भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(भारत सरकार का उपक्रम / A Government of India Undertaking)
CIN: L74899DL1964GOI004281
पावर सेक्टर पूर्वी क्षेत्र / Power Sector Eastern Region
भेल भवन, प्लॉट सं. - डी जे - 9/1, साल्ट लेक सेक्टर- II, कोलकाता - 700091, फोन 03323398000
BHEL Bhawan, Plot No. DJ- 9/1, Salt Lake Sector- II, Kolkata – 700091 Phone: 033-23398000
1 X 660 MW एसजीटीपीपी, डब्ल्यूबीपीडीसीएल, स्टेज III, यूनिट: 5, मोनीग्राम, मुर्शिदाबाद, प. बं. 742237
1 X 660 MW SGTPP, WBPDCL, Stage III, Unit: 5, Monigram, Murshidabad, WB 742237

Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 **Dtd. 24.01.2026**

To,

Sub.: Notice Inviting Tender (NIT) for procurement of items of Air Conditioning System at 1x660 MW Sagardighi site.

Dear Sir,

Your best price offer is invited in duly signed with seal copy in the format provided by BHEL through Email to amrendra@bhel.in, kcdas@bhel.in & r.pal@bhel.in from reputed & experienced bidders for the subject job by the undersigned on behalf of BHARAT HEAVY ELECTRICALS LIMITED, Sagardighi site as per tender document. The offers are to be sent latest by 3rd day of floating of tender up to 18:00 hrs to above stated email-id and the same will be evaluated on 4th day of floating of tender at 10:00 hrs. Bidders to note specifically that all pages of tender document including these NIT pages of this particular tender, shall be submitted by them, duly signed & stamped on each page, as part of the offer. Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the offer other than the Price Bid (BOQ), shall not be entertained. The bidders are requested to depute their representative during opening/evaluation of the tender documents received by mail. **This is Limited Tender. It is not open for all. Please check regarding applicability before Tender Submission.**

Thanking you,

Yours sincerely,
For & on behalf of BHEL

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1 X 660 MW SGTPP, WBPDCL, Stage III, Unit: 5, Monigram, Murshidabad, WB 742237

Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 **Dtd. 24.01.2026**

GENERAL INSTRUCTIONS TO TENDERERS

Bidders must take the print of all pages of NIT, Price Schedule Enclosed in mail, put the signature and seal on every page of NIT and fill the price schedule in prescribed format of Price schedule and must be signed by your authorised person with company seal and send these documents to given email id as per schedule given below:

SALIENT DETAILS OF NIT		
SL	**ISSUE**	**DESCRIPTION**
1.0	TENDER SPECIFICATION NO.	**BHEL: PSER: SGD: BOP:AC:Fan:01 Dtd. 24.01.2026**
2.0	DUE DATE OF SUBMISSION	**3rd day of floating of tender UP TO 1800 hrs (i.e. 27.01.2026)**
3.0	DUE DATE OF TENDER OPENING/Evaluation	**4th day of floating of tender at 1000 hrs (i.e. 28.01.2026).**
3.0	VENUE OF TENDER OPENING	Bharat Heavy Electricals Limited, 1x660 MW Sagardighi Thermal Power Project, Unit-5, WBPDCL, P.O.- Manigram, Dist.: Murshidabad, West Bengal-742237
4.0	Concerned mail Id for sending the bid	amrendra@bhel.in kcdas@bhel.in r.pal@bhel.in (Mail should be marked to all mail ids)

Scope of Supply:

As per Annexure-1.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(भारत सरकार का उपक्रम / A Government of India Undertaking)
CIN: L74899DL1964GOI004281
पावर सेक्टर पूर्वी क्षेत्र / Power Sector Eastern Region
भेल भवन, प्लॉट सं. - डी जे - 9/1, साल्ट लेक सेक्टर- II, कोलकाता - 700091, फोन 03323398000
BHEL Bhawan, Plot No. DJ- 9/1, Salt Lake Sector- II, Kolkata – 700091 Phone: 033-23398000
1 X 660 MW एसजीटीपीपी, डब्ल्यूबीपीडीसीएल, स्टेज III, यूनिट: 5, मोनीग्राम, मुर्शिदाबाद, प. बं. 742237
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Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 **Dtd. 24.01.2026**

Delivery Schedule:

- The entire supply under the above scope of supply shall be completed within 4 months from date of issue of purchase order/as per site requirement. However, bidder is requested to supply the materials as early as possible.

Validity of Offer:

The rates in the tender shall be kept valid for acceptance for a period of 30 days from the date of submission of offer.

Payment Terms: -

- 100% Payments will be made within 30 days on receipt of materials at BHEL Store and submission of original GST Invoice along with delivery challan.
- GST Will be release on submission of required/supporting document to BHEL.

Price Variation Compensation/Over Run Charges: Not applicable

Liquidated damages (LD): A sum equivalent to half (½) percent and applicable GST thereon, of the total main supply contract price excluding GST per week or part thereof, subject to a maximum of Five (5) percent of the total supply contract value excluding GST.

Packaging and forwarding/Transportation/Risk-Insurance:

- Packing & forwarding and transportation will be in your scope and will be done properly. Transit insurance (if any) will be in BHEL scope. However, preliminary intimation to be given to insurance agency prior to dispatch of the materials.

Guarantee/Warrantee of material:

- Material shall be inspected at site according to the specification given, if found any discrepancy in any material during inspection or during the job, same will be rejected and have to replace without any additional cost.

General Conditions of Supply:

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(भारत सरकार का उपक्रम / A Government of India Undertaking)
CIN: L74899DL1964GOI004281
पावर सेक्टर पूर्वी क्षेत्र / Power Sector Eastern Region
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BHEL Bhawan, Plot No. DJ- 9/1, Salt Lake Sector- II, Kolkata – 700091 Phone: 033-23398000
1 X 660 MW एसजीटीपीपी, डब्ल्यूबीपीडीसीएल, स्टेज III, यूनिट: 5, मोनीग्राम, मुर्शिदाबाद, प. बं. 742237
1 X 660 MW SGTPP, WBPDCL, Stage III, Unit: 5, Monigram, Murshidabad, WB 742237

Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 **Dtd. 24.01.2026**

- Supply of total materials as mentioned above to be done within 4 months gradually date of issue of purchase order/as per site requirement.
- MDCC shall be issued by BHEL/Owner or their authorized representative prior to dispatch based on inspection reports and compliance as per approved documents. In case the tests are not witnessed by BHEL/Owner's representative, the test certificates shall be submitted to owner through BHEL for review and MDCC will be issued thereafter.
- The customer/consultant and "BHEL" may depute their representative for checking and supervision of important stages of works. The bidder shall be required to provide all facilities for inspection of works at no extra cost to BHEL. Any defect in quality of work or deviations from drawings/specifications pointed out during such inspection shall be made good by the bidder as it pointed out by the BHEL Engineer, without any cost implication to BHEL.
- Unloading of materials is in BHEL's scope.
- Items to supplied strictly adhering to the given specification and make. Specification is enclosed.
- Test certificates of material to be submitted (if required for any material as applicable).
- BHEL reserve the right for cancellation/modification of Tender or Contract.

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Scope of Supply

NIT Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 Dated 24.01.2026

Job/Supply: procurement of items of Air Conditioning System at 1x660 MW Sagardighi site.

SL NO	ITEM DESCRIPTION	TOTAL QTY REQUIRED	UOM	Specification
1.0	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories for each AHU room			
1.1	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories (Capacity 4500 CFM, St. Pr. 30 mm.wg) for 24.0 m AHU Room.			
1.1.1	Fresh air fan (Capacity 4500 CFM, St Pr. 30 mm.wg) for 24.0 m AHU Room	1	No	PE-V0-445-553-A024
1.1.2	Motor for above fan- 1.5 Kw	1	No	PE-V0-445-553-A017
1.1.3	Air filters (pre and fine) with supporting frame			
1.1.3.1	Pre-Filter (610x610x50mm) - 4 NOS . & Fine Filter (610x610x150mm)- 4 NOS for above fan	1	Set	PE-V0-445-553-A035
1.1.3.2	Filter frame for above filters	1	Set	PE-V0-445-553-SK002
1.1.5	Cowl with birdmess (1200mm x 1000mm)	1	Set	PE-V0-445-553-SK002
1.1.7	VCD for above supply air fan duct (1250mm x 1250mm)	1	Set	PE-V0-445-553-SK002
1.1.8	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002
1.2	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories (Capacity 1200 CFM, St. Pr. 30 mm.wg) for 8.5 m AHU Room			
1.2.1	Fresh air fan (Capacity 1200 CFM, St. Pr. 30 mm.wg) for 8.5 m AHU Room	1	No	PE-V0-445-553-A024
1.2.2	Motor for above fan- 0.37 Kw	1	No	PE-V0-445-553-A017
1.2.3	Air filters (pre and fine) with supporting frame			
1.2.3.1	Pre-Filter (610x610x50mm) - 1 NOS . & Fine Filter (610x610x150mm) - 1 NOS for above fan alongwith filter frame	1	Set	PE-V0-445-553-A035
1.2.3.2	Filter frame for above filters	1	Set	PE-V0-445-553-SK002
1.2.5	Cowl with birdmess (600mm x 900mm)	1	Set	PE-V0-445-553-SK002
1.2.7	VCD for above supply air fan duct (650mm x 950mm)	1	Set	PE-V0-445-553-SK002
1.2.8	Fan support structure including mounting legs, Rubber pad,nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002
2.0	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &			
2.1	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &			
2.1.1	Smoke exhaust fan (Capacity 24000 CFM, St. Pr. 20 mm.wg) for 24.0 m AHU Room	1	No	PE-V0-445-553-A024
2.1.2	Motor for above fan (flame proof motor & mounting frame) - 3.7 Kw	1	No	PE-V0-445-553-A017
2.1.4	Cowl with birdmess (1500mm x 1400mm)	1	Set	PE-V0-445-553-SK002

Annexure-1

Scope of Supply

NIT Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 Dated 24.01.2026

Job/Supply: procurement of items of Air Conditioning System at 1x660 MW Sagardighi site.

SL NO	ITEM DESCRIPTION	TOTAL QTY REQUIRED	UOM	Specification
2.1.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002
2.2	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &			
2.2.1	Smoke exhaust fan (Capacity 6800 CFM, St. Pr. 20 mm.wg) for 8.5 m AHU Room	1	No	PE-V0-445-553-A024
2.2.2	Motor for above fan (flame proof motor & mounting frame)- 0.75 Kw	1	No	PE-V0-445-553-A017
2.2.4	Cowl with birdmess (1500mm x 1000mm)	1	Set	PE-V0-445-553-SK002
2.2.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002
3.0	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with			
3.1	Fresh air fan (Capacity 1800 CFM, St. Pr. 30 mm.wg) for 3.7 m PAC Room	1	No	PE-V0-445-553-A024
3.2	Motor for above fan- 0.55 Kw	1	No	PE-V0-445-553-A017
3.3	Air filters (pre and fine) with supporting frame			
3.3.1	Pre-Filter (610x610x50mm) - 1 NOS . & Fine Filter (610x610x150mm)- 1 NOS for above fan alongwith filter	1	Set	PE-V0-445-553-A035
3.3.2	Filter frame for above filters	1	Set	PE-V0-445-553-SK002
3.5	Fresh Air Louver (GI) with birdmess (650mm x 650mm)	1	Set	PE-V0-445-553-SK002
3.7	VCD for above supply air fan duct (600mm x 600mm)	1	Set	PE-V0-445-553-SK002
3.8	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002
4.0	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &			
4.1	Smoke exhaust fan (Capacity 19000 CFM, St. Pr. 20 mm.wg) for 9.2 m PAC Room	1	No	PE-V0-445-553-A024
4.2	Motor for above fan (flame proof motor & mounting frame)- 2.2 Kw	1	No	PE-V0-445-553-A017
4.4	Exhaust Louver (GI) with birdmess (1000mm x 1000mm)	1	Set	PE-V0-445-553-SK002
4.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set	PE-V0-445-553-SK002

Price Schedule

NIT Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 Dated 24.01.2026

Job/Supply: procurement of items of Air Conditioning System at 1x660 MW Sagardighi site.

SL NO	ITEM DESCRIPTION	TOTAL QTY REQUIRED	UOM	Unit Rate (Rs.)	Total Amount (in Rs)
1.0	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories for each AHU room				
1.1	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories (Capacity 4500 CFM, St. Pr. 30 mm.wg) for 24.0 m AHU Room.				
1.1.1	Fresh air fan (Capacity 4500 CFM, St Pr. 30 mm.wg) for 24.0 m AHU Room	1	No		
1.1.2	Motor for above fan- 1.5 Kw	1	No		
1.1.3	Air filters (pre and fine) with supporting frame				
1.1.3.1	Pre-Filter (610x610x50mm) - 4 NOS . & Fine Filter (610x610x150mm)- 4 NOS for above fan	1	Set		
1.1.3.2	Filter frame for above filters	1	Set		
1.1.5	Cowl with birdmess (1200mm x 1000mm)	1	Set		
1.1.7	VCD for above supply air fan duct (1250mm x 1250mm)	1	Set		
1.1.8	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set		
1.2	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with support structure and other accessories (Capacity 1200 CFM, St. Pr. 30 mm.wg) for 8.5 m AHU Room				
1.2.1	Fresh air fan (Capacity 1200 CFM, St. Pr. 30 mm.wg) for 8.5 m AHU Room	1	No		
1.2.2	Motor for above fan- 0.37 Kw	1	No		
1.2.3	Air filters (pre and fine) with supporting frame				
1.2.3.1	Pre-Filter (610x610x50mm) - 1 NOS . & Fine Filter (610x610x150mm) - 1 NOS for above fan alongwith filter frame	1	Set		
1.2.3.2	Filter frame for above filters	1	Set		
1.2.5	Cowl with birdmess (600mm x 900mm)	1	Set		
1.2.7	VCD for above supply air fan duct (650mm x 950mm)	1	Set		
1.2.8	Fan support structure including mounting legs, Rubber pad,nuts, bolts, washers etc.	1	Set		
2.0	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &				
2.1	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &				
2.1.1	Smoke exhaust fan (Capacity 24000 CFM, St. Pr. 20 mm.wg) for 24.0 m AHU Room	1	No		
2.1.2	Motor for above fan (flame proof motor & mounting frame) - 3.7 Kw	1	No		
2.1.4	Cowl with birdmess (1500mm x 1400mm)	1	Set		

Price Schedule

NIT Ref. No. BHEL: PSER: SGD: BOP:AC:Fan:01 Dated 24.01.2026

Job/Supply: procurement of items of Air Conditioning System at 1x660 MW Sagardighi site.

SL NO	ITEM DESCRIPTION	TOTAL QTY REQUIRED	UOM	Unit Rate (Rs.)	Total Amount (in Rs)
2.1.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set		
2.2	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &				
2.2.1	Smoke exhaust fan (Capacity 6800 CFM, St. Pr. 20 mm.wg) for 8.5 m AHU Room	1	No		
2.2.2	Motor for above fan (flame proof motor & mounting frame)- 0.75 Kw	1	No		
2.2.4	Cowl with birdmess (1500mm x 1000mm)	1	Set		
2.2.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set		
3.0	Fresh air fan (axial flow type), complete with motor, inlet cone, air filters (pre and fine), dampers etc. along with				
3.1	Fresh air fan (Capacity 1800 CFM, St. Pr. 30 mm.wg) for 3.7 m PAC Room	1	No		
3.2	Motor for above fan- 0.55 Kw	1	No		
3.3	Air filters (pre and fine) with supporting frame				
3.3.1	Pre-Filter (610x610x50mm) - 1 NOS . & Fine Filter (610x610x150mm)- 1 NOS for above fan alongwith filter	1	Set		
3.3.2	Filter frame for above filters	1	Set		
3.5	Fresh Air Louver (GI) with birdmess (650mm x 650mm)	1	Set		
3.7	VCD for above supply air fan duct (600mm x 600mm)	1	Set		
3.8	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set		
4.0	Smoke exhaust fan complete with flame proof motor & mounting frame, motorized isolating dampers with cowl &				
4.1	Smoke exhaust fan (Capacity 19000 CFM, St. Pr. 20 mm.wg) for 9.2 m PAC Room	1	No		
4.2	Motor for above fan (flame proof motor & mounting frame)- 2.2 Kw	1	No		
4.4	Exhaust Louver (GI) with birdmess (1000mm x 1000mm)	1	Set		
4.5	Fan support structure including mounting legs, Rubber pad, nuts, bolts, washers etc.	1	Set		
	Total amount for Supply				
	Packing and Freight Charge				
	Total amount (Supply + Packing & Freight)				
NOTE: GST is exclusive. GST will be paid as extra (As applicable).					

Signature with stamp of bidder

NO DEVIATION CERTIFICATE

To
Construction Manager/Project-Director
BHEL, Sagardighi site
1X660 MW, Sagardighi TPEP,
Sagardighi, Murshidabad

Sub: No Deviation Certificate.

Job: Procurement of items of Air Conditioning System at 1x660 MW Sagardighi site

Ref: BHEL PSER Sagardighi Site Tender Notice No. BHEL: PSER: SGD: BOP:AC: Fan:01 dated 24.01.2026

Dear Sir,

With reference to above, this is to confirm that as per tender conditions, we have noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred tender notice. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, and other terms and conditions, integrity pact (if applicable) as detailed in NIT.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

BHARAT HEAVY ELECTRICALS LTD
PROJECT ENGINEERING MANAGEMENT
PLOT NO-25 SECTOR 16A, FILM CITY NOIDA, UP-201301, INDIA

This is to certify that this document has been reviewed in PEM for conforming to the technical requirements of the project.

SIGNATURE	
NAME OF DEALING ENGINEER & DESIGNATION	ARVIND KUMAR (SR. MANAGER)
DATE	
DEPARTMENT	MECHANICAL AUXILLIARIES

Digitally signed by Arvind kumar
DN: cn=Arvind kumar, o=BHEL, ou=PEM, email=arvindkr@bhel.in, c=IN
Date: 2025.09.03 18:31:57 +05'30'

DEVELOPMENT CONSULTANTS PRIVATE LIMITED

Reviewed only for general conformance with contract drawings and specifications.

ACTION : 5			
1	Approved	4	Disapproved.
1*	Approved with Comments		
2	Approved except as noted, Forward final drawing.	5*	For information and record with comments.
3	Approved except as noted, Resubmission required.	5	For information and Record.

Contractor to be responsible for any errors and for fulfillment of detailed requirements of contract documents.

Digitally signed by Sourav Kundu
DN: cn=Sourav Kundu, o=DCPL, ou, email=sourav.kundu@in.dclgroup.com, c=IN
Date: 2025.10.10 17:33:08 +05'30'

01.09.2025	REV 02	IRSHAD SAIFI	IRSHAD SAIFI	SAHIL SINGH
08.07.2024	REV 01	SAHIL SINGH	PIYUSH	KRISHAN SINGH
26.04.2023	FIRST SUBMISSION	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
Date	**DESCRIPTION OF REVISION**	**Prep By**	**Checked**	**Approved**

PROJECT		**1 X 660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III**		
OWNER		**WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED (WBPDCL)**		
CONSULTANT		**DEVELOPMENT CONSULTANT PVT LTD. (DCPL), KOLKATA**		
PURCHASER		**BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NOIDA**		
CONTRACTOR		**PARKSONS ENGINEERING COMPANY PVT LTD. NEW DELHI**		
Job No	**445**	**BHEL DOCUMENT NO.**	**PE-V0-445-553-A017**	**REV 02**
STATUS	**CONTRACT**	**PARKSONS DOCUMENT NO.**	**PEC-0715A/22**	**REV 02**
PACKAGE	**AIR CONDITIONING SYSTEM**			
TITLE	**TDS AND GA OF AXIAL FAN MOTOR (FRESH AIR, SMOKE AIR FAN)**			

	Name	**Date**	**Submitted for**
Prep By	ASHOK KUMAR	26.04.2023	APPROVAL
Checked by	AHMAR KAMRAN	26.04.2024	APPROVAL
Approved by	KRISHAN SINGH	26.04.2025	APPROVAL

1x660 MW Sagardighi TPS-Stage-III, Unit-5, Air conditioning System					
Response to WBPDCL/DCPL Comments on TDS AND GA OF AXIAL FAN MOTOR (FRESH AIR, SMOKE AIR FAN) FOR AIR CONDITIONING SYSTEM					
BHEL DOC NO. PE-V0-445-553-A017- Rev 01 / PARKSONS DOC NO. PEC-0715A/22 REV 01					
Sr No	**Reference clause / document sheet**	**WBPDCL / DCPL Comments on Rev 00**	**BHEL / PARKSONS Reply on Rev 00**	**WBPDCL / DCPL Comments on Rev 01**	**BHEL / PARKSONS Reply on Rev 01**
1	TDS of Motor for Fresh Air fan 1200 CFM capacity located in AHU room at 8.5M Power House	PLS INCLUDE AN INDEX WITH PAGE NO. FOR ALL THE MOTORS DETAILED HERE FOR EASE OF NAVIGATION.	Noted & Incorporated	Noted.	Point closed.
2		Pls mention the DOR w.r.t fan's rotational requirements.	Noted & Incorporated	Noted.	Point closed.
3		Cable shall be selected as per Sizing Calculation (Typical)	Noted & Incorporated	Noted.	Point closed.
4		Type of cable (Copper)	Noted	Noted.	Point closed.
5		Epoxy paint with RAL 7032 paint shade need to be considered in line with NIT.	Noted & Incorporated	Noted.	Point closed.
6		Noise & Vibration: Pls mention the values in line with NIT specification.	Noted & Incorporated	Noted.	Point closed.
7		Pls include the following (Typ): 1. Starting time, 2. Full load current at 100% rated Volt and 110% rated volt. 3. safe stall time 4. Starting current at 100% and 110% rated volt.(Pls comply to the requirement that the starting current shall be limited to 6 times of the FLC plus IS tolerance at 100% RV.) 5. Bearing supplier (SKF/FAG) 6. Re-lubrication schedule.	1. Noted & Incorporated 2. Noted & Incorporated 3. Noted & Incorporated 4. Noted 5. Noted & Incorporated 6. Noted & Incorporated	Noted.	Point closed.
9	TDS of Motor for Fresh Air fan 4500 CFM capacity located in AHU room at 24.0M Power House	Same comments as made for 1200 CFM.	Noted & revised inline with 1200 CFM.	Noted.	Point closed.
10	TDS of Motor for Fresh Air fan 1800 CFM capacity located in PAC room at 9.2M ESP Cum FGD C Bldg	Same comments as made for 1200 CFM.	Noted & revised inline with 1200 CFM.	Noted.	Point closed.
11	TDS of Motor for Smoke exhaust fan 6800 CMH capacity located in AHU room at 8.5M Power House	Smoke exhaust fan make HAVELLS: This is not approved vendor as per WBPDCL approved vendor list.	HAVELLS is approved in NTPC. Further to note that these are special types of fan, pls accept the Havells.	Pls substantiate with NTPC approved vendor list for this special application.	Proposing LHP make Motor, which is approved and supplies in Central & State Govt. Projects
12		Correct the exhaust fan capacity unit from CFM to CMH	In Approved BBU Exhaust Fan unit is CFM. However in summary sheet both units are mentioned.	Noted.	Point closed.
13		Please Explain. Ambient DEG. C 50 - 400 / 2 Hrs.	At 50 deg Ambient normal condition run applicable S1 duty and Fire accidental condition when Ambient Temperature 400 deg then motor run 2 Hrs & applicable S2 duty (short time duty).	Noted.	Point closed.
14		All Motor shall be S1 Duty only	Noted.	Noted.	Point closed.
15		Cable Gland Material. Which Metal ?	Aluminium	Noted.	Point closed.
16		Starting Current at Rated Voltage: Whether this is including IS tolerance? As per NIT the motor starting current shall be limited to 6 times of FLC at 100% RV plus IS tolerance .	650 (+ Tolerance)	Noted.	Point closed.
17		Paint Shade. Pls mention the RAL code in line with NIT.	Noted & Incoporated	Noted.	Point closed.
18		Recommended cable size & Material	Cable size is '3C-2.5mm2 [Cu].	Noted.	Point closed.
19		Type of bearing DE/NDE. 1. Pls mention bearing make (SKF/FAG). 2. Pls mention the grease re lubrication schedule.	1. 6204 Z/6204 Z (Make- SKF). 2. Not applicable in these Frames (below 160 frame not offer regreasing device).	Noted.	Point closed.

Sr No	Reference clause / document sheet	WBPDCL / DCPL Comments on Rev 00	BHEL / PARKSONS Reply on Rev 00	WBPDCL / DCPL Comments on Rev 01	BHEL / PARKSONS Reply on Rev 01
20		Pls include starting curve also.	Not available with OEM. Pls accept.	Noted.	Point closed.
21		Flying Lead: What is the purpose?	If customer will used with exaust housing. This is havells by default feature for this segment.	Noted.	Point closed.
22		Please mention the recommended clearance to be maintained at MNDE for efficient cooling.	Min. 300 mm	Noted.	Point closed.
23	TDS of Motor for Smoke exhaust fan 1900 CMH capacity located located in PAC room at 9.2M ESP Cum FGD C Bldg.	Same comments as made for 6800CMH.	Noted & revised inline with 6800 CMH.	Noted.	Point closed.
24	TDS of Motor for Smoke exhaust fan 24000 CMH capacity located in AHU room at 24.0M Power House.	Same comments as made for 6800CMH.	Noted & revised inline with 6800 CMH.	Noted.	Point closed.

INDEX				
SR NO	**Capacity**	**LOCATION**	**EQIPMENT DRIVEN BY**	**PAGE NO**
1	0.37 kw / 2 pole	AHU Room at 8.5 MTR Power House	FRESH AIR FAN 1200 CFM/ 2039 CMH at 30 mm SP	1 to 6
2	1.5 kw / 2 pole	AHU Room at 24 MTR Power House	FRESH AIR FAN 4500 CFM/ 7646 CMH at 30 mm SP	7 to 12
3	0.55 kw / 2 pole	PAC room at 9.2M ESP CUM FGD BUILDING	FRESH AIR FAN 1800 CFM/ 3059 CMH at 30 mm SP	13 to 18
4	0.75 kw / 4 pole	AHU Room at 8.5 MTR Power House	SMOKE EXHAUST FAN 6800 CMH at 20 mmSP	19 to 27
5	2.2 KW / 6 pole	ESP CUM FGD BUILDING	SMOKE EXHAUST FAN 19000 CMH at 20 mmSP	28 to 36
6	3.7 KW / 6 pole	AHU ROOM AT 24 MTR for following CCR/CER Areas	SMOKE EXHAUST FAN 24000 CMH at 20 mm SP	37 to 45

Bharat Bijlee

DATA SHEET
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	LOCATION	AHU ROOM AT 8.5 MTR
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR- FRESH AIR FAN (1200 CFM``
Project :	Sagardighi Thermal Power Project-Unit-5 (Extn)		

Product Type : Line Operated IE3 Efficiency Motor

Output (kW)/Poles	:	0.37 / 2P	Frame Size	:	71
Voltage (V)	:	415 +/- 10%	Area Classification	:	Safe Area
Frequency (Hz)	:	50 +/- 5%	Type of Ex Protection	:	N.A.
Duty	:	S1 (Continuous)	Gas group / Temp. Class	:	N.A. / N.A.
Altitude (m)	:	< 1000	Approving Authority	:	N.A.
Amb Temp/ Temp Rise	:	50 Deg C / 70DegC	Enclosure / Cooling Type	:	TEFC / IC411
Insulation Class	:	F	Location-Indoor/Outdoor	:	Indoor
Temp. Rise Class on DOL	:	B	Mounting	:	B3
Rated Current (Amps)	:	0.91	Degree of protection	:	IP55
Rated Speed (RPM)	:	2860	T Box Position from DE	:	TOP
Rated Torque (kgm)	:	**0.13 (Full Load Torque)** R01	Type of coupling	:	Direct
Service Factor (SF)	:	1.00	Type of Bearing (DE/NDE)	:	Ball / Ball
			DE / NDE Bearing **(SKF/FAG)**	:	6202 2Z / 6202 2Z
Efficiency & Power factor	:		Lubrication R01	:	Lithium Soap Base Grease
% Full Load	% Efficiency	Power Factor	Connection / No. of terminals	:	STAR / 6
100%	73.8 IE3	0.77	Cable Size	:	1 X 3C X 2.5 SqmmCu R01
75%	73.8	0.65	Main T.Box ET Size	:	1 x 3/4 inch BSC R01
50%	67.0	0.55	Weight in kg (Approx)	:	7.7
Locked Rotor Current (% Full Load)		: 550%	Direction of rotation	:	Clockwise from NDE R01
Starting Current at 110% V % FLC R01		: 605%			
Locked Rotor Torque (% Full Load)		: 290% (0.377kgm)	Paint Type	:	**Acid Alkali Proof** R01
Breakdown Torque (% Full Load) - POT		: 320% (0.416kgm)	Paint Shade	:	RAL7032 R01
L.R. Withstand Time Hot/Cold (sec) at 100% V		: 15 / 30	Noise level (dBA)	:	As per IS12065
Application	:	Axial Flow Fan	Vibration level (mm/sec)	:	"Normal" as per IS12075
Type of Load Torque	:	Variable Torque	Brake Type	:	N.A.
Method of starting	:	DOL	Braking Torque (kgm)	:	N.A.
Speed Variation on VFD	:	NA	Brake release time (ms)	:	N.A.
Rotor GD^2 (kgm^2)	:	0.0016	Brake application time (ms)	:	N.A.
Load RPM	:	2880 R01	Accessories	:	NIL
Load GD^2 (kgm^2)	:	0.13			
Starting time (sec)	:	**0.5 (with load at 100% V)** R01			
No. of consecutive starts	:	2 Hot / 3 Cold			
Additional data 1	:				
Additional data 2	:				

Applicable Standards : IS/IEC60034-1, IS12615, IS1231, IS2223, IS12065, IS12075

Remarks : **TB Fault withstand current = 50kA/0.25Sec back up by suitable HRC Fuse.**
2nos. Grounding pads on motor body and 1no. Terminal Box. R01

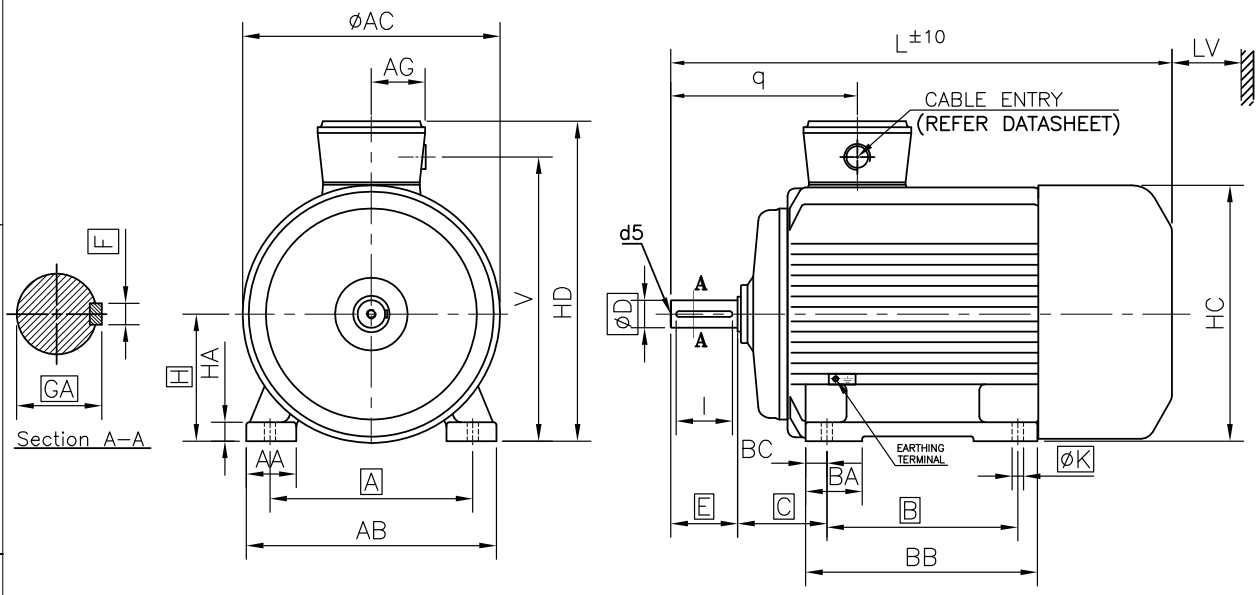
Notes

1) All performance values are subject to IS/IEC 60034-1 tolerances, unless otherwise specified.
2) Performance values are at rated voltage & rated frequency condition on sinusoidal supply.
3) Cable Lugs & Glands are not in motor manufacturer's scope.
4) Where starting time is more than 10 seconds, provision of heavy duty relays is mandatory.

0.370K2P3HLAXXAAX / 3H07123AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED



	Fixing						General									
Frame	Pole	A	B	C	H	øK	AB	BB	AA	BA	BC	HA	HC	HD	L	øAC	LV
71	2,4,6,8	112	90	45	71	7	135	110	31	30	13	7	141	195	235	140	30

T Box			Shaft					
V	q	AG	øD	E	F	GA	I	d5
166	122	40	14	30	5	16	25	M5

NOTES:–
1) SQUARE ('□') DIMENSIONS ARE AS PER IS:1231.
2) 'LV' IS MINIMUM DISTANCE TO BE MAINTAINED FOR EFFICIENT COOLING.

AMENDMENT	REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse
DRN	HJP	07.12.2020	
CHD	NPJ	07.12.2020	
APPD	YCJ	07.12.2020	

TITLE: DIMENSIONAL DRAWING

MOUNTING: IM B3 (IM 1001)

SCALE: NTS

Bharat Bijlee
AIROLI, NAVI MUMBAI

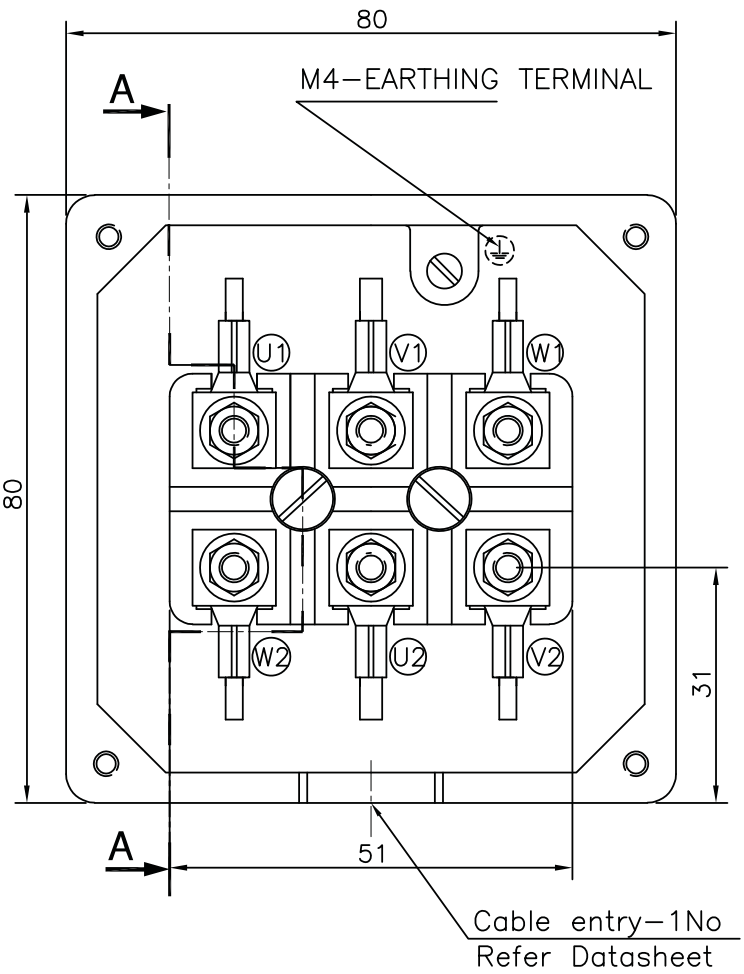
DRG. NO: A0712AATSSSX

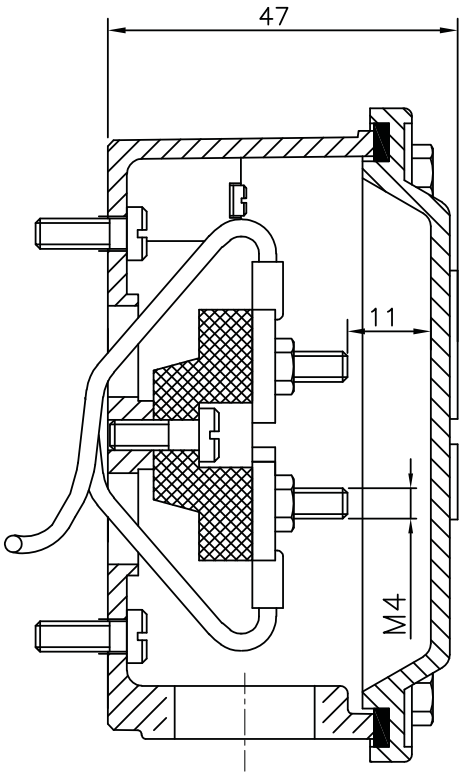
REF.:– A0714.31TA

REV.: 0

FRAME SIZE: 71

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED





Section A–A

NOTES:–

1) TERMINAL BOX MATERIAL:– ALUMMIUM.
2) TERMINAL BOX IS ROTATABLE BY 360° IN THE STEP OF 90°
3) BODY MATERIAL:– ALUMMIUM.

AMENDMENT

REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse
DRN	ORK	12.08.2020	
CHD	AAG	12.08.2020	
APPD	YCJ	12.08.2020	

TITLE:

TERMINAL BOX DRAWING

(FOR gK030)

SCALE NTS

Bharat Bijlee
AIROLI, NAVI MUMBAI

DRG. NO: TBAA063A027

REF.:–

REV. 0

FRAME SIZE 63,71,80

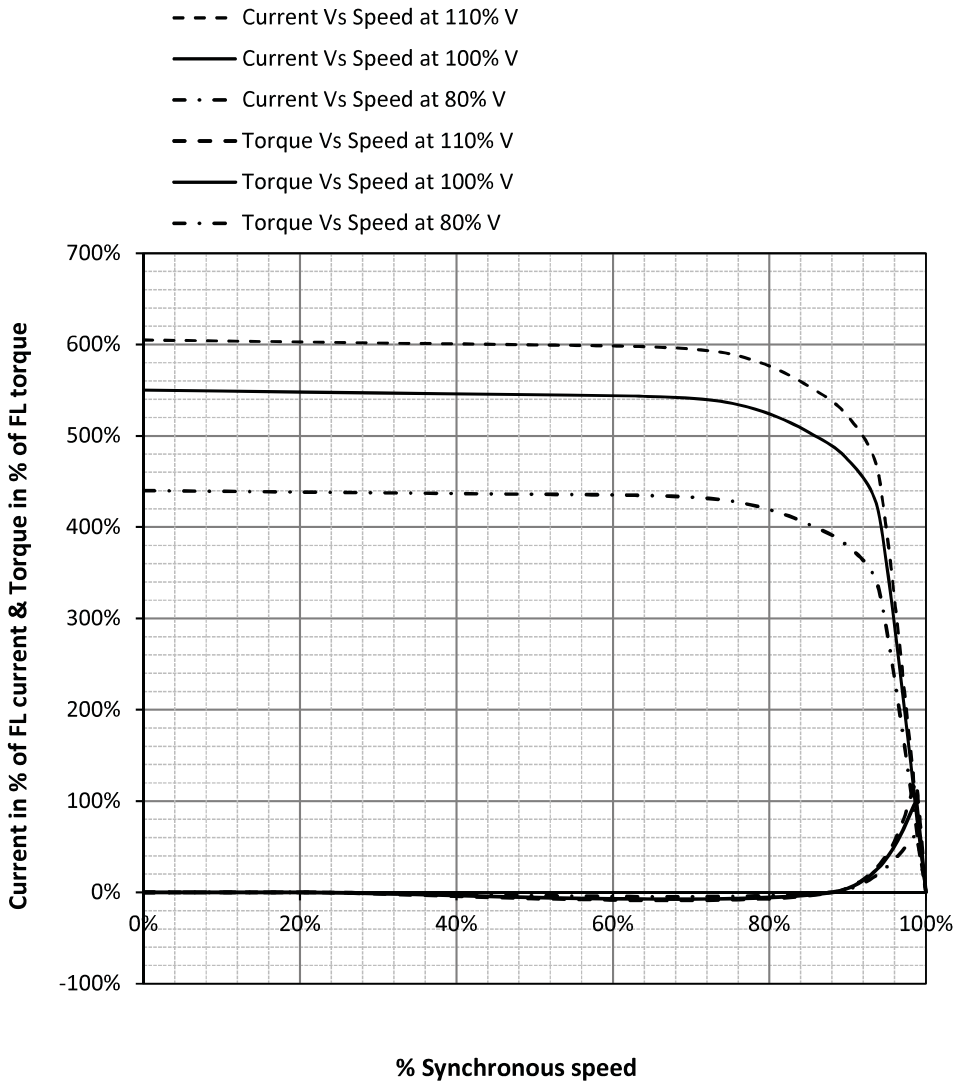
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**Location**	AHU ROOM AT 8.5 M
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR- FRESH AIR FAN (1200 CFM``
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.37 / 2P	Frame :	71

Torque & Current Vs Speed Curve



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0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

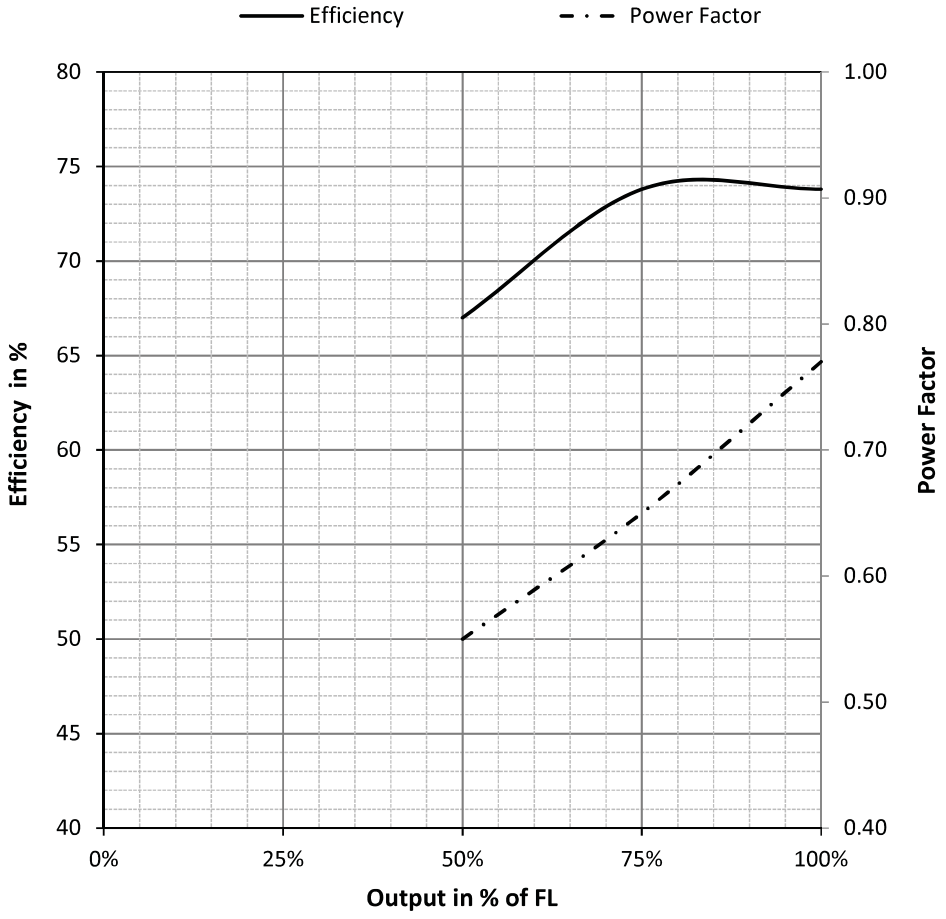
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	AHU ROOM AT 8.5 M
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR- FRESH AIR FAN (1200 CFM``
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.37 / 2P	Frame :	71

