIRECTION OF ROTATION OF PUMP.</p> <p>(f) PERFORMANCE TEST WITH CALIBRATED TEST BED MOTOR FOR VERIFICATION OF PUMP CHARACTERISTICS, VIZ. DISCHARGE AT THE GIVEN PRESSURE SCHEDULE OF POWER CONSUMPTION, NOISE AND VIBRATION LEVEL AS PER VDMA 24284.</p> <p>(g) STRIP DOWN TEST TO CHECK THE CONDITION OF BEARING, MECHANICAL CLEARANCES AND AXIAL PLAY OF SHAFT ETC.</p>		
COPYRIGHT AND CONFIDENTIAL 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	<p>8.3.3 AFTER TESTING THE PUMP, ALL THE SURFACES AND INTERNALS SHALL BE THOROUGHLY CLEANED, DRIED AND CONSERVED. ALL METALLIC SURFACES EXCEPT BRIGHT PARTS EXPOSED TO WEATHER SHALL BE GIVEN A SUITABLE PRIMING COAT AND THEN TWO COATS OF APPROVED PAINTS. ENSURE ASSEMBLY OF ALL THE COMPONENTS OF PUMP AS ONE UNIT AND PACK IN WATER AND DUST PROOF PACKAGE. THE PACKAGES SHOULD BE SUFFICIENTLY STRONG TO SAFEGAURD AGAINST ANY DAMAGE DURING TRANSIT AND IS SAFE FOR TWO YEARS IN A VERY DAMP :ATMOSPHERE.</p> <p>8.3.4 TEST CERTIFICATES INDICATING THE ACTUAL TEST RESULTS OF MATERIALY TETING, NOT, HYDRAULIC TEST, PERFORMANCE TEST, STRIP DOWN EXAMINATION Etc.' SHALL BE FURNISHED.</p>		
स्वत्वधिकार एवं गोपनीय इस प्रतीक में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग केवल भारत हेवी इलेक्ट्रिकल्स ही कर सकते हैं। इसकी कपी को बिना अनुमति के न किया जाए	<p>9.0 PRE-APPROVAL DOCUMENTS AT THE TIME OF OFFER</p> <p>9.1 ASSEMBLY DRAWING WITH PART LISTS, NOZZLE SIZES AND THEIR COORDINATES, BASE PLATE DETAILS AND CROSS SECTION ARRANGEMENT ALONGWITH STATIC LOADING.</p> <p>9.2 CALCULATIONS WITH NECESSARY DRAWINGS (TORQUE/SPEED CHARACTERISTICS Etc), POWER REQUIREMENTS, TORQUE SFFIING VALUE FOR MOTOR TRIP, PERMISSIBLE TORQUE VALUE FOR KEY AND POWER SHA.</p> <p>9.3 MAXIMUM MAGNETIC AND NON-MAGNETIC PARTICLE SIZE, WHICH CAN PASS THOROUGH PUMP SCREW LY CLEARANCE WITHOUT DAMAGING THE PUMP SHALL BE SPECIFIED IN THE OFFER.</p> <p>9.4 QUALITY PLAN WITH DETAILS OF QUALITY LEVELS AND MANUFACTURING TOLERANCES. THIS SHOULD GENERALLY CONFORM TO VDMA 24284. GENERALLY ACCELTED PRACTICES, IN PARTICULAR VDMA CODES AND STANDARDS OR EQUIVALENT SHALL BE APPLIED AND TAKEN INTO ACCOUNT FOR DESIGN OF SCREW PUMPS. THE CODES OF STANDARDS APPLIED IN EACH CASE SHALL BE SPCIFIED IN THE OFFER.</p>		
दिनांक एवं हस्ताक्षर SIGN & DATE  13/7/07	<p>9.5 FOR DOCUMENTATION ON MOTOR, PLEASE REFER ANNEXURE-I. EXAMINATION OF THE PRE-APPROVED DOCUMENTS BY BHEL SHAINOT RELIEVE THE MANUFACTURER AND HIS SUBCONTRACTORS OF THEIR RESPONSIBILITIES.</p> <p>THE PRE-APPROVED DOCUMENTS SHALL FORM THE BASIS FOR THE ORDER. NO CHANGES SHALL BE MADE WITHOUT APPROVAL FROM BHEL.</p>		
सामग्री सूची संख्या INVENTORY NO. P-5474	REV.NO. 08	WORKED BY CHECKED BY	DHARAMPAL ANUJ JAIN  26-06-07

