

NOTES:-

01. THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNERS ARE RESPONSIBLE FOR PROPER DESIGN OF FOUNDATION TAKING INTO ACCOUNT OF THE ALLOWANCES FOR VIBRATION ALSO.
02. THE DIFFERENT NATURAL FREQUENCY OF THE FOUNDATION HAVE TO BE 30% AWAY FROM THE SPEED FREQUENCY. $f_{max} = n/60$ AND 20% AWAY FROM THE DOUBLE OF THE SPEED FREQUENCY, $2 \times f_{max}$.
SPEED FREQUENCY: $f_{max} = 9.8333 \text{ Hz}$
($2 \times f_{max}$) = 19.6666 Hz
03. THE STIFFNESS OF THE FOUNDATION HAS TO BE ATLEAST $CPI \geq 0.08 \text{ N/mm}$ IN LONGITUDINAL, TRANSVERSAL, AND VERTICAL DIRECTIONS RELATING TO THE FAN AXIS. IT HAS TO BE TAKEN INTO CONSIDERATION THAT ON SETTLING OF THE FOUNDATION THE TOTAL NATURAL FREQUENCIES OF THE ELASTIC MODULUS. AN UNEVEN SETTLING OF THE FOUNDATION HAS TO BE ELIMINATED.
04. THE RATIO OF THE FOUNDATION MASS TO THE ROTOR MASS HAS TO BE GREATER THAN 20.
05. ADAPT IS: 2974 / PART-IV FOR THE FOUNDATION DESIGN.
06. THE PERMISSIBLE MAXIMUM AMPLITUDE REFERRED TO SUPPORTING AREA-TOP EDGE OF FOUNDATION IS 150 MICRONS.
07. THE CONNECTING CUTS AT INLET AND OUTLET OF FAN MUST BE SELF SUPPORTED AND SHOULD NOT BE WELDED WITH EXPANSION JOINTS.
08. FOUNDATION POCKETS SHOULD BE PERPENDICULAR TO THE FLAT SURFACES OF FOUNDATION.
09. ACCURATE TEMPLATES SHALL BE USED FOR LOCATING CORES FOR POCKET HOLES TO ENSURE THEIR DIMENSIONAL ACCURACY.
10. TOLERANCE BETWEEN ANY TWO POCKET CENTRES IS $\pm 5 \text{ mm}$.
11. IN AREAS WHERE SOLE PLATES AND ANCHOR PLATES ARE TO BE INCORPORATED IN FOUNDATION CONCRETE, THE SIZE OF THE CORNER REBAR/STEEL USED SHALL NOT EXCEED 20 mm AND DOWN GRADED TO FACILITATE DRIPPING AND SOAKING AND THEREBY ENSURING MAXIMUM CONTACT ON THE WELDING AREAS.
12. NON-SHANK GROUTS TO BE USED. REFER GENERAL SPECIFICATIONS ISSUED BY BHEL/RANGET FOR NON-SHANK GROUT. THIS ALSO COVERS THE PREPARATIONS OF PRIMA/FACETS & SHIMS.
13. GROUTING SHOULD BE DONE ONLY AFTER FINAL ALIGNMENT OF FAN.
14. ELEVATION & POCKET DEPTHS SHOWN IN FOUNDATION PLAN ARE INCLUDING GROUTING THICKNESS.
15. GROUTING IS IN THE SCOPE OF ERECTION/CONTRACTOR.
16. HANDRAILS, STEEL PLATFORMS, STAIRS, STEEL LADDERS & CANOPY FOR MOTOR AND THEIR EMBEDMENTS ARE IN THE SCOPE OF BHEL/TRIUMPH.
17. FAN FOUNDATION SHOULD NOT BE USED AS SUPPORT FOR OTHER STRUCTURES OR EQUIPMENTS.
18. FOUNDATION CONFIGURATION SHOWN IN THIS DRAWING IS ONLY INFORMATIVE/TYPICAL. TYPE AND DETAILS OF FOUNDATION ARE TO BE FINALISED BY CIVIL DESIGNERS.
19. FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
20. BASE FRAME, SOLE PLATE, FOUNDATION BOLTS, FAN STEEL & FASTENERS RELATED TO MOTORS.
21. FOUNDATION SLEEVES OF THE MOTOR IS TO BE EMBEDDED IN THE CONCRETE AS PER THE DIMENSION SHOWN. AFTER CONCRETE HAS SET, THE EXCESS PROTRUDING HEIGHT TO BE SUITABLY CUT-OFF.