Efficiency, Power Factor Vs Output Curve



0.370K2P3HLAXXAAX/3H07123AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

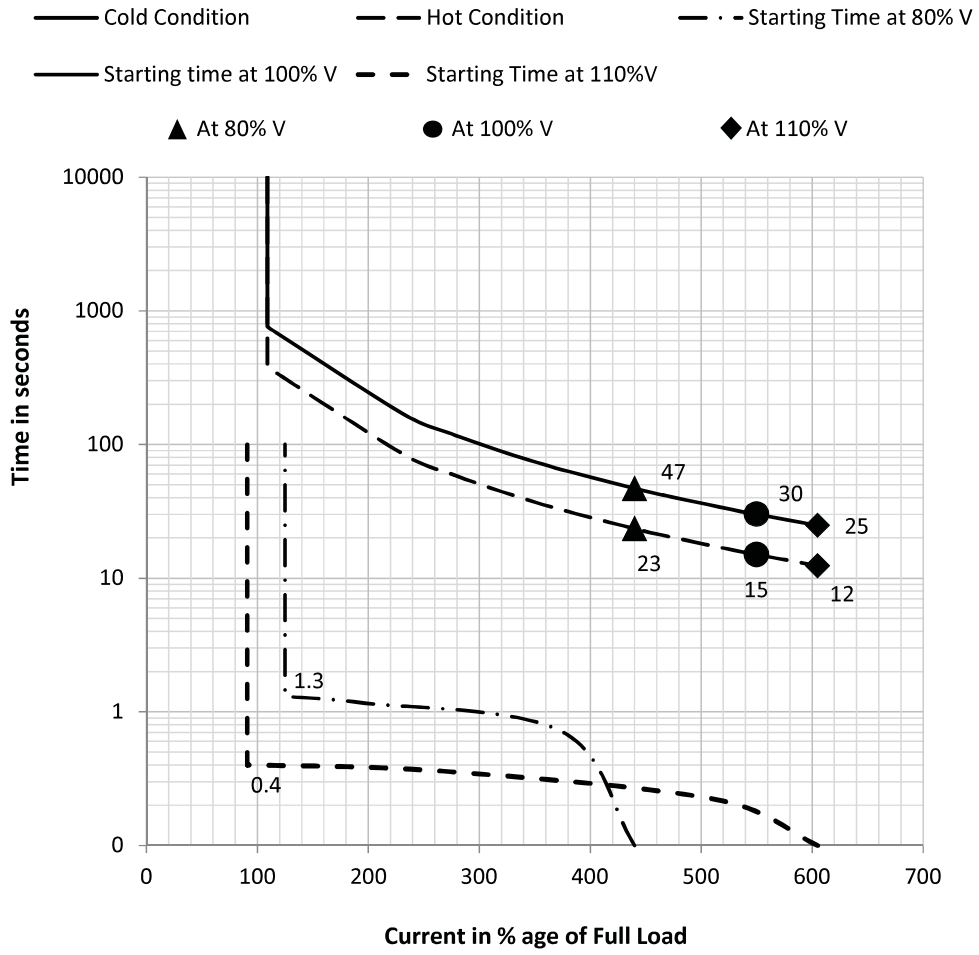
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	AHU ROOM AT 8.5 M
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR- FRESH AIR FAN (1200 CFM``
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.37 / 2P	Frame :	71

Thermal Withstand Time, Starting Time Vs Current Curve



0.370K2P3HLAXXAAX/3H07123AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

Bharat Bijlee

DATA SHEET
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	LOCATION	AHU ROOM AT 24 MTR for following CCR/CER Areas
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (4500 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Extn)		

Product Type : Line Operated IE3 Efficiency Motor

Output (kW)/Poles	:	1.5 / 2P	Frame Size	:	90S
Voltage (V)	:	415 +/- 10%	Area Classification	:	Safe Area
Frequency (Hz)	:	50 +/- 5%	Type of Ex Protection	:	N.A.
Duty	:	S1 (Continuous)	Gas group / Temp. Class	:	N.A. / N.A.
Altitude (m)	:	< 1000	Approving Authority	:	N.A.
Amb Temp/ Temp Rise	:	50 Deg C / 70DegC	Enclosure / Cooling Type	:	TEFC / IC411
Insulation Class	:	F	Location-Indoor/Outdoor	:	Indoor
Temp. Rise Class on DOL	:	B	Mounting	:	B3
Rated Current (Amps)	:	2.88	Degree of protection	:	IP55
Rated Speed (RPM)	:	2850 R01	T Box Position from DE	:	TOP
Rated Torque (kgm)	:	**0.51 (Full Load Torque)**	Type of coupling	:	Direct
Service Factor (SF)	:	1.00	Type of Bearing (DE/NDE)	:	Ball / Ball R01
	:		DE / NDE Bearing **(SKF/FAG)**	:	6205 2Z SKF/ 6205 2Z
Efficiency & Power factor	:		Lubrication	:	Lithium Soap Base Grease
% Full Load	% Efficiency	Power Factor	Connection / No. of terminals	:	STAR / 6
100%	84.2 IE3	0.86	Cable Size	:	1 X 3C X 2.5 SqmmCu R01
75%	84.2	0.81	Main T.Box ET Size	:	1 X 3/4 inch BSC R01
50%	84.2	0.72	Weight in kg (Approx)	:	18 R01
Locked Rotor Current (% Full Load)		: 650%	Direction of rotation	:	Clockwise from NDE
Starting Cuurent at 110% Volt % FLC		: 715%			R01
Locked Rotor Torque (% Full Load)		: 275% (1.4025kgm)	Paint Type	:	**Acid Alkali Proof**
Breakdown Torque (% Full Load) - POT		: 300% (1.53kgm)	Paint Shade	:	RAL7032 R01
L.R. Withstand Time Hot/Cold (sec) at 100% V		: 8 / 16	Noise level (dBA)	:	As per IS12065
Application	:	Axial Flow Fan	Vibration level (mm/sec)	:	"Normal" as per IS12075
Type of Load Torque	:	Variable Torque	Brake Type	:	N.A.
Method of starting	:	DOL	Braking Torque (kgm)	:	N.A.
Speed Variation on VFD	:	NA	Brake release time (ms)	:	N.A.
Rotor GD^2 (kgm^2)	:	0.0066	Brake application time (ms)	:	N.A.
Load RPM	:	2880 R01	Accessories	:	NIL
Load GD^2 (kgm^2)	:	0.32			
Starting time (sec)	:	**0.5 (with load at 100% V)** R01			
No. of consecutive starts	:	2 Hot / 3 Cold			
Additional data 1	:				
Additional data 2	:				

Applicable Standards : IS/IEC60034-1, IS12615, IS1231, IS2223, IS12065, IS12075

Remarks : **TB Fault withstand current = 50kA/0.25Sec back up by suitable HRC Fuse.**
2nos. Grounding pads on motor body and 1no. On Terminal Box. R01

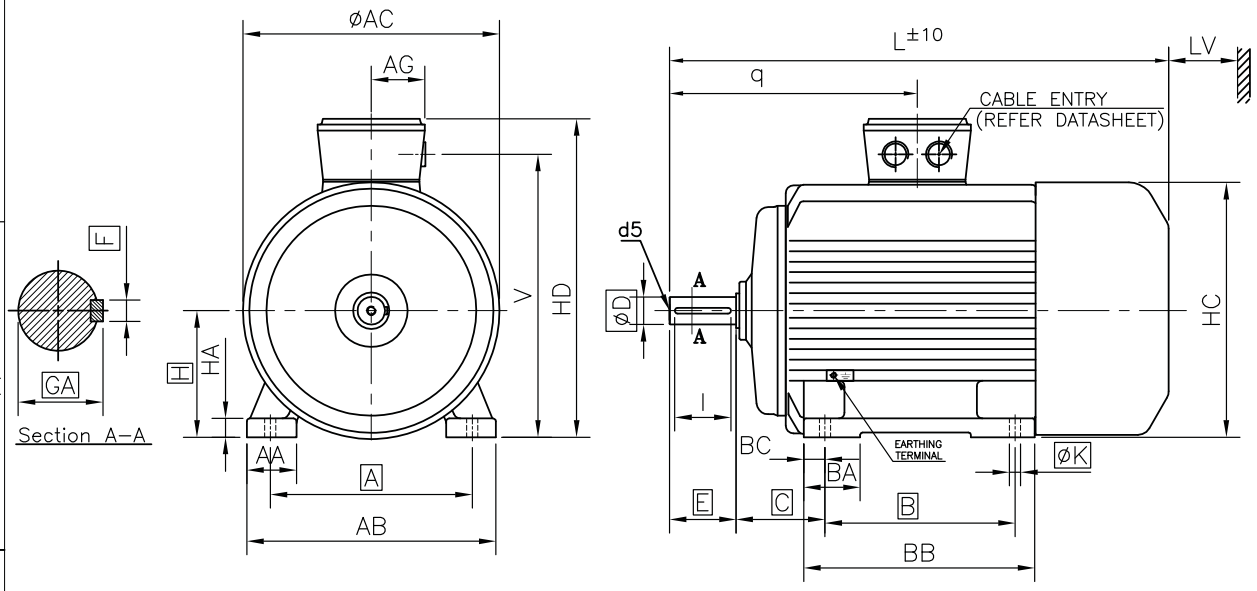
Notes

1) All performance values are subject to IS/IEC 60034-1 tolerances, unless otherwise specified.
2) Performance values are at rated voltage & rated frequency condition on sinusoidal supply.
3) Cable Lugs & Glands are in motor manufacturer's scope.
4) Where starting time is more than 10 seconds, provision of heavy duty relays is mandatory.

1.500K2P3HLAXXAAX / 3H09S2BACTSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED



	Fixing						General										
Frame	Pole	A	B	C	H	ØK	AB	BB	AA	BA	BC	HA	HC	HD	L	ØAC	LV
90S	2,4,6	140	100	56	90	10	168	125	34	31.5	13	12	177	230	336	174	35

T Box			Shaft					
V	q	AG	ØD	E	F	GA	I	d5
199	156	52	24	50	8	27	45	M8

NOTES:–
1) SQUARE ('□') DIMENSIONS ARE AS PER IS:1231.
2) 'LV' IS MINIMUM DISTANCE TO BE MAINTAINED FOR EFFICIENT COOLING.

AMENDMENT	REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse
DRN	HJP	04.03.2020	
CHD	AAG	04.03.2020	
APPD	YCJ	04.03.2020	

TITLE: DIMENSIONAL DRAWING

MOUNTING: IM B3 (IM 1001)

SCALE: NTS

Bharat Bijlee
AIROLI, NAVI MUMBAI

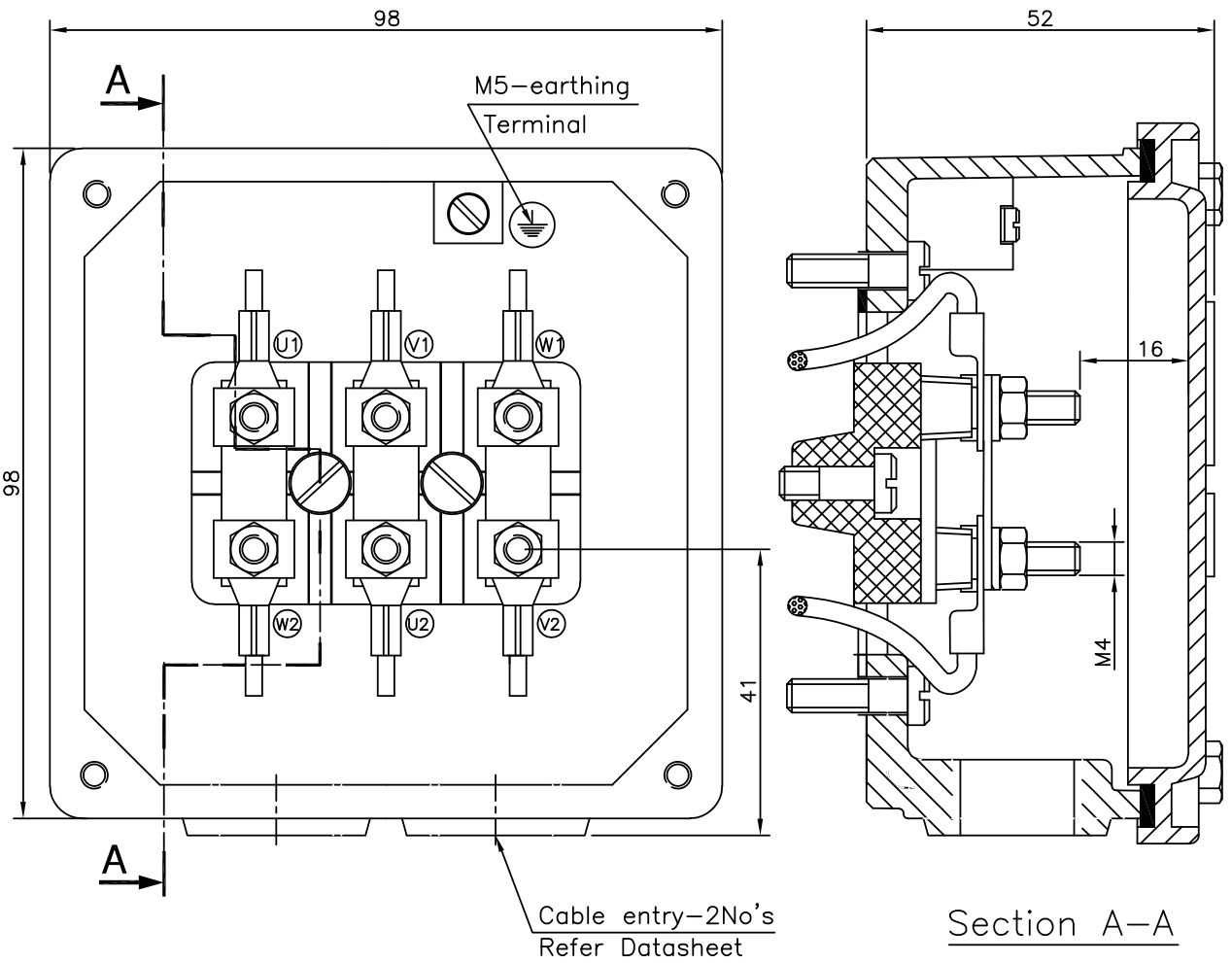
DRG. NO: A09S2ACTSSDX

REF.:– A09S43132

REV.: 0

FRAME SIZE: 90S

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED



NOTES:–

1) TERMINAL BOX MATERIAL:– ALUMINIUM
2) TERMINAL BOX IS ROTATABLE BY 360° IN THE STEP OF 90°
3) BODY MATERIAL:– ALUMINIUM

AMENDMENT	REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse	TITLE:		SCALE
DRN	ORK	12.08.2020		TERMINAL BOX DRAWING (FOR gk 130)		NTS
CHD	AAG	12.08.2020				
APPD	YCJ	12.08.2020				

Bharat Bijlee
AIROLI, NAVI MUMBAI

DRG. NO: TBAA09SA00

REF.:–

REV. 0

FRAME SIZE 90S,90L

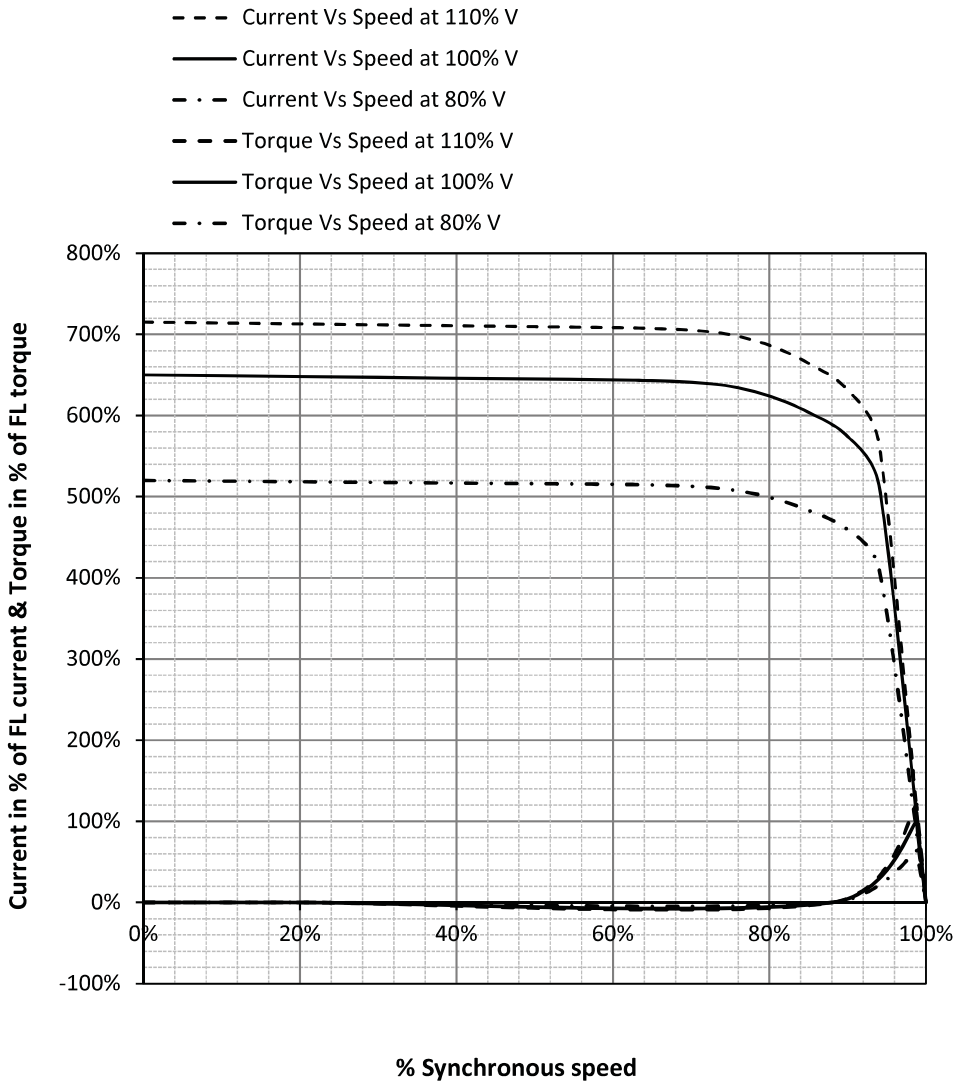
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	AHU ROOM AT 24 MT
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (4500 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	1.5 / 2P	Frame :	90S

Torque & Current Vs Speed Curve



1.500K2P3HLAXXAAX/3H09S2BACTSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

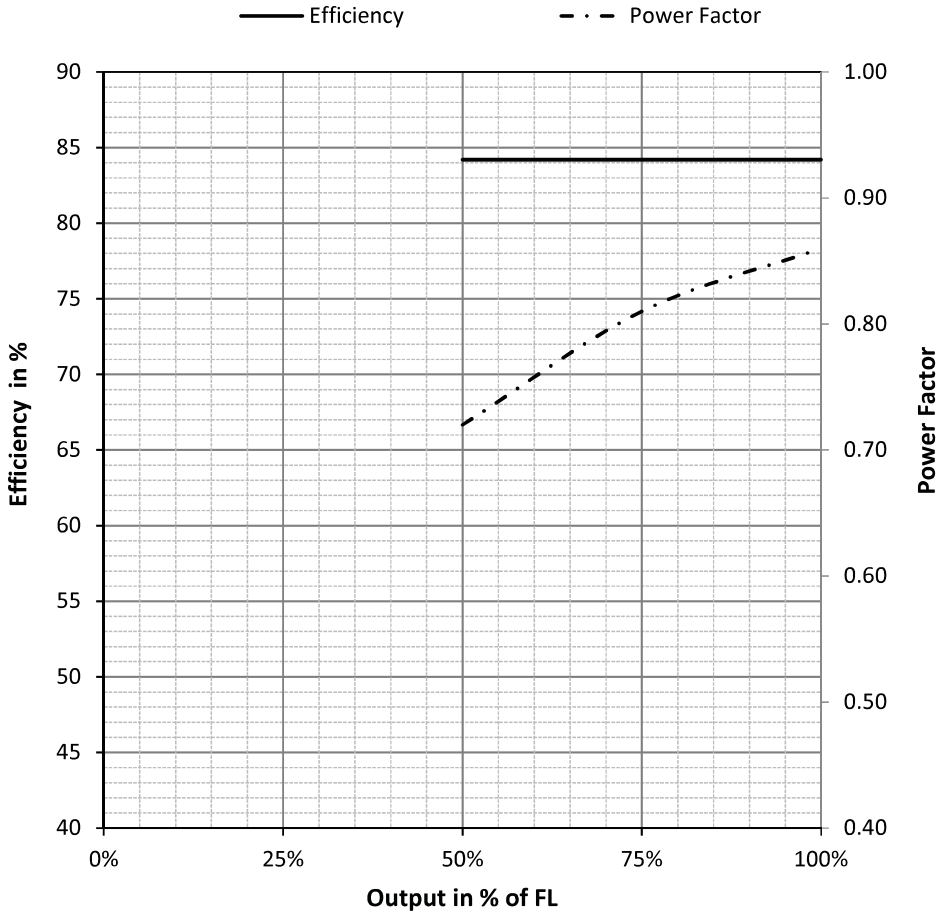
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	AHU ROOM AT 24 MT
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (4500 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	1.5 / 2P	Frame :	90S

Efficiency, Power Factor Vs Output Curve



1.500K2P3HLAXXAAX/3H09S2BACTSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

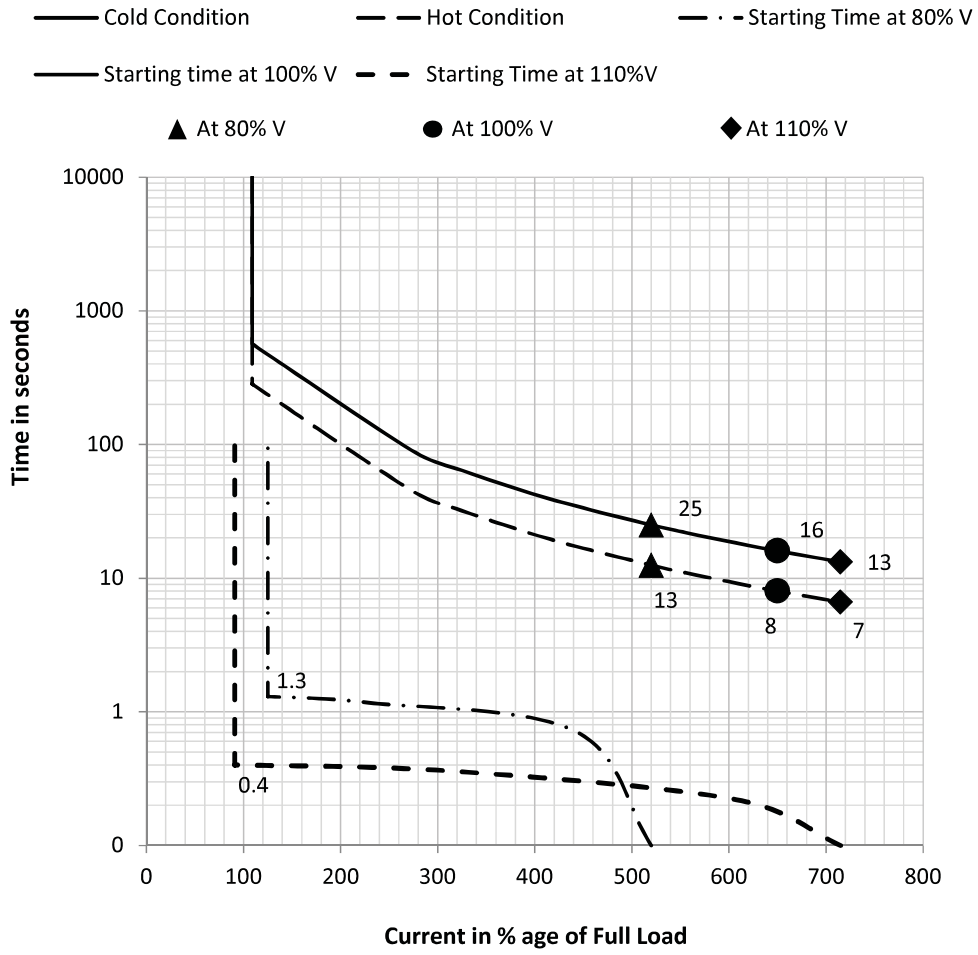
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	AHU ROOM AT 24 MT
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (4500 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	1.5 / 2P	Frame :	90S

Thermal Withstand Time, Starting Time Vs Current Curve



1.500K2P3HLAXXAAX/3H09S2BACTSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

Bharat Bijlee

DATA SHEET
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	LOCATION	ESP CUM FGD BUILDING
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (1800 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Extn)		

Product Type : Line Operated IE3 Efficiency Motor

Output (kW)/Poles	:	0.55 / 2P	Frame Size	:	71
Voltage (V)	:	415 +/- 10%	Area Classification	:	Safe Area
Frequency (Hz)	:	50 +/- 5%	Type of Ex Protection	:	N.A.
Duty	:	S1 (Continuous)	Gas group / Temp. Class	:	N.A. / N.A.
Altitude (m)	:	< 1000	Approving Authority	:	N.A.
Amb Temp/ Temp Rise	:	50 Deg C / 70DegC	Enclosure / Cooling Type	:	TEFC / IC411
Insulation Class	:	F	Location-Indoor/Outdoor	:	Indoor
Temp. Rise Class on DOL	:	B	Mounting	:	B3
Rated Current (Amps)	:	1.28	Degree of protection	:	IP55
Rated Speed (RPM)	:	2840 R01	T Box Position from DE	:	TOP
Rated Torque (kgm)	:	**0.19 (Full Load Torque)**	Type of coupling	:	Direct
Service Factor (SF)	:	1.00	Type of Bearing (DE/NDE) R01	:	Ball / Ball
			DE / NDE Bearing **(SKF/FAG)**	:	6202 2Z / 6202 2Z
Efficiency & Power factor	:		Lubrication	:	Lithium Soap Base Grease
% Full Load	% Efficiency	Power Factor	Connection / No. of terminals	:	STAR / 6
100%	77.8 IE3	0.77	Cable Size	:	1 X 3C X 2.5 Sqmm Cu R01
75%	77.8	0.70	Main T.Box ET Size	:	1 x 3/4 inch BSC R01
50%	74.5	0.56	Weight in kg (Approx)	:	9
Locked Rotor Current (% Full Load)		: 500%	Direction of rotation	:	Clockwise from NDE
Starting Current at 110% V % FLC R01		: 550%			
Locked Rotor Torque (% Full Load)		: 270% (0.513kgm)	Paint Type	:	**Acid Alkali Proof** R01
Breakdown Torque (% Full Load) - POT		: 300% (0.57kgm)	Paint Shade	:	RAL7032 R01
L.R. Withstand Time Hot/Cold (sec) at 100% V		: 15 / 30	Noise level (dBA)	:	As per IS12065
Application	:	Axial Flow Fan	Vibration level (mm/sec)	:	"Normal" as per IS12075
Type of Load Torque	:	Variable Torque	Brake Type	:	N.A.
Method of starting	:	DOL	Braking Torque (kgm)	:	N.A.
Speed Variation on VFD	:	NA	Brake release time (ms)	:	N.A.
Rotor GD^2 (kgm^2)	:	0.0018	Brake application time (ms)	:	N.A.
Load RPM	:	2880 R01	Accessories	:	NIL
Load GD^2 (kgm^2)	:	0.17			
Starting time (sec)	:	**0.5 (with load at 100% V)** R01			
No. of consecutive starts	:	2 Hot / 3 Cold			
Additional data 1	:				
Additional data 2	:				

Applicable Standards : IS/IEC60034-1, IS12615, IS1231, IS2223, IS12065, IS12075

Remarks : **TB Fault withstand current = 50kA/0.25Sec back up by suitable HRC Fuse.**
2nos. Grounding pads on motor body and 1no. On Terminal Box. R01

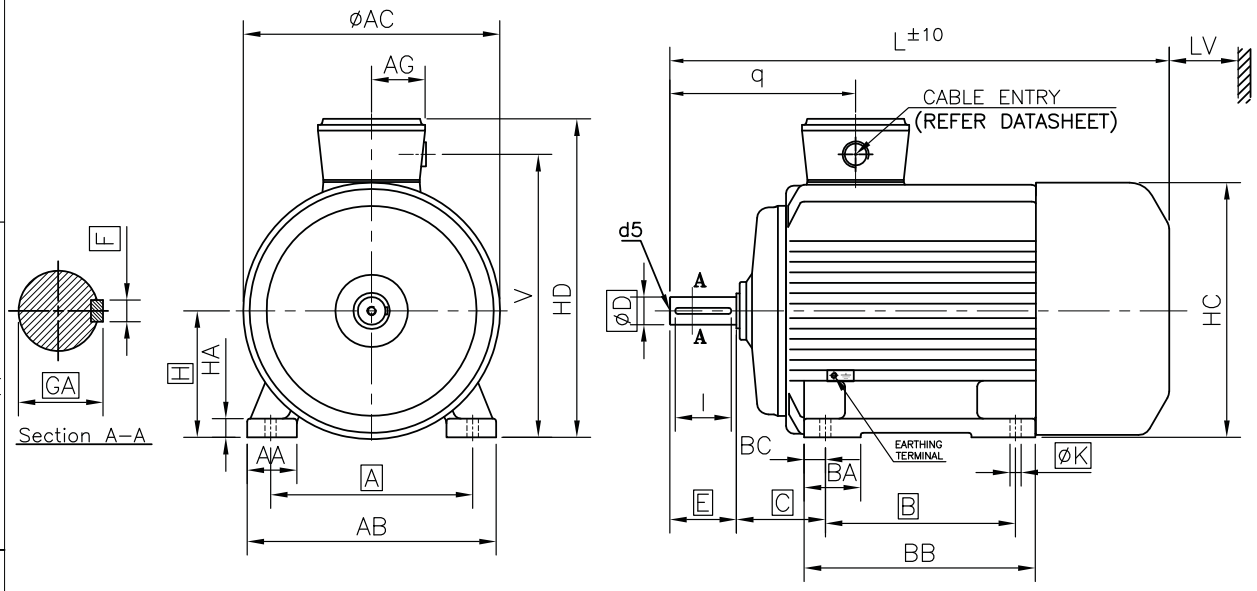
Notes

1) All performance values are subject to IS/IEC 60034-1 tolerances, unless otherwise specified.
2) Performance values are at rated voltage & rated frequency condition on sinusoidal supply.
3) Cable Lugs & Glands are not in motor manufacturer's scope.
4) Where starting time is more than 10 seconds, provision of heavy duty relays is mandatory.

0.550K2P3HLAXXAAX / 3H07125AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED



	Fixing						General										
Frame	Pole	A	B	C	H	ØK	AB	BB	AA	BA	BC	HA	HC	HD	L	ØAC	LV
71	2,4,6	112	90	45	71	7	135	110	31	30	13	7	141	195	269	140	30

T Box			Shaft					
V	q	AG	ØD	E	F	GA	I	d5
166	122	40	14	30	5	16	25	M5

NOTES:–
1) SQUARE ('□') DIMENSIONS ARE AS PER IS:1231.
2) 'LV' IS MINIMUM DISTANCE TO BE MAINTAINED FOR EFFICIENT COOLING.

AMENDMENT	REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse
DRN	HJP	07.12.2020	
CHD	NPJ	07.12.2020	
APPD	YCJ	07.12.2020	

TITLE: DIMENSIONAL DRAWING

MOUNTING: IM B3 (IM 1001)

SCALE: NTS

Bharat Bijlee
AIROLI, NAVI MUMBAI

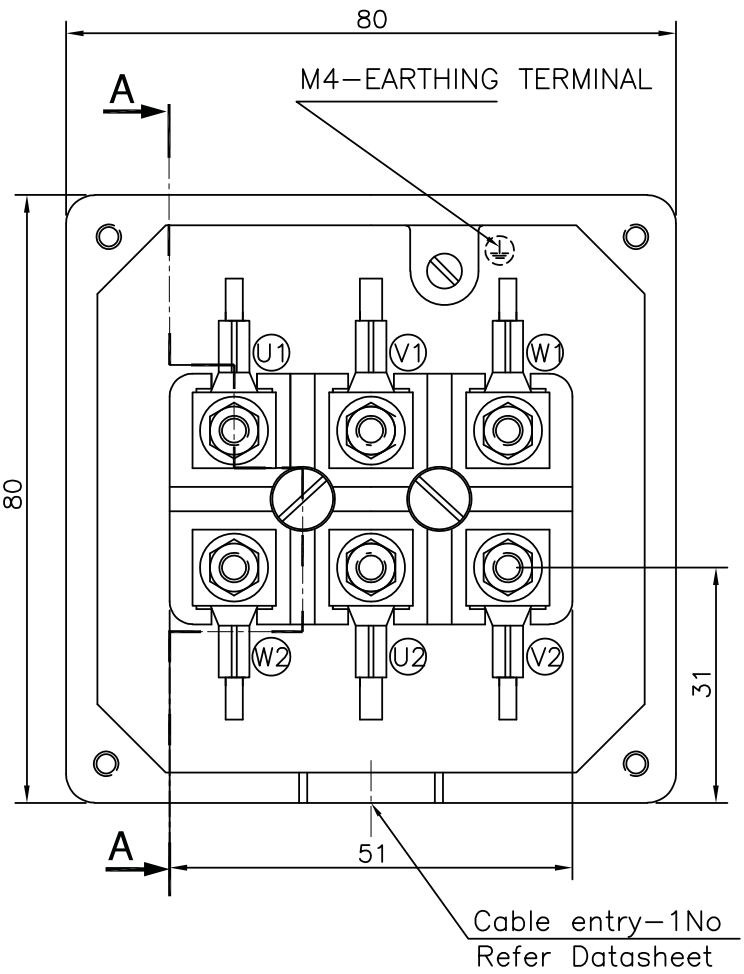
DRG. NO: A0712AATSSDX

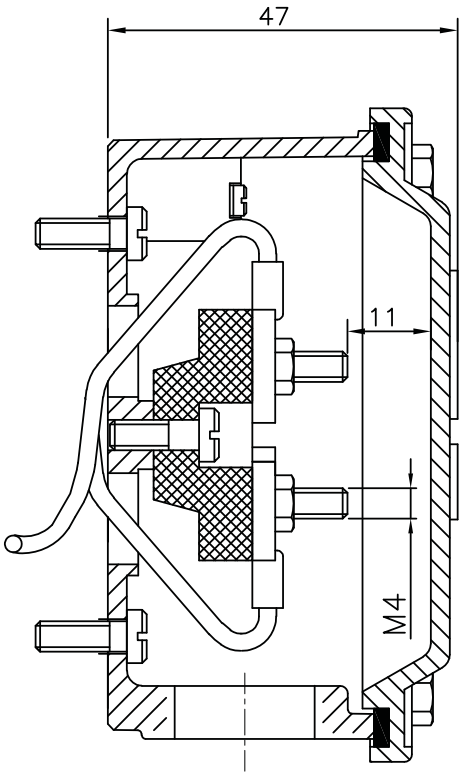
REF.:– A071431TA

REV.: 0

FRAME SIZE: 71

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED





Section A–A

NOTES:–

1) TERMINAL BOX MATERIAL:– ALUMMIUM.
2) TERMINAL BOX IS ROTATABLE BY 360° IN THE STEP OF 90°
3) BODY MATERIAL:– ALUMMIUM.

AMENDMENT

REV	ZONE	DESCRIPTION	SIGN	DATE

	NAME	DATE	Untolerated dimensions IS:1231 / IS:2223 / IS:2102–1–Very Coarse
DRN	ORK	12.08.2020	
CHD	AAG	12.08.2020	
APPD	YCJ	12.08.2020	

TITLE:

TERMINAL BOX DRAWING

(FOR gK030)

SCALE NTS

Bharat Bijlee
AIROLI, NAVI MUMBAI

DRG. NO: TBAA063A027

REF.:–

REV. 0

FRAME SIZE 63,71,80

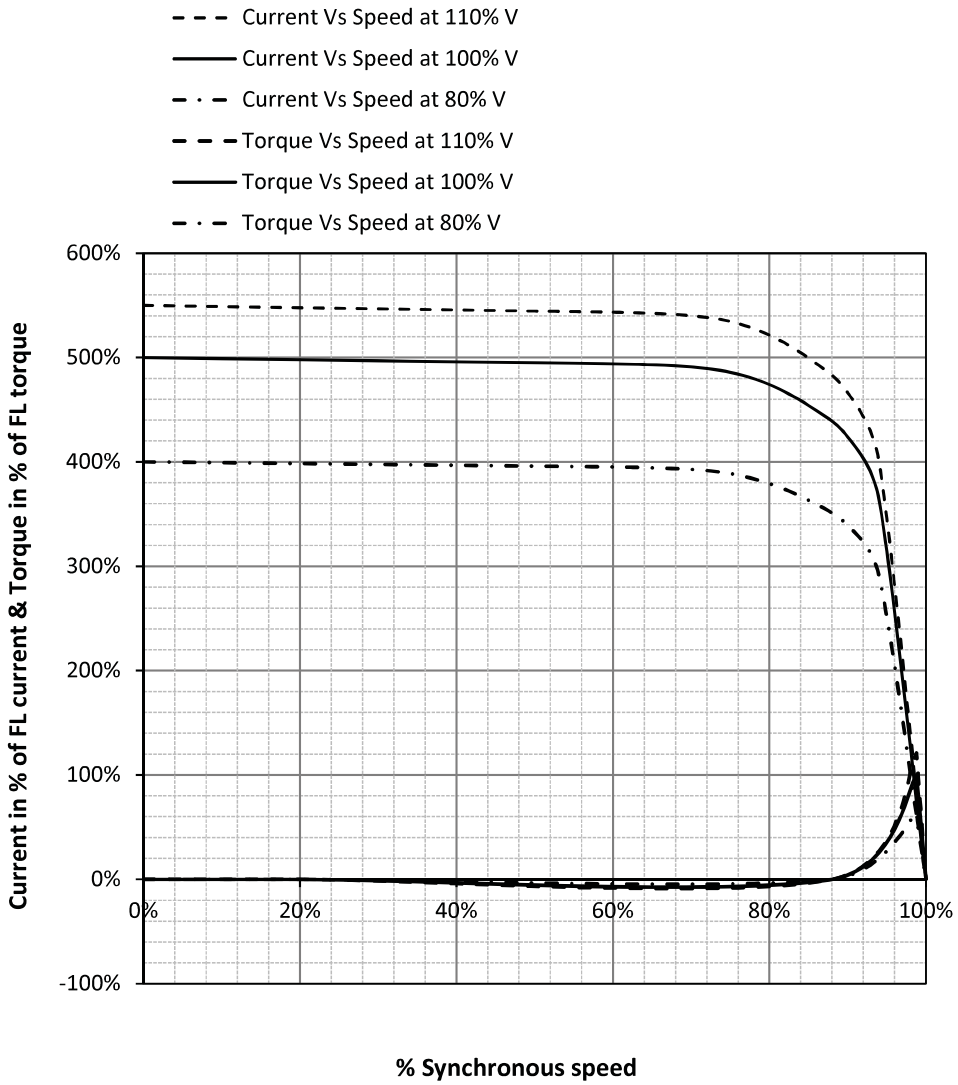
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	ESP CUM FGD BUILD
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (1800 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.55 / 2P	Frame :	71

Torque & Current Vs Speed Curve



0.550K2P3HLAXXAAX/3H07125AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

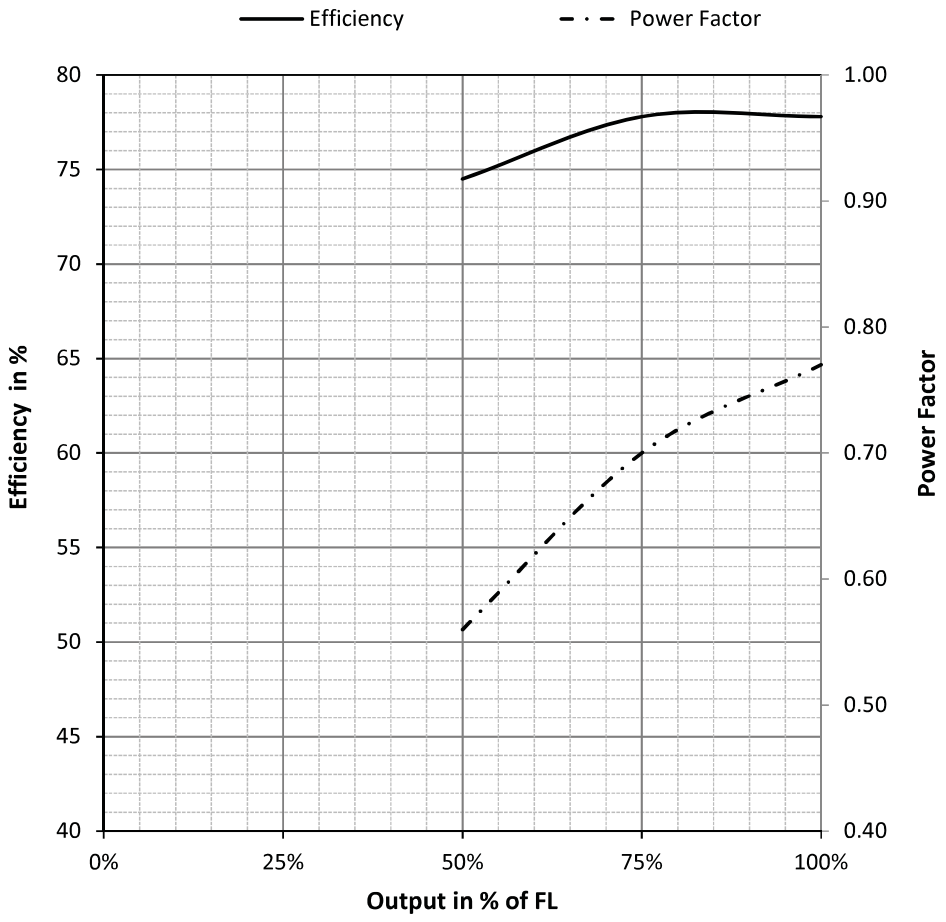
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	ESP CUM FGD BUILD
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (1800 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.55 / 2P	Frame :	71

Efficiency, Power Factor Vs Output Curve



0.550K2P3HLAXXAAX/3H07125AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

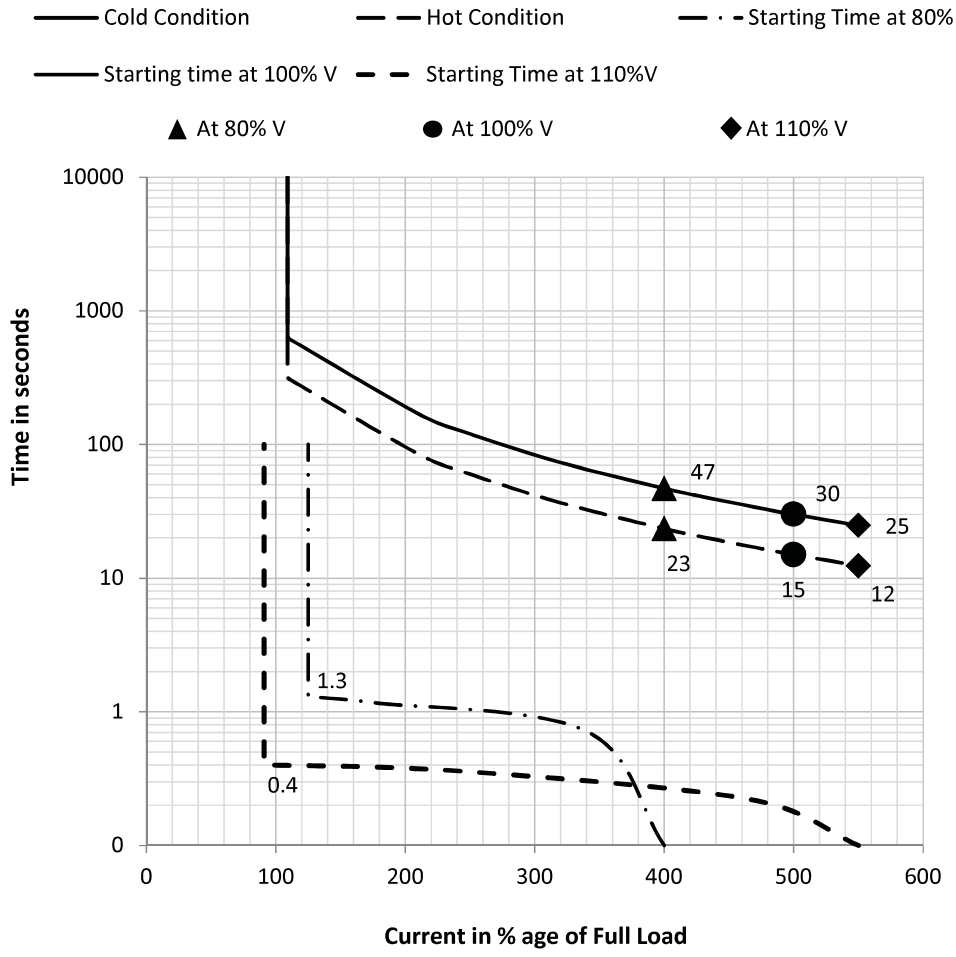
Bharat Bijlee

PERFORMANCE CURVES
3 Phase Squirrel Cage Induction Motor

Customer :	THE WBPDCL	**LOCATION**	ESP CUM FGD BUILD
Consultant :	DCPL		EQUIPMENT DRIVEN BY MOTOR - FRESH AIR FAN (1800 CFM)
Project :	Sagardighi Thermal Power Project-Unit-5 (Ex		