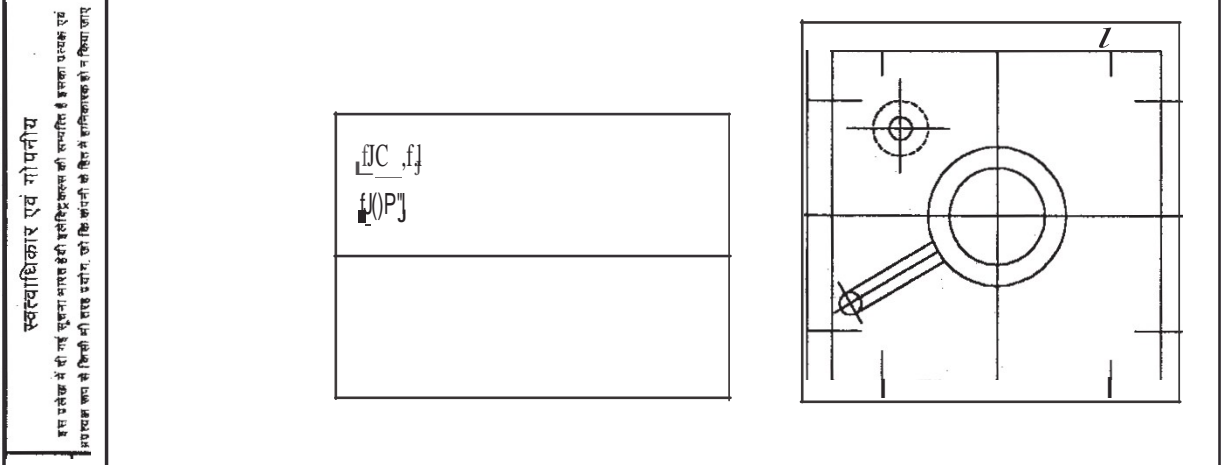
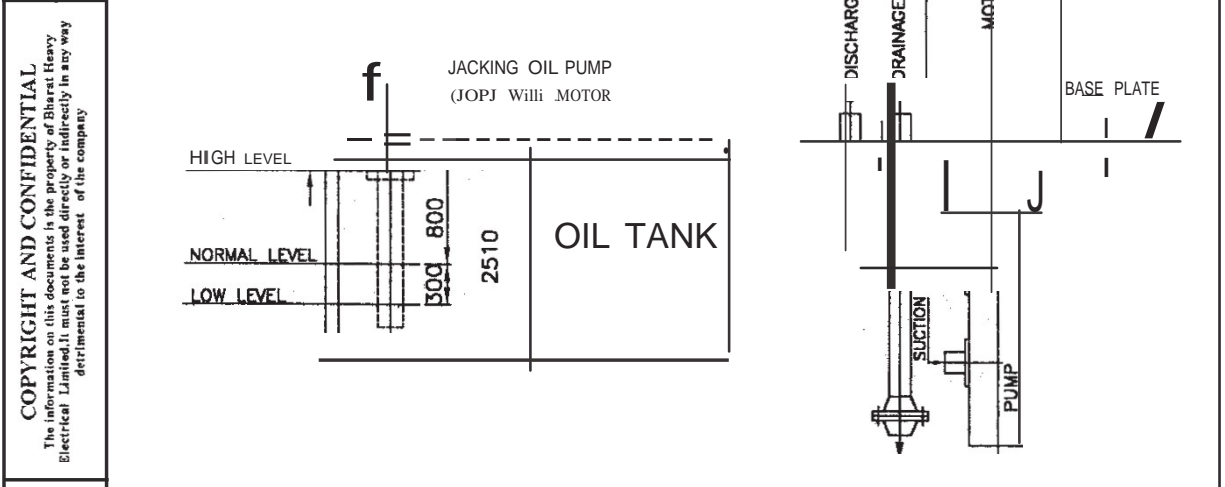
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सुपरसेडस इन्वेंटरी SUPERSEDES INVENTORY	<p>12.0 <u>CLEANING. PAINTING. CONSERVATION & PACKING:</u></p> <p>THE SURFACE SHALL BE CLEANED & PREPARED FOR APPLICATION OF THE COATINGS BY BLASTING WITH NON-SILICATIC ABRASIVE AGENTS. THE PROTECTIVE COATING SHOULD BE OIL RESISTANT TO PREVENT COTAMINATION 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 SHALL BE CHECKED AND APPROVED BY BHEL.</p> <p>INSTRUCTIONS SHOULD BE ISSUED REGARDING RECONSERVATION, DECONSERVATION ALONGWITH SPECIFICATION OF MATERIAL TO BE USED FOR ABOVE PURPOSE. 100% QUANTITY OF MATERIAL REQUIRED FOR RECONSERVATION AND DECONSERVATION AT SITE DURING STORAGE SHALL BE SUPPLIED ALONGWITH PUMP. ANY SPECIFIC INSTRUCTION TO BE FOLLOWED DURING STORAGE AT SITE TO AVOID ANY SEIZING ETC. SHALL ALSO BE INTIMATED. ALL SUCH INSTRUCTIONS SHALL BE MADE AVAILABLE TO SITE INCHARGE IN A SEPARATE COVER (NOT PACKED WITH PUMP PACKAGE).</p> <p>THE SUPPLIER SHALL BE RESPONSIBLE FOR ALL LOSS OR DAMAGE DURING TRANSPORTATION, HANDLING AND STORAGE DUE TO IMPROPER PACKING.</p>		