FAN DETAILS:-

TYPE : SAF 422/78A-1
WEIGHT OF ROTATING PARTS : 19000 kg
TOTAL WEIGHT OF FAN (WITHOUT MOTOR, COUPLING ETC.) : 61200 kg (APPROX)
SPEED OF FAN : 52400 kg-m²
NO. OF FANS PER BOILER : 590 RPM
CASING THICKNESS MIN. : 6mm
MAX ALLOWABLE BEARING VIBRATION:
SET POINTS FOR VIBRATION:
ALARM : TRIP
4.5mm/s [rms] : 11mm/s [rms]

INTERMEDIATE SHAFT WEIGHT: 2200kg.

| REV | DESCRIPTION | DATE | DRAWN BY | CHECKED BY | APPROD BY |
|-----|------------------------|------------|----------|------------|-----------|
| 00 | ISSUED FOR NTPC REVIEW | 05.09.2012 | PLN | R.G | T.S.S |

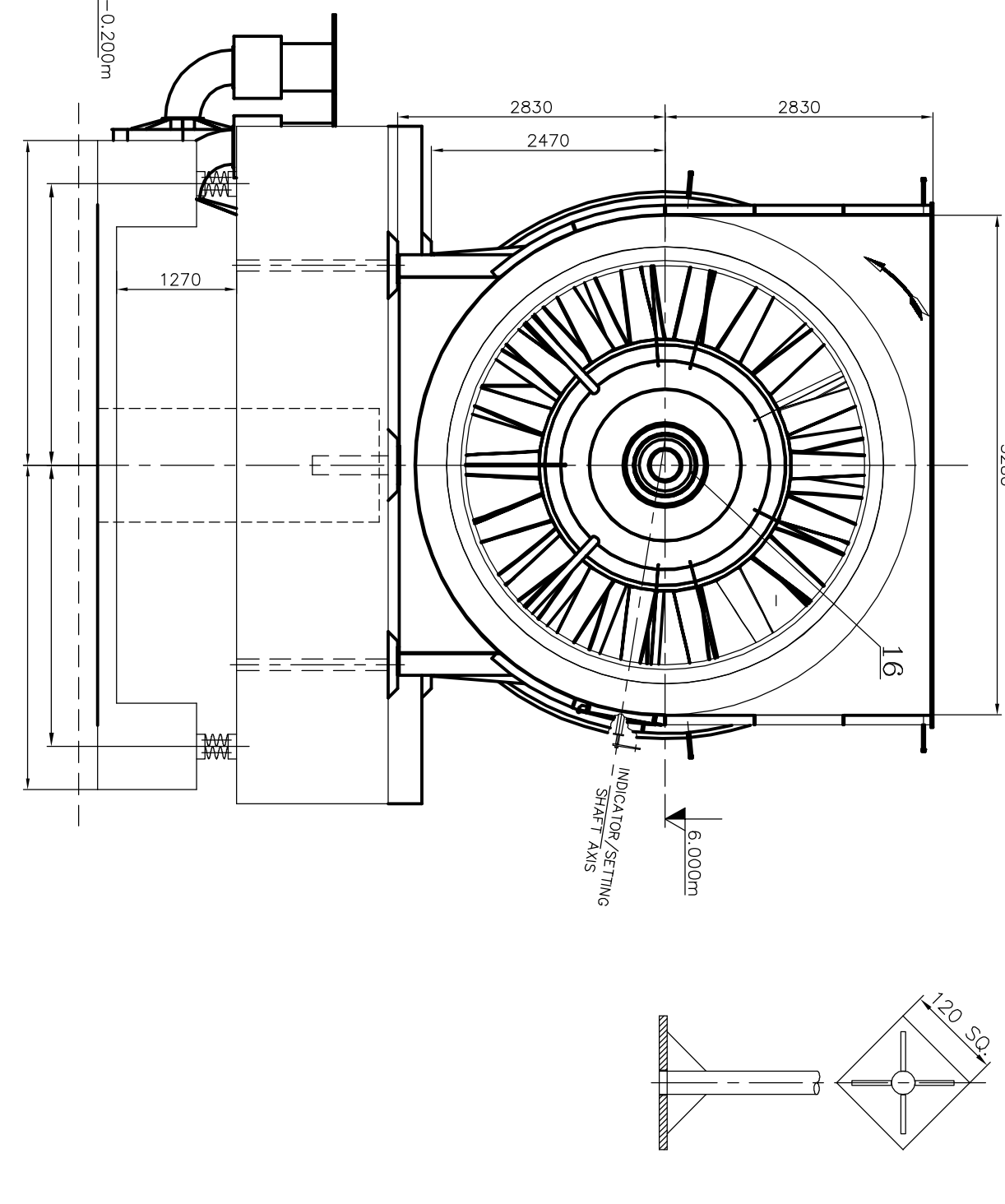
NTPC CUSTOMER NOS. R646&R647
CUSTOMER : 9575-102-RN-PVM-B-0108
(A Government of India Enterprise)
PROJECT : MOUDA SUPER THERMAL POWER PROJECT
STAGE-II (2 X 660MW)
BHEL AUXILIARIES PLANT
RAIPET - 632 406