Output (kW)/Poles :	0.55 / 2P	Frame :	71

Thermal Withstand Time, Starting Time Vs Current Curve



0.550K2P3HLAXXAAX/3H07125AATSSX

0	MCG	MCG	7/3/2024
Rev No.	Prepared By	Checked By	Date

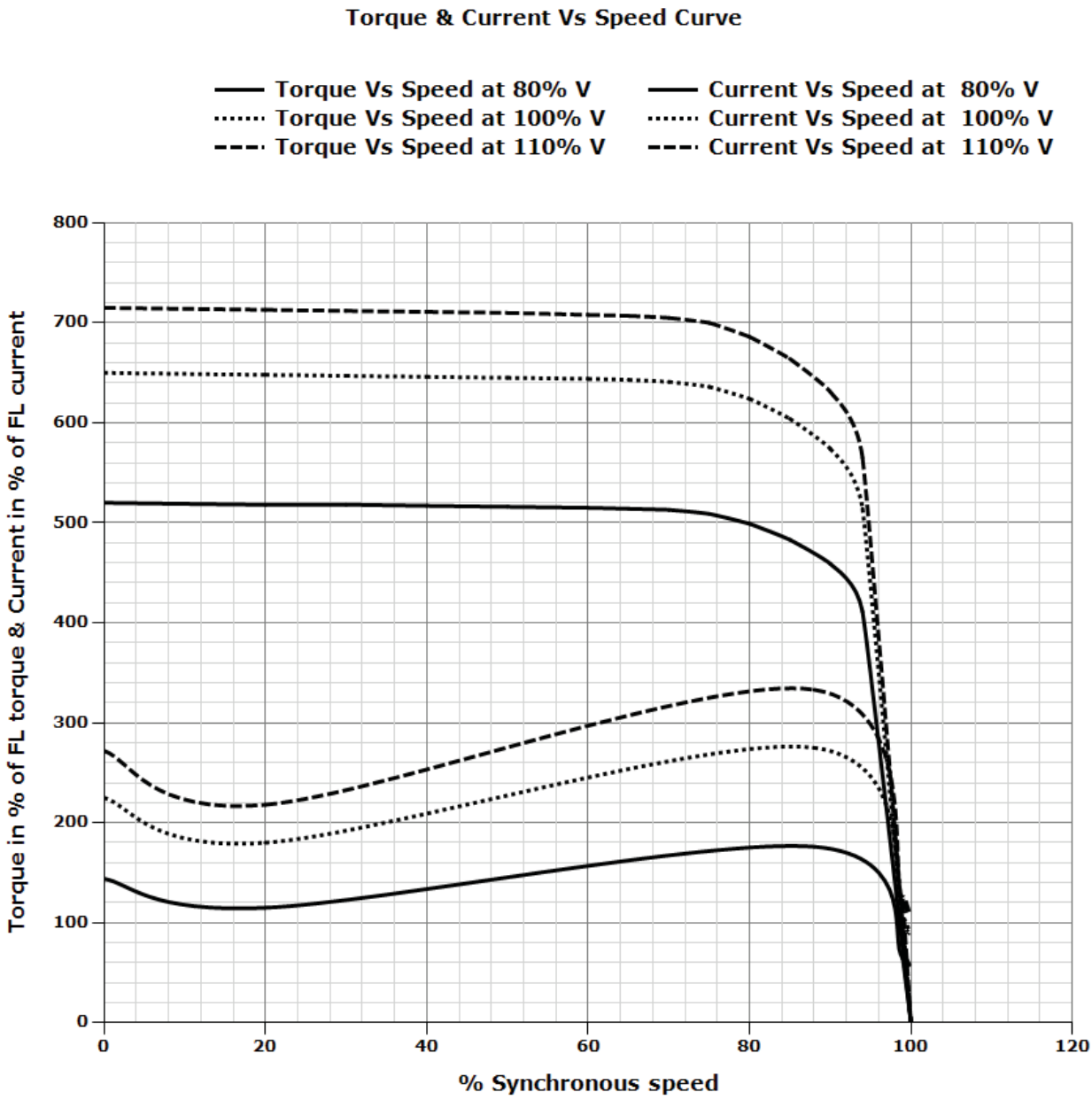
LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House

	MKTG Ref No.: **Doc.No. : 0000072123-2** **CR.No. : D8JP2506277**	LHP STD	**LAXMI HYDRAULICS PVT LTD., B-11- MIDC CHINCHOLI, SOLAPUR.**			
	MOTOR DATA SHEET					
	CUSTOMER :-SUBURBAN INDUSTRIAL WORKS PRIVATE L					**IE3**
	INDENT NO.:		**PO NO :**			
	PROJECT NAME :-					
	KW : 0.75	POLE : 4	VOLTS : 415			QTY : 1
	MOTOR TAG NO :		**PRO CODE** :			
1	**Basic Performance Requirement**					
	RATING (kW/HP) :		0.75/1			
	NO. OF POLES :		4			
	APPLICATION :		VARIABLE TORQUE			
	APPLICABLE STANDARD :		EN12101-3, IEC60034-1, IEC60034-2-1, IS 15999(Part 1) , IS 12615			
	TYPE OF DUTY :		S1-50°C,S2-120 Min-400°C			ALTITUED IN METER ≤ UPTO 1000 MSL
	AREA OF APPLICATION :		SAFE AREA,			
2	**Motor terminal voltage Data**					
	VOLTAGE (VOLTS):		415	+10%	-10%	3-ph. A.C.
	FREQUENCY (Hz) :		50	+5%	-5%	
	COMBINED VARIATION :		10%		(Absolute)	
3	**Construction Data**					
	TYPE :		3 PHASE, AC SQ.CAGE INDUCTION MOTOR			
	FRAME :		80			
	ENCLOSURE :		TEAO			
	DEG. OF PROTECTION :		IP55			
	TYPE OF COOLING :		IC418			
	TYPE OF MOUNTING :		B3			
	INSULATION CLASS AND RISE :		H/F			
	TYPE OF COUPLING :		FLEXIBLE COUPLING			
	STATOR CONNECTION :		STAR(6L);			FLYING LEAD LENGTH 1000
	TYPE OF STARTING :		VFD (30-50HZ)			
	ROTATION VIEWED FROM DE :		BI-Directional(CW)			
	TB POSITION FROM DE :		AS PER GAD			
	FAULT LEVEL OF TB :		50 KA FOR 0.25 SEC WITH APPROPRIATE FUSE PROTECTION			
	SPACE HEATER :		N.A			
	ACCESSORIES(RTD,THERMISTOR,THERMOTRP) :		N.A		N.A	N.A
	ROTOR TYPE :		AL			
	PAINT SHADE :		EPOXY RAL-7032 PEBBLE GREY			
	CABLE GLAND MATERIAL :		METALLIC (ALUMINUM)			
4	**Electrical Performance**					
	FULL LOAD CURRENT (A):		1.6			
	FULL LOAD SPEED (rpm):		1415			
	EFFICIENCY CLASS :		IE3			
			Full Load		3/4 LOAD	1/2LOAD
	EFFICIENCY (%):		82.5		80.4	78.5
	POWER FACTOR (P.U.) :		0.80		0.73	0.59
	AMBIENT (°C) :		50			
	TEMP RISE BY RES. (K) :		95		S.F = 1	RISE (K)= 95
	RATED TORQUE in Kgf-m :		0.52			
	STARTING TORQUE in Kgf-m (% FLT):		1.17			225 (DEPENDS ON VVVF)
	PULL OUT TORQUE in Kgf-m (% FLT) :		1.43			275
	STARTING CURRENT in Amps. (% FLC):		10.40			650 (Subject to tolerance) (DEPENDS ON VVVF)
			Hot			Cold
	THERMAL WITHSTAND TIME (sec):		10			20
	THERMAL HEATING / COOLING TIME CONST (Th/Tc) (min):		42/125			
	APROXIMATE STARTING TIME AT 100% & 80% V (sec):		(DEPENDS ON VVVF)			(DEPENDS ON VVVF)
	STARTS PER HOUR :		2 Hot/ 3 Cold			
	MOMENTARY EXCESS TORQUE :		1.6 TIME OF RATED TORQE FOR 15 SEC WITHOUT STALLING			
	MOTOR GD SQ. (kg m2) :		0.01032			
	LOAD GD SQ. (kg m2) :		=MOTOR GD²			
	VIBRATION (AT NO LOAD) :		AS PER IS:12075			
	NOISE (AT NO LOAD) :		AS PER IS:12065			
	VARNISH (WINDING) :		VPI			
	NOTE 1	ALL PERFORMANCE FIGURES ARE SUBJECT TO IS 15999-1:2021 TOLERANCES.				
	2	STARTING CURRENT MEASUREMENT AS PER IS 12615 : 2018 CLAUSE NO 16.2.2.3.1,				
	3	VFD PERFORMANCE COMMITMENT AS PER DOCUMENT NO.TIF-06C REV-3.				
	4	CUSTOMER / SYSTEM INTEGRATOR SHALL ENSURE CMV & SHAFT VOLTAGE WITHIN LIMIT AND PROPER EARTHING OF VFD, MOTOR & LOAD TO PREVENT BEARING CURRENT.				
NO	REVISION	SIGN	DATE		SIGN	DATE
				Downloaded By:	IKS	02-08-2025 11:56:01

	MKTG Ref No.: **Doc.No. : 0000072123-2**		
			VFD DETAILS
	METHOD OF STARTING	:	VFD
	APPLICATION	:	VARIABLE TORQUE
	AS PER CUSTOMER DOC.	:	AS PER DOC. NO.TIF-06C REV-3
	VFD OPR. FREQ. VARIATION	:	30-50HZ
	VFD THD VALUE	(UP TO %):	5
	VFD DV/DT VALUES	(kV/ µ sec):	1.2
	VFD CABLE LEN.	(SAFE UPTO Meter):	10
	VFD STRESS CATEGORY	:	IVIC-B
	VFD MAX PEAK VOLTAGE	(KV):	1.5
	VFD DRIVE	:	N.A
	VFD OP. VTG. AT MOTOR TERMINAL	:	415
	VFD O/P FILTER	:	SINE
	VFD SWITCHING FREQ.	:	3KHZ-5KHZ
	VFD PULSE RISE TIME	(µ sec):	>0.3
	VFD REGEN. BRAKING	:	NO
	VFD DC LINK	:	INDIVIDUAL
	VFD OPERATION MODE	:	(V/F)/SCALAR
	VFD FEEDBACK	:	OPEN LOOP
	VFD DRIVE DETAILS	:	N.A

Torque & Current Vs Speed Curve

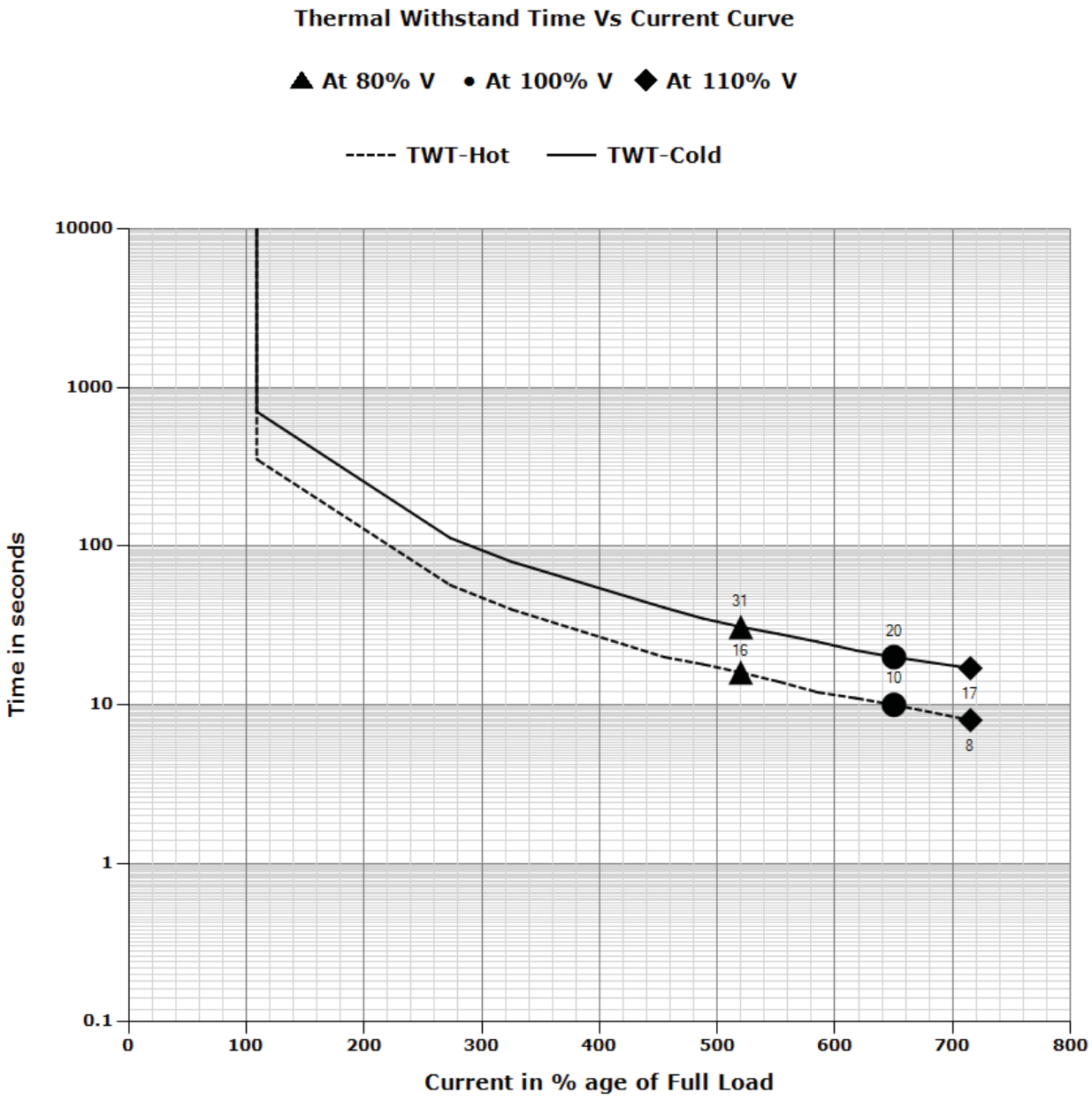
Customer	LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House			
Enq. Ref No.: 0000072123	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	0.75 / 4	**IE3**
Tag Numbers		**Frame Size**	80	



Project		**Downloaded By**	
		Revision	0
		Date	02-08-2025

Thermal Withstand Time Vs Current Curve

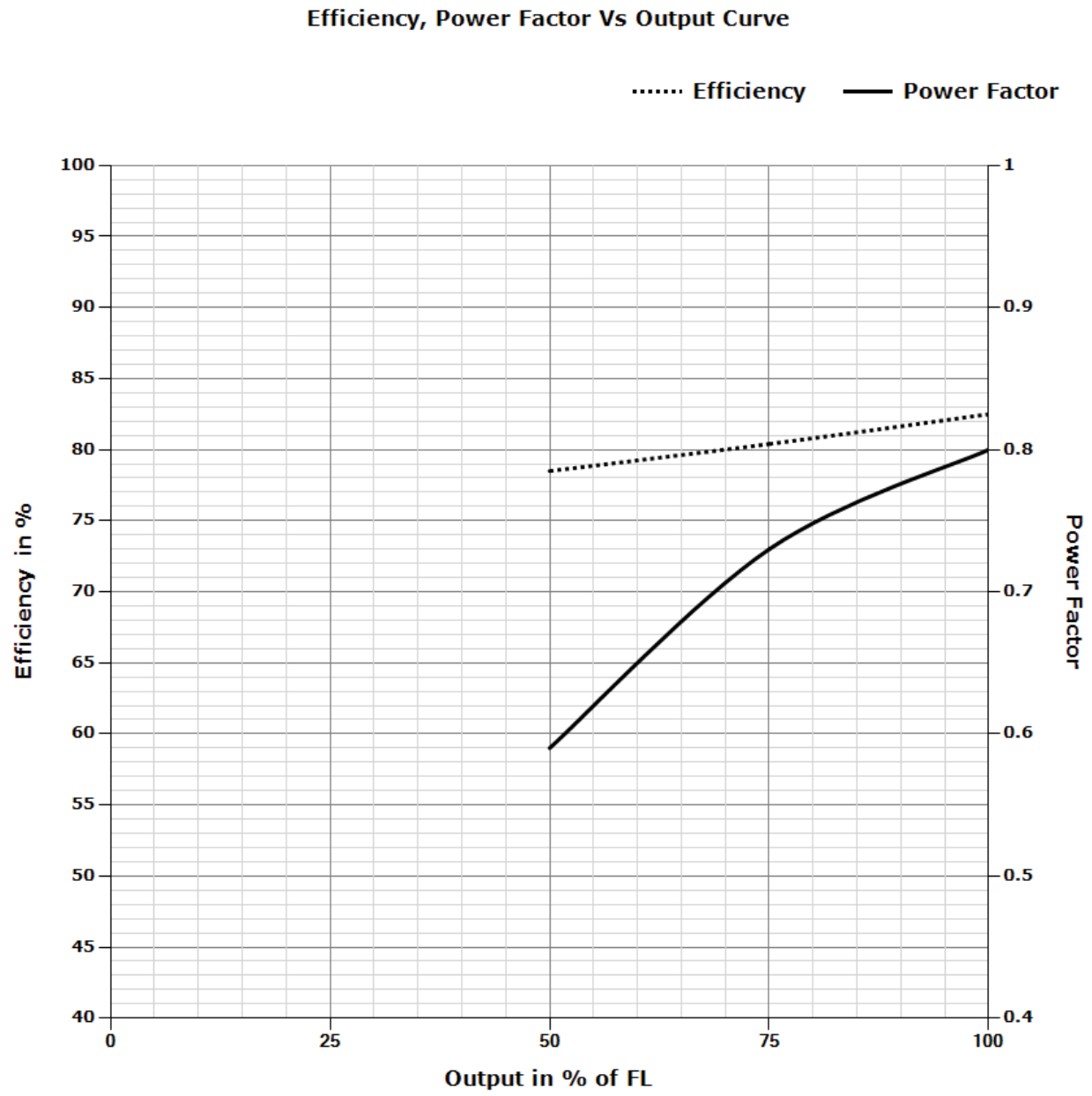
Customer	LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House			
Enq. Ref No.: 0000072123	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	0.75 / 4	**IE3**
Tag Numbers		**Frame Size**	80	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Efficiency, Power Factor Vs Output Curve

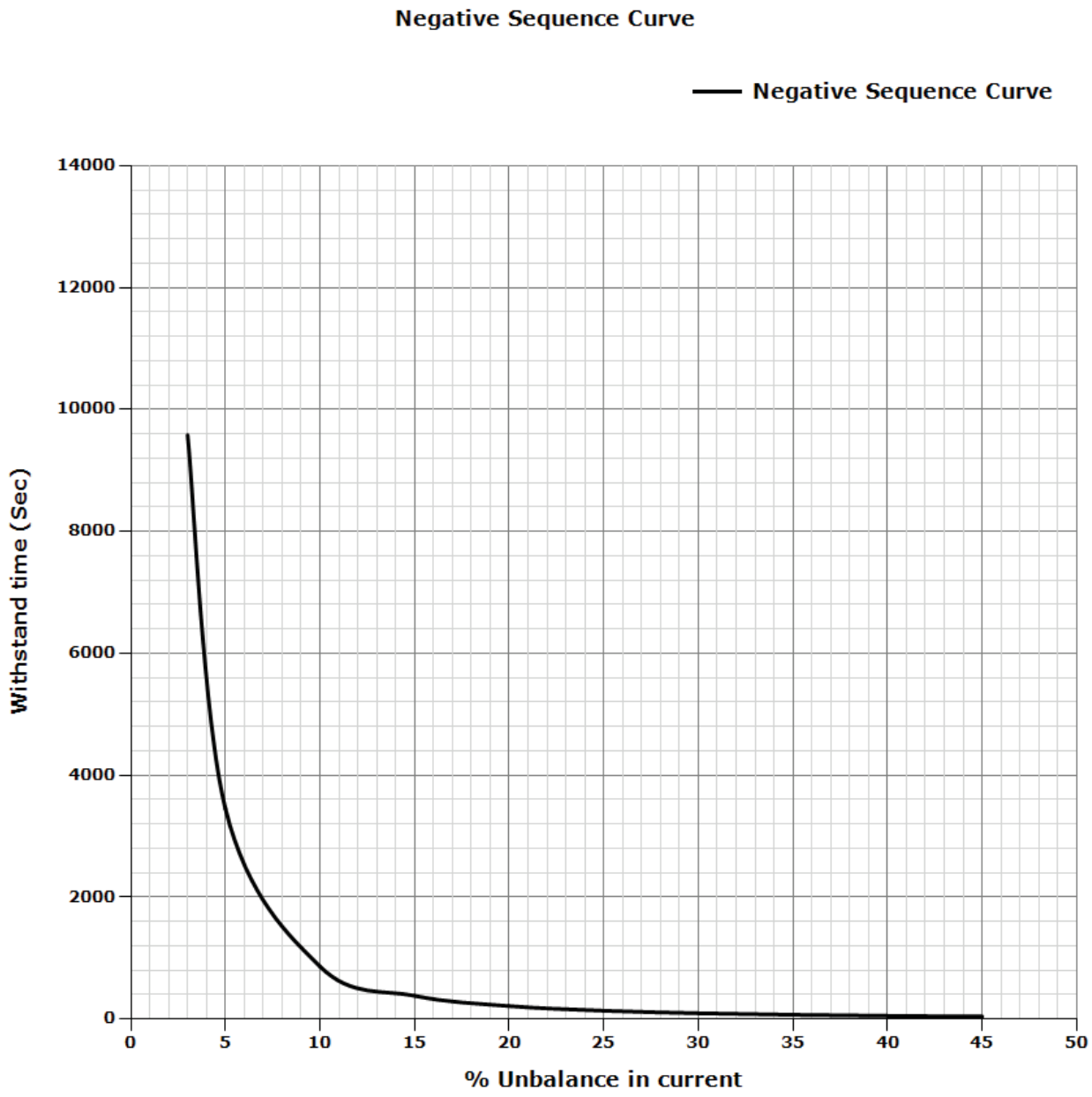
Customer	LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House			
Enq. Ref No.: 0000072123	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	0.75 / 4	**IE3**
Tag Numbers		**Frame Size**	80	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Negative Sequence Curve

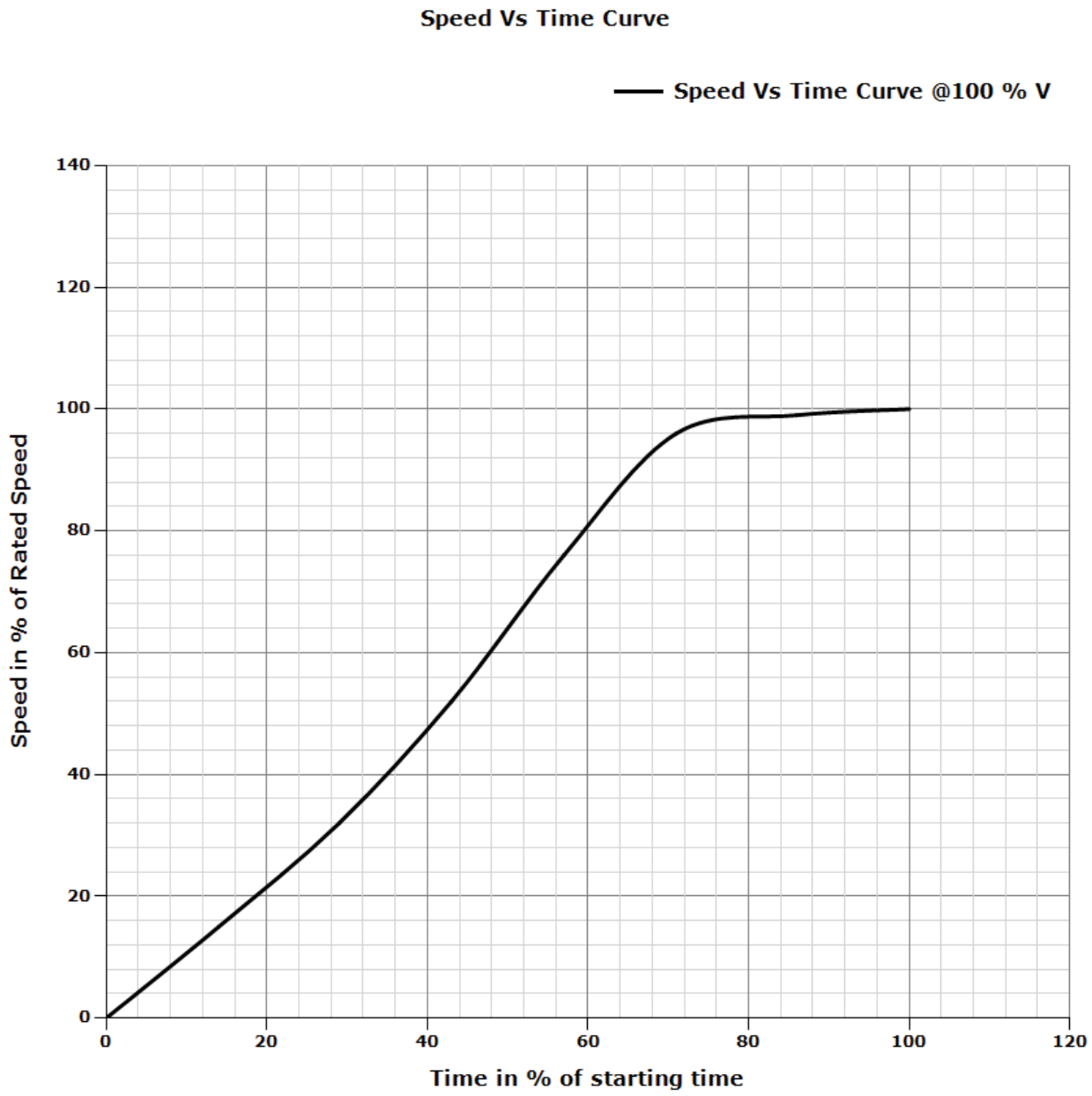
Customer	LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House			
Enq. Ref No.: 0000072123	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	0.75 / 4	**IE3**
Tag Numbers		**Frame Size**	80	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

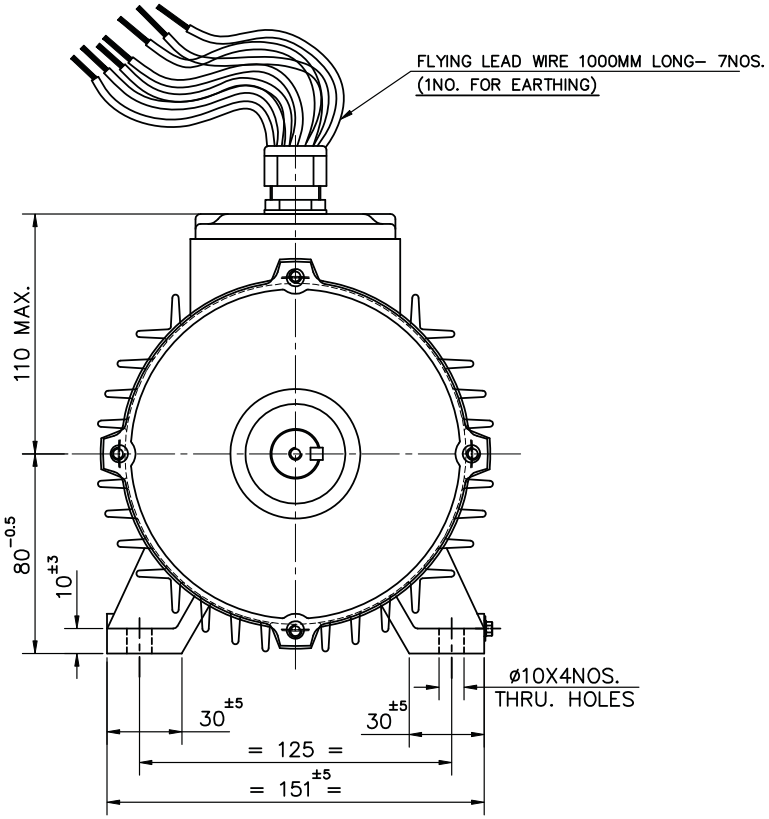
Speed Vs Time Curve

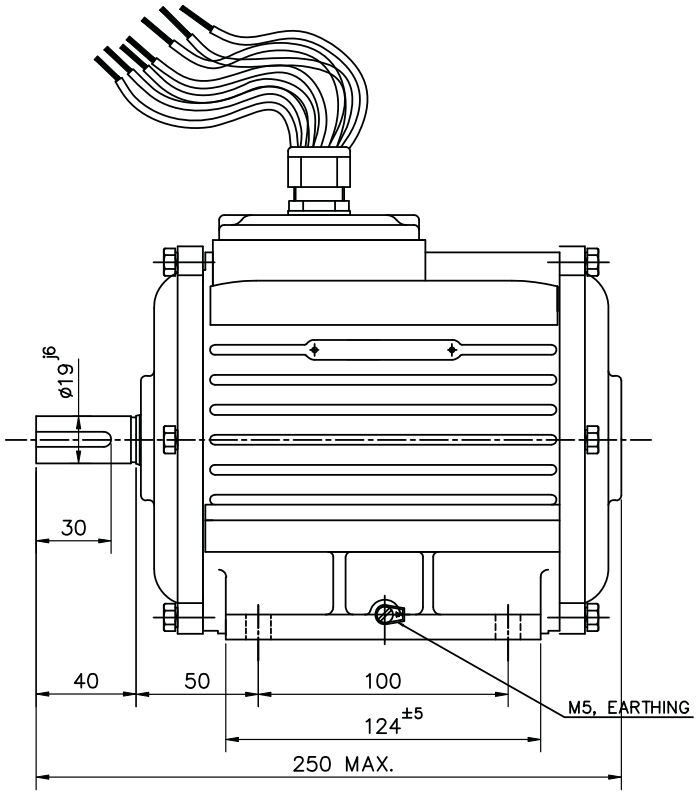
Customer	LOCATION: SMOKE EXHAUST FAN 6800 CMH / 20 mmSP at AHU Room at 8.5 MTR Power House			
Enq. Ref No.: 0000072123	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	0.75 / 4	**IE3**
Tag Numbers		**Frame Size**	80	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

DRG. REVIEW POINTS:– Standardisation | Gemometrical Reqmnts. | Surface Finish | Sectional Views/Arrows. | Material Grade | Process.Reqmnts. | Gauging Reqmnts. | Drg.No./Rev.No./Issue No. | Signature



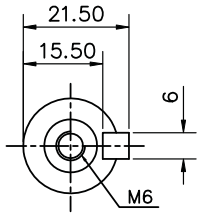


SPECIFICATION:-

RATING	0.75 KW/1.0 KW
POLE	4
BEARING DE	6204 Z
BEARING NDE	6204 Z

MATERAL OF CONSTRUCTION:-

FRAME	CAST IRON
END COVER (DE)	CAST IRON
END COVER (NDE)	CAST IRON
SHAFT	CARBON STEEL



SHAFT END DETAIL

UNMENTIONED TOLERANCES ARE AS PER IS:2102-1/ ISO:2768-1									
	LINEAR DIMNS.	OVER & UPTO	0.5-3	3-6	6-30	30-120	120-400	400-1000	1000-2000
		TOLERANCE	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3
	ANGULAR DIMNS.	PERMISSIBLE DEVIATIONS FOR LENGTHS OF THE SHORTER SIDE OF THE ANGLE							
		OVER & UPTO	0-10		10-50	50-120	120-400	400.....	
		TOLERANCE	±1°		±0°30'	±0°20'	±0°10'	±0°5'	

	NAME	DATE
DGN		
DRN	PRAFULL	11.07.25
CHD		11.07.25
APPD		11.07.25

TITLE: *GENERAL ARRANGEMENT DRAWING FOR 80 FRAME (B3) FOOT MOUNTED MOTOR*

SCALE: 1:1

SHEET:- 01 OF 02

REV NO.	ECN DETAILS	DATE	INTL.
1	CABLE ENTRY M20X2 NOS. WAS M25X2 NOS. FOR M20 CABLE ENTRY, CABLE SIZE UPDATED.	12.08.25	PPK

Laxmi Hydraulics Pvt. Ltd.
Website:- www.lhp.co.in SOLAPUR

DRG NO. MGAN080A0719

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM | DO NOT SCALE THE DRAWING | ISSUE NO. 01 | REV. NO. 01

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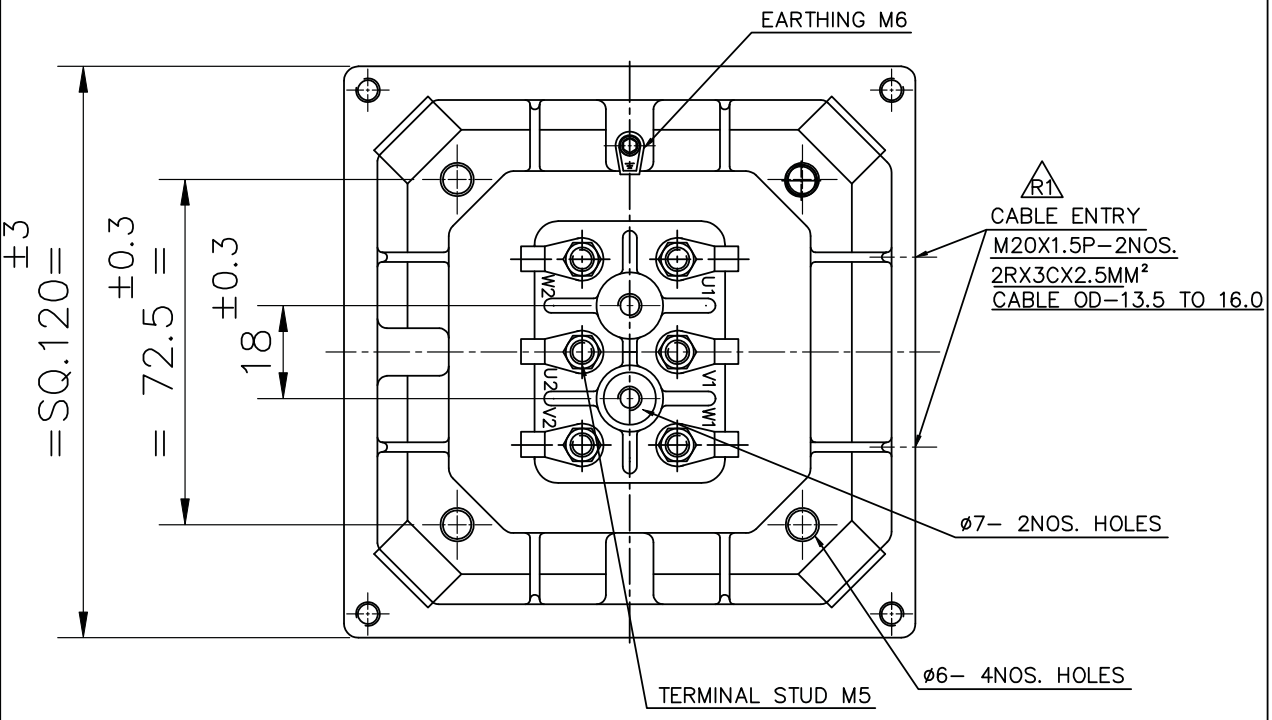
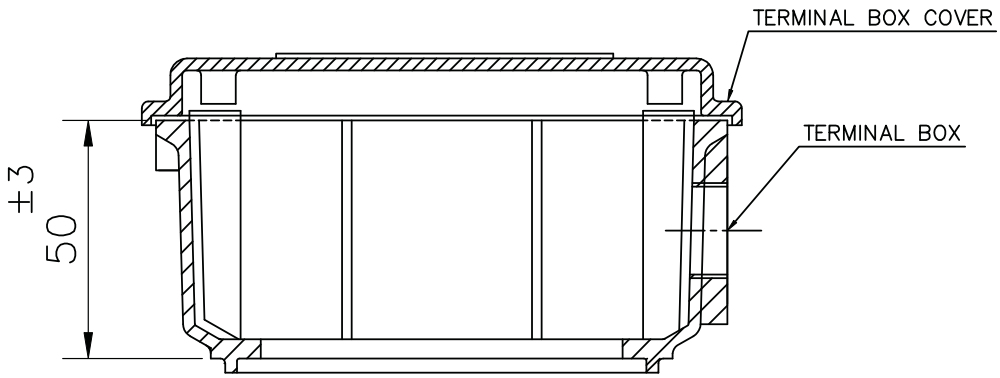
LAXMI HYDRAULICS PVT. LTD, SOLAPUR

TERMINAL BOX ARRANGEMENT (80 FRAME)





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SHEET:– 02 OF 02

ISSUE.NO.– 01	REV.NO.– 01	DATE–11.07.25	DRG.NO.– MGAN080A0719
DRN.BY.– PRAFULL	CHD.BY.–		APPD.BY.–

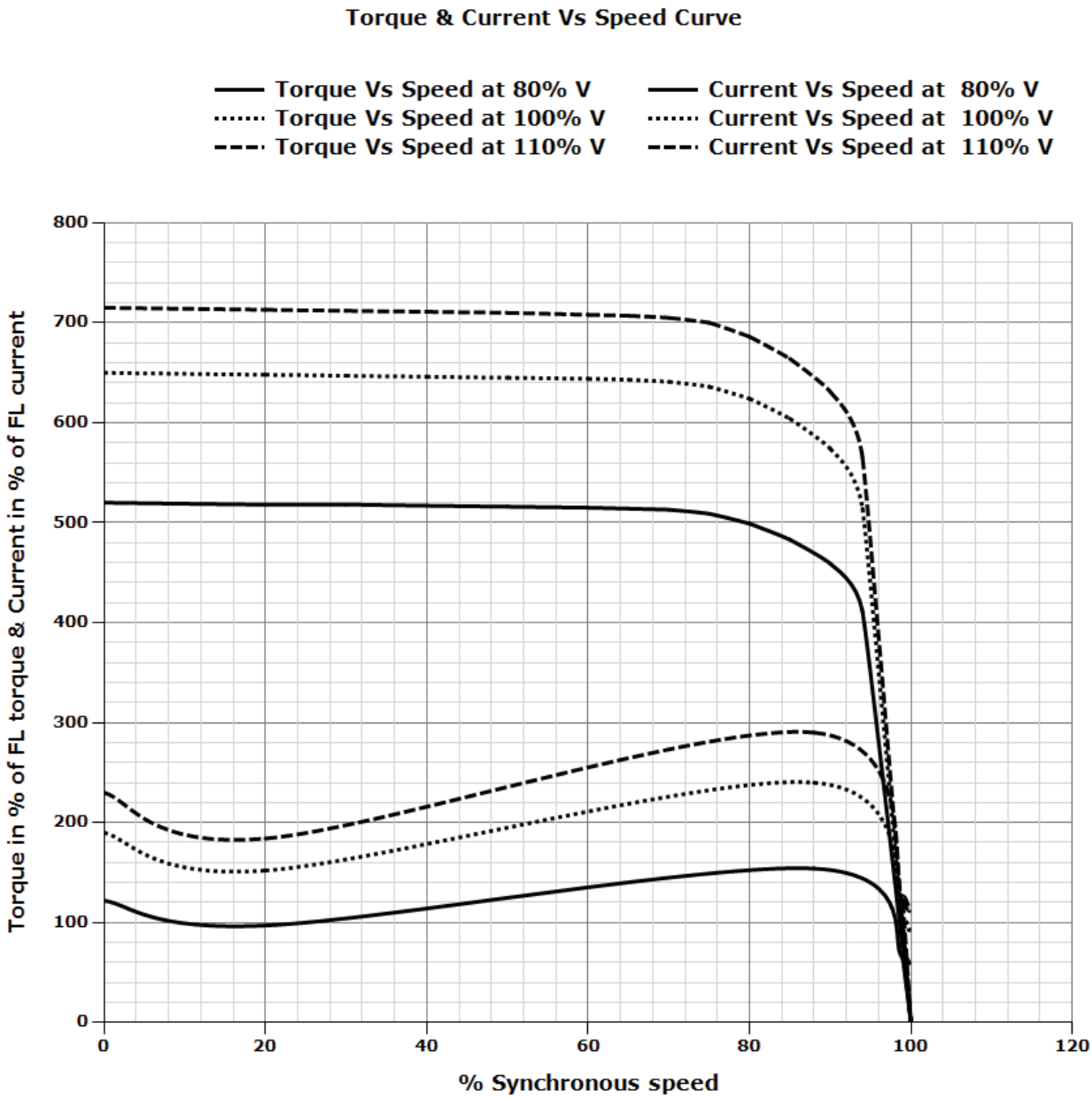
LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING

	MKTG Ref No.: **Doc.No. : 0000072124-1** **CR.No. : D8JP2506277**	LHP STD	**LAXMI HYDRAULICS PVT LTD., B-11- MIDC CHINCHOLI, SOLAPUR.**			
	MOTOR DATA SHEET					
	CUSTOMER :-SUBURBAN INDUSTRIAL WORKS PRIVATE L					**IE3**
	INDENT NO.:		**PO NO :**			
	PROJECT NAME :-					
	KW : 2.2	POLE : 6	VOLTS : 415			QTY : 1
	MOTOR TAG NO :		**PRO CODE** :			
1	**Basic Performance Requirement**					
	RATING (kW/HP) :		2.2/3			
	NO. OF POLES :		6			
	APPLICATION :		VARIABLE TORQUE			
	APPLICABLE STANDARD :		EN12101-3, IEC60034-1, IEC60034-2-1, IS 15999(Part 1) , IS 12615			
	TYPE OF DUTY :		S1-50°C,S2-120 Min-400°C			ALTITUED IN METER ≤ UPTO 1000 MSL
	AREA OF APPLICATION :		SAFE AREA,			
2	**Motor terminal voltage Data**					
	VOLTAGE (VOLTS):		415	+10%	-10%	3-ph. A.C.
	FREQUENCY (Hz) :		50	+5%	-5%	
	COMBINED VARIATION :		10%		(Absolute)	
3	**Construction Data**					
	TYPE :		3 PHASE, AC SQ.CAGE INDUCTION MOTOR			
	FRAME :		112M			
	ENCLOSURE :		TEAO			
	DEG. OF PROTECTION :		IP55			
	TYPE OF COOLING :		IC418			
	TYPE OF MOUNTING :		B3			
	INSULATION CLASS AND RISE :		H/F			
	TYPE OF COUPLING :		FLEXIBLE COUPLING			
	STATOR CONNECTION :		STAR(6L);			FLYING LEAD LENGTH 1000
	TYPE OF STARTING :		VFD (30-50HZ)			
	ROTATION VIEWED FROM DE :		BI-Directional(CW)			
	TB POSITION FROM DE :		AS PER GAD			
	FAULT LEVEL OF TB :		50 KA FOR 0.25 SEC WITH APPROPRIATE FUSE PROTECTION			
	SPACE HEATER :		N.A			
	ACCESSORIES(RTD,THERMISTOR,THERMOTRP) :		N.A		N.A	N.A
	ROTOR TYPE :		AL			
	PAINT SHADE :		EPOXY RAL-7032 PEBBLE GREY			
	CABLE GLAND MATERIAL :		METALLIC (ALUMINUM)			
4	**Electrical Performance**					
	FULL LOAD CURRENT (A):		5			
	FULL LOAD SPEED (rpm):		960			
	EFFICIENCY CLASS :		IE3			
			Full Load		3/4 LOAD	1/2LOAD
	EFFICIENCY (%):		84.3		84	82.8
	POWER FACTOR (P.U.) :		0.73		0.62	0.47
	AMBIENT (°C) :		50			
	TEMP RISE BY RES. (K) :		95		S.F = 1	RISE (K)= 95
	RATED TORQUE in Kgf-m :		2.23			
	STARTING TORQUE in Kgf-m (% FLT):		4.24			190 (DEPENDS ON VVVF)
	PULL OUT TORQUE in Kgf-m (% FLT) :		5.35			240
	STARTING CURRENT in Amps. (% FLC):		32.50			650 (Subject to tolerance) (DEPENDS ON VVVF)
			Hot			Cold
	THERMAL WITHSTAND TIME (sec):		10			20
	THERMAL HEATING / COOLING TIME CONST (Th/Tc) (min):		42/125			
	APROXIMATE STARTING TIME AT 100% & 80% V (sec):		(DEPENDS ON VVVF)			(DEPENDS ON VVVF)
	STARTS PER HOUR :		2 Hot/ 3 Cold			
	MOMENTARY EXCESS TORQUE :		1.6 TIME OF RATED TORQE FOR 15 SEC WITHOUT STALLING			
	MOTOR GD SQ. (kg m2) :		0.0864			
	LOAD GD SQ. (kg m2) :		=MOTOR GD²			
	VIBRATION (AT NO LOAD) :		AS PER IS:12075			
	NOISE (AT NO LOAD) :		AS PER IS:12065			
	VARNISH (WINDING) :		VPI			
	NOTE 1	ALL PERFORMANCE FIGURES ARE SUBJECT TO IS 15999-1:2021 TOLERANCES.				
	2	STARTING CURRENT MEASUREMENT AS PER IS 12615 : 2018 CLAUSE NO 16.2.2.3.1,				
	3	VFD PERFORMANCE COMMITMENT AS PER DOCUMENT NO.TIF-06C REV-3.				
	4	CUSTOMER / SYSTEM INTEGRATOR SHALL ENSURE CMV & SHAFT VOLTAGE WITHIN LIMIT AND PROPER EARTHING OF VFD, MOTOR & LOAD TO PREVENT BEARING CURRENT.				
NO	REVISION	SIGN	DATE		SIGN	DATE
				Downloaded By:	IKS	02-08-2025 11:56:34