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स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इका प्रलेख एवं प्रकाशक रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।	<p>14.0 GUARANTEE</p> <p>14.1 THE SUPPLIER SHALL GUARANTEE TROUBLE FREE AND SATISFACTORY OPERATION OF THE EQUIPMENT FOR A PERIOD OF 12 MONTHS AFTER THE INSTALLATION AND COMMISSIONING OR FOR A PERIOD OF 18 MONTHS FROM THE DAY THE EQUIPMENT LEAVES THE SUPPLIER'S WORKS WHICHEVER IS EARLIER.</p> <p>14.2 THE SUPPLIER SHALL GUARANTEE THE CAPACITY, HEAD AND EFFICIENCY OF THE PUMP AS PER THE TESTED CHARACTERISTIC WITH OIL.</p> <p>14.3 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 DESIRE MAY DEPUTE HS REPRESENTATIVE TO SITE OTHERWISE THE FINDING OF BHEL REPRESENTATIVE SHALL BE FINAL AND BINDING ON THE SUPPLIER OF PUMPING SET.</p>		
दिनांक एवं हस्ताक्षर SIGN & DATE 13/7/07	<p>14.4 THE SUPPLIER SHALL REPAIR/REPLACE THE DEFECTIVE PARTS AT HIS OWN COST DURING THE GUARANTEE PERIOD.</p> <p>15.0 SPARES</p> <p>THE SUPPLIER SHALL QUOTE ITEMWISE PRICE OF RECOMMENDED SPARES FOR 3 YEARS AND 5 YEARS OPERATION RESPECTIVELY.</p>		
सुपरसेडस इन्वेंटरी नं. P-5474	REV.NO. 08	f.loltomri WORKED BY DHARAMPAL	26-06-07 ANUJ JAIN 26-06-07