BHARAT HEAVY ELECTRICALS LIMITED,
BOILER AUXILIARIES PLANT
RAIPET - 632 406

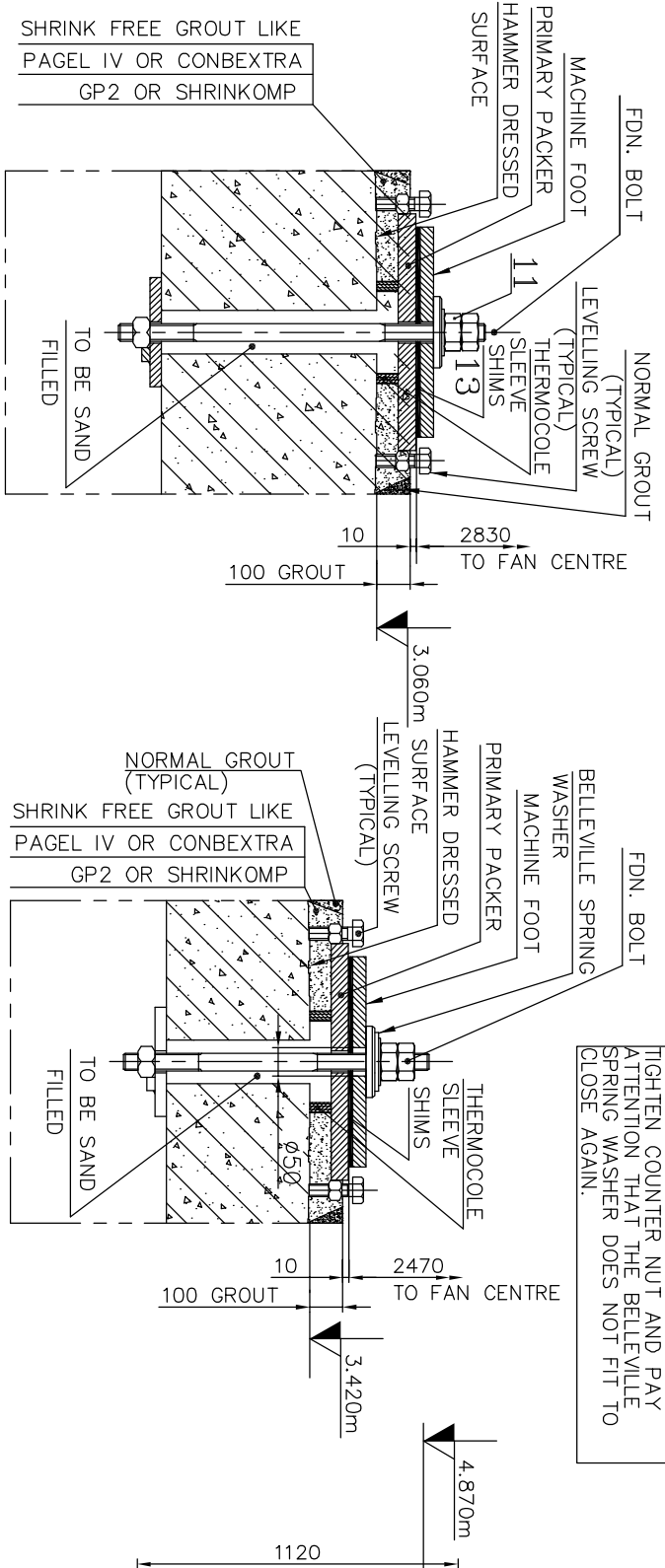
TITLE : GA DRAWING FOR ID FAN WITH
FOUNDATION PLAN AND LOADING DATA
SAFE 42.2/26.6-1