	MKTG Ref No.: **Doc.No. : 0000072124-1**		
			VFD DETAILS
	METHOD OF STARTING	:	VFD
	APPLICATION	:	VARIABLE TORQUE
	AS PER CUSTOMER DOC.	:	AS PER DOC. NO.TIF-06C REV-3
	VFD OPR. FREQ. VARIATION	:	30-50HZ
	VFD THD VALUE	(UP TO %):	5
	VFD DV/DT VALUES	(kV/ µ sec):	1.2
	VFD CABLE LEN.	(SAFE UPTO Meter):	10
	VFD STRESS CATEGORY	:	IVIC-B
	VFD MAX PEAK VOLTAGE	(KV):	1.5
	VFD DRIVE	:	N.A
	VFD OP. VTG. AT MOTOR TERMINAL	:	415
	VFD O/P FILTER	:	SINE
	VFD SWITCHING FREQ.	:	3KHZ-5KHZ
	VFD PULSE RISE TIME	(µ sec):	>0.3
	VFD REGEN. BRAKING	:	NO
	VFD DC LINK	:	INDIVIDUAL
	VFD OPERATION MODE	:	(V/F)/SCALAR
	VFD FEEDBACK	:	OPEN LOOP
	VFD DRIVE DETAILS	:	N.A

Torque & Current Vs Speed Curve

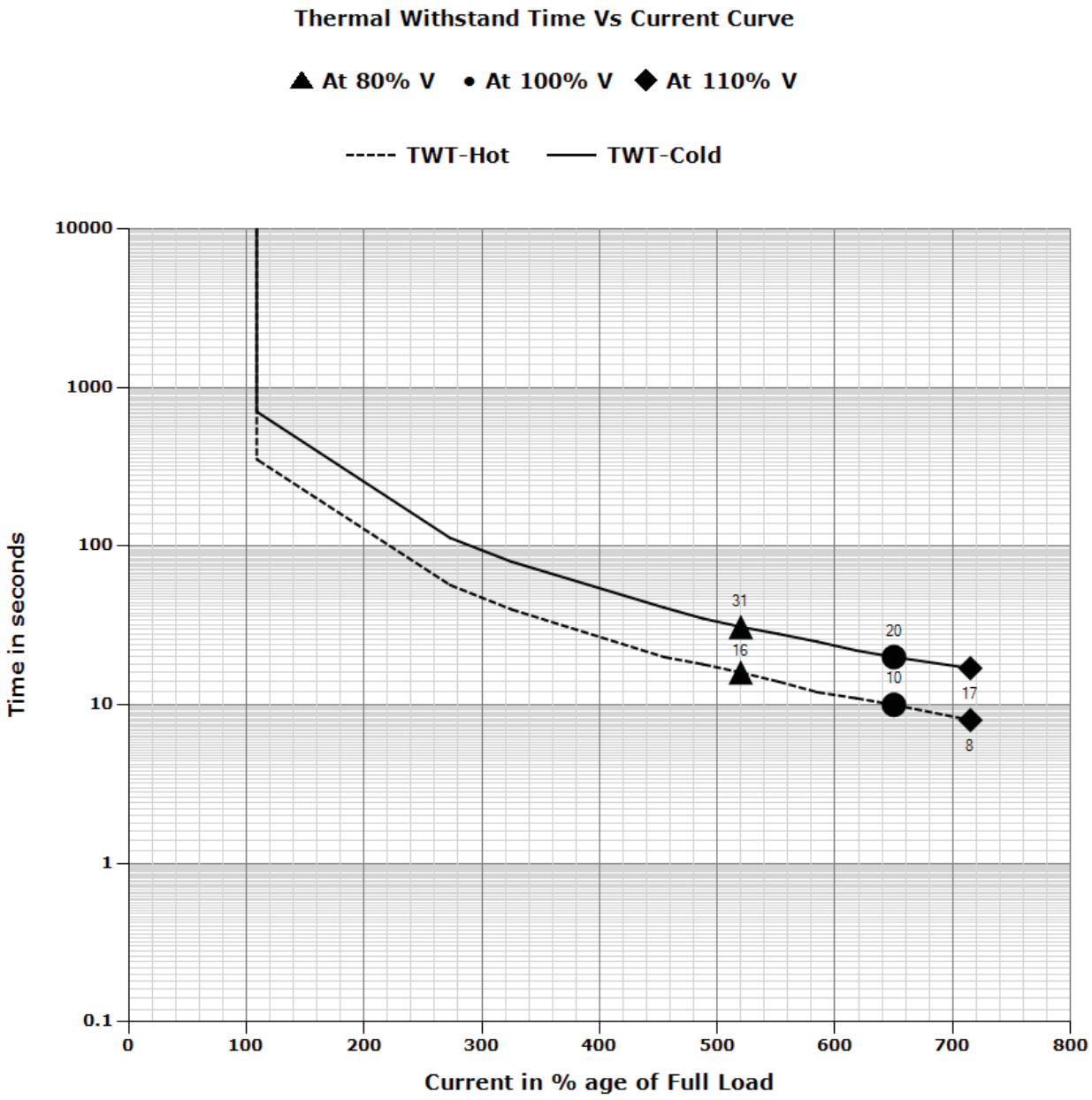
Customer	LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING			
Enq. Ref No.: 0000072124	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	2.2 / 6	**IE3**
Tag Numbers		**Frame Size**	112M	



Project		**Downloaded By**	
		Revision	0
		Date	02-08-2025

Thermal Withstand Time Vs Current Curve

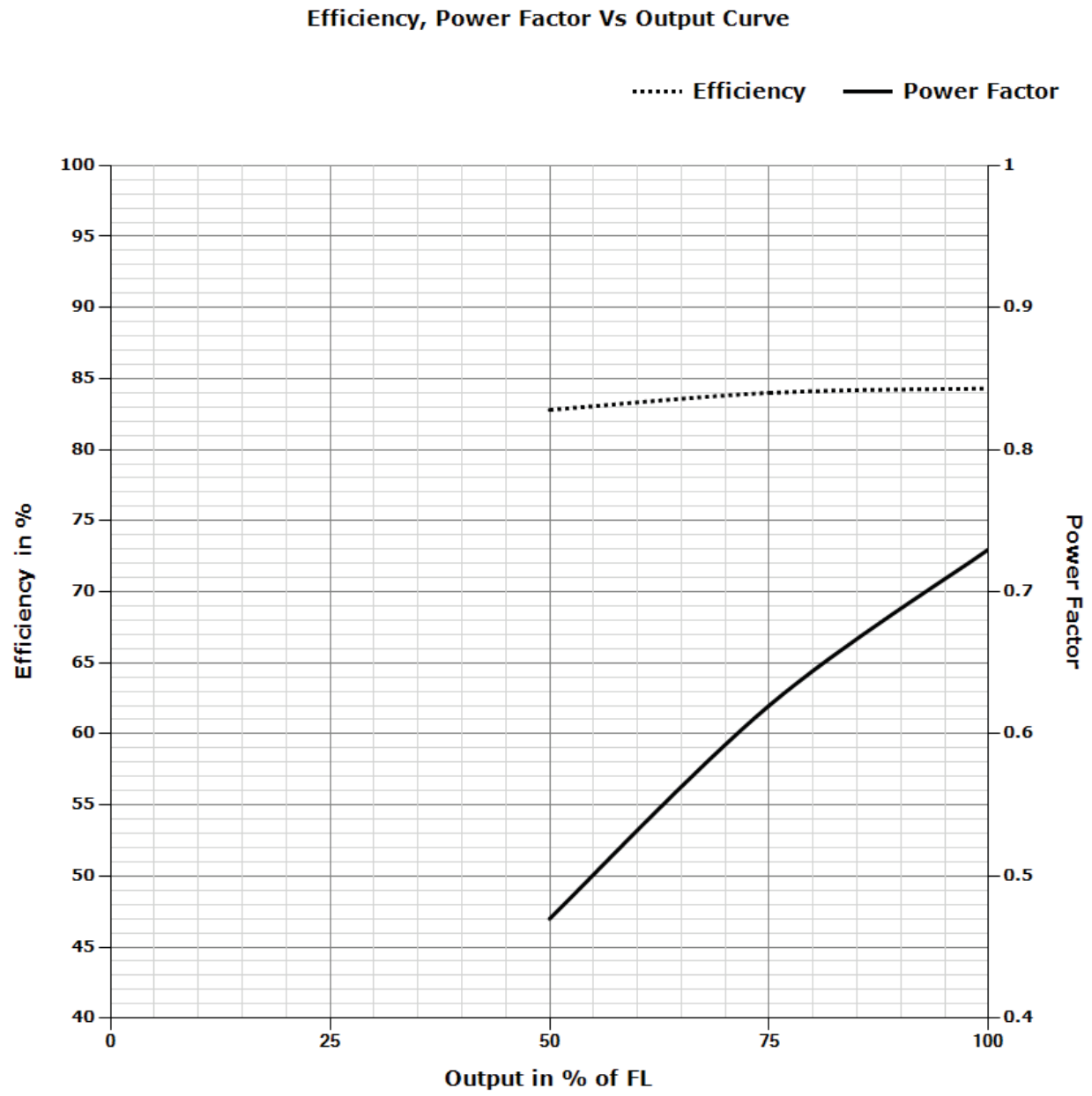
Customer	LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING			
Enq. Ref No.: 0000072124	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	2.2 / 6	**IE3**
Tag Numbers		**Frame Size**	112M	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Efficiency, Power Factor Vs Output Curve

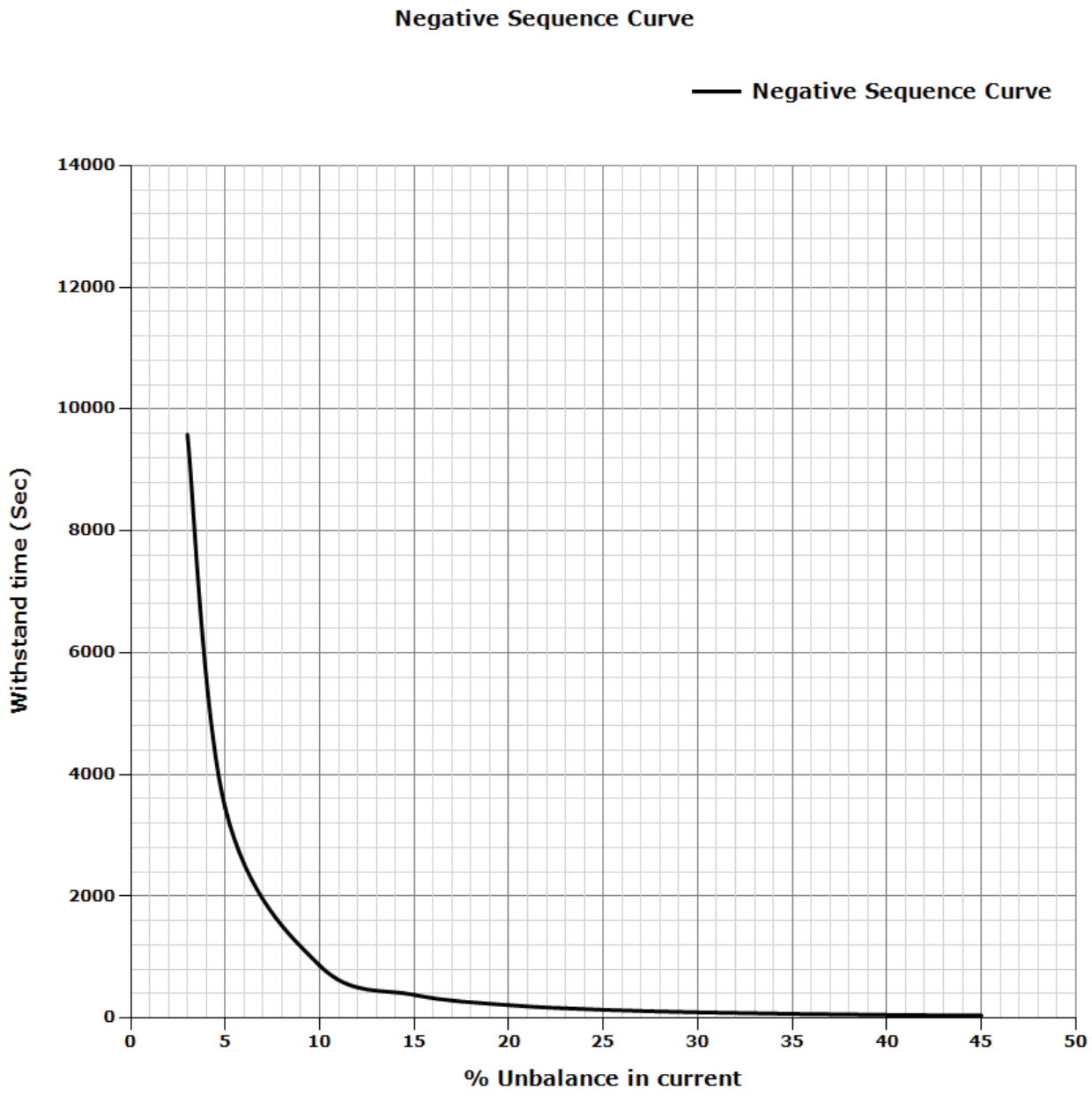
Customer	LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING			
Enq. Ref No.: 0000072124	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	2.2 / 6	**IE3**
Tag Numbers		**Frame Size**	112M	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Negative Sequence Curve

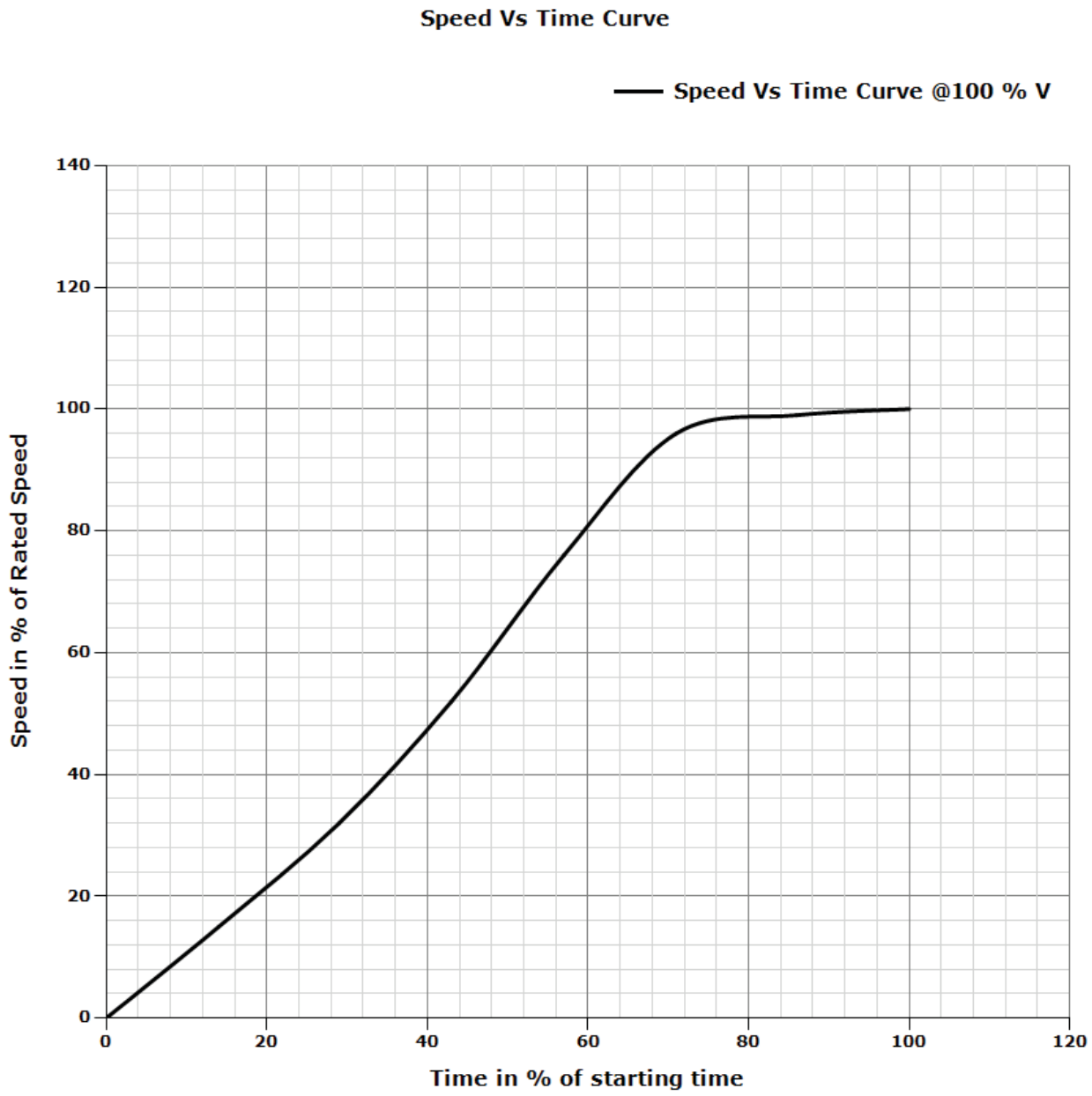
Customer	LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING			
Enq. Ref No.: 0000072124	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	2.2 / 6	**IE3**
Tag Numbers		**Frame Size**	112M	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

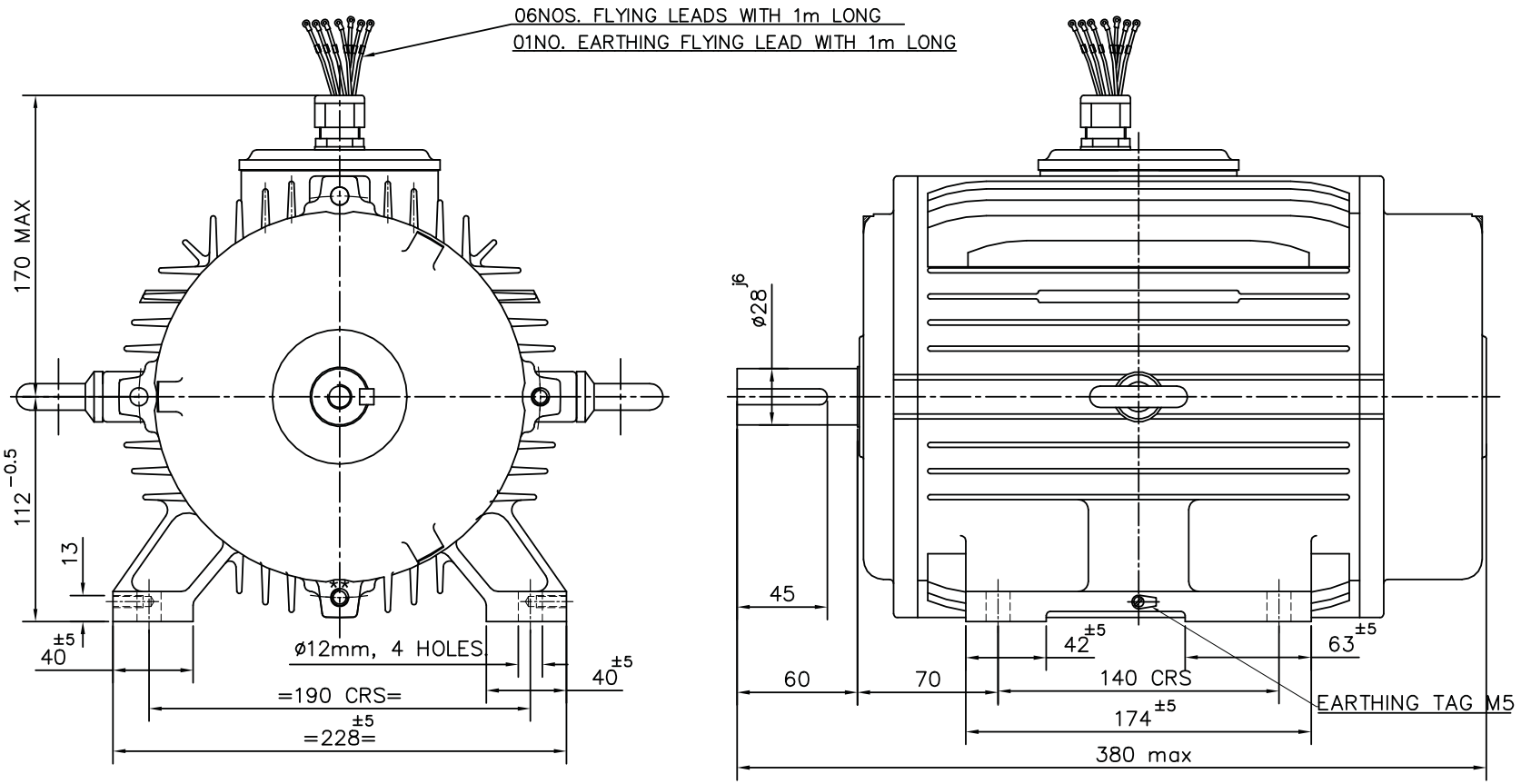
Speed Vs Time Curve

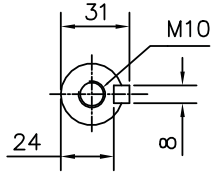
Customer	LOCATION: SMOKE EXHAUST FAN 19000 CMH CMH / 20 mmSP AT PAC ROOM OF ESP CUM FGD BUILDING			
Enq. Ref No.: 0000072124	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	2.2 / 6	**IE3**
Tag Numbers		**Frame Size**	112M	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

DRG. REVIEW POINTS: – Standardisation | Gemometrical Reqmnts. | Surface Finish | Sectional Views / Arrows. | Material Grade | Process.Reqmnts. | Gauging Reqmnts. | Drg.No./Rev.No./Issue No. | Signature





SHAFT END DETAILS

SPECIFICATION:-

KW/HP.	2.2/3.0
POLE	6
BEARING DE SIDE	6306.Z.C3
BEARING NDE SIDE	6206.Z.C3

MATERIAL OF CONSTRUCTION:-

FRAME	CAST IRON
END COVER (DE)	CAST IRON
END COVER (NDE)	CAST IRON
T. BOX / COVER	CAST IRON
SHAFT	CARBON STEEL

REV. NO.	DETAIL OF CHANGE	DATE.	INTL.

UNMENTIONED TOLERANCES ARE AS PER IS:2102-1/ ISO 2768-1

LINEAR DIMNS.	OVER & UPTO	0.5-3	3-6	6-30	30-120	120-400	400-1000	1000-2000
	TOLERANCE	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3
ANGULAR DIMNS.	PERMISSIBLE DEVIATIONS FOR LENGTHS OF THE SHORTER SIDE OF THE ANGLE.							
	OVER & UPTO	0-10	10-50	50-120	120-400	400.....		
	TOLERANCE	±1°	±0°30'	±0°20'	±0°10'	±0°5'		

TITLE: *GENERAL ARRANGEMENT DRG. FOR*
112 FRAME (B3) MOUNTED TTB (AOM)
SMOKE EXTRACTION MOTOR - 400°C FOR 2HRS.

Laxmi Hydraulics Pvt.Ltd. SOLAPUR
Website : www.lhp.co.in
UNLESS OTHERWISE SPECIFIED ALL DIMNS. ARE IN MM. | DO NOT SCALE THE DRAWING.

	NAME.	DATE.
DGN.		
DRN.	RAK	11.08.25
CHD.		11.08.25
APPD.		11.08.25

SCALE :--1:1

DRG. NO. MGAN112A0657

ISSUE NO. 01 | REV.NO. 00

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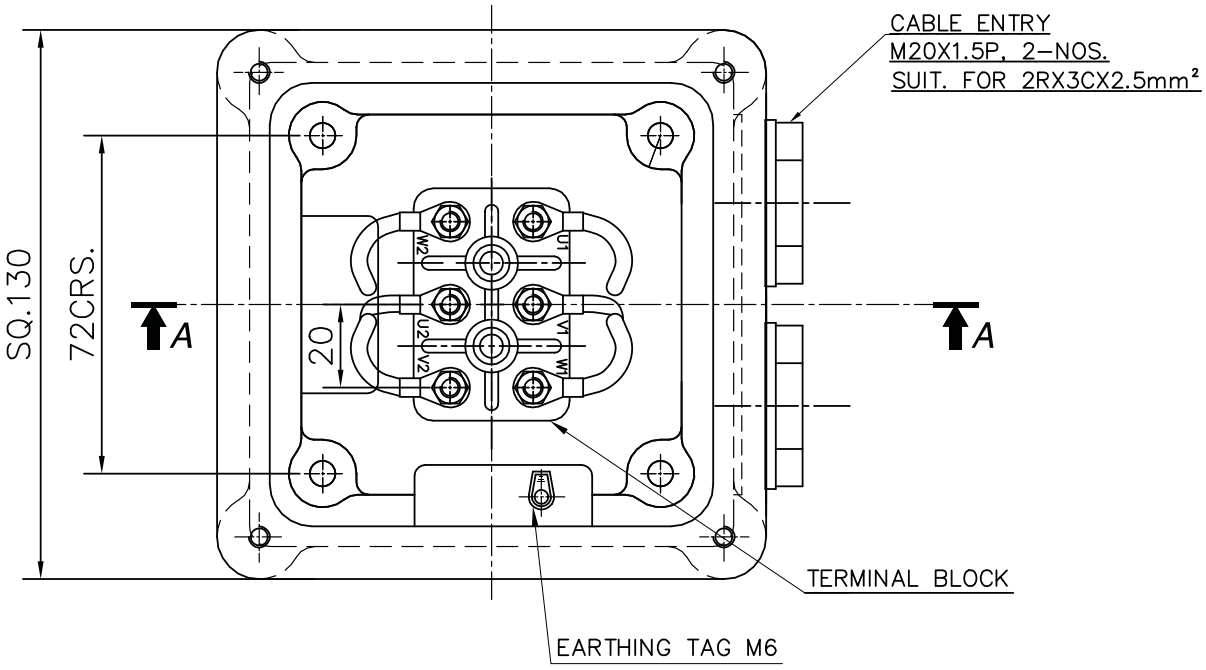
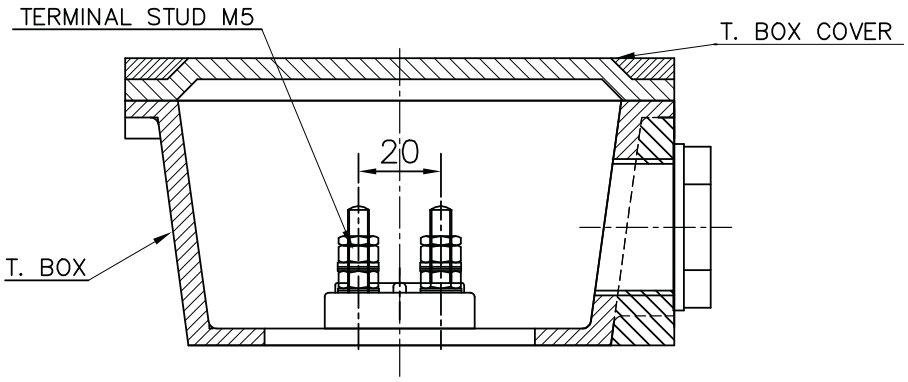
LAXMI HYDRAULICS PVT. LTD, SOLAPUR

LOOSE TERMINAL BOX ARRANGEMENT FOR 112 FR.





SECTION A-A

ISSUE.NO.-01	REV.NO.-00	DATE:- 11.08.25	DRG.NO.:- MGAN112A0657
SHEET-2 OF 2	DRN.BY:- RAK	CHD BY:-	APPD. BY: GRM

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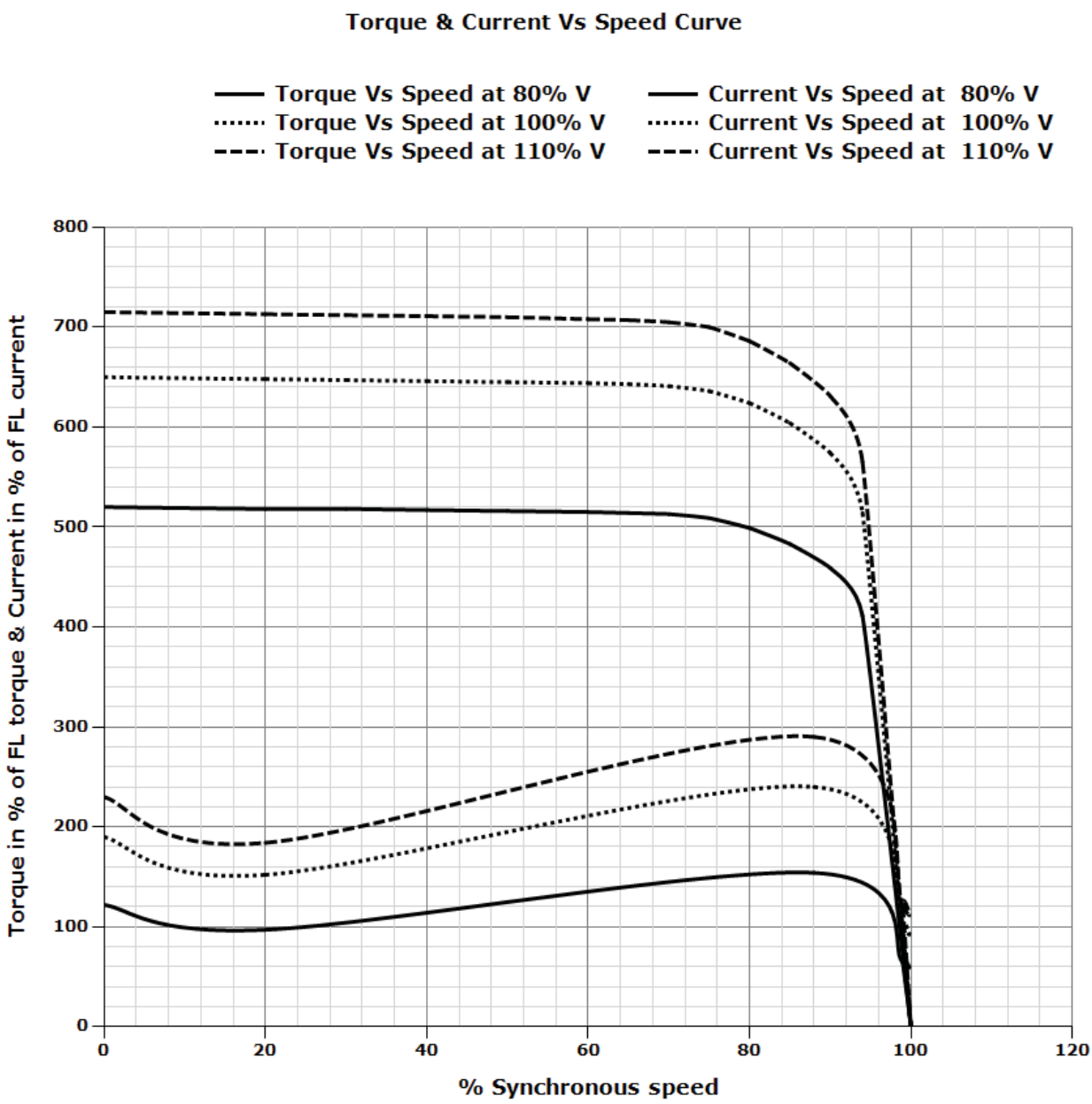
LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA

	MKTG Ref No.: **Doc.No. : 0000072122-2** **CR.No. : D8JP2506277**	LHP STD	**LAXMI HYDRAULICS PVT LTD., B-11- MIDC CHINCHOLI, SOLAPUR.**			
	MOTOR DATA SHEET					
	CUSTOMER :-SUBURBAN INDUSTRIAL WORKS PRIVATE L					**IE3**
	INDENT NO.:		**PO NO :**			
	PROJECT NAME :-					
	KW : 3.7	POLE : 6	VOLTS : 415			QTY : 1
	MOTOR TAG NO :		**PRO CODE** :			
1	**Basic Performance Requirement**					
	RATING (kW/HP) :		3.7/5			
	NO. OF POLES :		6			
	APPLICATION :		VARIABLE TORQUE			
	APPLICABLE STANDARD :		EN12101-3, IEC60034-1, IEC60034-2-1, IS 15999(Part 1) , IS 12615			
	TYPE OF DUTY :		S1-50°C,S2-120 Min-400°C			ALTITUED IN METER ≤ UPTO 1000 MSL
	AREA OF APPLICATION :		SAFE AREA,			
2	**Motor terminal voltage Data**					
	VOLTAGE (VOLTS):		415	+10%	-10%	3-ph. A.C.
	FREQUENCY (Hz) :		50	+5%	-5%	
	COMBINED VARIATION :		10%		(Absolute)	
3	**Construction Data**					
	TYPE :		3 PHASE, AC SQ.CAGE INDUCTION MOTOR			
	FRAME :		132S			
	ENCLOSURE :		TEAO			
	DEG. OF PROTECTION :		IP55			
	TYPE OF COOLING :		IC418			
	TYPE OF MOUNTING :		B3			
	INSULATION CLASS AND RISE :		H/F			
	TYPE OF COUPLING :		FLEXIBLE COUPLING			
	STATOR CONNECTION :		DELTA(6L);			FLYING LEAD LENGTH 1000
	TYPE OF STARTING :		VFD (30-50HZ)			
	ROTATION VIEWED FROM DE :		BI-Directional(CW)			
	TB POSITION FROM DE :		AS PER GAD			
	FAULT LEVEL OF TB :		50 KA FOR 0.25 SEC WITH APPROPRIATE FUSE PROTECTION			
	SPACE HEATER :		N.A			
	ACCESSORIES(RTD,THERMISTOR,THERMOTRP) :		N.A		N.A	N.A
	ROTOR TYPE :		AL			
	PAINT SHADE :		EPOXY RAL-7032 PEBBLE GREY			
	CABLE GLAND MATERIAL :		METALLIC (ALUMINUM)			
4	**Electrical Performance**					
	FULL LOAD CURRENT (A):		8			
	FULL LOAD SPEED (rpm):		955			
	EFFICIENCY CLASS :		IE3			
			Full Load		3/4 LOAD	1/2LOAD
	EFFICIENCY (%):		86.5		86	85.5
	POWER FACTOR (P.U.) :		0.74		0.70	0.60
	AMBIENT (°C) :		50			
	TEMP RISE BY RES. (K) :		95		S.F = 1	RISE (K)= 95
	RATED TORQUE in Kgf-m :		3.77			
	STARTING TORQUE in Kgf-m (% FLT):		7.16			190 (DEPENDS ON VVVF)
	PULL OUT TORQUE in Kgf-m (% FLT) :		9.05			240
	STARTING CURRENT in Amps. (% FLC):		52.00			650 (Subject to tolerance) (DEPENDS ON VVVF)
			Hot			Cold
	THERMAL WITHSTAND TIME (sec):		10			20
	THERMAL HEATING / COOLING TIME CONST (Th/Tc) (min):		42/125			
	APROXIMATE STARTING TIME AT 100% & 80% V (sec):		(DEPENDS ON VVVF)			(DEPENDS ON VVVF)
	STARTS PER HOUR :		2 Hot/ 3 Cold			
	MOMENTARY EXCESS TORQUE :		1.6 TIME OF RATED TORQE FOR 15 SEC WITHOUT STALLING			
	MOTOR GD SQ. (kg m2) :		0.204			
	LOAD GD SQ. (kg m2) :		=MOTOR GD²			
	VIBRATION (AT NO LOAD) :		AS PER IS:12075			
	NOISE (AT NO LOAD) :		AS PER IS:12065			
	VARNISH (WINDING) :		VPI			
	NOTE 1	ALL PERFORMANCE FIGURES ARE SUBJECT TO IS 15999-1:2021 TOLERANCES.				
	2	STARTING CURRENT MEASUREMENT AS PER IS 12615 : 2018 CLAUSE NO 16.2.2.3.1,				
	3	VFD PERFORMANCE COMMITMENT AS PER DOCUMENT NO.TIF-06C REV-3.				
	4	CUSTOMER / SYSTEM INTEGRATOR SHALL ENSURE CMV & SHAFT VOLTAGE WITHIN LIMIT AND PROPER EARTHING OF VFD, MOTOR & LOAD TO PREVENT BEARING CURRENT.				
NO	REVISION	SIGN	DATE		SIGN	DATE
				Downloaded By:	IKS	02-08-2025 11:55:13

	MKTG Ref No.: **Doc.No. : 0000072122-2**		
			VFD DETAILS
	METHOD OF STARTING	:	VFD
	APPLICATION	:	VARIABLE TORQUE
	AS PER CUSTOMER DOC.	:	AS PER DOC. NO.TIF-06C REV-3
	VFD OPR. FREQ. VARIATION	:	30-50HZ
	VFD THD VALUE	(UP TO %):	5
	VFD DV/DT VALUES	(kV/ µ sec):	1.2
	VFD CABLE LEN.	(SAFE UPTO Meter):	10
	VFD STRESS CATEGORY	:	IVIC-B
	VFD MAX PEAK VOLTAGE	(KV):	1.5
	VFD DRIVE	:	N.A
	VFD OP. VTG. AT MOTOR TERMINAL	:	415
	VFD O/P FILTER	:	SINE
	VFD SWITCHING FREQ.	:	3KHZ-5KHZ
	VFD PULSE RISE TIME	(µ sec):	>0.3
	VFD REGEN. BRAKING	:	NO
	VFD DC LINK	:	INDIVIDUAL
	VFD OPERATION MODE	:	(V/F)/SCALAR
	VFD FEEDBACK	:	OPEN LOOP
	VFD DRIVE DETAILS	:	N.A

Torque & Current Vs Speed Curve

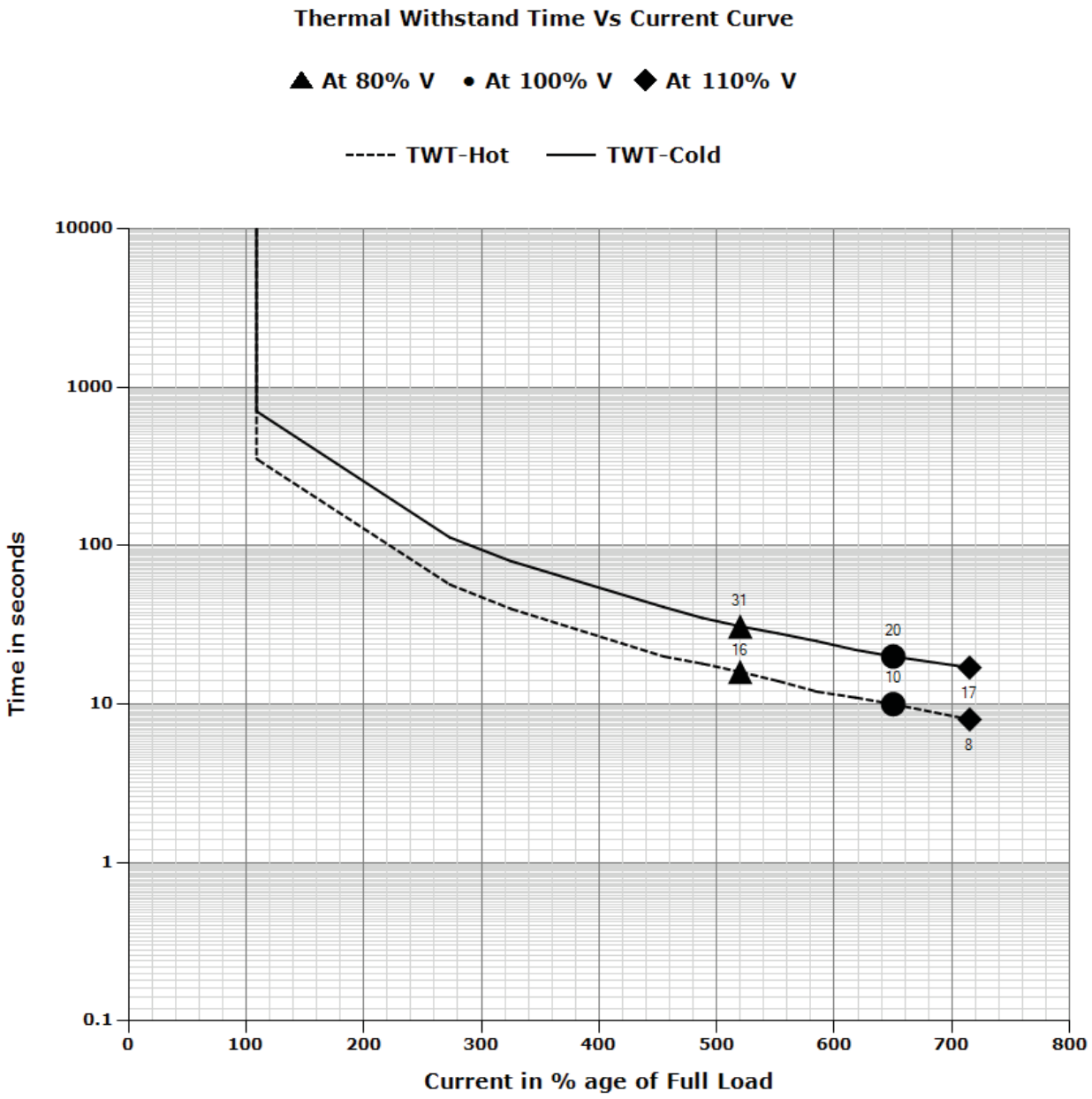
Customer	LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA			
Enq. Ref No.: 0000072122	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	3.7 / 6	**IE3**
Tag Numbers		**Frame Size**	132S	