SUPERSEDES INVENTORY INC. प्रमाणित एवं प्रमाणित प्रमाणित एवं प्रमाणित	<p>5.2 THE MOTOR SHALL BE RE-WOUNDABLE.</p> <p>5.3 THE MOTOR SHALL HAVE ON LINE GREASING FACILITY.</p> <p>5.4 THE MOTOR CONSTRUCTION SHALL BE SUITABLE FOR EASY DISASSEMBLY AND REASSEMBLY.</p> <p>5.5 MOTOR SHALL BE PAINTED WITH PAINT SUITABLE FOR WORKING CONDITION AND ITS COLOUR SHALL BE INTIMATED LATER ON.</p> <p>5.6 THE MOTOR SHALL BE THOROUGHLY DECREASED AND SHARP EDGES AND SCALES REMOVED AND TREATED WITH ONE COAT OF PRIMER AND TWO COATS OF ENAMEL PAINT. FAN SHALL ALSO BE PAINTED TO WITHSTAND CORROSION.</p> <p>6.00 TESTS MANUFACTURER'S WORKS:-</p> <p>(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.</p> <p>(ii) IN ADDITION THE FOLLOWING TESTS SHALL ALSO BE CARRIED OUT.</p> <p>(a) DEGREE OF PROTECTION TEST TO CONFORM TO THE SPECIFIED DEGREE OF PROTECTION (TYPE TEST).</p> <p>(b) 20% OVERSPEED TEST FOR 2 MINUTES (ROUTINE TEST).</p> <p>(c) MEASUREMENT OF VIBRATION (ROUTINE TEST) AS PER IS: 12075.</p> <p>(d) MEASUREMENT OF NOISE AS PER IS: 12065. MOTOR NOISE LEVEL SHALL BE LIMITED SO AS TO ACHIEVE PUMP-MOTOR SET NOISE LEVEL AS GIVEN IN CLAUSE 7.4 ON PAGE-3.</p> <p>7.0 DOCUMENTS TO BE SUPPLIED WITH OFFER:- THESE SHALL BE SUPPLIED IN TWO COPIES EACH.</p> <p>7.1 TYPE AND FRAME SIZE.</p> <p>7.2 STARTING TIME IN SECONDS.</p> <p>7.3 WITH 100% VOLTAGE AT TERMINALS</p> <p>7.4 WITH 85% VOLTAGE AT TERMINALS.</p> <p>7.5 WITH 80% VOLTAGE AT TERMINALS.</p> <p>7.6 SAFE STALL TIME AT 100% RATED VOLTAGE UNDER HOT CONDITION.</p> <p>7.7 MOTOR GD VALUE.</p> <p>7.8 WEIGHT OF MOTOR / ROTOR</p> <p>7.9 EXPECTED LIFE OF BEARING.</p> <p>7.10 TYPE AND SIZE OF CABLE FOR WHICH GLAND IS PROVIDED IN THE THE TERMINAL BOX.</p> <p>7.11 MOTOR KW RATING CALCULATION . W.R.T PUMP REQUIREMENT.</p> <p>7.12 VALUE OF STARTING RESISTANCE / RESISTANCES.</p> <p>7.13 DATA IN RESPECT OF ALL ITEMS MENTIONED AT PARA 1.0 TO 5.0 OF ANNEXURE-I.</p> <p>d.0 <u>DOCUMENTS TO BE FURNISHED WITHIN FOUR WEEKS OF PLACEMENT OF ORDER.</u></p> <p>8.1 SIX HARD COPIES AND ONE SOFT COPY (IN PDF FORMAT) OF MOTOR DATA SHEET AND G.A. DRAWING.</p> <p>8.2 DRAWING SHOWING TERMINAL DETAIL OF ALL TERMINALS AND LOCATION AND DIMENSION OF TERMINAL BOXES.</p> <p>8.3 ROTOR WEIGHT AND TOTAL MOTOR WEIGHT.</p> <p>8.4 CHARACTERISTIC CURVES OF THE MOTOR.</p> <p>9.0 SIX COPIES OF TESTS CARRIED OUT AS PER CLAUSE NO. 6.0 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.</p>
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सामग्री सूची संख्या को अधिकृतित करना है 03:R:30 N	ANNEXURE-II DATA TO BE FURNISHED BY BIDDER ALONGWITH OFFER FOR JACKING OIL PUMP																																										