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ALL DIMENSIONS IN MILLIMETRE
PROJECTION : 1:60
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1-00-099-28724

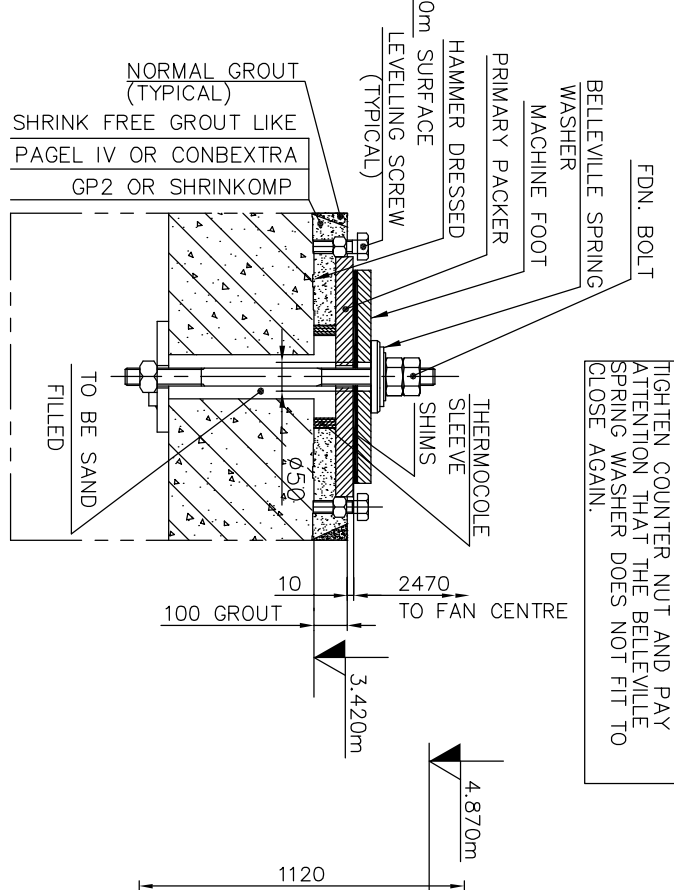
BOTTOM OF FAN FDN. BOLT



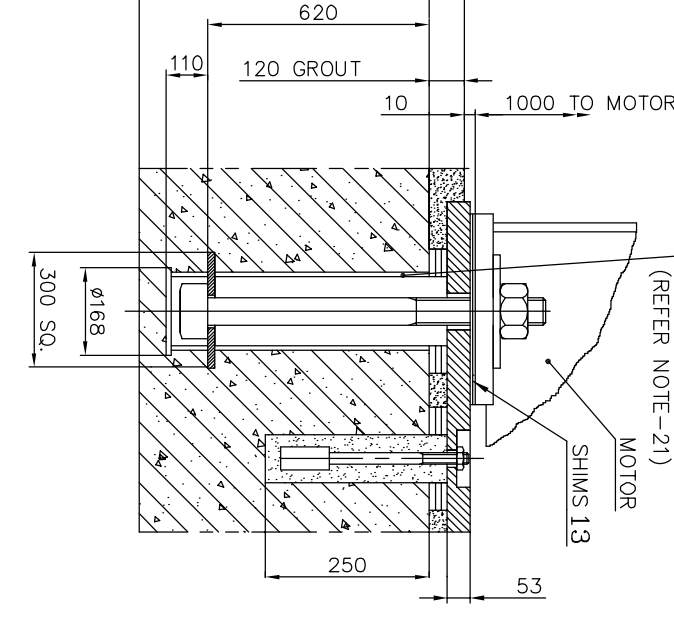
SECTION-B1B1 (AT D)