Project		**Downloaded By**	
		Revision	0
		Date	02-08-2025

Thermal Withstand Time Vs Current Curve

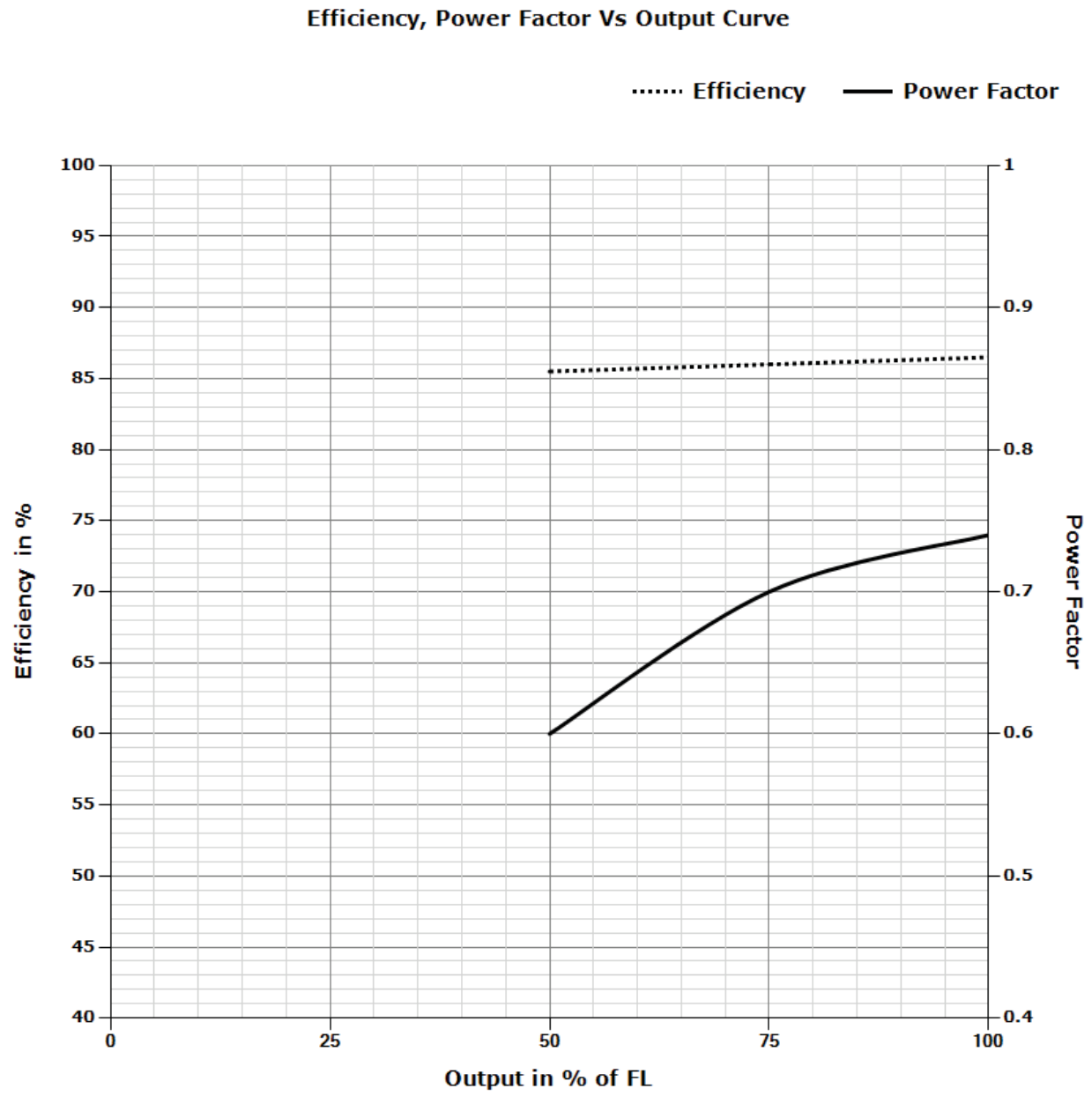
Customer	LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA			
Enq. Ref No.: 0000072122	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	3.7 / 6	**IE3**
Tag Numbers		**Frame Size**	132S	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Efficiency, Power Factor Vs Output Curve

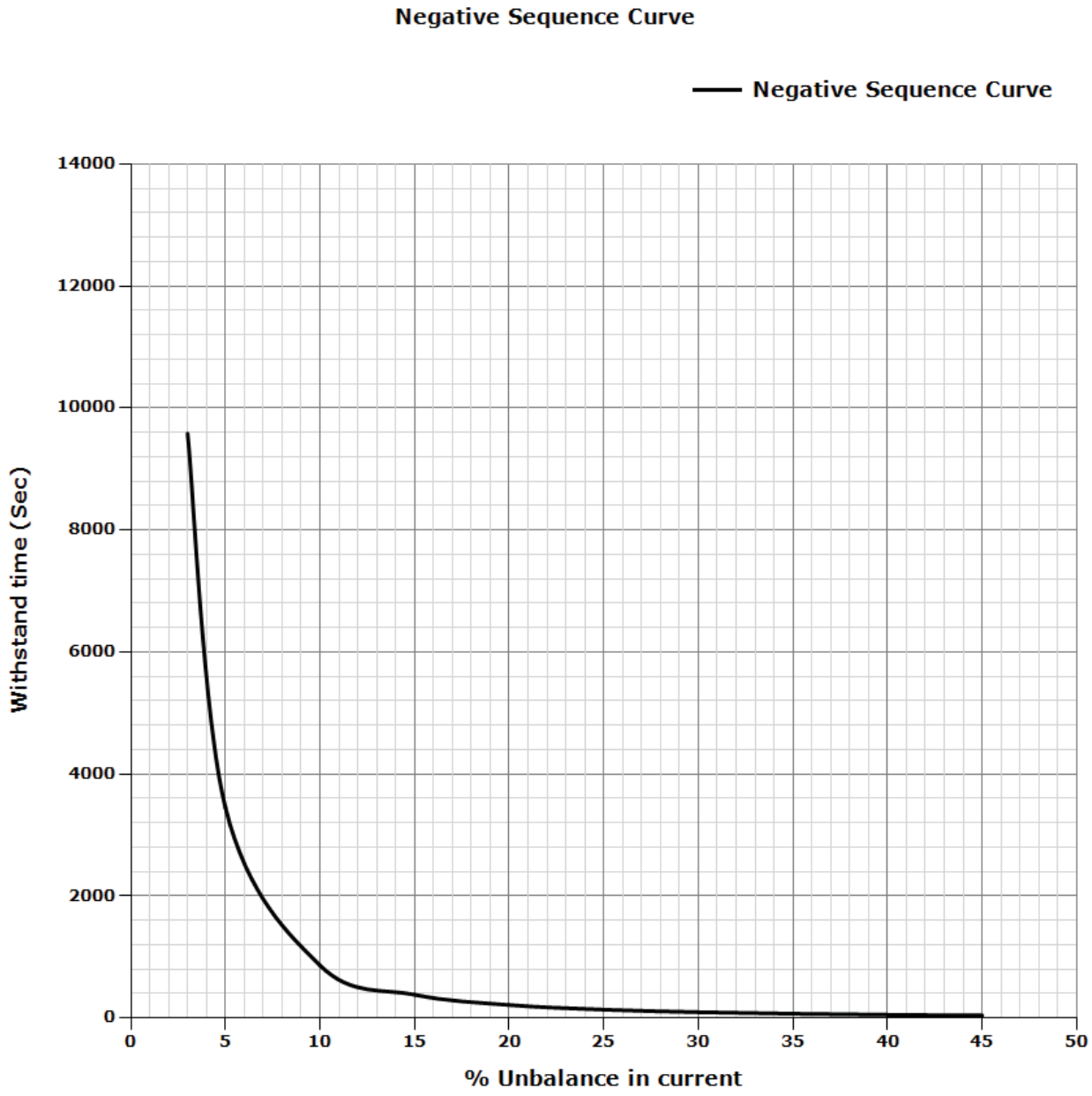
Customer	LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA			
Enq. Ref No.: 0000072122	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	3.7 / 6	**IE3**
Tag Numbers		**Frame Size**	132S	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Negative Sequence Curve

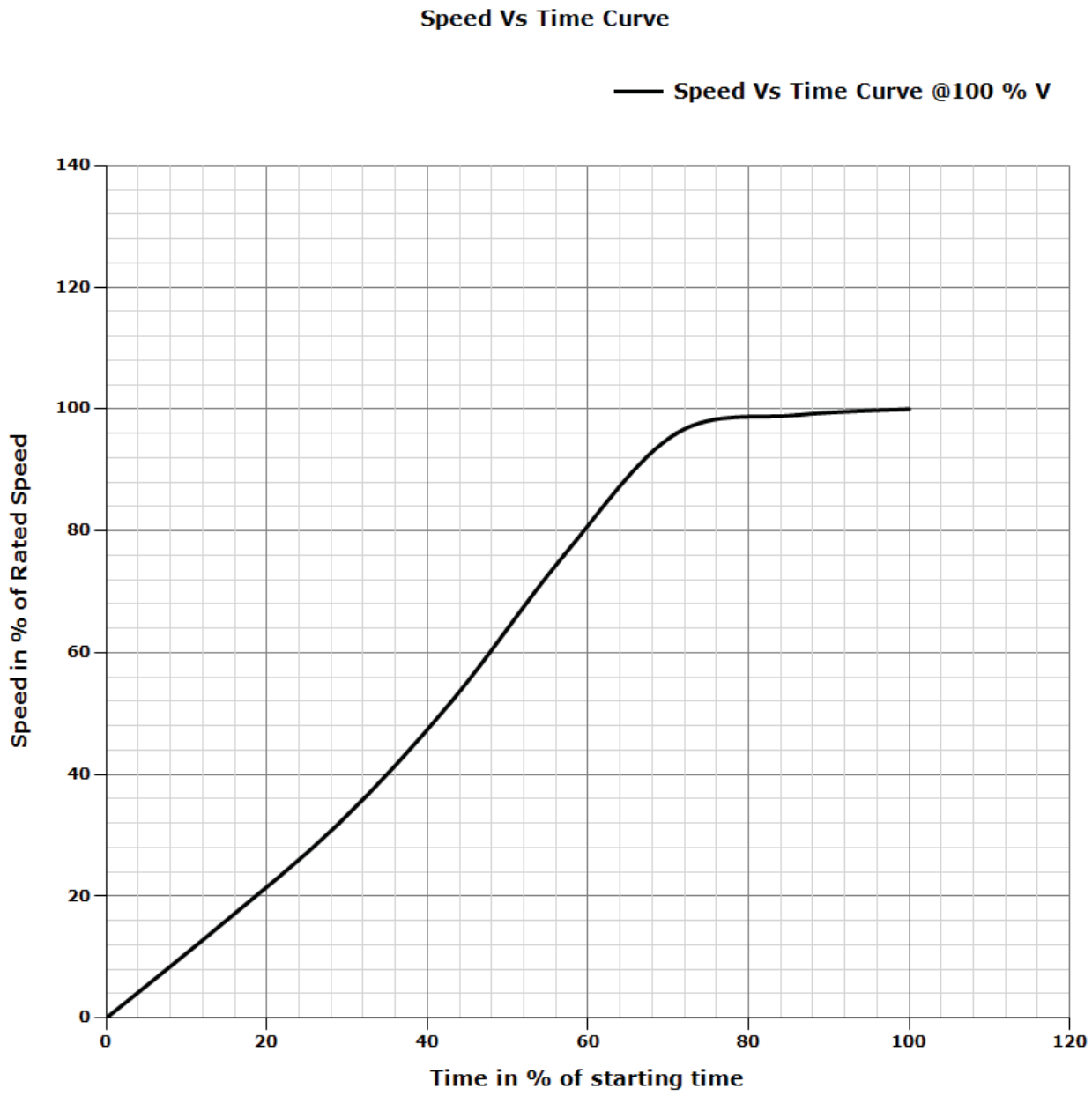
Customer	LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA			
Enq. Ref No.: 0000072122	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	3.7 / 6	**IE3**
Tag Numbers		**Frame Size**	132S	



Project		**Downloaded By**	IKS
		Revision	0
		Date	02-08-2025

Speed Vs Time Curve

Customer	LOCATION: SMOKE EXHAUST FAN 24000 CMH CMH / 20 mmSP AT AHU ROOM AT 24 MTR FOR CCR/CER AREA			
Enq. Ref No.: 0000072122	Smoke Extraction Motor	**Customer PO Number**		
WO / SAP Number		**kW / Poles**	3.7 / 6	**IE3**
Tag Numbers		**Frame Size**	132S	



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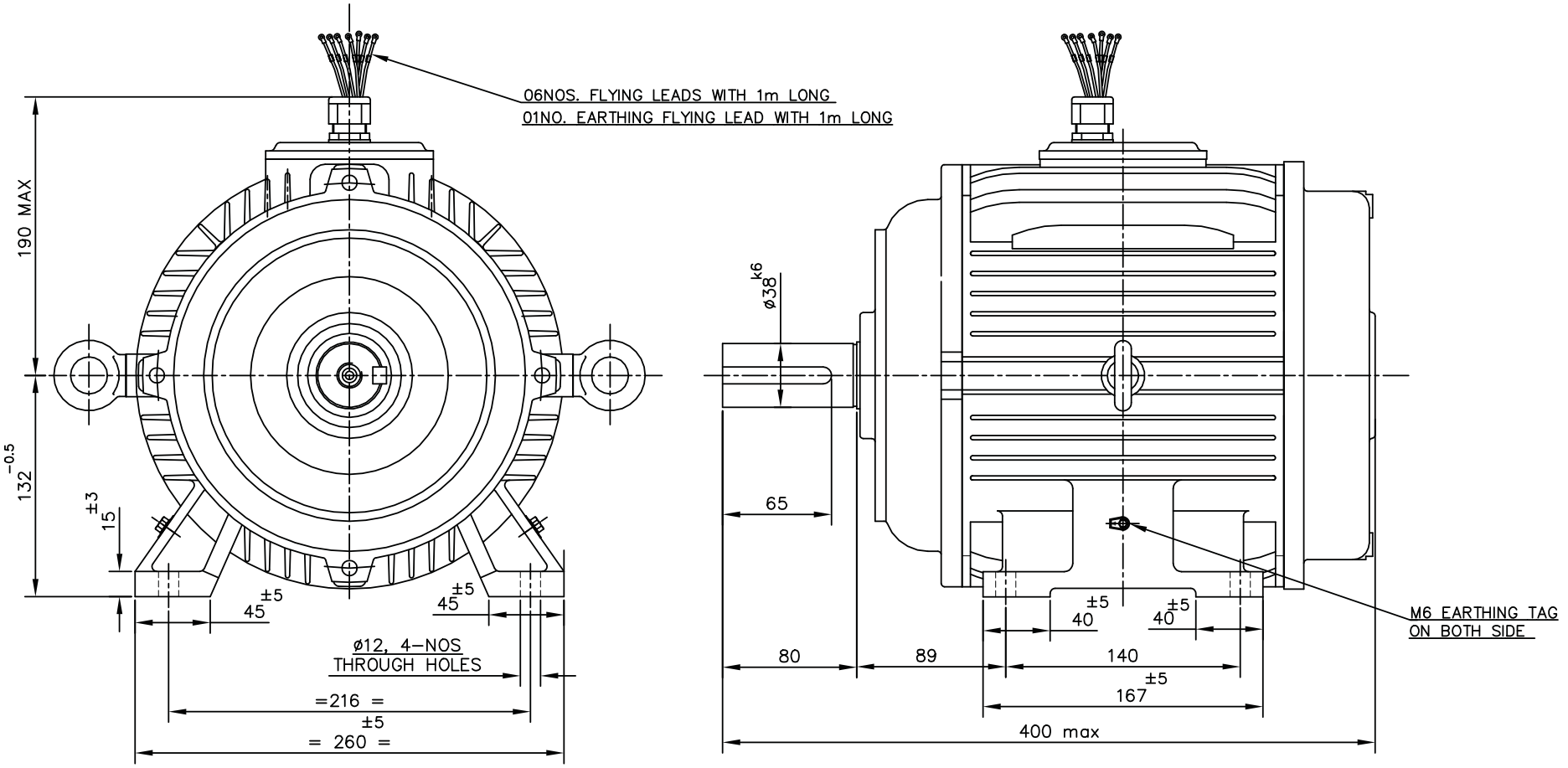
		Revision	0
		Date	02-08-2025

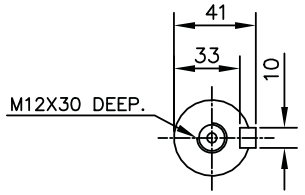


SPECIFICATION:-

KW/HP	3.7/5.0
POLE	6
BEARING DE SIDE	6308.2Z.C3
BEARING NDE SIDE	6208.2Z.C3

MATERIAL OF CONSTRUCTION:-

FRAME	CAST IRON
END COVER (DE)	CAST IRON
END COVER (NDE)	CAST IRON
T. BOX COVER	CAST IRON/M.S
SHAFT	CARBON STEEL



SHAFT END DETAILS

PROD CODE:-

REV. NO.	DETAIL OF CHANGE	DATE.	INTL.

UNMENTIONED TOLERANCES ARE AS PER IS:2102-1/ ISO 2768-1									
	LINEAR DIMNS.	OVER & UPTO	0.5-3	3-6	6-30	30-120	120-400	400-1000	1000-2000
		TOLERANCE	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3
	ANGULAR DIMNS.	PERMISSIBLE DEVIATIONS FOR LENGTHS OF THE SHORTER SIDE OF THE ANGLE.							
		OVER & UPTO	0-10	10-50		50-120	120-400	400.....	
		TOLERANCE	±1°	±0°30'		±0°20'	±0°10'	±0°5'	

	NAME.	DATE.
DGN.		
DRN.	RAK	11.08.25
CHD.		11.08.25
APPD.		11.08.25

TITLE: GENERAL ARRANGEMENT DRG. FOR 132S FRAME (B3) MOUNTED TTB (AOM) SMOKE EXTRACTION MOTOR - 400°C FOR 2HRS.

SCALE :--1:1
SHEET :--1 OF 2

Laxmi Hydraulics Pvt.Ltd.
Website : www.lhp.co.in SOLAPUR

DRG. NO. MGAN132A1589

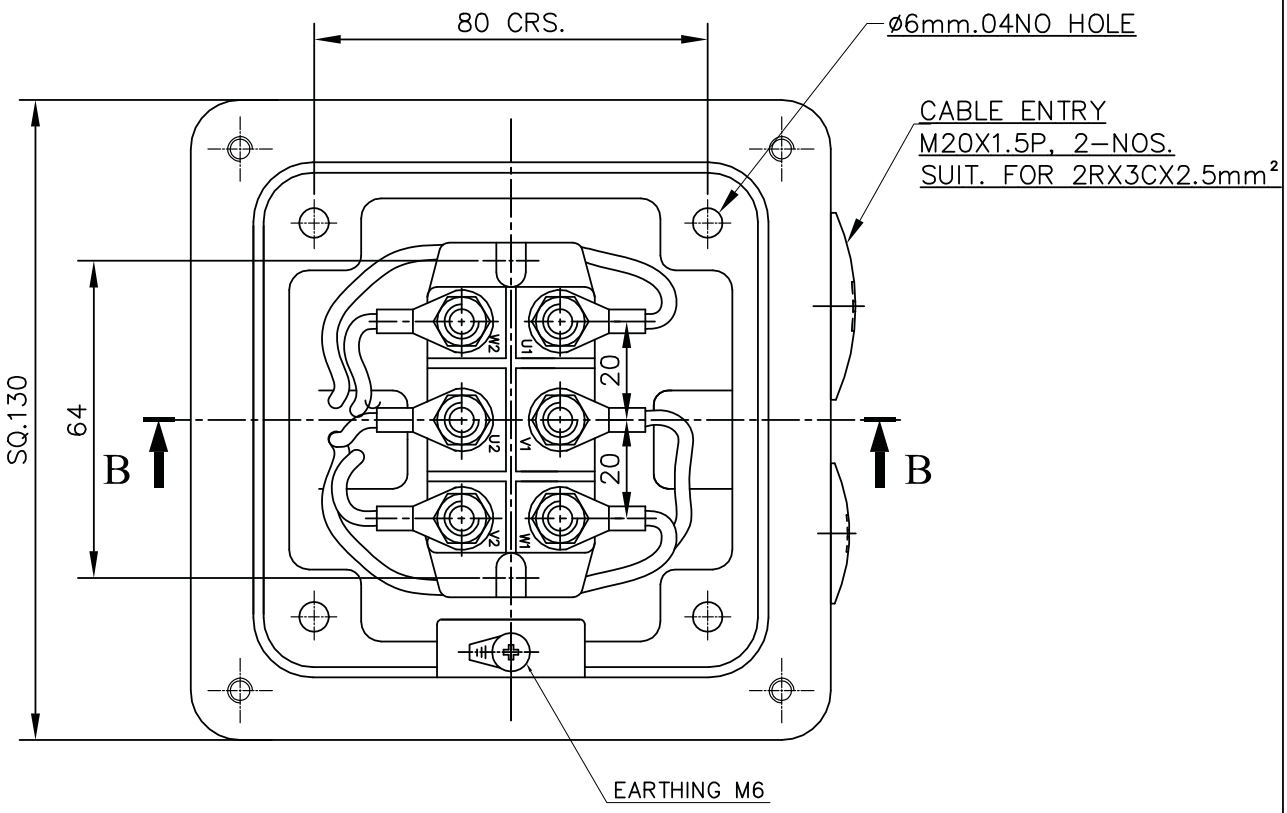
UNLESS OTHERWISE SPECIFIED ALL DIMNS. ARE IN MM. DO NOT SCALE THE DRAWING.

ISSUE NO. 01 REV.NO. 00

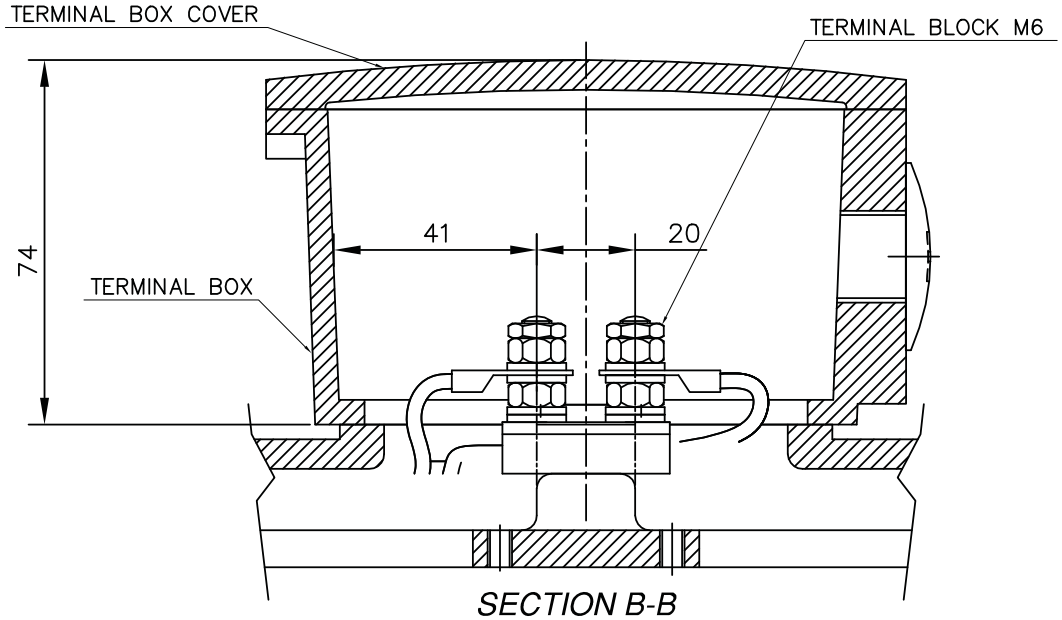
\\192.168.4.125\drg\DRGS3\G.A.DWG\MGAN\132\B3\MGAN132A1589.dwg

LAXMI HYDRAULICS PVT. LTD, SOLAPUR

TERMINAL BOX ARRANGEMENT OF 132 FRAME MOTOR



TOP VIEW WITHOUT COVER



SECTION B-B

ISSUE.NO.–01	REV.NO.–00	DATE– 11.08.25	DRG.NO.– MGAN132A1589
DWG.BY.– RAK	CHD. BY.–	APPD.BY.–	SHEET– 2/2

Statement of Confirmation

SOC No	:	TUV/SOC/2021-22/0004
Name & Address of the Manufacture:	:	**Laxmi Hydraulics Pvt. Ltd.** B11 & B16, MIDC Chincholi, Solapur- 413255 Maharashtra, India
Trademark	:	
Product Nomenclature	:	Smoke Extraction Motor
Sample Tested/Serial No	:	Machine No:1001079842 Frame: 71 Machine No:1001090309 Frame: 315
Type	:	TEFC
Frame Size / Range Covered	:	71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315.
Efficiency Class	:	IE2 / IE3 / IE4
Standards Referred	:	BS EN 12101-3:2015
Test Specification	:	Temperature 400°C for Duration 2 Hours
Review Results/Observations	:	**Pass (See Annexure)**
Issuing office	:	**TUV India Pvt. Ltd.** ANJANI PALLADIUM, 203 & 204, Second Floor and Mezzanine Floor, 104B, Survey No. 126/1, Baner Main Road, Baner, PUNE - 411045, Maharashtra, India.

"In the basis of the tests undertaken, the sample(s) of the above product have been found to comply with the requirements of the reference standards specifications as applicable at the time of tests were carried out."

Date of Issue: 29/07/2021

Technical Testing Services TUV TUV India

Authorised Signatory
Anand Vedpathak
(Head- Product Testing Lab)

Disclaimer:

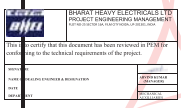
1. This Statement of conformation is based on the document/Test report evaluation of the above mentioned product only.
2. This Statement of conformation (SOC.) cannot be re-produced,
3. This Statement of conformation (SOC.), in full or in part, shall not be used to make any misleading claims or for any legal purposes.
4. This Document is part of the full test reports and should be read accordance with them.
5. The applicant is authorized to use the certificate in connection with the annexure for Test / Summary only
6. TUV India does not accept any liability whatsoever for the tampering or any unlawful or inadvertent alteration of documents that have been handed over to the Customer
7. All services rendered by TUV India will be treated as strictly Confidential.

VALIDITY:

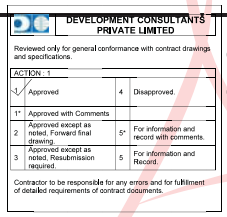
- This document is valid as long as the rules of technology on which it was based are valid.
- This document will become invalid if the applicable standard is revised.
- This document will become invalid if the design of the product is changed.

Annexure for Test / Summary

Sr. No	Test Report Reference
1	TUV/PTL/21-22/SFTY-WT/0024
2	TUV/PTL/21-22/SFTY-WT/0026



Digitally signed by Arvind kumar
DN: cn=Arvind kumar, o=BHEL PEM, ou=MAUX, email=arvindkr@bhel.in, c=IN
Date: 2023.02.01 19:26:45 +05'30'



Digitally signed by Swarup
DN: cn=Swarup, o=DCPL, ou, email=swarup.mondal@in.dclgroup.com, c=IN
Date: 2023.02.16 17:08:52 +05'30'

25.01.2023	R03	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
15.12.2022	R02	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
09.09.2022	R01	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
27.07.2022	FIRST SUBMISSION	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
Date	**DESCRIPTION OF REVISION**	**Prep By**	**Checked**	**Approved**

PROJECT		**1 X 660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III**		
OWNER		**THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED (WBPDCL)**		
CONSULTANT		**DEVELOPMENT CONSULTANT PVT LTD. (DCPL), KOLKATA**		
PURCHASER		**BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NOIDA**		
CONTRACTOR		**PARKSONS ENGINEERING COMPANY PVT LTD. NEW DELHI**		
Job No	**445**	**BHEL DOCUMENT NO.**	**PE-V0-445-553-A024**	**REV 03**
STATUS	**CONTRACT**	**PARKSONS DOCUMENT NO.**	**PEC-0715A/22**	**REV 03**
PACKAGE	**AIR CONDITIONING SYSTEM**			
TITLE	**TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM**			

	Name	**Date**	**Submitted for**
Prep By	RAJAT SONI	27.07.2022	APPROVAL
Checked by	AHMAR KAMRAN	27.07.2022	APPROVAL
Approved by	KRISHAN SINGH	27.07.2022	APPROVAL

1x660 MW Sagardighi TPS-Stage-III, Unit-5, Air conditioning System					
Response to WBPDCL / DCPL Comments on TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM					
BHEL DOC NO.PE-V0-445-553-A024_Rev 02 & Rev 01					
Sr No	**Reference clause / document sheet**	**WBPDCL / DCPL Comments on Rev 01**	**BHEL / PARKSONS Reply on Rev 01**	**WBPDCL / DCPL reply on Rev 02**	**BHEL / PARKSONS Reply on Rev 02**
1	Data sheet	Pl. Refer (specification Cl. 5.02.05 VolII J2, Section 2 Page 19). Axial Fans Speed is to be below 1000rpm. Hence it is not acceptable. Please consider this for all axial flow fans.	Please note that as per approved DESIGN MEMORANDUM OF VENTILATION SYSTEM (doc. no. PE-DC-445-554-A001_Rev 04) clause no. 5.4.2 (page 8 of 17) "The speed of fans shall not exceed 960 rpm for fan with impeller diameter above 450 mm and 1400 rpm for fan with impeller diameter 450 mm or less. **However, for fans having static pressure of 30 mm WC or above the speed of the fan shall not exceed 1500 rpm for fan with impeller diameter of above 450mm and 2800 rpm for with impeller diameter of 450 mm or less**." in view of above, WBPDCL/DCPL is again requested to review and accept the fan speed.	Contractual obligation is to be maintained. Please consider Centrifugal Fan if necessary.	As discussed in meeting held at WBPDCL office Kolkata dated 19.01.2023, this issue has been delebrated by fan OEM i.e. M/s SARALA and being the technical constraint, kindly accept the speed as mentioned in data sheet.
2	make	Please incorporate the WBPDCL/DCPL's comments on R-01 Document: This Brand is not accepted by WBPDCL. Please provide the Brand as "SARLA"	Noted and document revised.	Noted. Point closed.	Point closed

1x660 MW Sagardighi TPS-Stage-III, Unit-5, Air conditioning System					
Response to WBPDCL / DCPL Comments on TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM					
BHEL DOC NO.PE-V0-445-553-A024_Rev 00					
Sr No	**Reference clause / document sheet**	**WBPDCL / DCPL Comments on Rev 00**	**BHEL / PARKSONS Reply on Rev 00**	**WBPDCL / DCPL reply on Rev 01**	**BHEL / PARKSONS Reply on Rev 01**
1	Smoke exhaust fan	Please confirm that All parts of this system coming in contact with hot smoke shall be suitable for handling hot gas/smoke at 400 °C for 2 hours.	We confirm that the materials of the equipment shall be suitable for handling hot gas / smoke at 400 Deg. C for 2 Hours.	Noted. Point closed.	Point closed
2	Fresh air supply fan	Please restrict the speed within 1450 rpm.	Axial flow fans with require capacity, static pressure (30 mmSP) combination can not be achieved with fan speed of 1450 RPM. Hence request to accept our design @ 2880 RPM. Moreover, the impeller diameter of these fans are less than or equal to 450 mm. In view of above kindly review and accept the same.	Pl. Refer (specification Cl. 5.02.05 VolII J2, Section 2 Page 19). Axial Fans Speed is to be below 1000rpm. Hence it is not acceptable. Please consider this for all axial flow fans.	Pls refer BHEL reply on compliance sheet of rev 01.
3				Please incorporate the WBPDCL/DCPL's comments on R-01 Document: This Brand is not accepted by WBPDCL. Please provide the Brand as "SARLA"	Pls refer BHEL reply on compliance sheet of rev 01.

1x660 MW SAGARDIGHI TPS- Stage-III						
FRESH AIR SUPPLY FAN REQUIREMENT						
S. No.	**AREAS**	**FRESH AIR REQUIREMENT AS PER HEAT LOAD CALCULATION (CFM)**	**TOTAL FRESH AIR REQUIREMENT (CFM)**	**SELECTED FAN**	**QUANTITY (Nos)**	**REMARKS**
1	**POWER HOUSE**					
A	**AHU ROOM AT 24 MTR for following AC Areas:**					
i	CER	1785	4240	4500 CFM/ 7646 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW
ii	CCR,	959				
iii	Computer Room, Conference Room, Rest Room, Misc. Room etc.	753				
iv	C&I Lab,	413				
v	R&I Lab	330				
B	**AHU ROOM AT 8.5 MTR**					
i	UPS & 24VDC Chargr	328	1114	1200 CFM/ 2039 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW
ii	,UPS & 24V DC battery Room	786				
2	**ESP CUM FGD BUILDING**					
i	Control Room at 3.7M Including PAC Room	1625	1625	1800 CFM/ 3059 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW

1x660 MW SAGARDIGHI TPS- Stage-III								
SMOKE AIR FAN SCHEDULE & CAPACITY CALCULATION								
S. No.	**AREAS**	**ROOM HEIGHT (MTR)**	**EFFECTIVE AREA (SQ. MTR)**	**VOLUME (CUBIC MTR.)**	**AIR CHANGE PER HOUR**	**AIR QUANTITY (CMH)**	**SELECTED FAN**	**QUANTITY OF FAN (Nos)**
1	**POWER HOUSE**							
i	AHU ROOM AT 24 MTR POWER HOUSE	7.75	235.5	1825	12	21902	24000 CMH at 20 mm SP	1
ii	AHU ROOM AT 8.5 MTR POWER HOUSE	4.75	113.5	539	12	6470	6800 CMH at 20 mmSP	1
2	**PAC ROOM AT ESP CUM FGD BUILDING**							
i	PAC ROOM AT ESP CUM FGD BUILDING	5.2	273.5	1422	12	17066	19000 CMH at 20 mmSP	1

NOTE: The smoke Exhuast fan sizing has been made based on 12 ACPH in line with requirement mentioned in NBC 2016 part IV, wherein 12 ACPH is mentioned.

4.5 Compartmentation

4.5.1 *General*

a) It is important to limit the spread of a fire in any building. The usual method is to use fire barriers. In some instances these barriers need to be penetrated for ductwork, plumbing and electrical systems, and in such cases, use of passive fire protection measures shall be done so that the integrity of these barriers is not compromised.

b) Floor(s) shall be compartmented with area as given below.

4.5.2 All floors shall be compartmented/zoned with area of each compartment being not more than 750 m^2. The maximum size of the compartment shall be as follows, in case of sprinklered basement/building:

Sl No.	*Use*	*Compartmentation Area* m^2
(1)	(2)	(3)
i)	Basement car parking	3 000
ii)	Basements (other than car parking)	2 000
iii)	Institutional buildings: Subdivision C-1	1 800
iv)	Institutional buildings: Subdivision C-2 and C-3	1 125
v)	Mercantile and assembly buildings	2 000
vi)	Business buildings	3 000
vii)	All other buildings (Excluding low hazard and moderate hazard industrial buildings and storage buildings)[1)]	750

[1)] Compartmentation for low hazard and moderate hazard industrial buildings and storage buildings shall be done in consultation with local fire department.

In addition, there shall be requirement of a minimum of two compartments if the floor plate size is equal or less than the areas mentioned above. However, such requirement of minimum two compartments shall not be required, if the floor plate is less than 750 m^2.

Compartmentation shall be achieved by means of fire barrier having fire resistance rating of 120 min.

4.6 Smoke Control

4.6.1 *Smoke Exhaust and Pressurization of Areas Above Ground*

Corridors in exit access (exit access corridor) are created for meeting the requirement of use, privacy and layout in various occupancies. These are most often noted in hospitality, health care occupancies and sleeping accommodations.

Exit access corridors of guest rooms and indoor patient department/areas having patients lacking self preservation and for sleeping accommodations such as apartments, custodial, penal and mental institutions, etc, shall be provided with 60 min fire resistant wall and 20 min self-closing fire doors along with all fire stop sealing of penetrations.

Smoke exhaust system having make-up air and exhaust air system or alternatively pressurization system with supply air system for these exit access corridors shall be required.

Smoke exhaust system having make-up air and exhaust air system shall also be required for theatres/auditoria.

Such smoke exhaust system shall also be required for large lobbies and which have exit through staircase leading to exit discharge. This would enable eased exit of people through smoke controlled area to exit discharge.

All exit passageway (from exit to exit discharge) shall be pressurized or naturally ventilated. The mechanical pressurization system shall be automatic in action with manual controls in addition. All such exit passageway shall be maintained with integrity for safe means of egress and evacuation. Doors provided in such exit passageway shall be fire rated doors of 120 min rating.

Smoke exhaust system where provided, for above areas and occupancies shall have a minimum of 12 air changes per hour smoke exhaust mechanism. Pressurization system where provided shall have a minimum pressure differential of 25-30 Pa in relationship to other areas.

The smoke exhaust fans in the mechanical ventilation system shall be fire rated, that is, 250°C for 120 min.

For naturally cross-ventilated corridors or corridors with operable windows, such smoke exhaust system or pressurization system will not be required.

4.6.2 *Smoke Exhaust and Pressurization of Areas Below Ground*

Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills, or breakable stall board lights or pavement lights or by way of shafts.

Alternatively, a system of mechanical ventilation system may be provided with following requirements:

a) Mechanical ventilation system shall be designed to permit 12 air changes per hour in case of fire or distress call. However, for

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III **DATE: 14.12.2022**

TECHNICAL DATA SHEET OF TUBE AXIAL FAN

SL. NO.			1	2	3	4	5	6
1	FAN MAKE / BRAND		SUBURBAN INDUSTRIAL WORKS PVT. LTD. / SARALA					
2	FAN MODEL		**TL J- 450**	**TL J-315**	**TL J-355**	**TL J-1000**	**TL J-630**	**TL J- 1000**
3	FAN TYPE		AXIAL FLOW FAN			FIRE RATED AXIAL FLOW FAN		
4	QTY. OF A FAN	Nos	1	1	1	1	1	1
5	DESIGN DENSITY	kg/m³	1.2 @ 20 DEG. C.,					
6	CAPACITY	CFM /CMH	4500 CFM	1200 CFM	1800 CFM	24000 CMH	6800 CMH	19000 CMH
7	STATIC PRESSURE	mm wg.	30	30	30	20	20	20
8	TOTAL PRESSURE	mm wg.	40.36	33.00	34.32	24.43	22.20	22.75
9	RATED SPEED	RPM	2800	2800	2800	960	1400	960
10	CRITICAL SPEED	RPM	4000	4000	4000	1500	2400	1500
11	FAN POWER AT RATED SPEED (SHAFT BKW)	bkw	1.12	0.27	0.40	2.36	0.63	1.81
12	TOTAL EFFICIENCY	%	71.2	61.70	67.2	67.4	62.9	65.2
13	IMPELLER DIAMETER	mm	450	315	355	1000	630	1000
14	OUTLET VELOCITY	mps	13.00	7.00	8.40	8.50	6.00	6.70
15	FAN ARRANGEMENT		IV					
16	DRIVE ARRANGEMENT		DIRECT DRIVE					
17	IMPELLER DESIGN		AEROFOIL TYPE					
18	BALANCING		AS PER ISO:1940, G-6.3					
19	VIBRATION LEVEL RIGID BASE	MM/S	4.5 (AS PER VDI-2056)					
20	SOUND LEVEL @ 1.5 MTR. DISTANCE	dB(A)	84	84	84	82	82	82
21	PAINTING:		COMPLETE FAN SHALL BE PAINTED WITH EPOXY PAINT					
MOC								
22	IMPELLER MATERIAL		CAST ALUMINIUM MATERIAL, GR-LM-6					
23	CASING MATERIAL		AS PER FAN SPECIFICATION CASING BODY- 3.00 MM (MIN.), (IS:1079/2062)					
RECOMMENDED MOTOR DETAILS								
24	RATED VOLT OF MOTOR		415V, ±10%, 3 PHASE, 50 HZ ± 5%					
25	RECOMMENDED MOTOR (15% MORE THAN FAN POWER)	KW/POLE	1.5/2	0.37/2	0.55/2	3.7/6	0.75/4	2.2/6
26	TYPE OF INSULATION		CLASS - F, TEMP. RISE UPTO CLASS-B			CLASS -H, SMOKE SPILL MOTORS OPERATE AT 400 DEG.C. FOR 2 HRS.		
27	TYPE OF PROTECTION		IP-55	IP-55	IP-55	IP-55	IP-55	IP-55
28	TYPE OF ENCLOSURE		TEFC SQ. CAGE INDUCTION MOTOR					

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

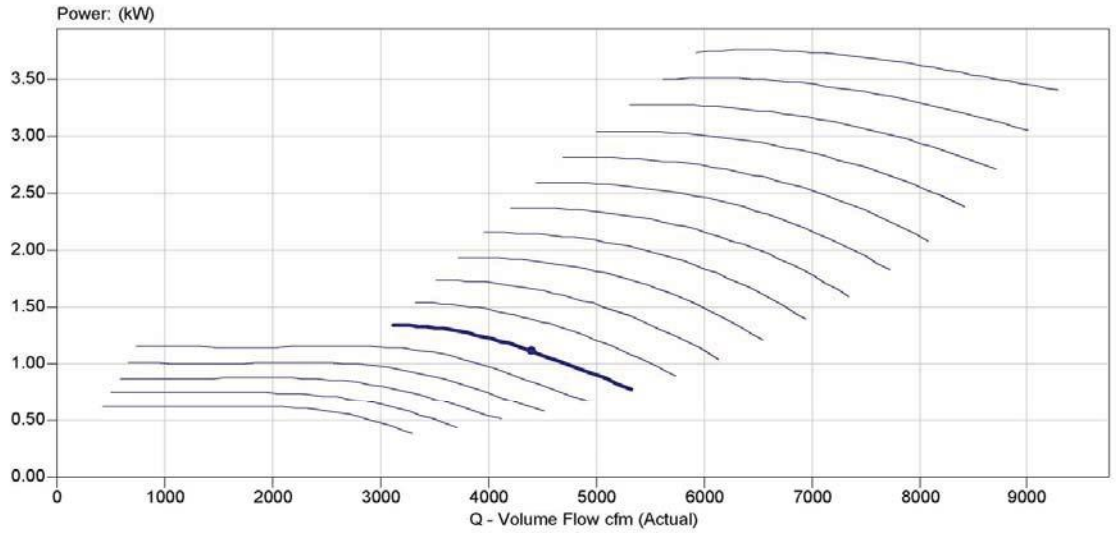
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

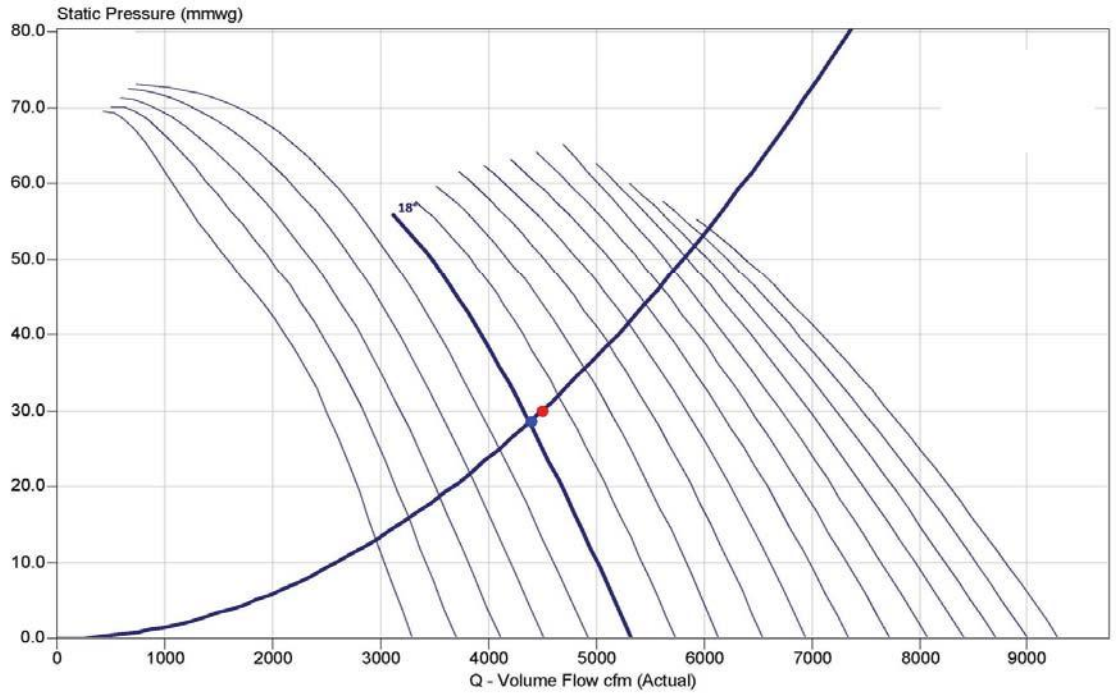
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

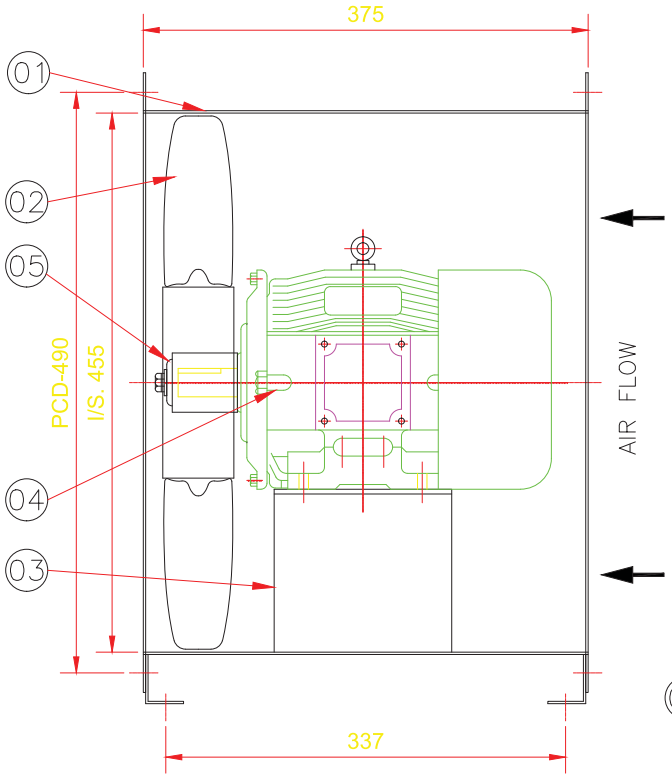
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-450