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	<p>1.0 <u>EQUIPMENT AND SERVICES OFFERED</u></p> <p>PLEASE STATE WHETHER THE FOLLOWING EQUIPMENT SERVICE AS SPECIFIED IN THE DATA SHEETS ARE OFFERED OR NOT.</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">1.1</td> <td style="width:85%;">PUMP AS PER SPECIFICATION</td> <td style="width:10%;">YES/NO</td> </tr> <tr> <td>1.2</td> <td>MOTOR/MAKE</td> <td>YES/NO</td> </tr> <tr> <td>1.3</td> <td>NECESSARY INSTRUMENTS, TEST CONNECTIONS.</td> <td>YES/NO</td> </tr> <tr> <td>1.4</td> <td>BASE PLATE AS PER DRAWING.</td> <td>YES/NO</td> </tr> <tr> <td>1.5</td> <td>COMPANION FLANGES</td> <td>YES/NO</td> </tr> <tr> <td>1.6</td> <td>SPARE PARTS</td> <td>YES/NO</td> </tr> <tr> <td>1.7</td> <td>MAINTENANCE AND SPECIAL ERECTION TOOLS.</td> <td>YES/NO</td> </tr> <tr> <td>1.8</td> <td>COMMISSIONING OF THE SET.</td> <td>YES/NO</td> </tr> <tr> <td>1.9</td> <td>NO. OF PUMPS OFFERED.</td> <td>YES/NO</td> </tr> </table> <p>2.0 <u>DESIGN AND PERFORMANCE.</u></p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">2.1</td> <td style="width:85%;">DESIGNED CAPACITY OF EACH PUMP.</td> <td style="width:10%; text-align: center;">J M /hour</td> </tr> <tr> <td>2.2</td> <td>NORMAL DISCHARGE PRESSURE</td> <td></td> </tr> <tr> <td>2.3</td> <td>EFFICIENCY</td> <td></td> </tr> <tr> <td>2.4</td> <td>RATED SPEED</td> <td></td> </tr> <tr> <td>2.5</td> <td>PERFORMANCE GUARANTEED WHEN INSTALLED AS PER GIVEN ARRANGEMENT.</td> <td>YES/NO</td> </tr> </table> <p>2.6 PUMP b.h.p./Kw AT RATED CAPACITY</p> <p>2.7 MAXIMUM ALLOWABLE SUCTION LIFT (FOR MINIMUM NPSH REQUIRED)</p> <p>2.8 MAXIMUM DISCHARGE PRESSURE FOR WHICH PUMP IS SUITABLE.</p> <p>2.9 PARTY SHALL INFORM THE FILTERATION LEVEL OF THE FLOW MEDIA FOR PROPER FUNCTIONING OF PUMP.</p> <p>3.0 MATERIAL OF CONSTRUCTION</p> <p>3.1 CASING</p> <p>3.2 DRIVING AND DRIVEN SPINDLE SCREW</p> <p>3.3 BASE PLATE</p> <p>3.4 WEARING RINGS</p> <p>3.5 TYPE OF BEARINGS USED</p> <p>3.6 TYPE OF COUPLING</p> <p>3.7 PACKING</p> <p>4.0 CONNECTIONS</p> <p>4.1 SUCTION SIZE</p> <p>4.2 DISCHARGE SIZE</p> <p>5.0 DRAWINGS</p> <p>5.1 GENERAL ARRANGEMENT AND SECTIONAL DRAWING ENCLOSED WITH OFFER. YES/NO</p>	1.1	PUMP AS PER SPECIFICATION	YES/NO	1.2	MOTOR/MAKE	YES/NO	1.3	NECESSARY INSTRUMENTS, TEST CONNECTIONS.	YES/NO	1.4	BASE PLATE AS PER DRAWING.	YES/NO	1.5	COMPANION FLANGES	YES/NO	1.6	SPARE PARTS	YES/NO	1.7	MAINTENANCE AND SPECIAL ERECTION TOOLS.	YES/NO	1.8	COMMISSIONING OF THE SET.	YES/NO	1.9	NO. OF PUMPS OFFERED.	YES/NO	2.1	DESIGNED CAPACITY OF EACH PUMP.	J M /hour	2.2	NORMAL DISCHARGE PRESSURE		2.3	EFFICIENCY		2.4	RATED SPEED		2.5	PERFORMANCE GUARANTEED WHEN INSTALLED AS PER GIVEN ARRANGEMENT.	YES/NO
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स्वत्वधिकार एवं गोपनीय इस दस्तावेज में की गई सूचना भारत की इलेक्ट्रिकल की सम्पत्ति है इसका प्रस्ताव एवं प्रकरण का से किसी भी तरह प्रयोग, उसे किसी अन्य व्यक्ति को देना या प्रकाशित करना गैर कानूनी है																																											
हस्ताक्षर एवं दिनांक SIGN & DATE 13/7/07																																											