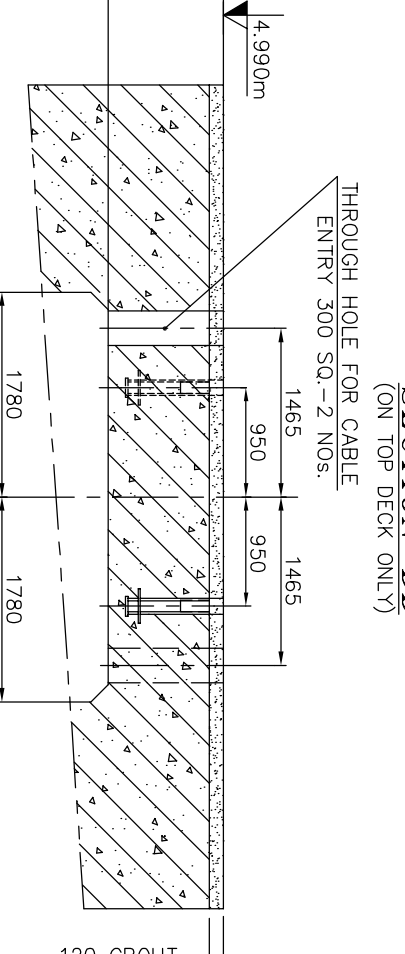
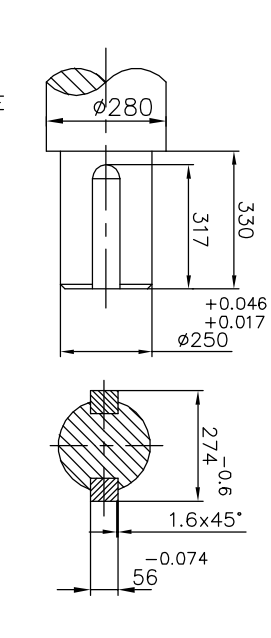
SECTION-B2B2 (AT II)



SECTION-CC



MOTOR SHAFT END

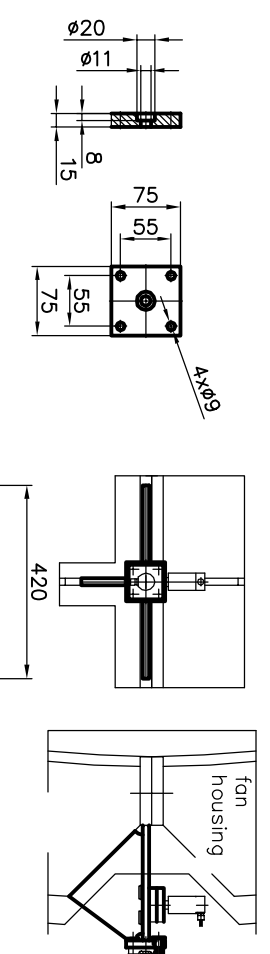


| Point Forces in [N] | Static Load | Dynamic Load | Static Load | Dynamic Load | Static Load | Dynamic Load |
|---------------------|-------------|--------------|-------------|--------------|-------------|--------------|
| I | +23000 | ±900 | ±4600 | ±4600 | ±4600 | ±4600 |
| II | +72800 | ±3100 | ±13800 | ±200 | ±2600 | ±2600 |
| III | +96200 | ±1800 | ±13800 | ±200 | ±2600 | ±2600 |
| IV | +34400 | ±2100 | ±6900 | ±6900 | ±2100 | ±2100 |
| V | +4600 | ±100 | ±200 | ±200 | ±200 | ±200 |
| VI | +4600 | ±27000 | ±200 | ±900 | ±900 | ±900 |
| VII | +3800 | ±175000 | ±200 | ±13000 | ±2600 | ±2600 |
| VIII | +3800 | ±100 | ±100 | ±13000 | ±2600 | ±2600 |

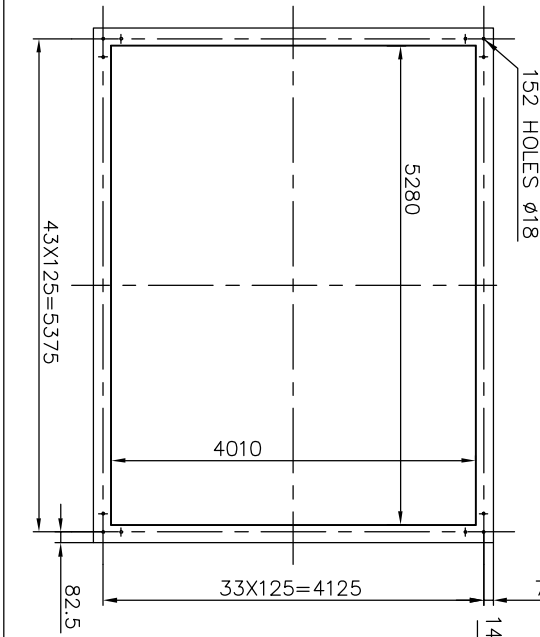
| NO | DESCRIPTION | MATERIAL | QTY |
|----|------------------------------|---|----------|
| 01 | SUCTION CHAMBER | IS : 2062 OR EQUIVALENT | 1 |
| 02 | IMPELLER HOUSING | IS : 2062 OR EQUIVALENT | 1 |
| 03 | OUTLET GUIDE VANE ASSY. | IS : 2062 OR EQUIVALENT | 1 |
| 04 | DIFFUSER | IS : 2062 OR EQUIVALENT | 1 |
| 05 | (FAN HOUSING HUB) | IS : 2062 OR EQUIVALENT | 1 |
| 06 | IMPELLER HUB | IS : 2062 OR EQUIVALENT | 1 |
| 07 | IMPELLER HUB | IS : 2062 OR EQUIVALENT | 1 |
| 08 | MOTOR WITH RNDN. FASTENERS | IS : 2062 OR EQUIVALENT | 1 |
| 09 | SPACER COUPLING | IS : 2062 OR EQUIVALENT | 1 |
| 10 | COUPLING GUARD | IS : 1079 | 1 |
| 11 | FOUNDATION FASTENERS FOR FAN | ASTM A105 | 19 |
| 12 | PRIMARY PACKER | IS : 2062 | AS REQD. |
| 13 | SHIMS | S.S | AS REQD. |
| 14 | BEARINGS | 24ANGULAR CONTACT BALL BRG. ASSY IN 1 BRG. HSG. | 1 |

BILL OF MATERIAL

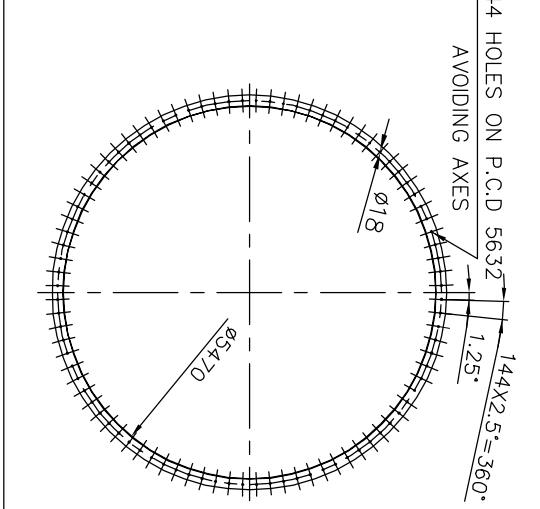
VIBRATION PICK-UP PAD DETAILS



SUCTION FLANGE



DELIVERY FLANGE



MOTOR DETAILS:-

RATING : 4500kW
FRAME SIZE : M/A-BHEL/BHOPAL
WEIGHT OF MOTOR : 27800kg
WEIGHT OF ROTATING PARTS : 9250kg
MOTOR DRG. NO. : 37606G/M
LOADING ON MOTOR FOUNDATION : 1402000872

LOADING ON MOTOR FOUNDATION
REACTION DUE TO WEIGHT ON EACH SIDE (G) = 139 kN
MAX. SHORT CIRCUIT FORCE (MS) = 515 kN
REACTION DOWARD (MS+G) = 237 kN
REACTION UPWARD (MS-G) = 237 kN
MOTOR NOTES:
01. THE FORCES OCCUR ALTERNATELY INDEPENDENT OF THE DIRECTION OF ROTATION. (REFER LOADING ON FOUNDATION TABLE).
02. THE TRANSFER OF VIBRATION FROM SURROUNDING EQUIPMENT HAS TO BE AVOIDED BY SUITABLE LAYOUT OF FOUNDATION.
03. THE FIRST NATURAL FREQUENCIES OF THE FOUNDATION AFTER ERECTION OF RUNNING SPEED FREQUENCIES & TWO TIMES THE ELECTRICAL FREQUENCY.

MOTOR BEARING DATA:

BEARING : 4500kW
SIZE : M/A-BHEL/BHOPAL
LUBRICANT : 27800kg
OIL FILLING QTY. : 9250kg
WATER FLOW RATE FOR TWO ELEMENTS : 350 LPM
WATER INLET / OUTLET TEMPERATURE : 38°C/45°C
OPERATING PRESSURE : 380 mbar
TEST PRESSURE : max. 6 bar
9 bar

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