VOLUME OF AIR (CFM)	4500	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	1.12







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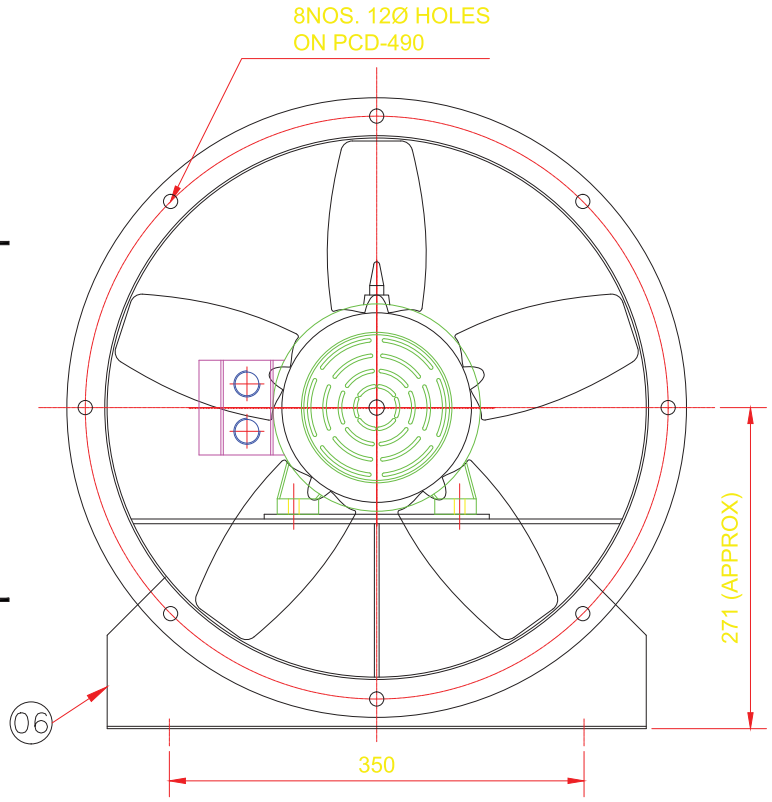


DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/01	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
01	FRESH AIR AXIAL FAN	TLJ–450	SARALA	01	4500	30	2800	1.12

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
1.5/2	415V, 3PH. 50 HZ. AC SUPPLY	90S	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

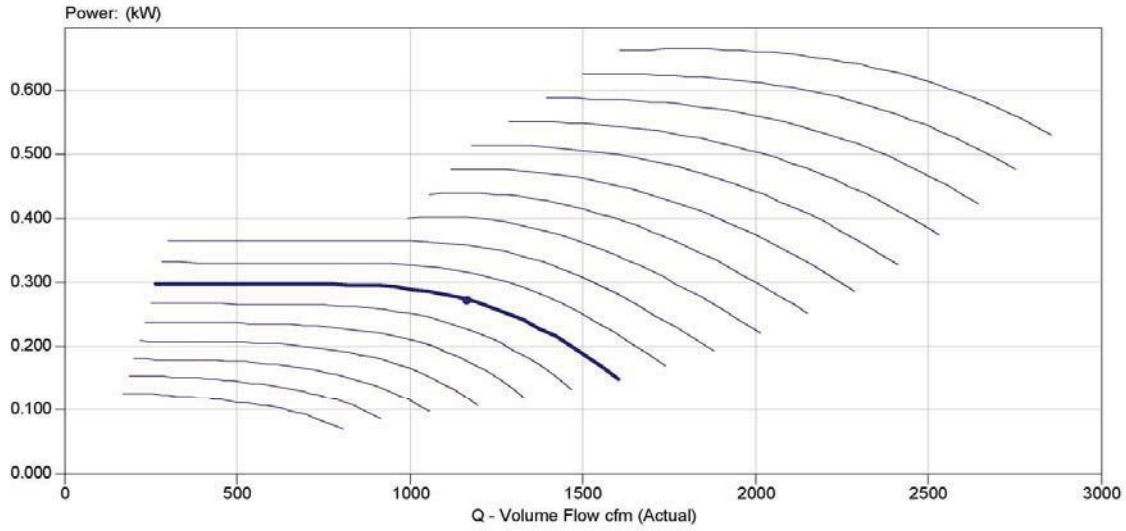
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

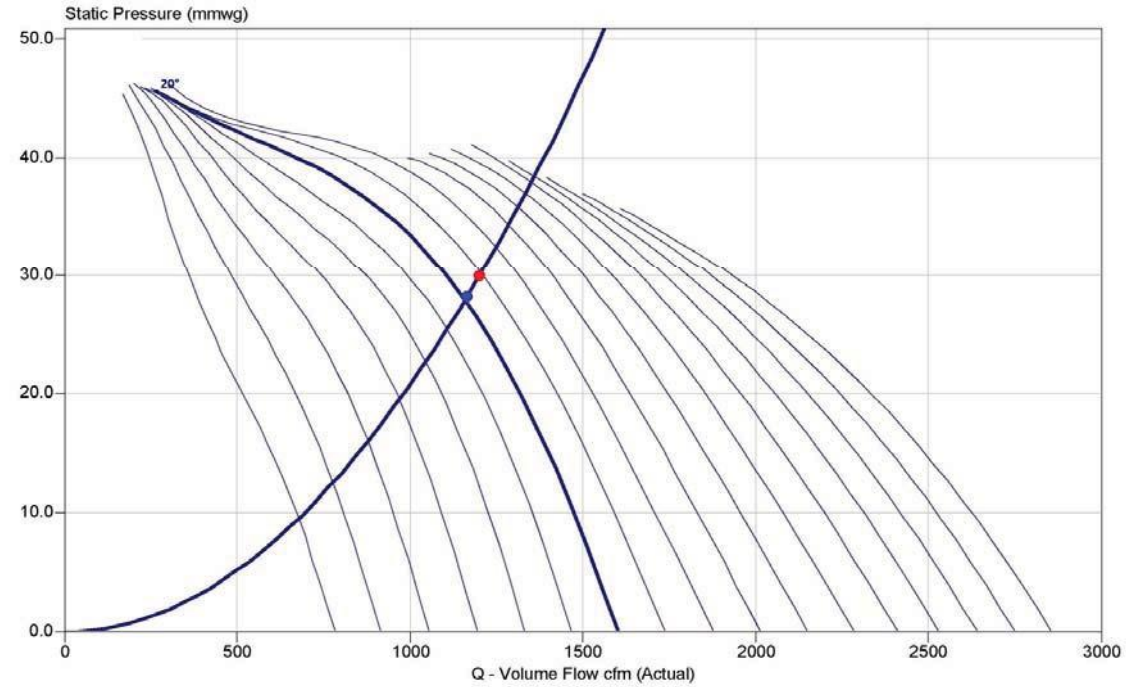
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

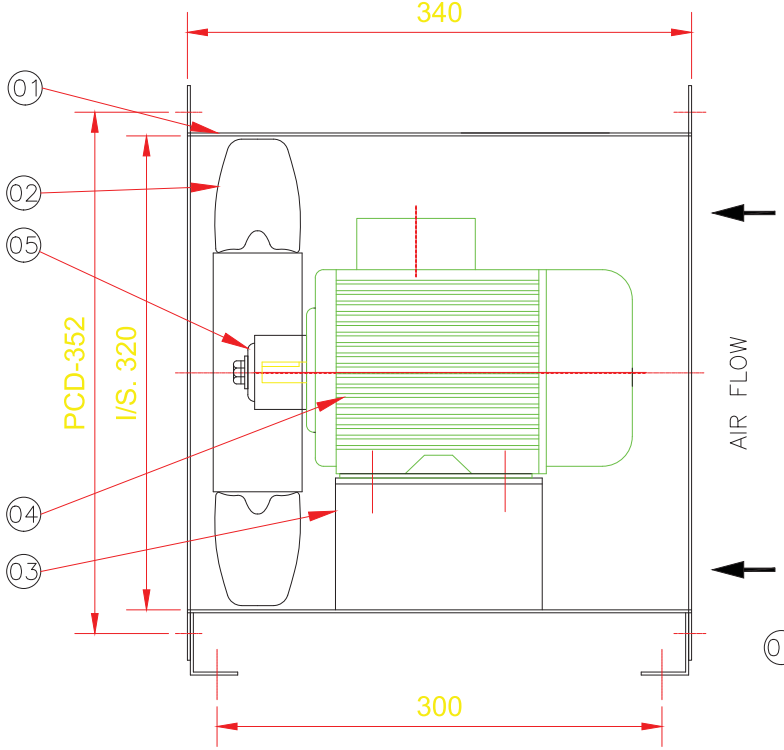
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-315

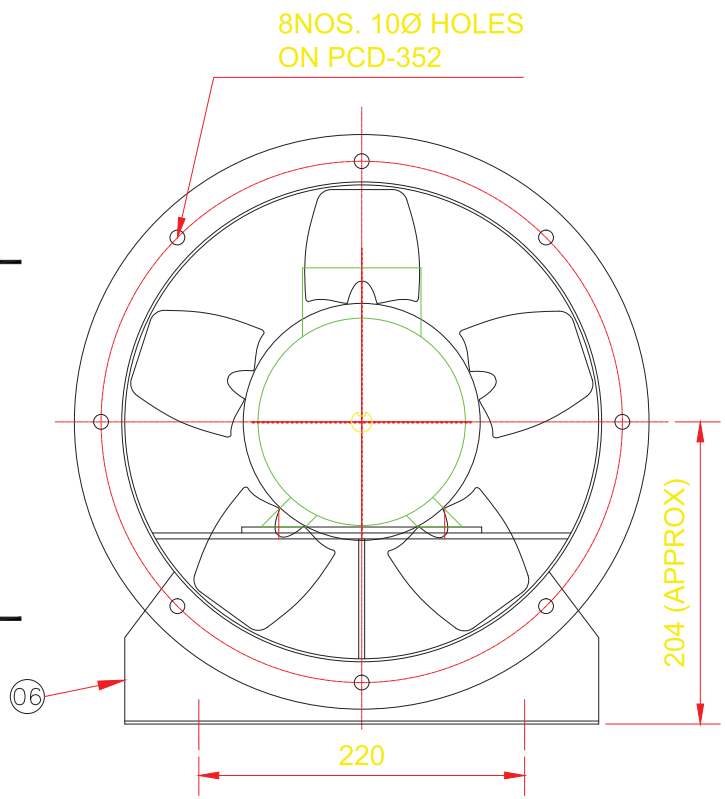
VOLUME OF AIR (CFM)	1200	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	0.27







ELEVATION



DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/02	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
02	FRESH AIR AXIAL FAN	TLJ–315	SARALA	01	1200	30	2800	0.27

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.37/2	415V, 3PH. 50 HZ. AC SUPPLY	71	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

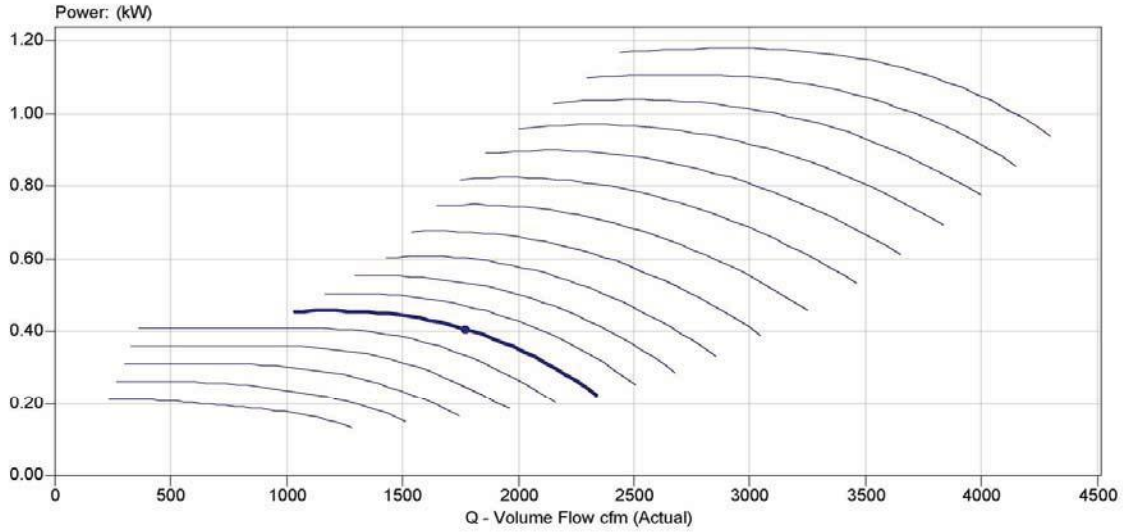
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

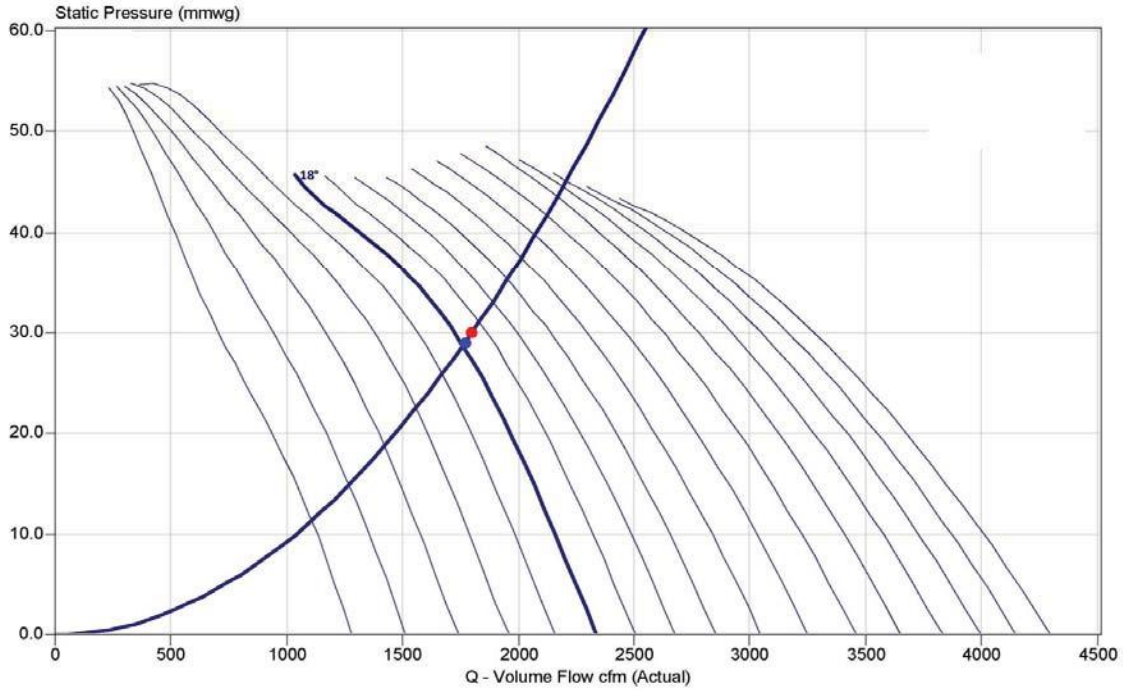
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

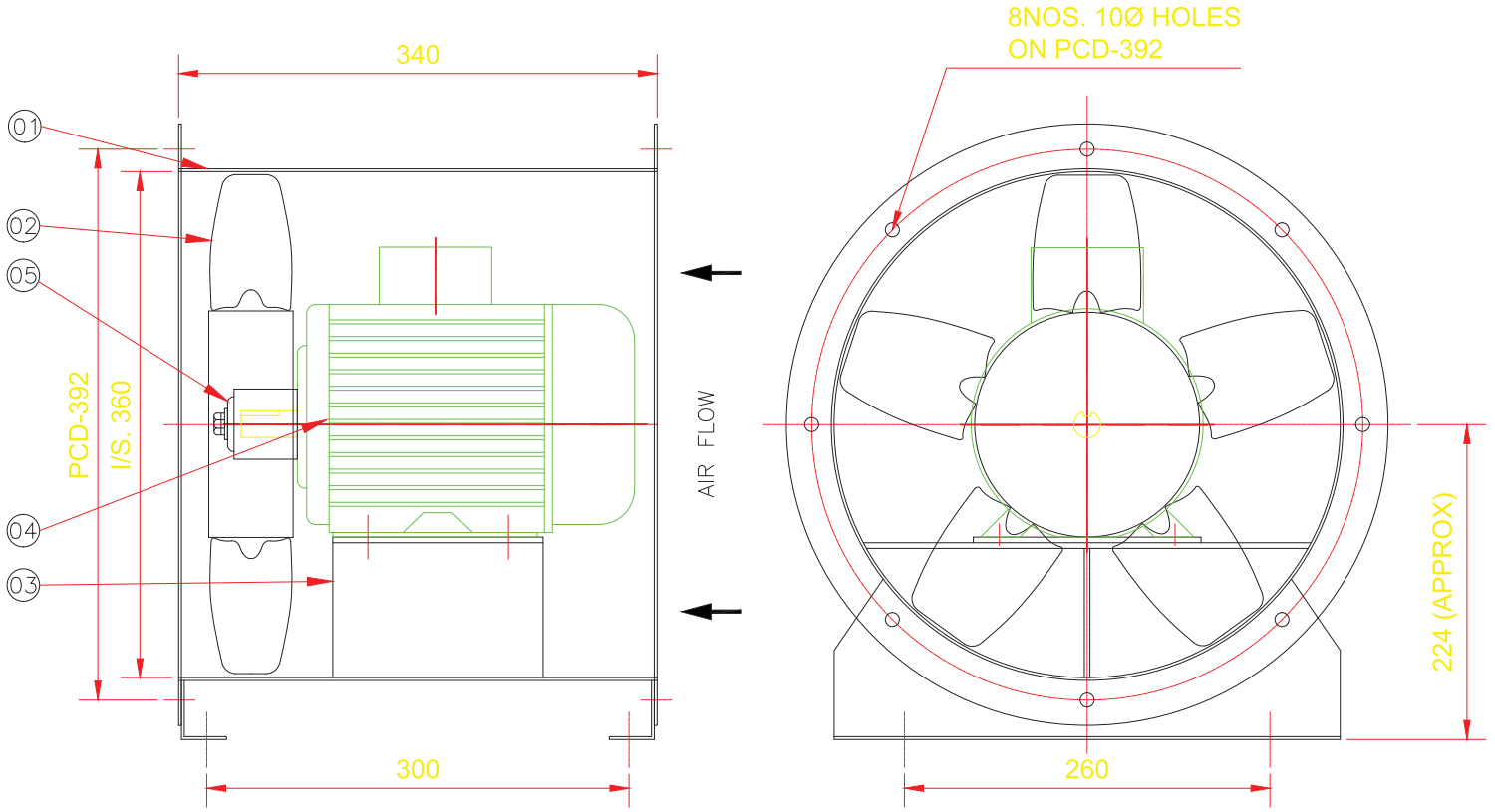
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-355

VOLUME OF AIR (CFM)	1800	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	0.4







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/03	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
03	FRESH AIR AXIAL FAN	TLJ–355	SARALA	01	1800	30	2800	0.40

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.55/2	415V, 3PH. 50 HZ. AC SUPPLY	80	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

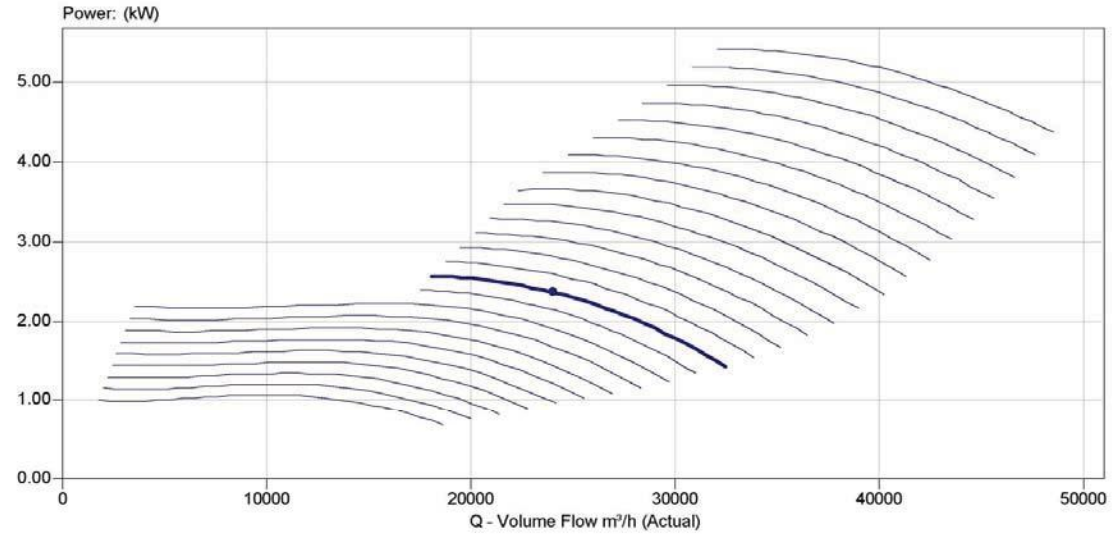
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

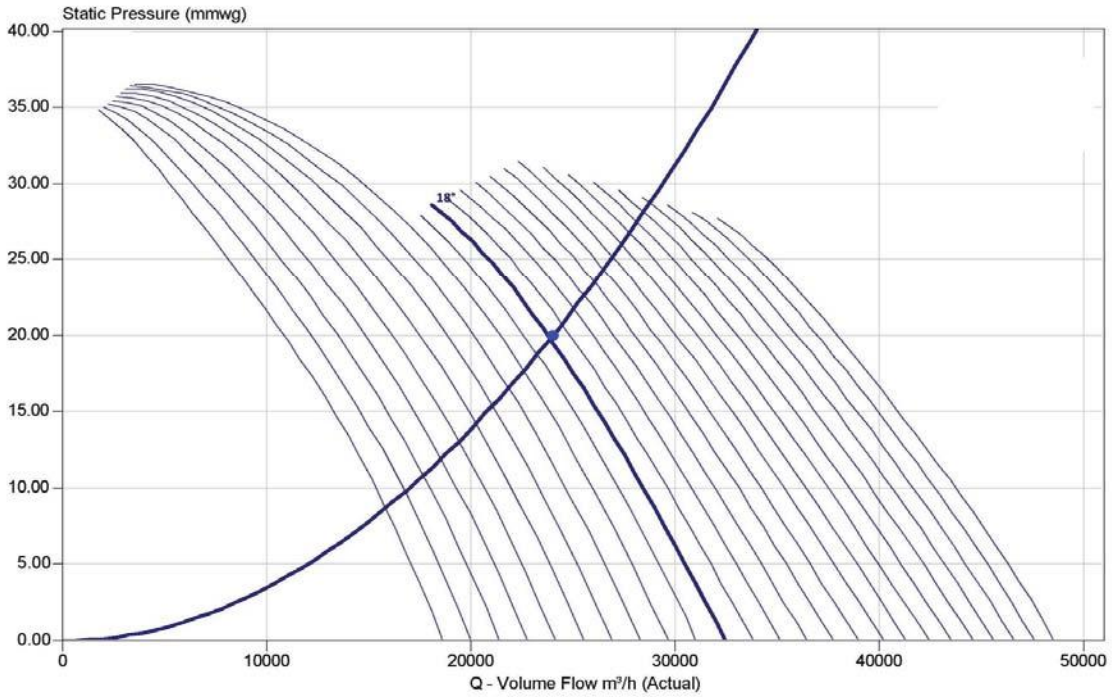
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

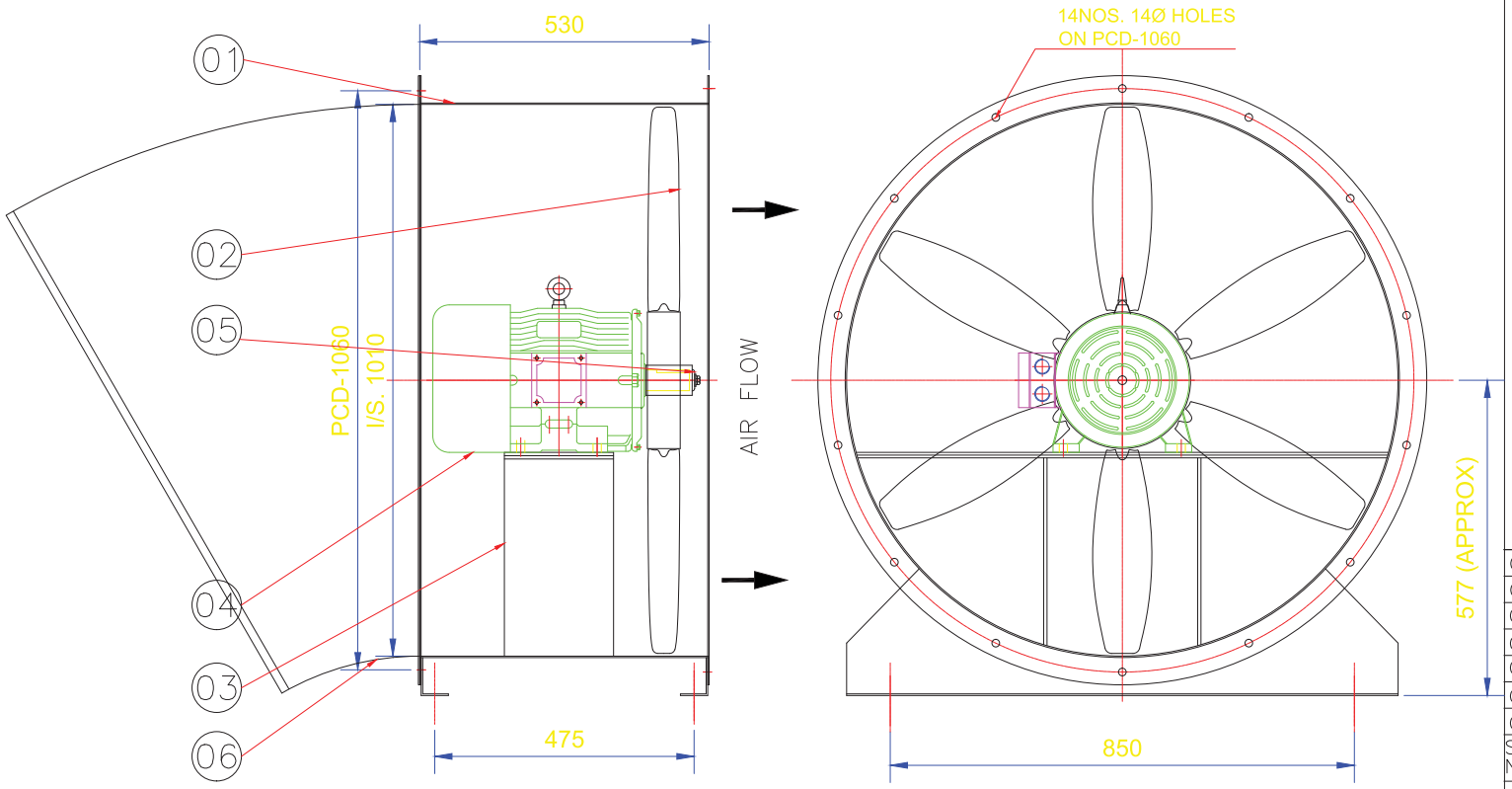
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-1000

VOLUME OF AIR (CMH)	24000	FAN SPEED (RPM)	960
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	2.36







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.22	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.22	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/04	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
04	EXHAUST AIR AXIAL FAN	TLJ–1000	SARALA	01	24000	20	960	2.36

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
3.7/6	415V, 3PH. 50 HZ. AC SUPPLY	132S	1000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

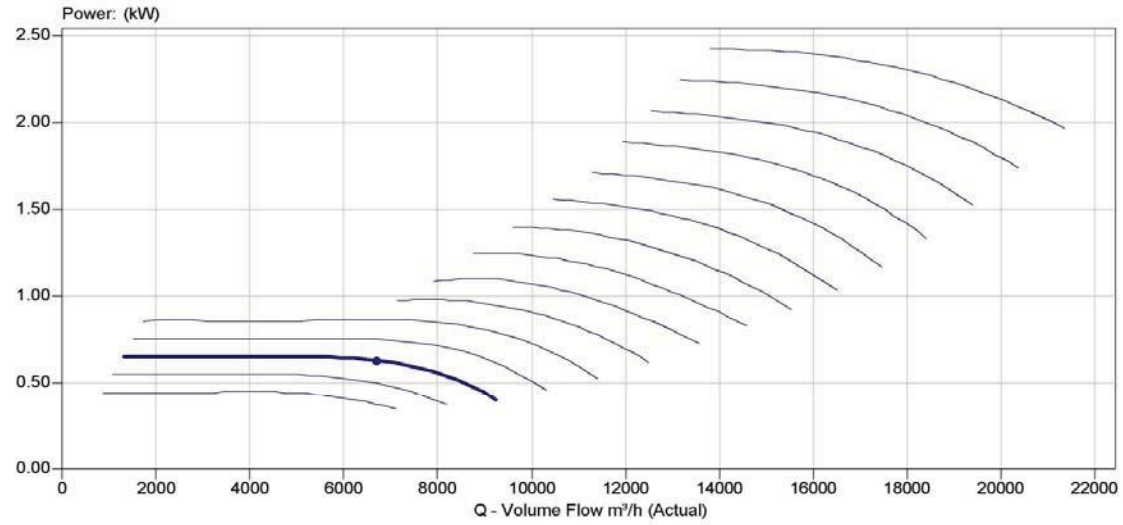
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

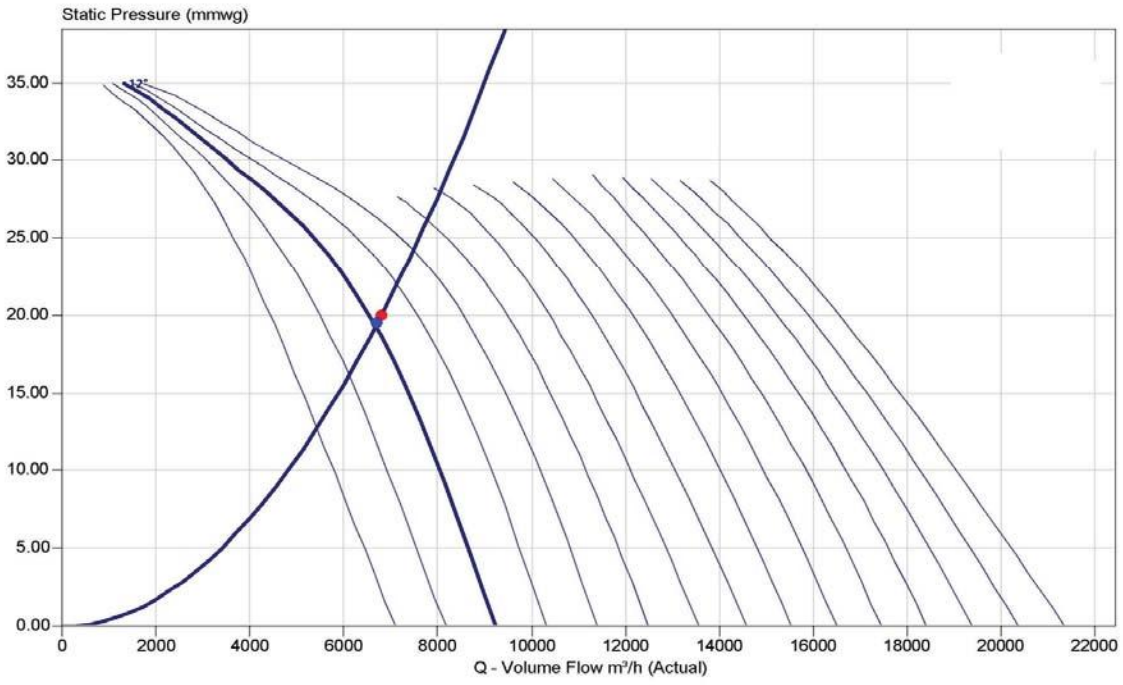
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

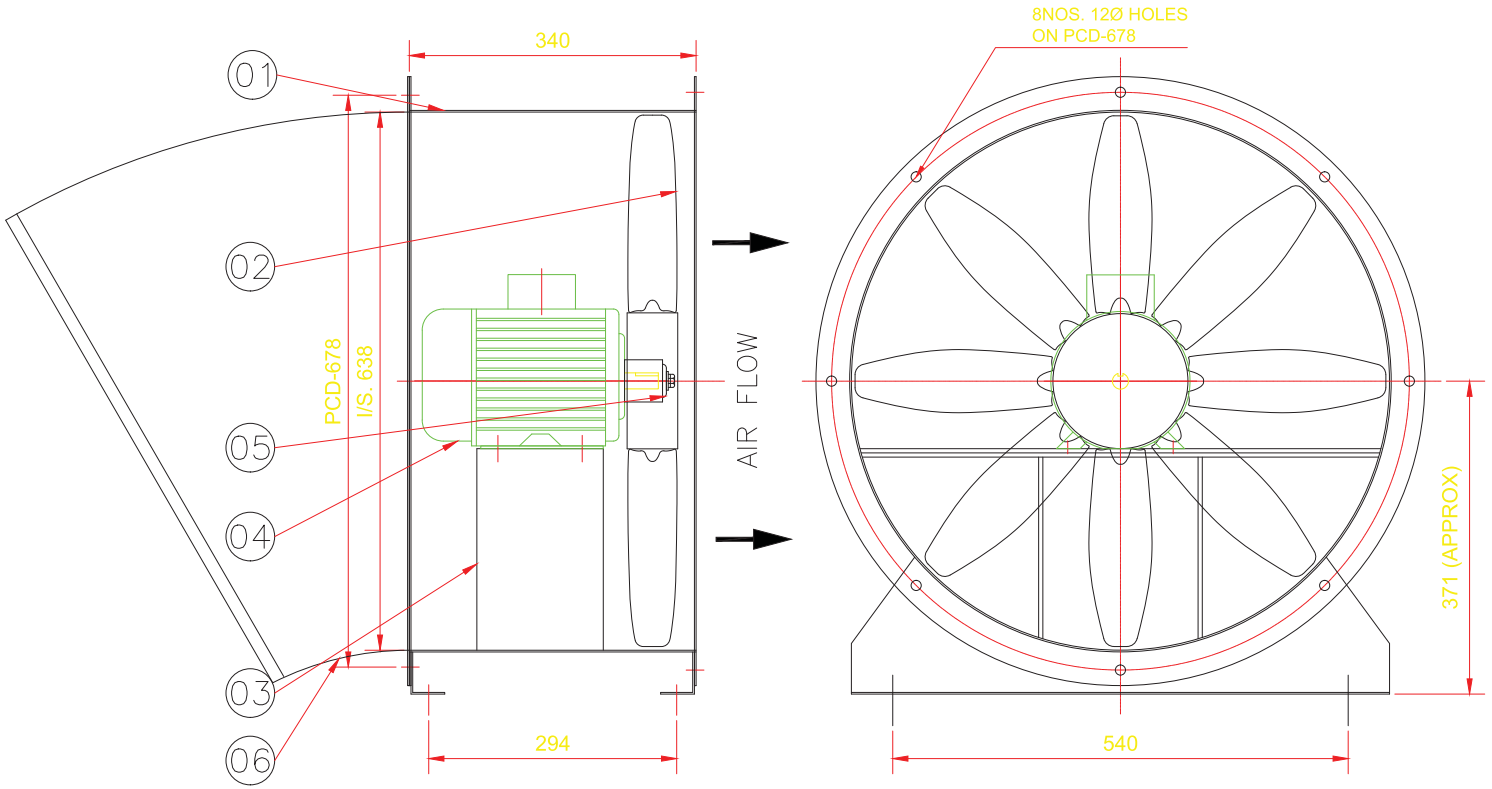
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-630

VOLUME OF AIR (CMH)	6800	FAN SPEED (RPM)	1400
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	0.63







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

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25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV (R1)

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/05	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN (R1) (R2)

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
05	EXHAUST AIR AXIAL FAN	TLJ–630	SARALA	01	6800	20	1400	0.63

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.75/4	415V, 3PH. 50 HZ. AC SUPPLY	80	1500

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

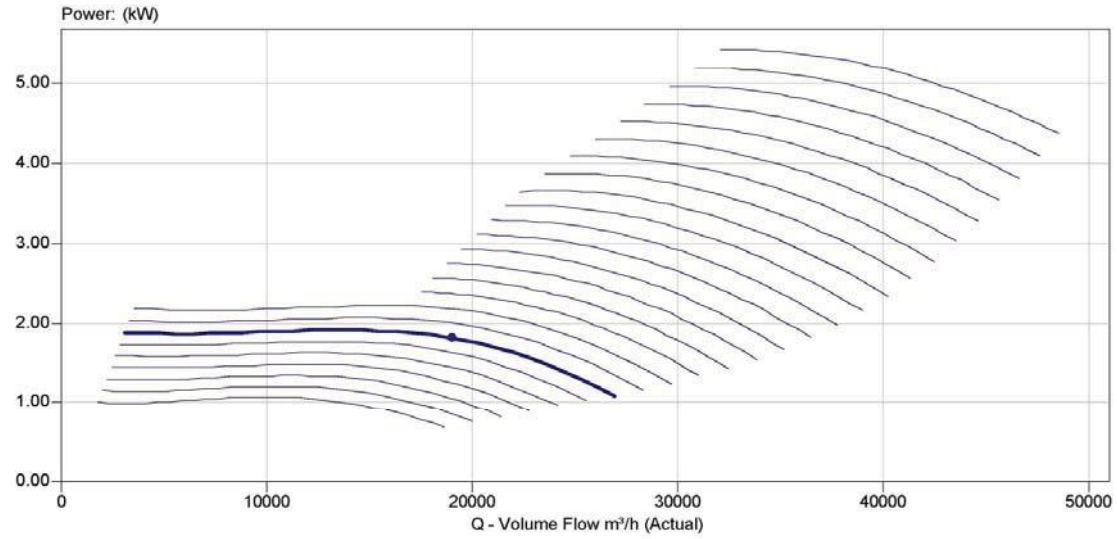
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

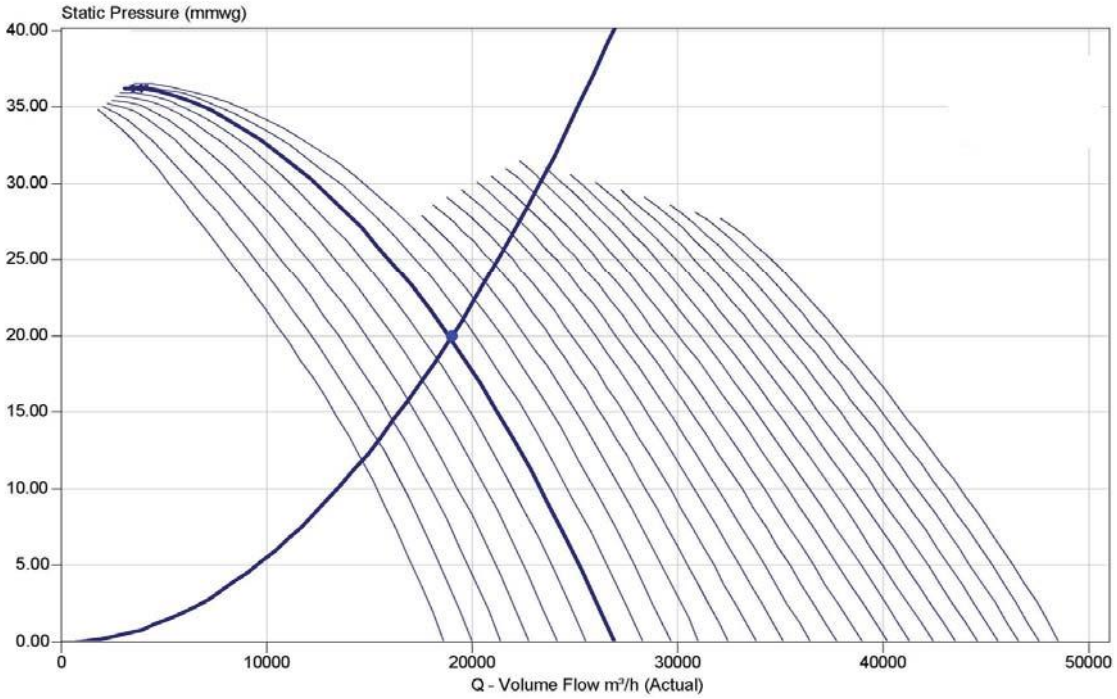
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

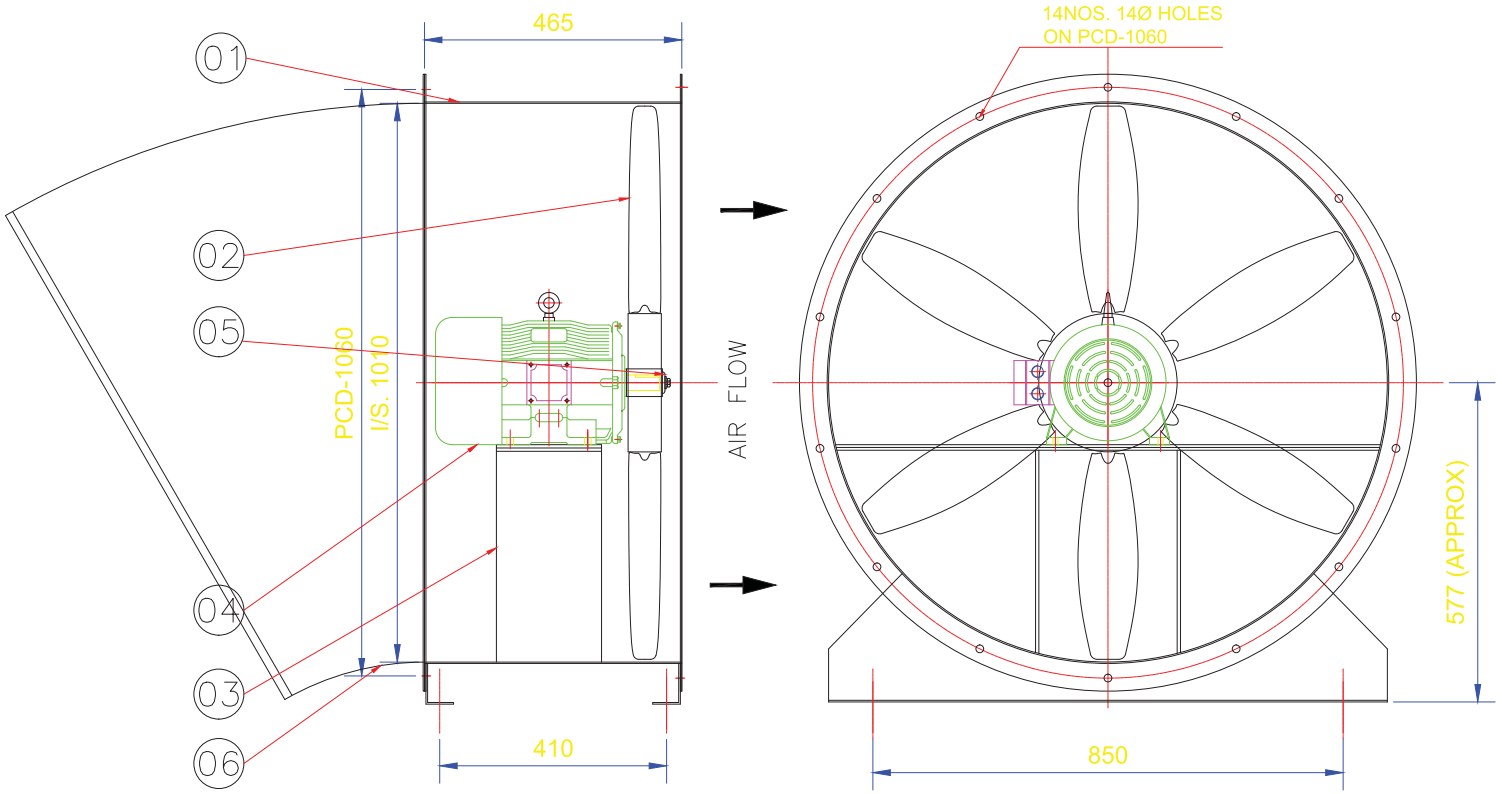
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-1000

VOLUME OF AIR (CMH)	19000	FAN SPEED (RPM)	960
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	1.81







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

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25.11.22	R1	AS PER COMMENTS DTD. 03.11.22	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

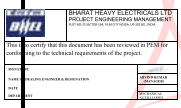
DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/06	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

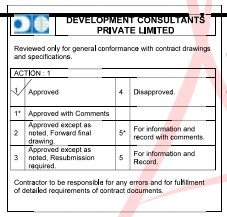
SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
06	EXHAUST AIR AXIAL FAN	TLJ–1000	SARALA	01	19000	20	960	1.81

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
2.2/6	415V, 3PH. 50 HZ. AC SUPPLY	112M	1000



Digitally signed by Arvind kumar
DN: cn=Arvind kumar, o=BHEL PEM, ou=MAUX, email=arvindkr@bhel.in, c=IN
Date: 2023.02.01 19:26:45 +05'30'



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DN: cn=Swarup, o=DCPL, ou, email=swarup.mondal@in.dclgroup.com, c=IN
Date: 2023.02.16 17:08:52 +05'30'

25.01.2023	R03	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
15.12.2022	R02	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
09.09.2022	R01	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
27.07.2022	FIRST SUBMISSION	RAJAT SONI	AHMAR KAMRAN	KRISHAN SINGH
Date	**DESCRIPTION OF REVISION**	**Prep By**	**Checked**	**Approved**

PROJECT		**1 X 660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III**		
OWNER		**THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED (WBPDCL)**		
CONSULTANT		**DEVELOPMENT CONSULTANT PVT LTD. (DCPL), KOLKATA**		
PURCHASER		**BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NOIDA**		
CONTRACTOR		**PARKSONS ENGINEERING COMPANY PVT LTD. NEW DELHI**		
Job No	**445**	**BHEL DOCUMENT NO.**	**PE-V0-445-553-A024**	**REV 03**
STATUS	**CONTRACT**	**PARKSONS DOCUMENT NO.**	**PEC-0715A/22**	**REV 03**
PACKAGE	**AIR CONDITIONING SYSTEM**			
TITLE	**TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM**			

	Name	**Date**	**Submitted for**
Prep By	RAJAT SONI	27.07.2022	APPROVAL
Checked by	AHMAR KAMRAN	27.07.2022	APPROVAL
Approved by	KRISHAN SINGH	27.07.2022	APPROVAL

1x660 MW Sagardighi TPS-Stage-III, Unit-5, Air conditioning System					
Response to WBPDCL / DCPL Comments on TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM					
BHEL DOC NO.PE-V0-445-553-A024_Rev 02 & Rev 01					
Sr No	**Reference clause / document sheet**	**WBPDCL / DCPL Comments on Rev 01**	**BHEL / PARKSONS Reply on Rev 01**	**WBPDCL / DCPL reply on Rev 02**	**BHEL / PARKSONS Reply on Rev 02**
1	Data sheet	Pl. Refer (specification Cl. 5.02.05 VolII J2, Section 2 Page 19). Axial Fans Speed is to be below 1000rpm. Hence it is not acceptable. Please consider this for all axial flow fans.	Please note that as per approved DESIGN MEMORANDUM OF VENTILATION SYSTEM (doc. no. PE-DC-445-554-A001_Rev 04) clause no. 5.4.2 (page 8 of 17) "The speed of fans shall not exceed 960 rpm for fan with impeller diameter above 450 mm and 1400 rpm for fan with impeller diameter 450 mm or less. **However, for fans having static pressure of 30 mm WC or above the speed of the fan shall not exceed 1500 rpm for fan with impeller diameter of above 450mm and 2800 rpm for with impeller diameter of 450 mm or less**." in view of above, WBPDCL/DCPL is again requested to review and accept the fan speed.	Contractual obligation is to be maintained. Please consider Centrifugal Fan if necessary.	As discussed in meeting held at WBPDCL office Kolkata dated 19.01.2023, this issue has been delebrated by fan OEM i.e. M/s SARALA and being the technical constraint, kindly accept the speed as mentioned in data sheet.
2	make	Please incorporate the WBPDCL/DCPL's comments on R-01 Document: This Brand is not accepted by WBPDCL. Please provide the Brand as "SARLA"	Noted and document revised.	Noted. Point closed.	Point closed

1x660 MW Sagardighi TPS-Stage-III, Unit-5, Air conditioning System					
Response to WBPDCL / DCPL Comments on TDS AND GA OF FRESH AIR FANS AND SMOKE EXHAUST FAN FOR AIR CONDITIONING SYSTEM					
BHEL DOC NO.PE-V0-445-553-A024_Rev 00					
Sr No	**Reference clause / document sheet**	**WBPDCL / DCPL Comments on Rev 00**	**BHEL / PARKSONS Reply on Rev 00**	**WBPDCL / DCPL reply on Rev 01**	**BHEL / PARKSONS Reply on Rev 01**
1	Smoke exhaust fan	Please confirm that All parts of this system coming in contact with hot smoke shall be suitable for handling hot gas/smoke at 400 °C for 2 hours.	We confirm that the materials of the equipment shall be suitable for handling hot gas / smoke at 400 Deg. C for 2 Hours.	Noted. Point closed.	Point closed
2	Fresh air supply fan	Please restrict the speed within 1450 rpm.	Axial flow fans with require capacity, static pressure (30 mmSP) combination can not be achieved with fan speed of 1450 RPM. Hence request to accept our design @ 2880 RPM. Moreover, the impeller diameter of these fans are less than or equal to 450 mm. In view of above kindly review and accept the same.	Pl. Refer (specification Cl. 5.02.05 VolII J2, Section 2 Page 19). Axial Fans Speed is to be below 1000rpm. Hence it is not acceptable. Please consider this for all axial flow fans.	Pls refer BHEL reply on compliance sheet of rev 01.
3				<u>Please incorporate the WBPDCL/DCPL's comments on R-01 Document:</u> This Brand is not accepted by WBPDCL. Please provide the Brand as "SARLA"	Pls refer BHEL reply on compliance sheet of rev 01.