सामग्री सूची संख्या INVENTORY NO. P-5A74	REV.NO. 08		WORKED BY DHARAMPAL 	26-06-07
		CHECKED BY ANUJJAIN 	26-06-07	

OIL TANK ARRANGEMENT

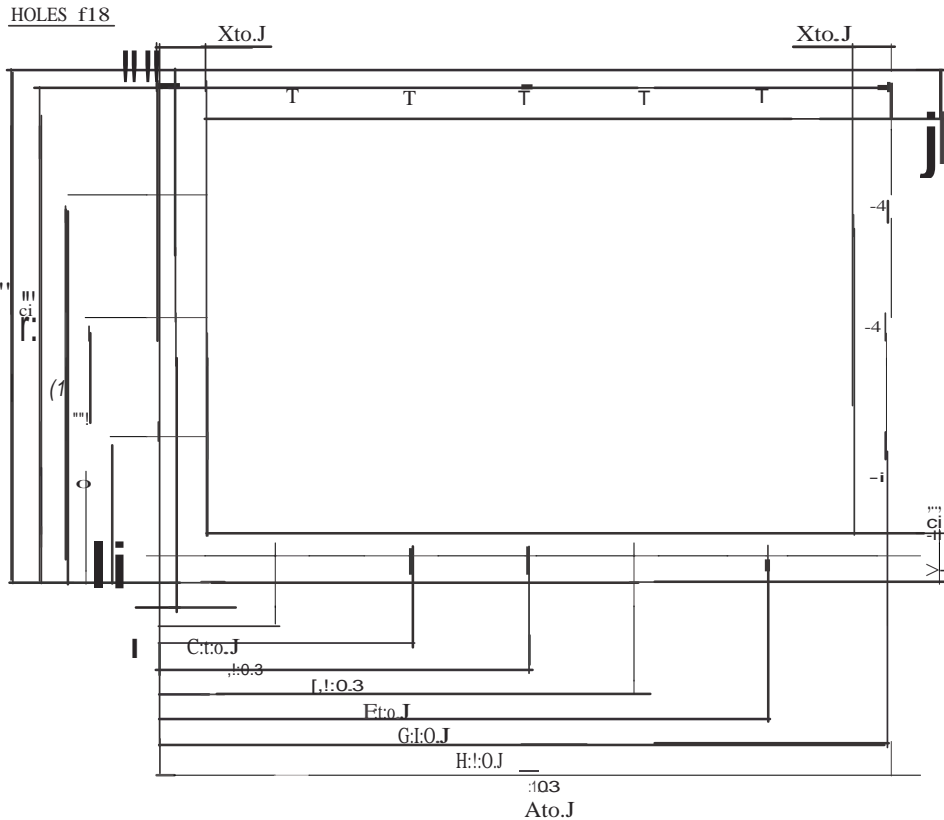


स्वतंत्रताधिकार एवं गोपनीय

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चिह्नक एवं तारीख SIGN & DATE 	REV. NO. 01		कार्यकारी WORKED BY DHARAMPAL	
			जांचकारी CHECKED BY ANUJ JAIN	

BED PLATE EXISTING ON OIL TANK



BED PLATE TYPE	A±0.3	8±0.3	C±0.3	0 ±0.3	£±0.3	F±0.3	G±0.3	H ±0.3	J±0.3	X±0.3	NO. OFF HOLES
M	700	700	50	250	450	650	-	-	-	80 80	12
BB	700	700	35	245	455	665	-	-	-	60 60	12
CC	1320	900	30	240	450	660	870	1080	1290	85 85	20

REV. NO.

1: 07

WORKED BY

DHARAMPAL

11/11

CHECKED BY

ANUJ JAIN

11111