1x660 MW SAGARDIGHI TPS- Stage-III						
FRESH AIR SUPPLY FAN REQUIREMENT						
S. No.	**AREAS**	**FRESH AIR REQUIREMENT AS PER HEAT LOAD CALCULATION (CFM)**	**TOTAL FRESH AIR REQUIREMENT (CFM)**	**SELECTED FAN**	**QUANTITY (Nos)**	**REMARKS**
1	**POWER HOUSE**					
A	**AHU ROOM AT 24 MTR for following AC Areas:**					
i	CER	1785	4240	4500 CFM/ 7646 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW
ii	CCR,	959				
iii	Computer Room, Conference Room, Rest Room, Misc. Room etc.	753				
iv	C&I Lab,	413				
v	R&I Lab	330				
B	**AHU ROOM AT 8.5 MTR**					
i	UPS & 24VDC Chargr	328	1114	1200 CFM/ 2039 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW
ii	,UPS & 24V DC battery Room	786				
2	**ESP CUM FGD BUILDING**					
i	Control Room at 3.7M Including PAC Room	1625	1625	1800 CFM/ 3059 CMH at 30 mm SP	1	FRESH AIR SHALL BE CONTROLLED WITH DAMPER TO SUIT CALCULATED FLOW

1x660 MW SAGARDIGHI TPS- Stage-III								
SMOKE AIR FAN SCHEDULE & CAPACITY CALCULATION								
S. No.	**AREAS**	**ROOM HEIGHT (MTR)**	**EFFECTIVE AREA (SQ. MTR)**	**VOLUME (CUBIC MTR.)**	**AIR CHANGE PER HOUR**	**AIR QUANTITY (CMH)**	**SELECTED FAN**	**QUANTITY OF FAN (Nos)**
1	**POWER HOUSE**							
i	AHU ROOM AT 24 MTR POWER HOUSE	7.75	235.5	1825	12	21902	24000 CMH at 20 mm SP	1
ii	AHU ROOM AT 8.5 MTR POWER HOUSE	4.75	113.5	539	12	6470	6800 CMH at 20 mmSP	1
2	**PAC ROOM AT ESP CUM FGD BUILDING**							
i	PAC ROOM AT ESP CUM FGD BUILDING	5.2	273.5	1422	12	17066	19000 CMH at 20 mmSP	1

NOTE: The smoke Exhuast fan sizing has been made based on 12 ACPH in line with requirement mentioned in NBC 2016 part IV, wherein 12 ACPH is mentioned.

4.5 Compartmentation

4.5.1 *General*

a) It is important to limit the spread of a fire in any building. The usual method is to use fire barriers. In some instances these barriers need to be penetrated for ductwork, plumbing and electrical systems, and in such cases, use of passive fire protection measures shall be done so that the integrity of these barriers is not compromised.

b) Floor(s) shall be compartmented with area as given below.

4.5.2 All floors shall be compartmented/zoned with area of each compartment being not more than 750 m^2. The maximum size of the compartment shall be as follows, in case of sprinklered basement/building:

Sl No.	*Use*	*Compartmentation Area* m^2
(1)	(2)	(3)
i)	Basement car parking	3 000
ii)	Basements (other than car parking)	2 000
iii)	Institutional buildings: Subdivision C-1	1 800
iv)	Institutional buildings: Subdivision C-2 and C-3	1 125
v)	Mercantile and assembly buildings	2 000
vi)	Business buildings	3 000
vii)	All other buildings (Excluding low hazard and moderate hazard industrial buildings and storage buildings)[1)]	750

[1)] Compartmentation for low hazard and moderate hazard industrial buildings and storage buildings shall be done in consultation with local fire department.

In addition, there shall be requirement of a minimum of two compartments if the floor plate size is equal or less than the areas mentioned above. However, such requirement of minimum two compartments shall not be required, if the floor plate is less than 750 m^2.

Compartmentation shall be achieved by means of fire barrier having fire resistance rating of 120 min.

4.6 Smoke Control

4.6.1 *Smoke Exhaust and Pressurization of Areas Above Ground*

Corridors in exit access (exit access corridor) are created for meeting the requirement of use, privacy and layout in various occupancies. These are most often noted in hospitality, health care occupancies and sleeping accommodations.

Exit access corridors of guest rooms and indoor patient department/areas having patients lacking self preservation and for sleeping accommodations such as apartments, custodial, penal and mental institutions, etc, shall be provided with 60 min fire resistant wall and 20 min self-closing fire doors along with all fire stop sealing of penetrations.

Smoke exhaust system having make-up air and exhaust air system or alternatively pressurization system with supply air system for these exit access corridors shall be required.

Smoke exhaust system having make-up air and exhaust air system shall also be required for theatres/auditoria.

Such smoke exhaust system shall also be required for large lobbies and which have exit through staircase leading to exit discharge. This would enable eased exit of people through smoke controlled area to exit discharge.

All exit passageway (from exit to exit discharge) shall be pressurized or naturally ventilated. The mechanical pressurization system shall be automatic in action with manual controls in addition. All such exit passageway shall be maintained with integrity for safe means of egress and evacuation. Doors provided in such exit passageway shall be fire rated doors of 120 min rating.

Smoke exhaust system where provided, for above areas and occupancies shall have a minimum of 12 air changes per hour smoke exhaust mechanism. Pressurization system where provided shall have a minimum pressure differential of 25-30 Pa in relationship to other areas.

The smoke exhaust fans in the mechanical ventilation system shall be fire rated, that is, 250°C for 120 min.

For naturally cross-ventilated corridors or corridors with operable windows, such smoke exhaust system or pressurization system will not be required.

4.6.2 *Smoke Exhaust and Pressurization of Areas Below Ground*

Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills, or breakable stall board lights or pavement lights or by way of shafts.

Alternatively, a system of mechanical ventilation system may be provided with following requirements:

a) Mechanical ventilation system shall be designed to permit 12 air changes per hour in case of fire or distress call. However, for

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III **DATE: 14.12.2022**

TECHNICAL DATA SHEET OF TUBE AXIAL FAN

SL. NO.			1	2	3	4	5	6
1	FAN MAKE / BRAND		SUBURBAN INDUSTRIAL WORKS PVT. LTD. / SARALA					
2	FAN MODEL		**TL J- 450**	**TL J-315**	**TL J-355**	**TL J-1000**	**TL J-630**	**TL J- 1000**
3	FAN TYPE		AXIAL FLOW FAN			FIRE RATED AXIAL FLOW FAN		
4	QTY. OF A FAN	Nos	1	1	1	1	1	1
5	DESIGN DENSITY	kg/m³	1.2 @ 20 DEG. C.,					
6	CAPACITY	CFM /CMH	4500 CFM	1200 CFM	1800 CFM	24000 CMH	6800 CMH	19000 CMH
7	STATIC PRESSURE	mm wg.	30	30	30	20	20	20
8	TOTAL PRESSURE	mm wg.	40.36	33.00	34.32	24.43	22.20	22.75
9	RATED SPEED	RPM	2800	2800	2800	960	1400	960
10	CRITICAL SPEED	RPM	4000	4000	4000	1500	2400	1500
11	FAN POWER AT RATED SPEED (SHAFT BKW)	bkw	1.12	0.27	0.40	2.36	0.63	1.81
12	TOTAL EFFICIENCY	%	71.2	61.70	67.2	67.4	62.9	65.2
13	IMPELLER DIAMETER	mm	450	315	355	1000	630	1000
14	OUTLET VELOCITY	mps	13.00	7.00	8.40	8.50	6.00	6.70
15	FAN ARRANGEMENT		IV					
16	DRIVE ARRANGEMENT		DIRECT DRIVE					
17	IMPELLER DESIGN		AEROFOIL TYPE					
18	BALANCING		AS PER ISO:1940, G-6.3					
19	VIBRATION LEVEL RIGID BASE	MM/S	4.5 (AS PER VDI-2056)					
20	SOUND LEVEL @ 1.5 MTR. DISTANCE	dB(A)	84	84	84	82	82	82
21	PAINTING:		COMPLETE FAN SHALL BE PAINTED WITH EPOXY PAINT					
MOC								
22	IMPELLER MATERIAL		CAST ALUMINIUM MATERIAL, GR-LM-6					
23	CASING MATERIAL		AS PER FAN SPECIFICATION CASING BODY- 3.00 MM (MIN.), (IS:1079/2062)					
RECOMMENDED MOTOR DETAILS								
24	RATED VOLT OF MOTOR		415V, ±10%, 3 PHASE, 50 HZ ± 5%					
25	RECOMMENDED MOTOR (15% MORE THAN FAN POWER)	KW/POLE	1.5/2	0.37/2	0.55/2	3.7/6	0.75/4	2.2/6
26	TYPE OF INSULATION		CLASS - F, TEMP. RISE UPTO CLASS-B			CLASS -H, SMOKE SPILL MOTORS OPERATE AT 400 DEG.C. FOR 2 HRS.		
27	TYPE OF PROTECTION		IP-55	IP-55	IP-55	IP-55	IP-55	IP-55
28	TYPE OF ENCLOSURE		TEFC SQ. CAGE INDUCTION MOTOR					

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

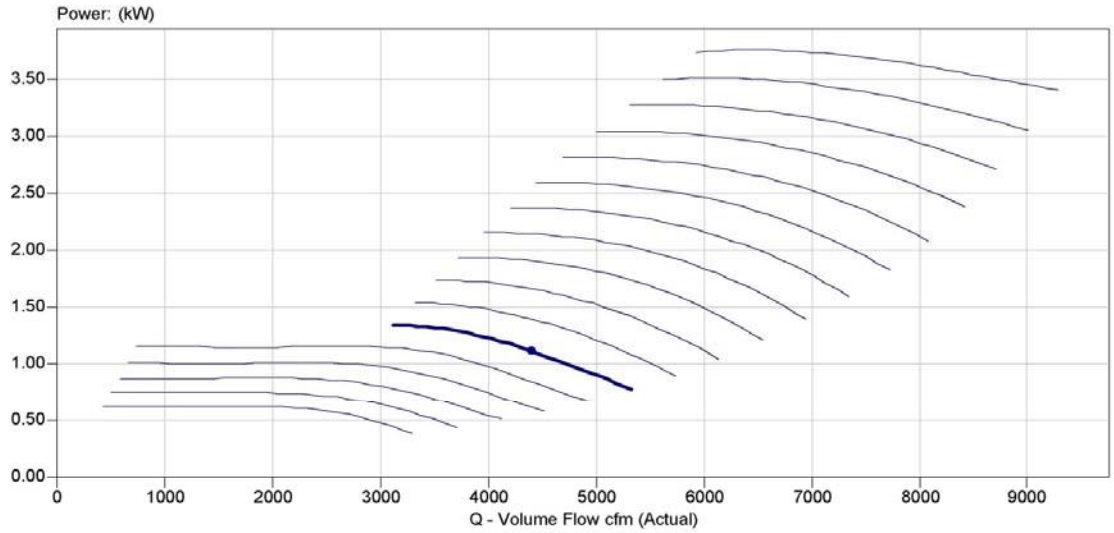
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

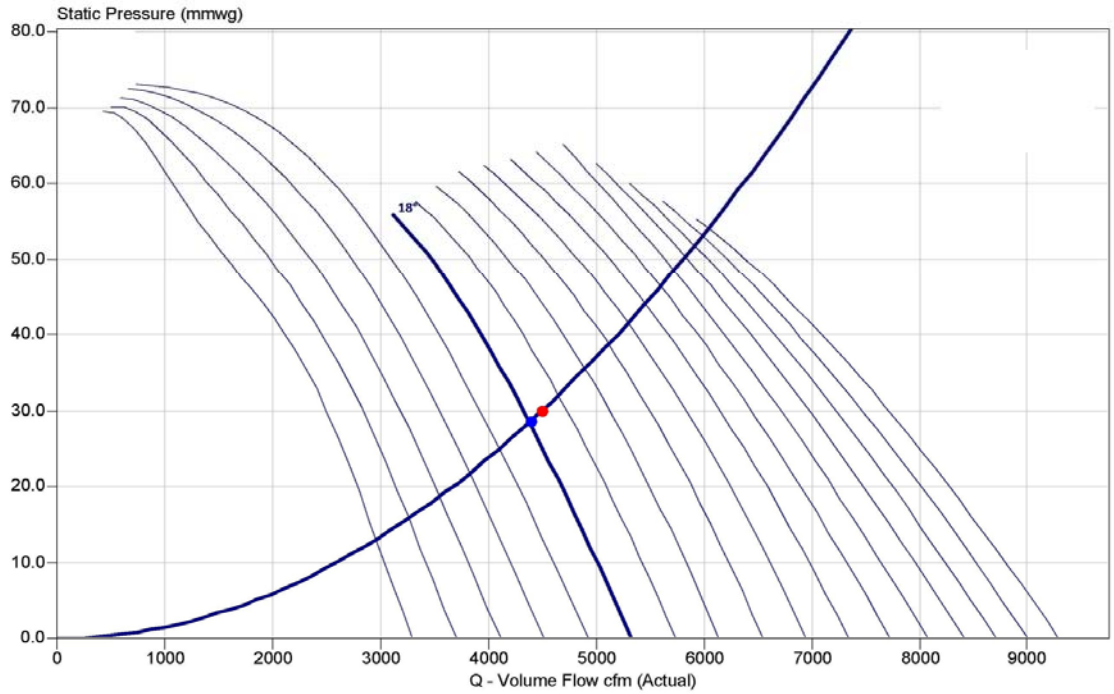
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

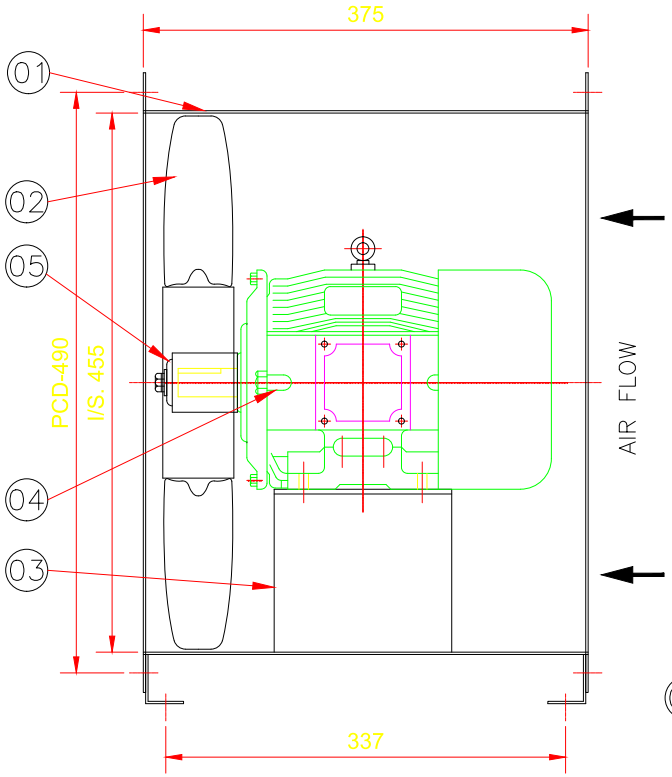
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-450

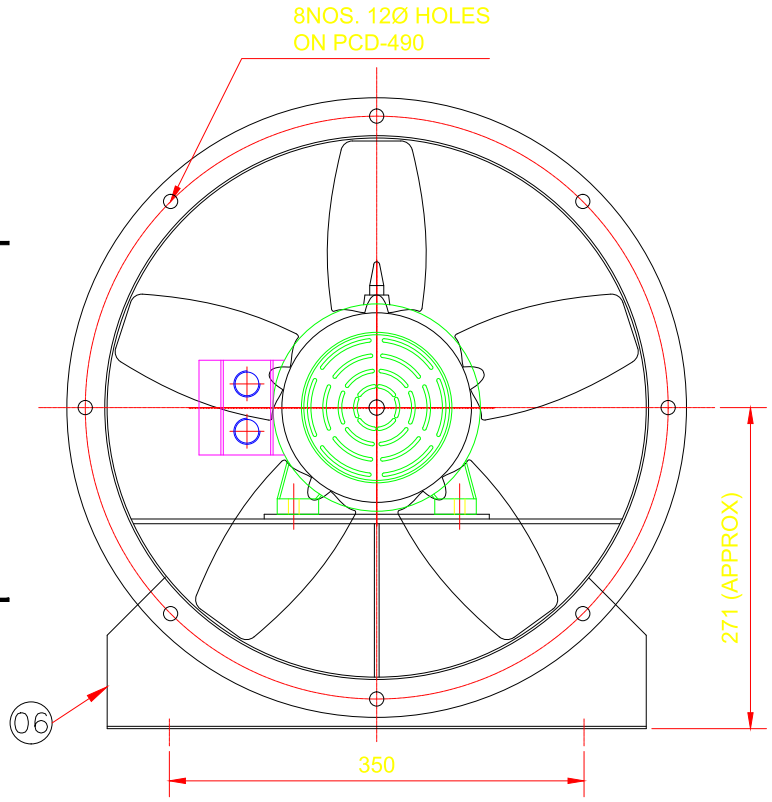
VOLUME OF AIR (CFM)	4500	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	1.12







ELEVATION



DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/01	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
01	FRESH AIR AXIAL FAN	TLJ–450	SARALA	01	4500	30	2800	1.12

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
1.5/2	415V, 3PH. 50 HZ. AC SUPPLY	90S	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

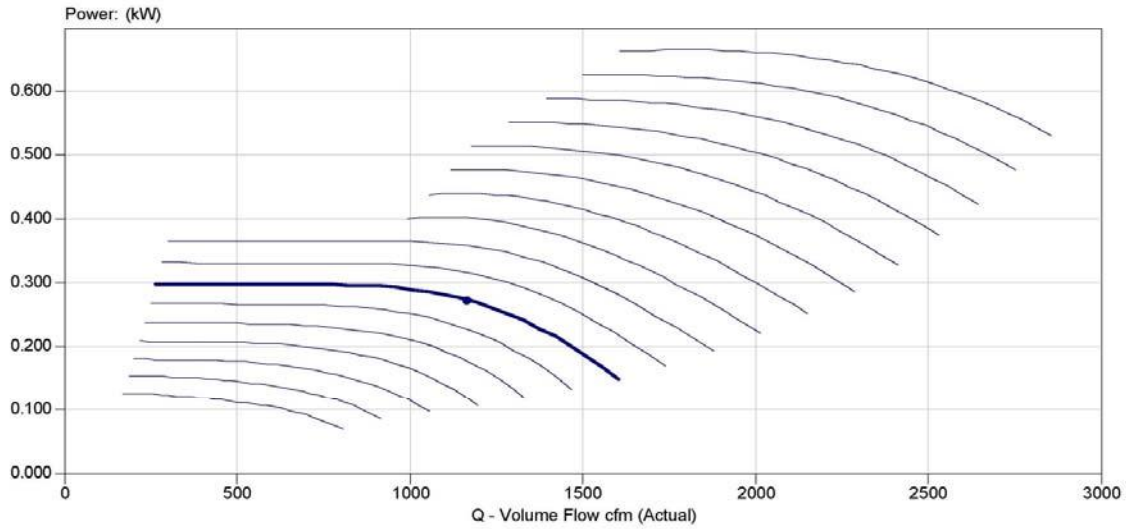
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

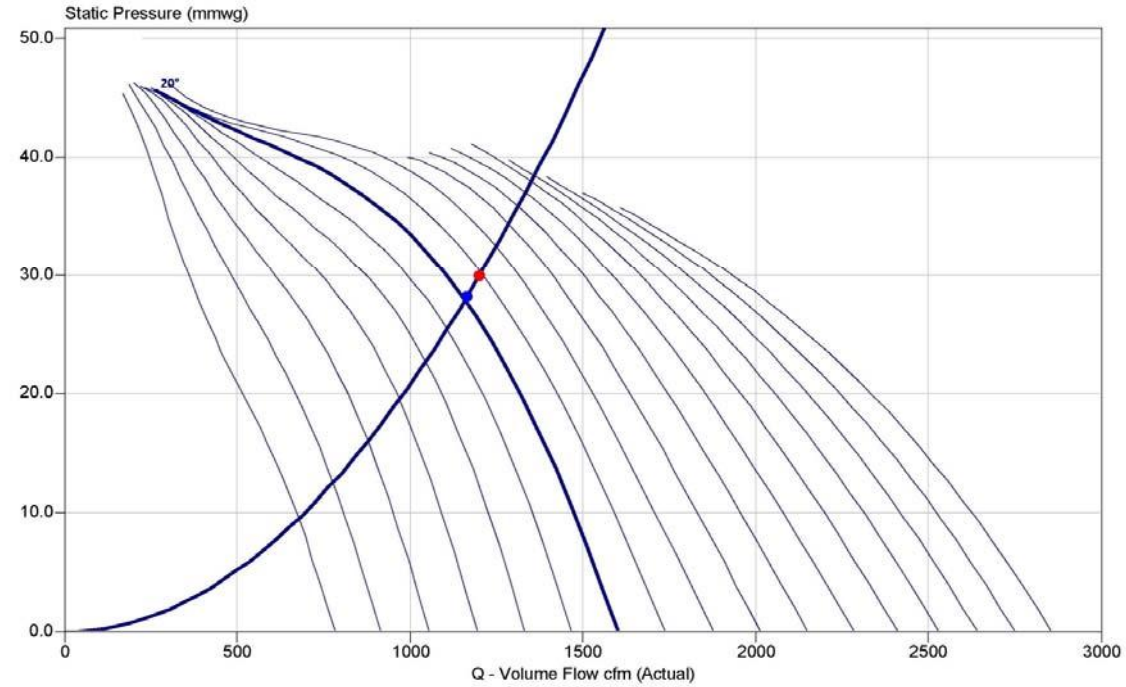
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

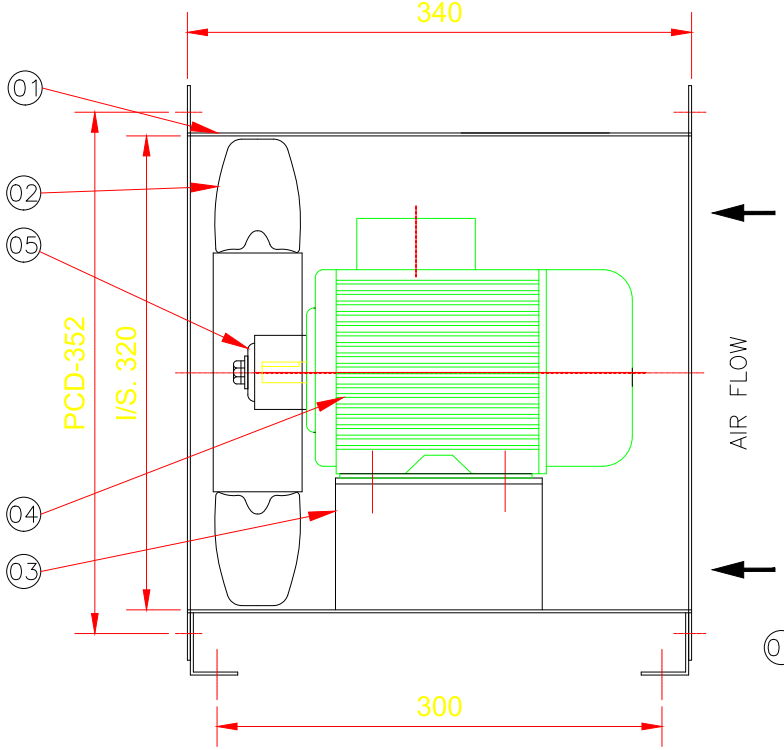
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-315

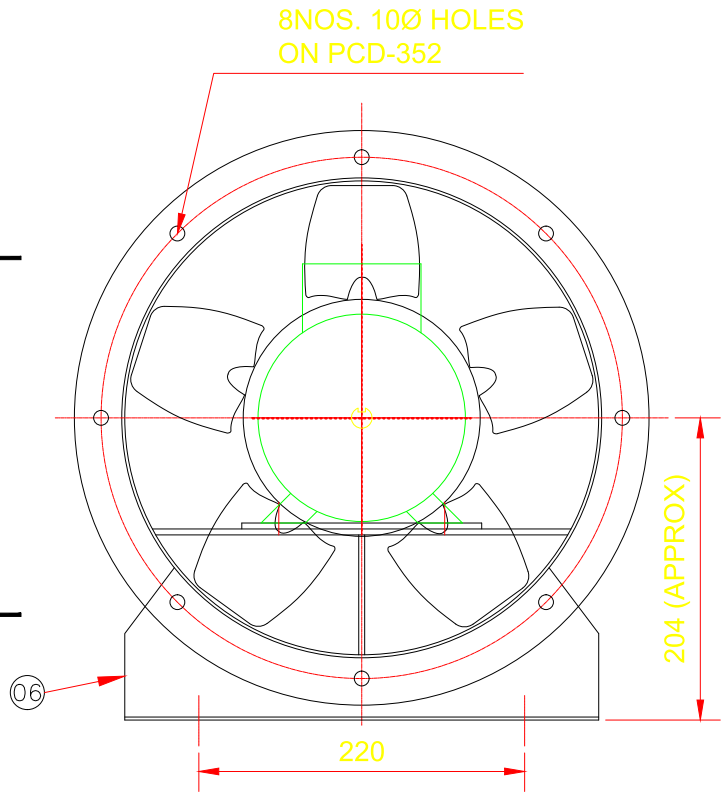
VOLUME OF AIR (CFM)	1200	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	0.27







ELEVATION



DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/02	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
02	FRESH AIR AXIAL FAN	TLJ–315	SARALA	01	1200	30	2800	0.27

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.37/2	415V, 3PH. 50 HZ. AC SUPPLY	71	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

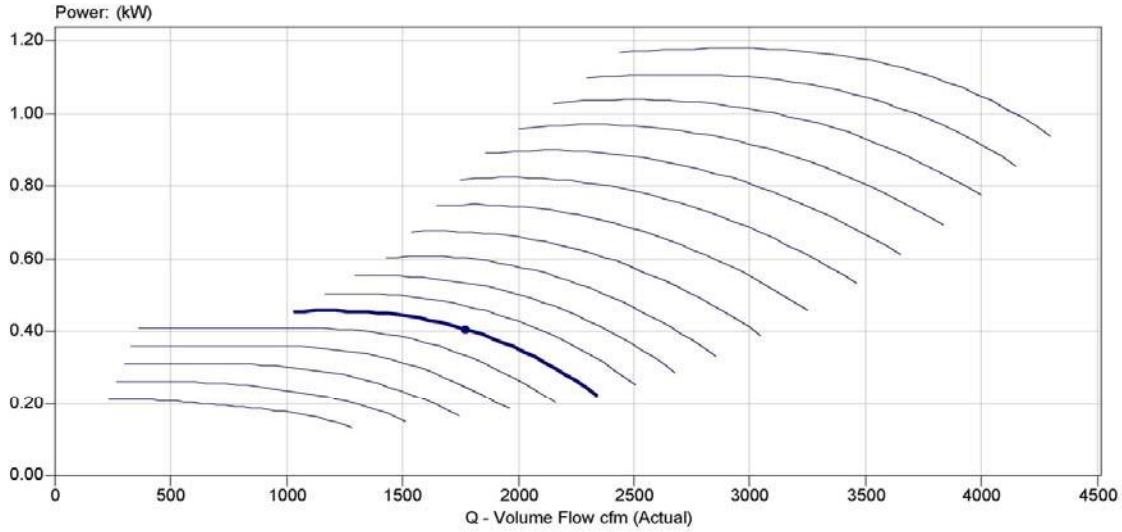
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

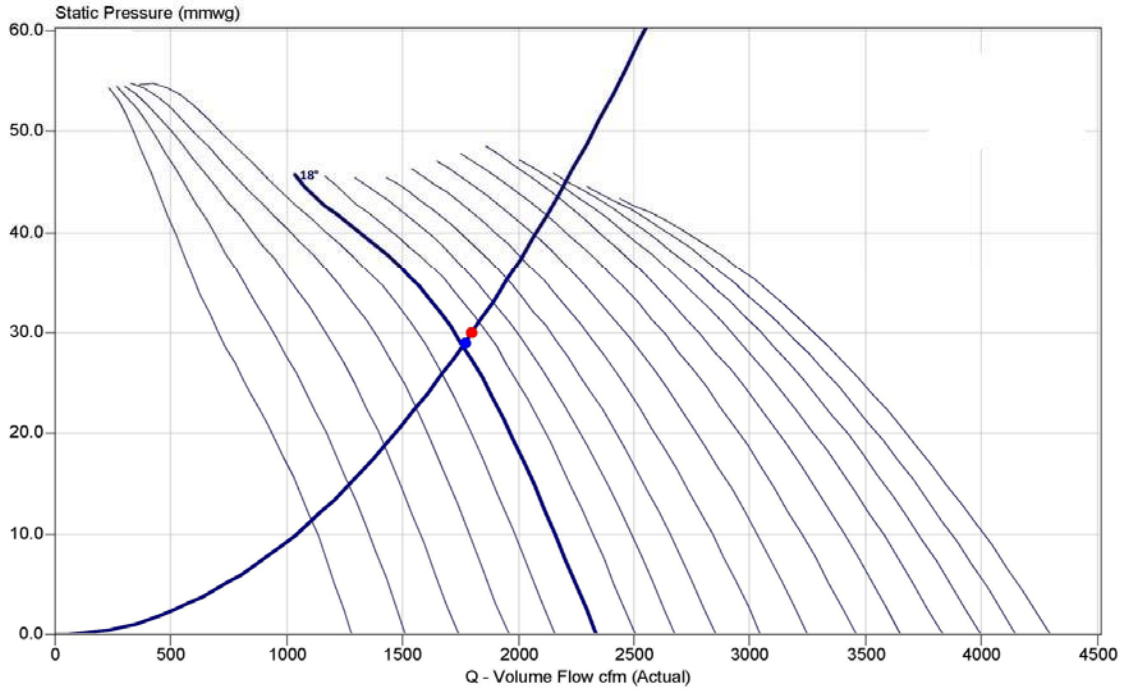
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

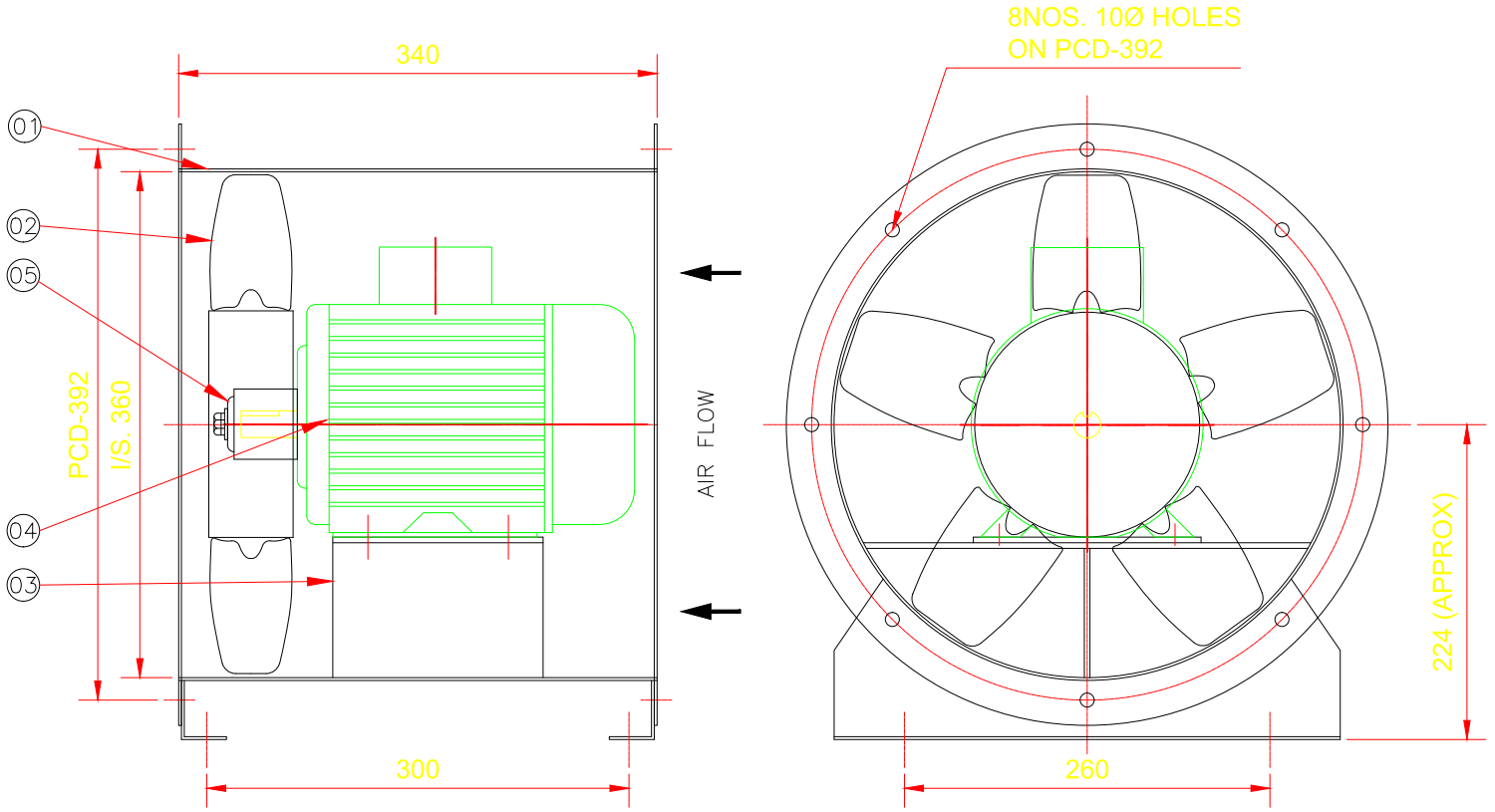
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-355

VOLUME OF AIR (CFM)	1800	FAN SPEED (RPM)	2800
STATIC PRESSURE (MM. WG.)	30	FAN POWER (KW)	0.4







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
06.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

R2

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/03	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CFM	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
03	FRESH AIR AXIAL FAN	TLJ–355	SARALA	01	1800	30	2800	0.40

TECHNICAL DATA OF MOTOR

RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.55/2	415V, 3PH. 50 HZ. AC SUPPLY	80	3000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

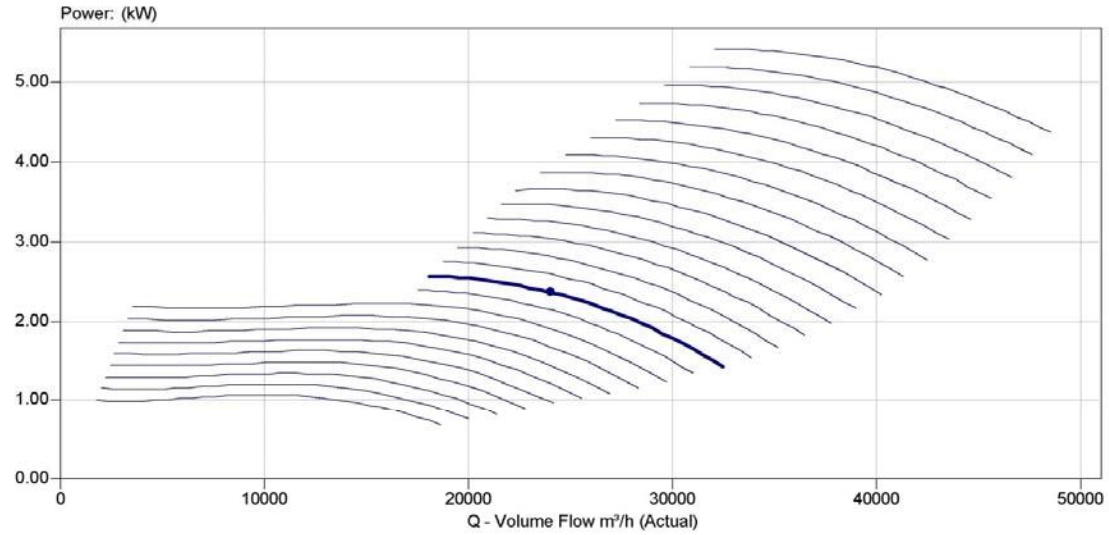
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

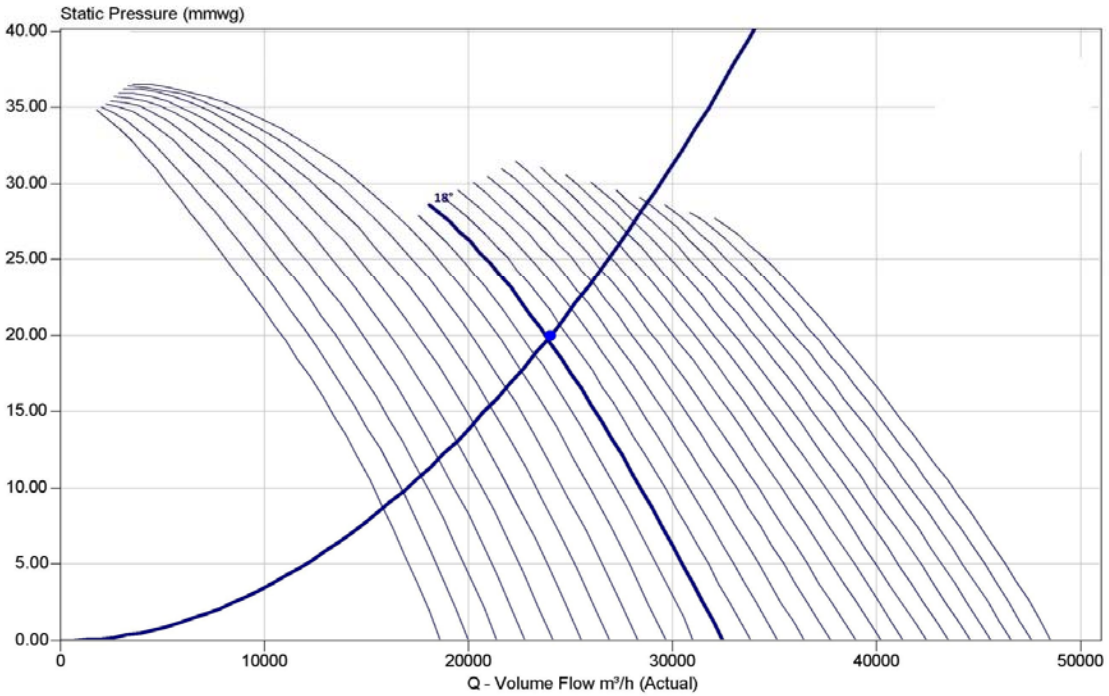
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

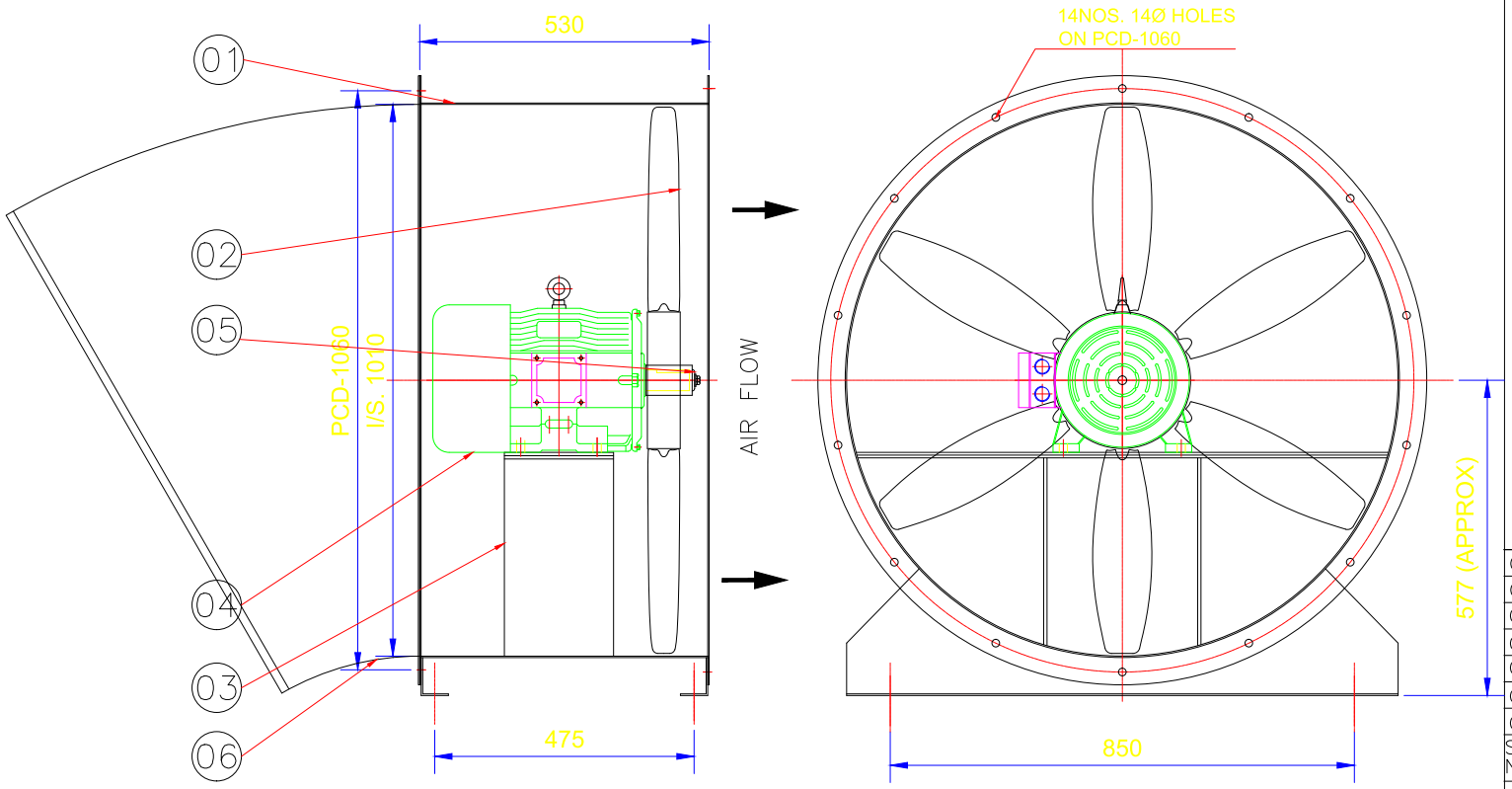
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-1000

VOLUME OF AIR (CMH)	24000	FAN SPEED (RPM)	960
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	2.36







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.22	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.22	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/04	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
04	EXHAUST AIR AXIAL FAN	TLJ–1000	SARALA	01	24000	20	960	2.36

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
3.7/6	415V, 3PH. 50 HZ. AC SUPPLY	132S	1000

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

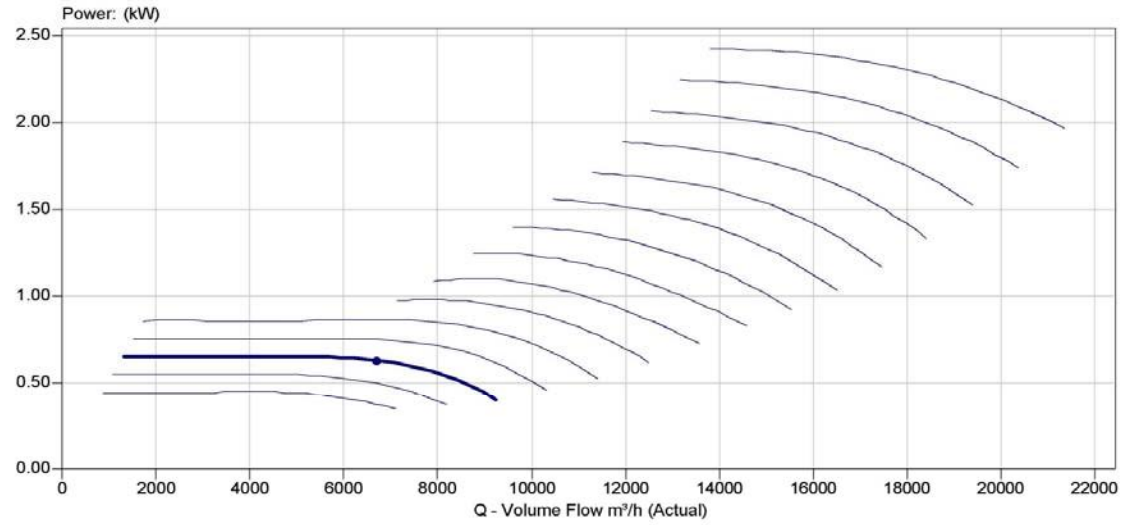
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

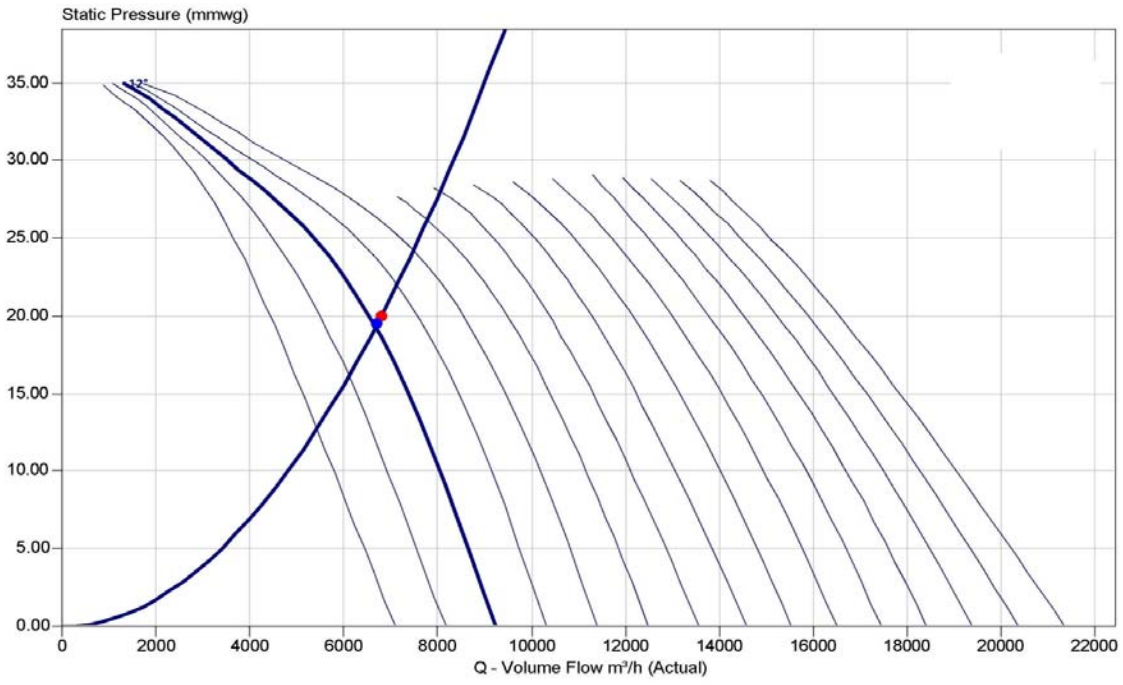
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

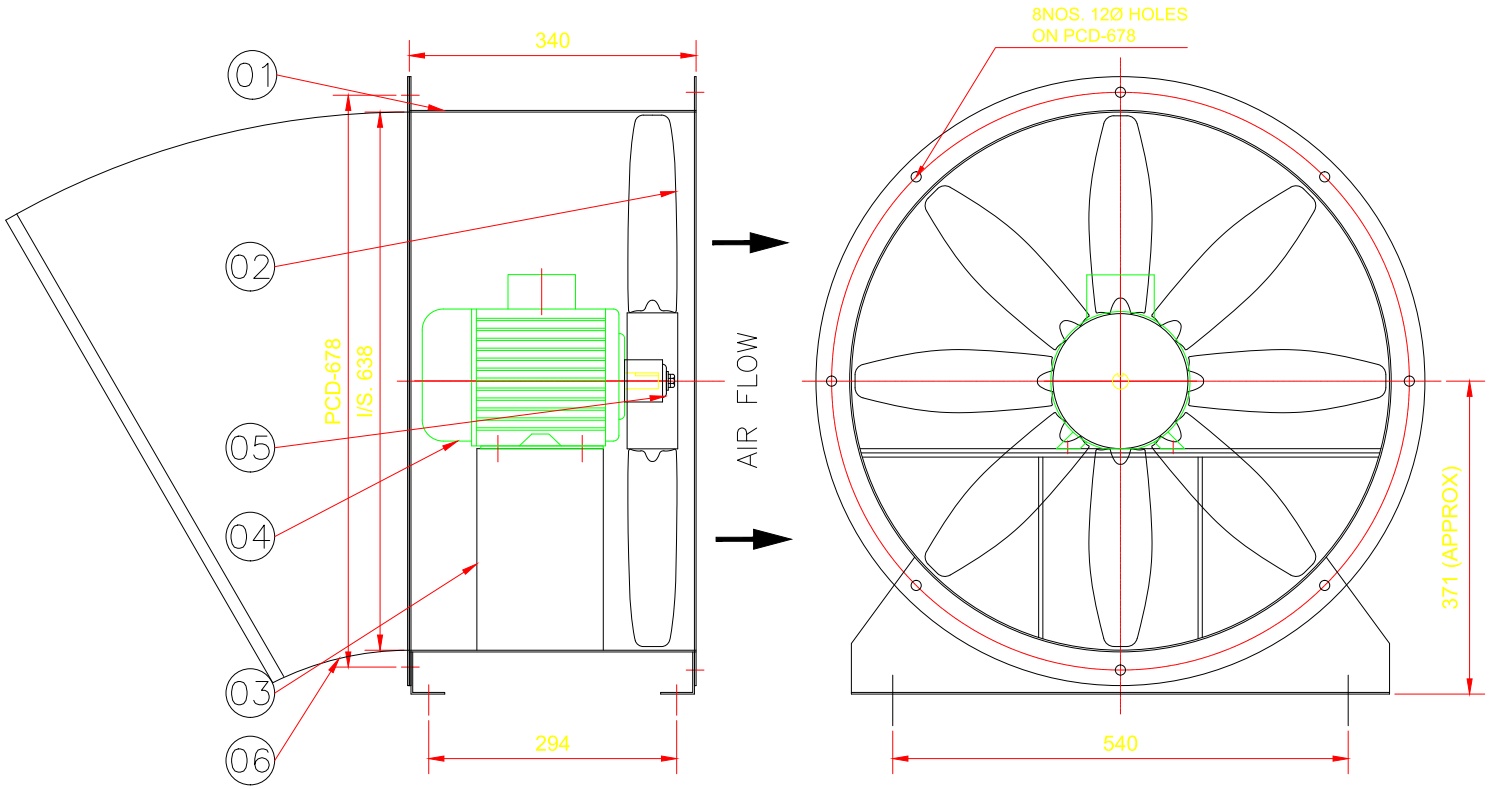
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-630

VOLUME OF AIR (CMH)	6800	FAN SPEED (RPM)	1400
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	0.63







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

R2

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.2022	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.2022	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV R1

DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/05	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN R1 R2

SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
05	EXHAUST AIR AXIAL FAN	TLJ–630	SARALA	01	6800	20	1400	0.63

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
0.75/4	415V, 3PH. 50 HZ. AC SUPPLY	80	1500

SUBURBAN INDUSTRIAL WORKS PVT. LTD.

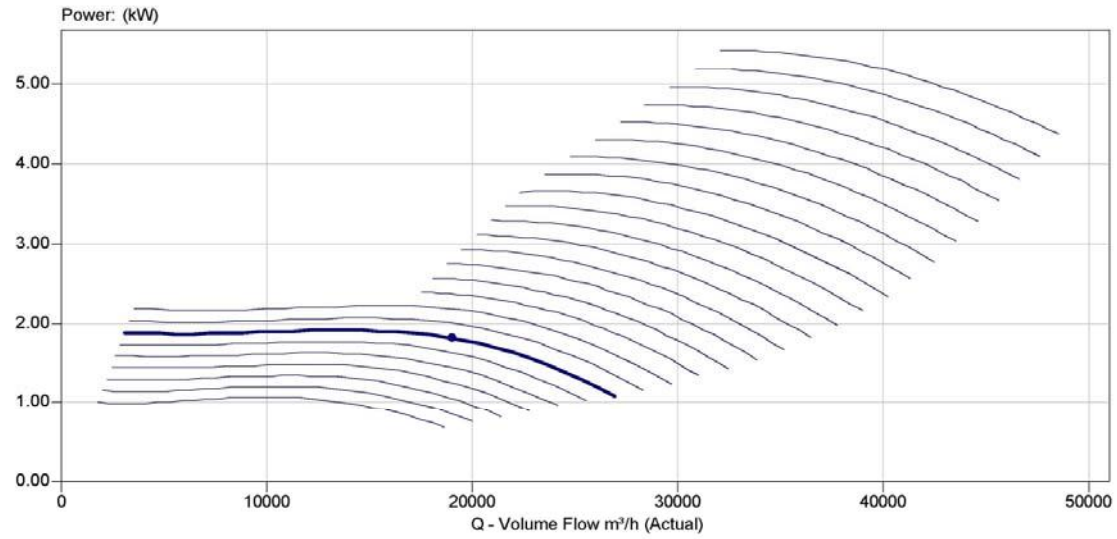
CLIENT'S NAME : THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

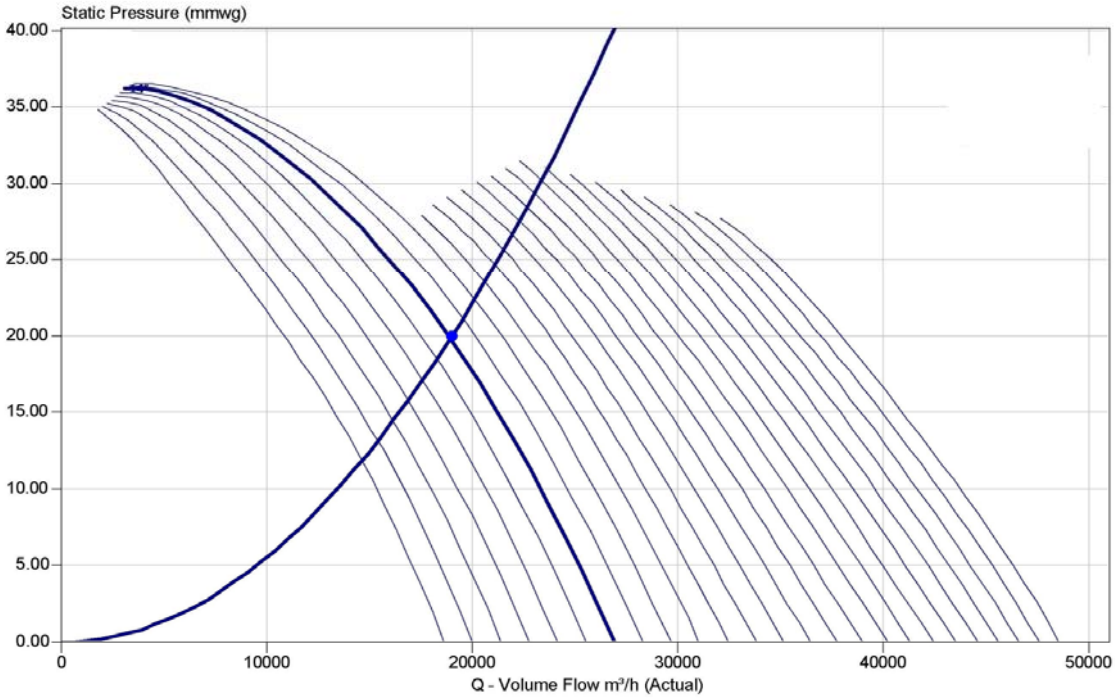
PROJECT : 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III

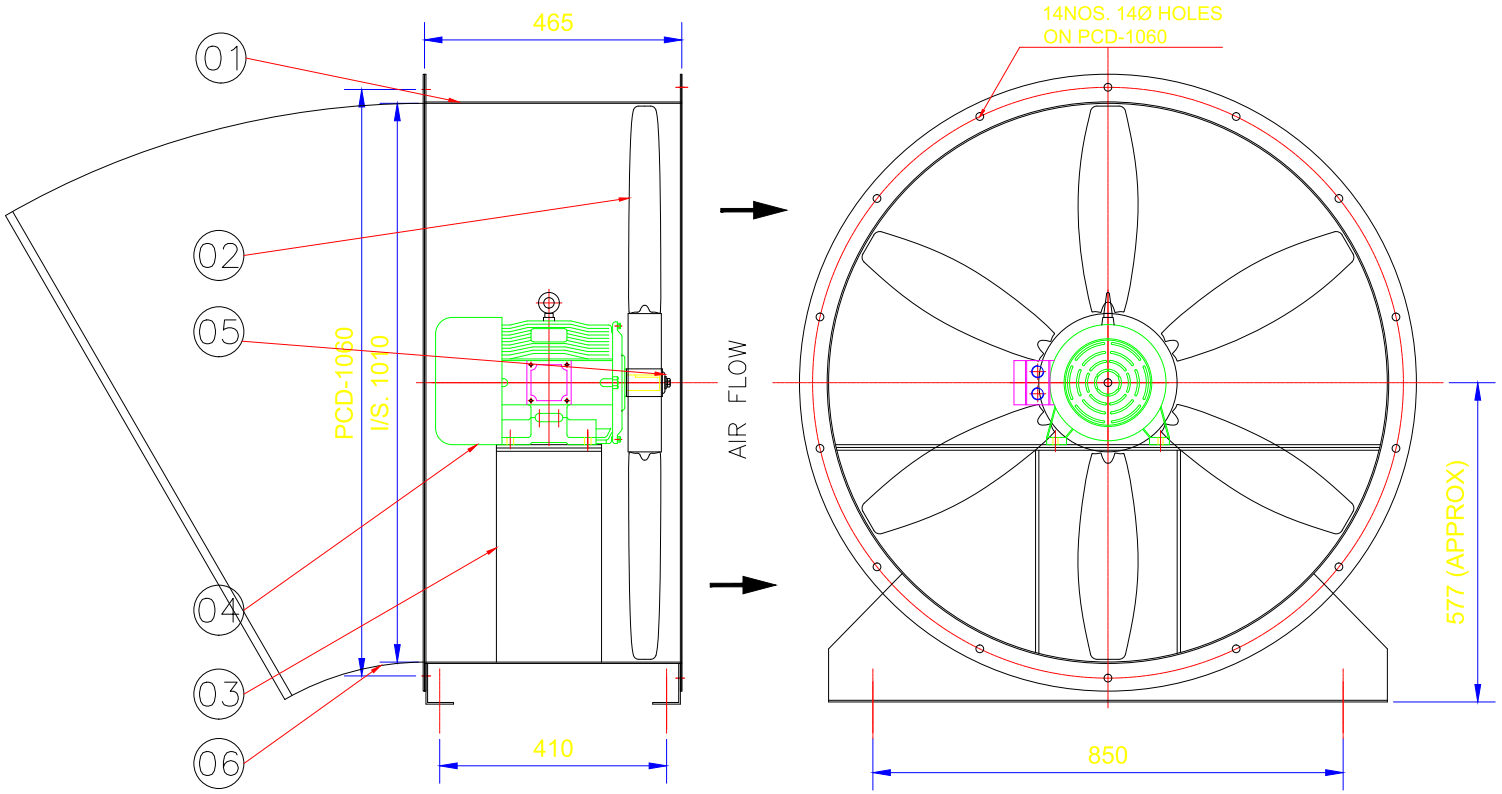
SARALA FAN CHARACTERISTIC CURVE

FAN MODEL- TLJ-1000

VOLUME OF AIR (CMH)	19000	FAN SPEED (RPM)	960
STATIC PRESSURE (MM. WG.)	20	FAN POWER (KW)	1.81







ELEVATION

DRIVE END VIEW

(NO. OF BLADES SHOWN ARE PICTORIAL ONLY.
ACTUAL NO. OF BLADES VARIED AS PER SELECTION.)

NOTES:–

1. IMPELLER WOULD BE BALANCED AS PER ISO:1940,G:6.3.
2. PAINTING:–FAN CASING & RPC SHALL BE PAINTED WITH EPOXY PAINT.

SL. NO.	DESCRIPTION	QTY.	MATL.	REFERENCE
07.	MOUNTING LEG	2NOS.	MS	IS: 1079/2062
06.	RAIN PROTECTION COWL WITH BIRD SCREEN	1 NO.	MS	25 SQ. WIRE MESH
05.	IMPELLER RETAINING WASHER	1 NO.	MS	IS: 1079/2062
04.	MOTOR	1 NO.		AS MENTION
03.	MOTOR BASE	1 NO.	MS	IS: 1079/2062
02.	IMPELLER	1 NO.	CAST AL.	LM–6
01.	FAN CASING	1 NO.	MS	IS: 1079/2062

BILL OF MATERIAL

DATE	MARK	DESCRIPTION OF REVISION	BY
14.12.22	R2	AS PER COMMENTS DTD. 14.12.22	S.NASKAR
25.11.22	R1	AS PER COMMENTS DTD. 03.11.22	S.NASKAR

CLIENT–THE WEST BENGAL POWER DEVELOPMENT CORPORATION LTD.

PROJECT– 1X660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT–5, PHASE–III

SUBURBAN INDUSTRIAL WORKS PVT. LTD.
KOLKATA , INDIA

GENERAL ARRANGEMENT DRAWING FOR 'SARALA' FAN ARR. IV (R1)

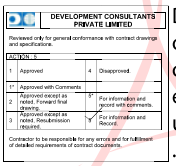
DRAWN	S.NASKAR	DRAWING NO.	JOB NO.
CHECKED	P.DAS		SCALE NTS
APPROVED		SIWL–643/06	REV 2
DATE	22–07–22		

TECHNICAL DATA OF FAN (R1) (R2)

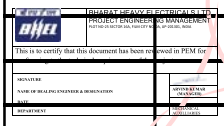
SL. NO.	FAN TYPE	FAN MODEL	MAKE	QTY	CAPACITY CMH	S.P. MM. WG.	FAN SPEED IN RPM	FAN BKW.
06	EXHAUST AIR AXIAL FAN	TLJ–1000	SARALA	01	19000	20	960	1.81

TECHNICAL DATA OF MOTOR

FIRE RATED MOTOR KW/POLE	POWER SUPPLY	FRAME SIZE	SYN. SPEED RPM
2.2/6	415V, 3PH. 50 HZ. AC SUPPLY	112M	1000



Digitally signed by Indranil
DN: cn=Indranil, o=DCPL, ou=HVAC, email=indranil.dutta@in.dclgroup.com, c=IN
Date: 2022.08.01 14:38:43 +05'30'



Digitally signed by Arvind kumar
DN: cn=Arvind kumar, o=BHEL PEM, ou=MAUX, email=arvindkr@bhel.in, c=IN
Date: 2022.07.02 12:29:45 +05'30'

21.06.2022	01	MOHD. AMIR	AHMAR KAMRAN	KRISHAN SINGH
24.04.2022	FIRST SUBMISSION	MOHD. AMIR	AHMAR KAMRAN	KRISHAN SINGH
Date	**DESCRIPTION OF REVISION**	**Prep By**	**Checked**	**Approved**

PROJECT		**1 X 660 MW WBPDCL SAGARDIGHI TPP EXTN UNIT-5, PHASE-III**		
OWNER		**WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED (WBPDCL)**		
CONSULTANT		**DEVELOPMENT CONSULTANT PVT LTD. (DCPL), KOLKATA**		
PURCHASER		**BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NOIDA**		
CONTRACTOR		**PARKSONS ENGINEERING COMPANY PVT LTD. NEW DELHI**		
Job No	**445**	**BHEL DOCUMENT NO.**	**PE-V0-445-553-A035**	**REV 01**
STATUS	**CONTRACT**	**PARKSONS DOCUMENT NO.**	**PEC-0424A/22**	
PACKAGE	**AIR CONDITIONING SYSTEM**			
TITLE	**TDS AND GA OF FILTERS FOR AIR CONDITIONING SYSTEM**			

	Name	Date	Submitted for
Prep By	MOHD. AMIR	24.04.2022	APPROVAL
Checked by	AHMAR KAMRAN	24.04.2022	APPROVAL
Approved by	KRISHAN SINGH	24.04.2022	APPROVAL

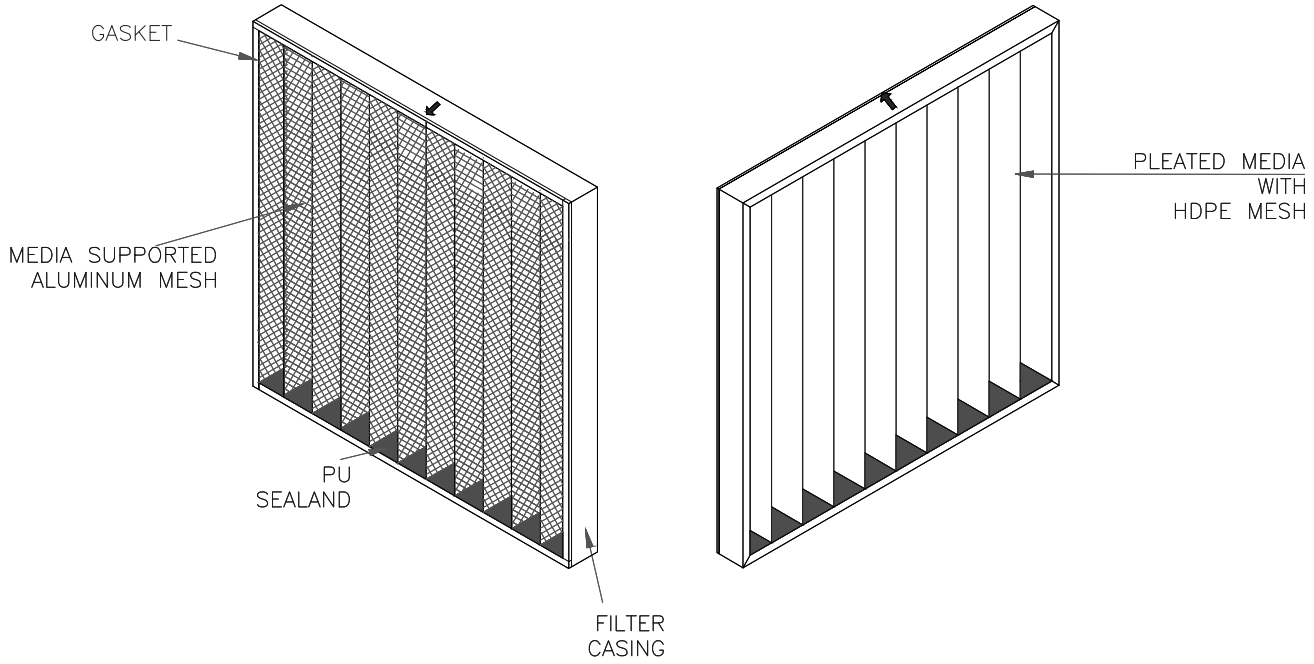
Response to WBPDCL Comments on TDS AND GA OF FILTERS FOR AIR CONDITIONING SYSTEM			
BHEL DOC NO. E-V0-445-553-A035			
Sr No	**WBPDCL/DCPL Comments**	**BHEL/PARKSONS Reply**	
1	Dry panel type	Noted & incorporated	WBPDCL/DCPL Noted & Issue Closed
2	below	Noted & incorporated	WBPDCL/DCPL noted & Issue Closed

TDS & GA OF PRE FILTER

SL NO	Description	Particulars
1	**Item**	Pre-filter
2	**Make**	Puromatic /Spectrum
3	**Application**	AHUs,PAC Units,Fresh Air Fan in Airconditioning System
4	**Type**	**Dry Panel type**
5	**Cleanable or non cleanable**	cleanable
6	**Velocity of Air across the filter**	2.5 m/sec
7	**Filter media**	Synthetic non-oven(washable and fire returndant)
8	**Efficiency**	90 % down to 10 µm
9	**Allowable pressure drop**	2.5 mm & 6.5 mm in clean and dirty Condition respectively
10	**Frame work**	18G GSS
11	**Size**	**Refer Below** (As per approved Layout Drawings)
12	**Quantity**	
13	**Capacity**	
14	**Temperature resistance**	70^0 C

TDS & GA OF FINE FILTER

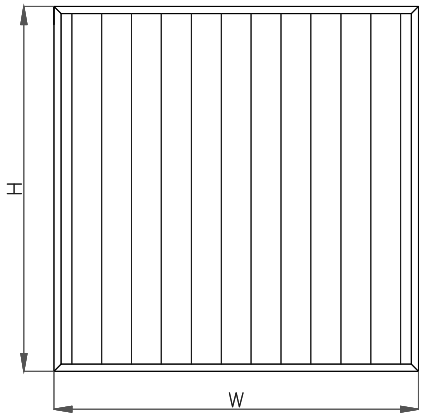
SL NO	Description	Particulars
1	**Item**	Fine-filter
2	**Make**	Puromatic /Spectrum
3	**Application**	AHUs and in PAC units and in Fresh Air Fan in Airconditioning System
4	**Type**	Flange type
5	**Cleanable or non cleanable**	cleanable
6	**Maximum face Velocity of Air across the filter**	1.25 m/sec
7	**Filter media**	Reinforced glass fibre or cotton fabric or any type of fabric materials sandwitched in between two galvanised wire netting.
8	**Efficiency**	99 % down to 5 µm
9	**Allowable pressure drop**	Maximum pressure drop shall be limited to 15 mm WG in all conditions.
10	**Frame work**	18G GSS
11	**Size**	**Refer Below** (As per approved Layout Drawings)
12	**Quantity**	
13	**Capacity**	
14	**Temperature resistance**	70^0C



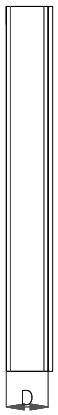
ISOMETRIC VIEW

SPECIFICATION	
MODEL	PRE FILTER
FILTER MEDIA	SYNTHETIC NON WOVEN
FILTER GRADE	G4 (EU4)
SIZE	H*W*D
AVG. ARRESTANCE	90% DOWN TO 10**MICRON**
FRAME WORK	ALUMINIUM
SEALANT	POLYURETHANE
OPERATING TEMP.	AMBIENT
NUMBER OF PLEATS	7 PLEATS PER FOOT
CONTRACTION	PLEATED TYPE
GASKET	XLP GASKET (CROSS LINKED POLYETHYLENE)

FILTER SIZES					
BOX SIZE (H*W*D)			AIR FLOW IN CFM @2.5m/sec	IPD	FPD
HEIGHT	WIDTH	DEPTH			
610	610	50	2000	60Pa±10%	250pa



FRONT VIEW

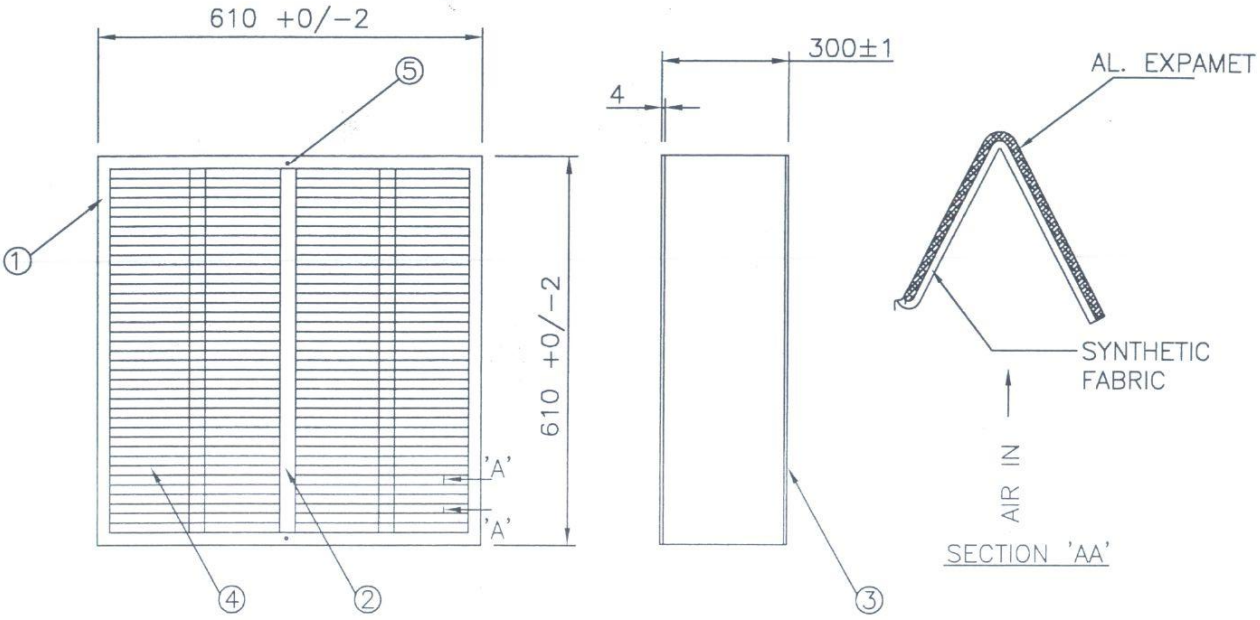


SIDE VIEW

Tolerances :	
Height	: +0−3mm.
Width	: +0−3mm.
Depth	: ±1mm.
Diagonal	: Max Difference 5mm.

PROJECT :1 X 660 MW WBPDCL
SAGARDIGHI TPP EXTN UNIT-5

3RD ANGLE PROJECTION		TITLE	PRE FILTER BOX TYPE
SIZE	A3		
UNIT	MM		
SCALE	NTS	MAKE	AS PER APPROVED MAKE LIST
DATE		DWG NO	PAGE 4 OF 5



NO. OF FINS : 9 ±1.

FILTER MEDIA : ONE LAYER OF SYNTHETIC FABRIC MEDIA WITH AL. EXPAMET WIRE MESH AT OUTLET SIDE.

EFFICIENCY : 99% DOWN TO 5 MICRON AS PER BS:2831

S.NO.	DESCRIPTION	MATL	REMARKS	QTY.
5	RIVET	AL.		6
4	FILTER MEDIA	SYNTHETIC FABRIC		1
3	SEALING GASKET	SPONGE RUBBER		8
2	SPACER	Al.	26 SWG.	3
1	FILTER FRAME	GI.	18 SWG.	1

PROJECT :1 X 660 MW WBPDCL
SAGARDIGHI TPP EXTN UNIT-5

TITLE: FINE FILTER

SIZE	CODE IDENT.NO.	DWG. NO.
A4	–	ASK 4501

SCALE 1 : 1 | RELEASE DATE | SHEET 5 OF 5

Lev – | Ver – | Rev -0

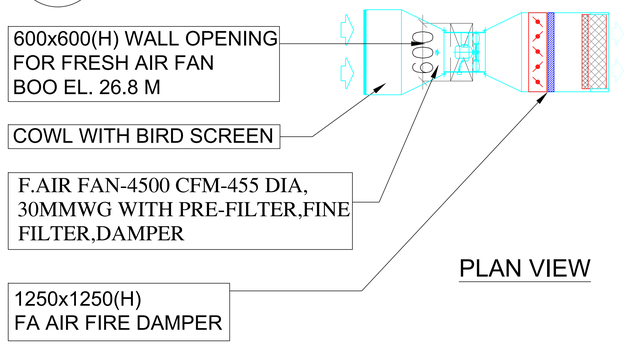
FILE NAME: A4501FF

FIRST ANGLE PROJECTION | ALL DIMENSIONS ARE IN MM

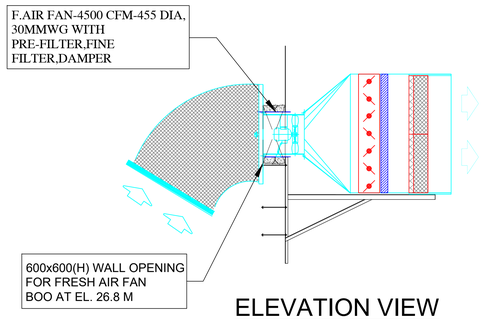
DRAWING NO. PE-V0-445-553-SK001

POWER HOUSE AHU ROOM 24.0M

01 FRESH AIR FAN

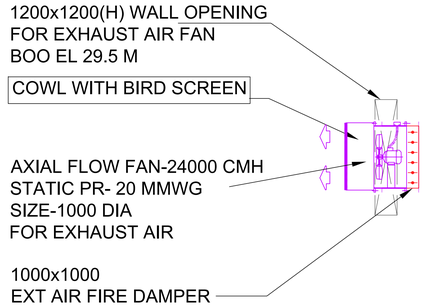


PLAN VIEW

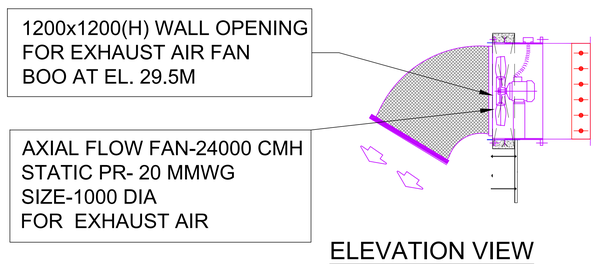


ELEVATION VIEW

02 SMOKE EXHAUST FAN



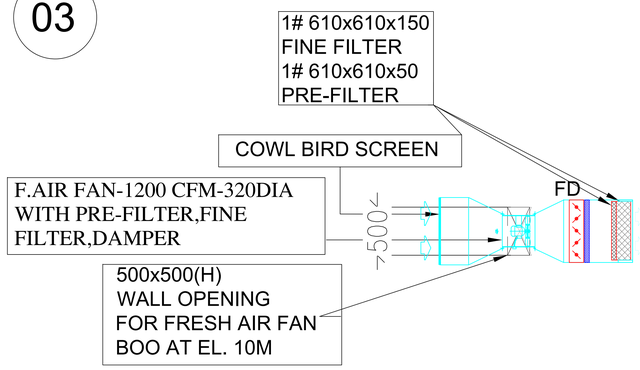
PLAN VIEW



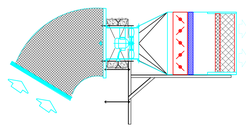
ELEVATION VIEW

POWER HOUSE AHU ROOM 8.5M

03 FRESH AIR FAN

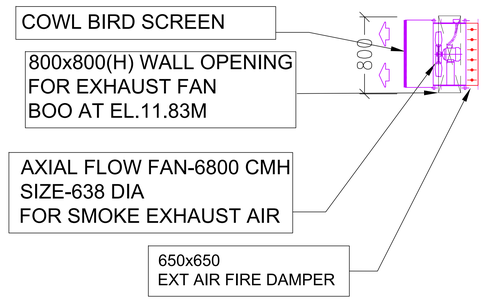


PLAN VIEW

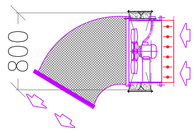


ELEVATION VIEW

04 SMOKE EXHAUST FAN



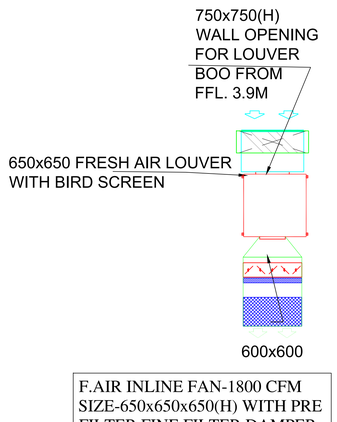
PLAN VIEW



ELEVATION VIEW

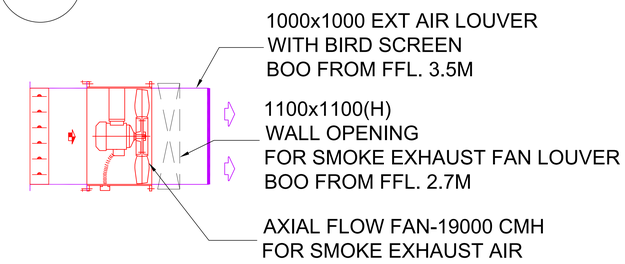
ESP PAC ROOM 9.2M

05 FRESH AIR FAN

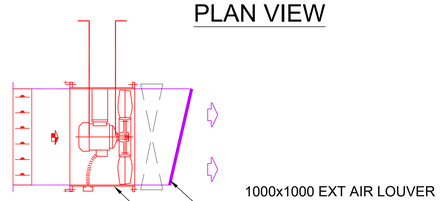


F.AIR INLINE FAN-1800 CFM
SIZE-650x650x650(H) WITH PRE
FILTER,FINE FILTER,DAMPER,
BIRD SCREEN

06 SMOKE EXHAUST FAN



PLAN VIEW



ELEVATION VIEW

SR. NO.	EQUIPMENTS	QTY	CAPACITY (EACH)	LOCATION	REFERENCE DRAWINGS / DOCUMENTS
1	FRESH AIR FAN	1	4500 CFM/ 30MMWG	24.0M AHU ROOM	MOC: AS PER DOC. NO: PE-V0-445-553-A024 MOTOR: AS PER DOC. NO: PE-V0-445-553-A017 LOCATION: AS PER DRG NO: PE-V0-445-553-A043
2	SMOKE EXHAUST AIR FAN	1	24000 CMH/ 20MMWG		
3	FRESH AIR FAN	1	1200 CFM/ 30mm SP	8.5M AHU ROOM	MOC: AS PER DOC. NO: PE-V0-445-553-A024 MOTOR: AS PER DOC. NO: PE-V0-445-553-A017 LOCATION: AS PER DRG NO: PE-V0-445-553-A042
4	SMOKE EXHAUST AIR FAN	1	6800 CMH/ 20mm SP		
5	FRESH AIR FAN	1	1800 CFM/ 30MMWG	9.2M PAC ROOM	MOC: AS PER DOC. NO: PE-V0-445-553-A024 MOTOR: AS PER DOC. NO: PE-V0-445-553-A017 LOCATION: AS PER DRG NO: PE-V0-445-553-A041
6	SMOKE EXHAUST AIR FAN	1	19000 CMH/ 20mm SP		

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

JOB NO. 445
STATUS CONTRACT
DISTRIBUTION

CUSTOMER: WBPDCL
THE WEST BENGAL POWER DEVELOPMENT CORPN. LTD.(WBPDCL)
1X660MW, SAGARDIGHI THERMAL POWER EXTENSION PROJECT (UNIT #5)

CONSULTANT:
DEVELOPMENT CONSULTANTS PRIVATE LTD.
KOLKATA

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

PARKSONS ENGINEERING CO. PVT. LTD.

	NAME	SIGN	DATE
DRN	YPSS	-sd-	31.10.2025
DESN	YPSS	-sd-	31.10.2025
CHD	AK	-sd-	31.10.2025
APPD	SR	-sd-	31.10.2025

TITLE: GA FOR FRESH AIR FAN AND SMOKE EXHAUST FAN FOR AC SYSTEM

DEPT. | SCALE 1:100 | SIGN

DRAWING NO. PE-V0-445-553-SK002

SHEET 01 OF 01 | REV. R0

SIZE-A0

ELECTRONIC FILE NAME: