



Purchase Department
Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant, Ranipet – 632 406, INDIA

NIT

Offer is requested for the supply of Space Heater of 60W as details below.

SCOPE: Supply of item.

Sl No	Material code	Description	Make	Unit	Qty	Delivery Schedule
01	A119235699801001	Space Heater of 60W suitable for 90KW LT Motor of CGL make. (Ref: Previously supplied by CGL against PO No 5243126 dt 26.02.2015. And approved Drawing/Datasheet is attached for reference).	Crompton Greaves Ltd	No	01	Shortest possible delivery time is preferable

Note: Only M/s CGL make is acceptable. Offer of other make will summarily be rejected.

Destination: BHEL Stores, Ranipet 632406, Tamil Nadu, India
RA not applicable.

Documents to be Submitted:

- 1) **NIT:** Offer details.
- 2) **Annexure-C:** Commercial Terms and Conditions of the Enquiry shall be filled and send back along with the Offer.

Note: BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall not be considered.

Contact Details

Shri. Mallikarjun Nayak Sr Manager/Purchase Dept BHEL, Ranipet – 632 406 E mail: m.nayk@bhel.in Phone: 04172-284240 Cell : 91-9980371698	Shri. Indradyumna Mirda Addl Engineer / Purchase BHEL, Ranipet – 632406. Email: idm@bhel.in Phone: 04172-284811 Mobile: 9442572858
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LETTER OF TRANSMITTAL FOR VENDOR DOCUMENTS

To, BHARAT HEAVY ELECTRICALS LTD Power Sector-PMG First Floor, Vasant Square Mall, Sect-B Vasant Kunj, New Delhi-110 070 Attn.: Rajiv B, Sudesh P	JOB NO: TCE. 5750A	YOUR REF: PEDM-DMS
	CLIENT: Rajasthan Rajya Vidyut Utpadan Nigam Ltd	DATE: 17-08-2015
	PROJECT: 2X660MW Super Critical TPS, Stage-V, Units #7&8 at Suratgarh Rajasthan	OUR REF: TCE.5750A-EL-701-VDT-102 DATE: 18-08-2015
	SUBJECT: Data Sheet, OGA Auxiliary FD Fan Motor (Rev.02)	SH 1 OF 1

We are herein conveying our approval/comments on the documents listed below. Approval/comments conveyed herein neither relieves the vendor/contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of the supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

SKK
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PROJECT MANAGER/ENGINEER

CODES	
A: Document approved as submitted; proceed with fabrication/construction.	F: Correct original of the document to reflect our comments and resubmit for records.
B: Document approved subject to comments noted; proceed with fabrication/construction considering our comments.	G: Documents of this category are for information only and not for approval. Information furnished on the document is noted.
C: Our comments are noted on the enclosed marked-up print.	H: Document reviewed only against our previous comments and other revisions highlighted and identified by the vendor.
D: Our comments are noted in the memo attached to this transmittal.	I: Document returned without review.
E: Correct original of the document to reflect our comments and resubmit for approval.	J: Print not enclosed.

SL. NO.	VENDOR'S DOCUMENT NO.	TCE NO.	TITLE	REV NO	CODE
A.	xxxxxx	-	Data Sheet, OGA Auxiliary FD Fan Motor	02	A H J

COPY TO :	
File: TCE.	
cc: RRVUNL-Jaipur Attn Mr Jinesh Jain MG ,SE –TD-I	- One copy with/without encl.
cc: Attn: Chief Engineer, Suratgarh Super Thermal Power Station, Prabhat Nagar, Dist Sri Ganganagar , Suratgarh-335804 Ph01509-245252	- One copy with/without encl.

TATA CONSULTING ENGINEERS LIMITED

ம. ஜெயமுகுநாதன்
 एम. जयमुरुगानंद / M. JEYAMURUGANAND
 वरि. उप महाप्रबंधक / Sr. Dy. General Manager
 ईडीसी, विद्युत, सी एण्ड आई/EDC, Electrical, C&I
 राणिपेट, बिलासपुर, छत्तीसगढ़/BHEL,BAP,RANIPET - 632406

Material Code :: R56367240000

PO NO :: 5243126 Dated 26.02.2015		
DATA SHEET - Customer No :: R654, R655 Project:RRVUNL/Suratgarh,stage-V,2*660MW,units-7 & 8		
CL. NO	CHARACTERISTICS	Vendor data
1.0	Application	Auxiliary Fan
1.1	Fan / Load Curve referred	Yes
1.2	Qty	2
2.0	Manufacturer	Crompton Greaves Ltd
3.0	Type & frame size	Normal / Energy Efficient Frame Size : ND280M
3.1	Degree of Protection	IP55
4.0	Rated output in kW	90
4.1	Rated speed RPM	1485
5.0	Rated voltage , frequency & phases	415 V AC +/-10% ; 50 Hz +/- 5% ; 10% absolute sum - 3 phase
6.0	Full load current Amps	145
7.0	Energy efficient	IE3
8.0	efficiency & power factor at Full Load	Eff - 95.2 PF -- 0.91
9.0	efficiency & power factor at 75% load	Eff - 95.2 PF -- 0.88
10.0	efficiency & power factor at 50% load	Eff - 94.6 PF -- 0.82
11.0	Duty Cycle	S1 - Continuous
12.0	Rated torque KGM	197.81
13.0	Starting current	700% Subject of IS tolerance
14.0	No load current Amps	40/46 @ RV and Frequency
15.0	Starting torque in % of full load torque	225
16.0	Pull up torque in % of full load torque	191.25
17.0	Pull out torque in % of full load torque	275
18.0	No load starting time (without mechanism coupled)	Less than 2 Seconds
19.0	Locked rotor withstand time at rated voltage	a. Hot 29 b. Cold 58
20.0	Locked rotor withstand time at minimum starting voltage (85% RV)	a. Hot 40 b. Cold 80
21.0	Locked rotor withstand time at 110% rated voltage	a. Hot 24 b. Cold 48
22.0	Starting time at minimum starting voltage with mechanism couples	a. Hot 20.78 b. Cold 41
23.0	Starting time at rated voltage with mechanism couples	a. Hot 13.3 b. Cold 27
24.0	Maximum permissible starting time	35
25.0	Stator thermal time constant	1/2 Minutes
26.0	Type & No. of terminals brought out	Non-Phase Segregated , 3 No's.

TATA CONSULTING ENGINEERS LIMITED
VENDOR DOCUMENT REVIEW STATUS

- ☒ A Drawing/Document approved as submitted. Proceed with fabrication/construction.
- ☐ B Drawing/Document approved subjected to comments noted. Proceed with fabrication/construction considering our comments.
- ☐ C Our comments are noted on this marked up print.
- ☐ D Our comments are noted in memo attached to the forwarding transmittal letter No. TCE.5750A-EL-701-VDT-102 Dated. 18/08/2015
- ☐ E Correct original of this drawing/document to reflect our comments and resubmit for approval.
- ☐ F Correct original of this drawing/document to reflect our comments and resubmit for records.
- ☐ G Drawings/Documents of this category are for information only and not for approval. Information furnished on the drawing/document is noted.
- ☒ H Drawing/Document reviewed against our previous comments and other revisions highlighted and identified by the vendor.
- ☐ I Drawing/Document returned without review.
- ☒ J Print not enclosed.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of the supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

Reviewed by SKK Date 18/08/2015

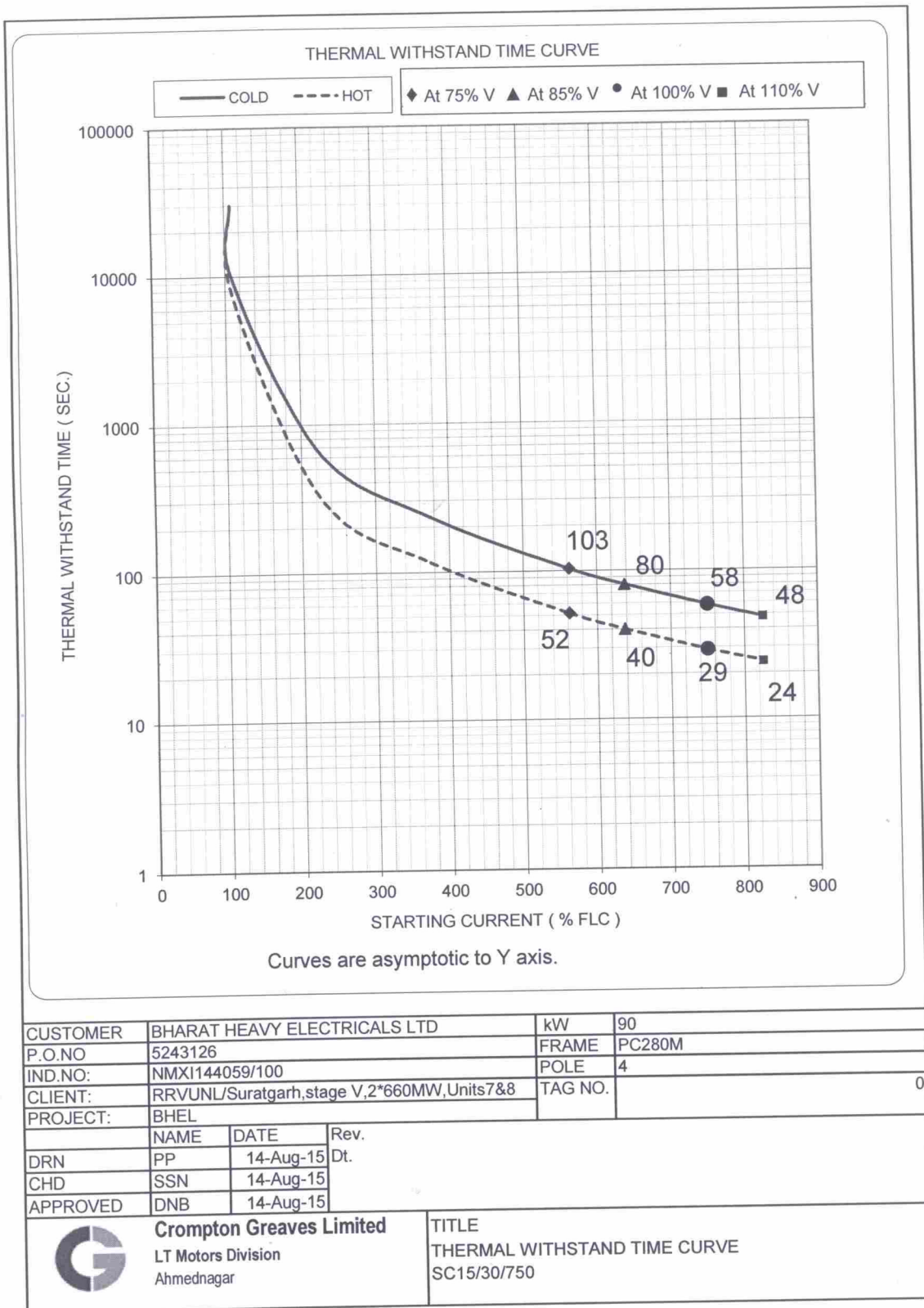
Material Code :: R56367240000

PO NO :: 5243126 Dated 26.02.2015		
DATA SHEET - Customer No :: R654, R655 Project:RRVUNL/Suratgarh,stage-V,2*660MW,units-7 &8		
CL. NO	CHARACTERISTICS	REQUIREMENTS
27.0	Stator winding connection	Delta / Star
28.0	Class of insulation & temperature rise	Class F; 70°C by resistance method
29.0	Minimum permissible starting Voltage	85%
30.0	Resistance per phase (indicative) at 70°C	35.00/35.30 Ohms
31.0	No of successive starts in Hot condition	ONE / TWO
32.0	Quantity and power consumption of space heater	Qty == 2 Nos Watts == 60W
33.0	Direction of rotation	Bi-Directional.
34.0	Bearing make & type	Make :: SKF/FAG/NTN - BALL
		Drive End :6318-C3 Non Drive End :6318-C3
35.0	Lubricant quantity , grade & recommended interval of lubrication	Unirex-N3 20,000 Hours
36.0	Type of mounting & shaft orientation	Foot mounting; Horizontal
	Terminal Box	
37.0	Location & angle of rotation	RHS from DE, 90°
38.0	Gland size for stator rotation	3C-240. Gland Size - CBW010,ATC lug 240 sqmm
39.0	Gland size for space heater	Suitable for 2CX2.5 sq.mm(armoured), if applicable.
40.0	Cable Entry	TOP
41.0	GD ² of motor (kg-m ²)	7.22
42.0	Total weight of motor (Kg).	760
43.0	weight of stator (Kg)	456
44.0	weight of rotor (Kg)	228
45.0	Anticipated bearing life	40,000 Hours
46.0	Method of connection to driven equipment	Direct
	Limiting rotor temperature of determining safe	350 deg celcius
47.0	stall time	
48.0	RTD for winding / Bearing	Applicable for Thermistor
49.0	Grade of balance of motor	GR.2.5
50.0	Standard continuous rating at 40 Deg C ambient.	97.83
51.0	Derated rating of motor at 50 Deg C.	90
52.0	a. Locked Rotor KVA	781.7
	b. Ratio of Locked Rotor KVA / Rated KW	8.69
53.0	a. Motor Dynamic Load	410 kg
	b. Motor Static load	190 kg
54.0	PAINT SHADE	631 of IS : 5
55.0	T.BOX SHORT TIME RATING(FAULT LEVEL)	50 KA FOR 0.25 SEC WITH BACK UP HRC FUSE
56.0	MAX. SHAFT INDUCED VOLTAGE	>200mV
57.0	NOISE LEVEL	85 dB (A) at 1.5 m
58.0	VIBRATION LEVEL	2.2 mm/s

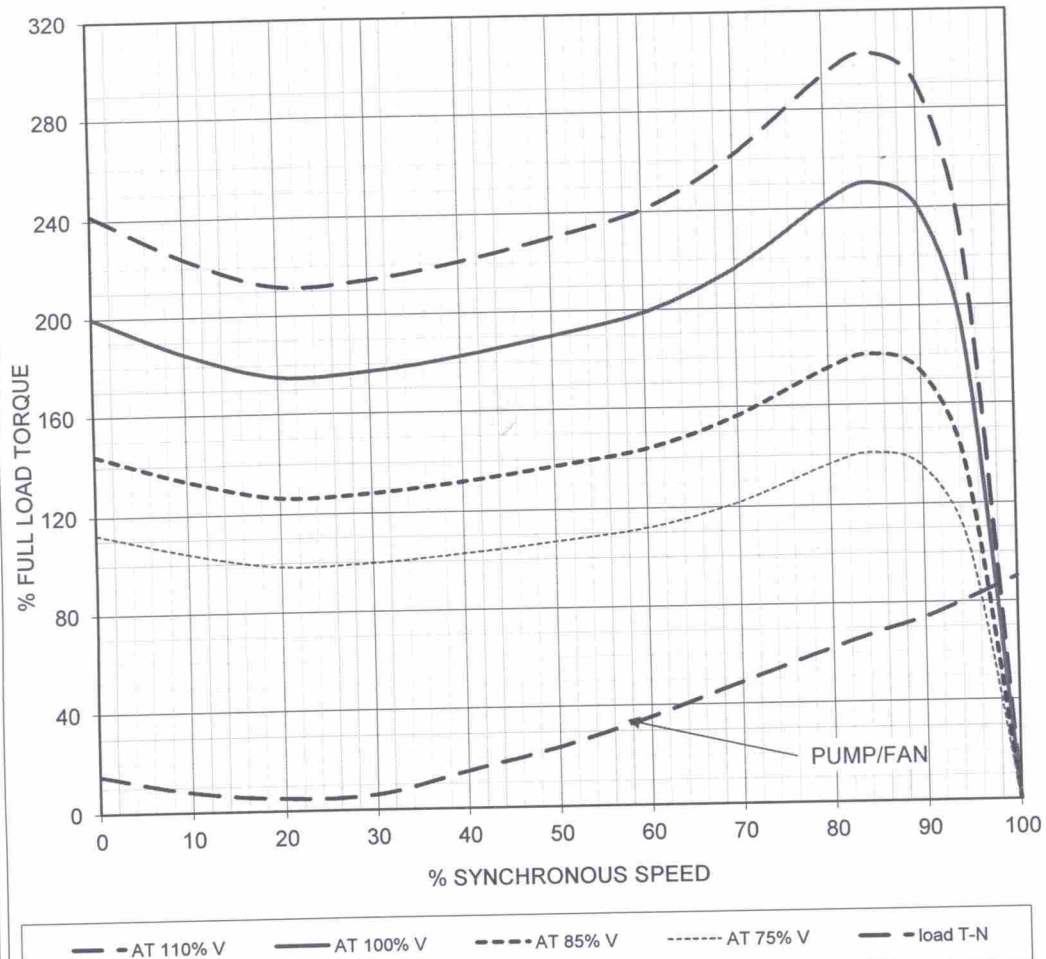
Vendor's Signature and seal.

Rev No :: 3

Date :: 14.08.2015



SPEED VS TORQUE



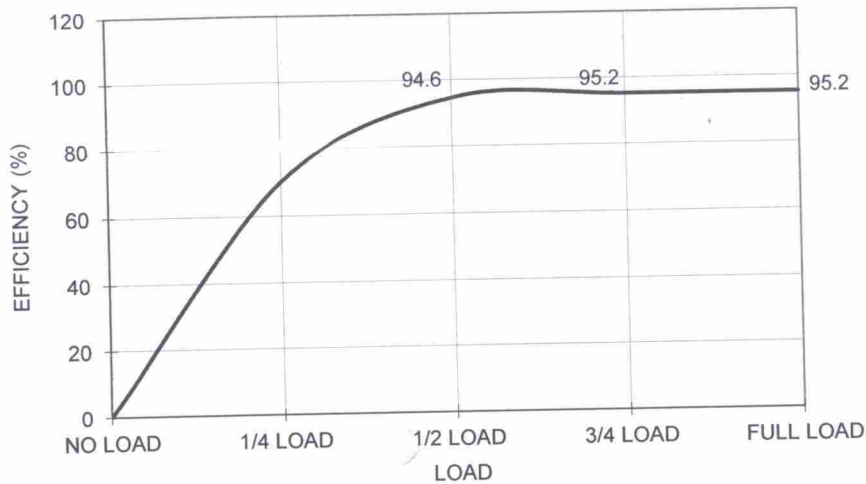
CUSTOMER	BHARAT HEAVY ELECTRICALS LTD		kW	90
P.O.NO	5243126		FRAME	PC280M
IND.NO:	NMXI144059/100		POLE	4
CLIENT:	RRVUNL/Suratgarh, stage V, 2*660MW, Units 7&8		TAG NO.	0
PROJECT:	BHEL			
	NAME	DATE	Rev.	
DRN	PP	14-Aug-15	Dt.	
CHD	SSN	14-Aug-15		
APPROVED	SSN	14-Aug-15		



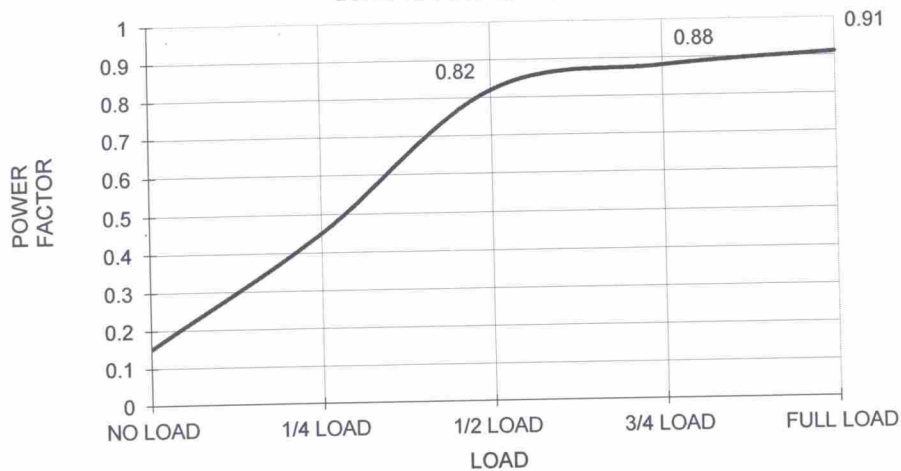
Crompton Greaves Limited
LT Motors Division
Ahmednagar

TITLE
SUPERIMPOSED TORQUE SPEED CURVE
SC200/750

LOAD Vs EFFICIENCY



LOAD Vs POWER-FACTOR



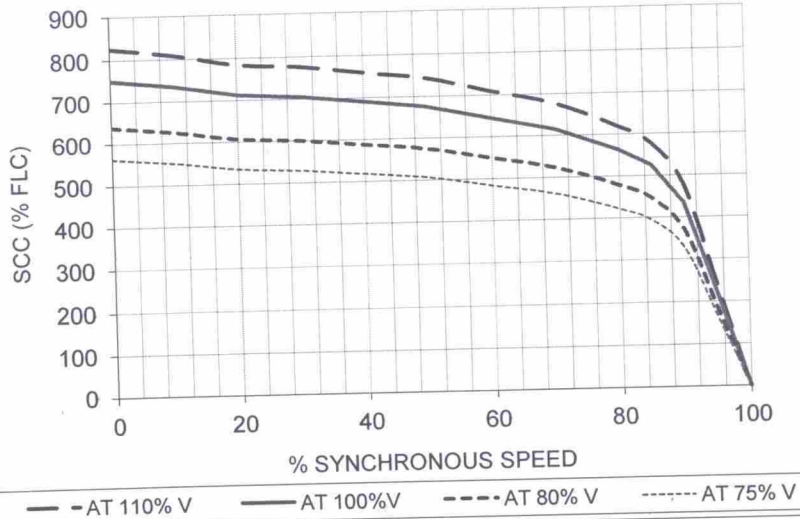
CUSTOMER	BHARAT HEAVY ELECTRICALS LTD		kW	90
P.O.NO	5243126		FRAME	PC280M
IND.NO:	NMXI144059/100		POLE	4
CLIENT:	RRVUNL/Suratgarh, stage V, 2*660MW, Units 7&8		TAG NO.	0
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DRN	PP	14-Aug-15	Dt.	
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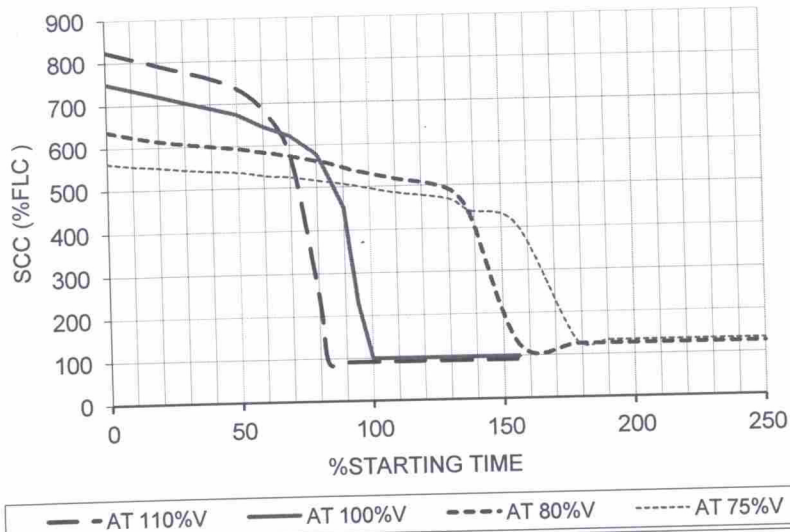
Crompton Greaves Limited
LT Motors Division
Ahmednagar


TITLE
LOAD Vs EFFICIENCY & POWER FACTOR CURVE
SC95.20/0.91

SPEED Vs CURRENT



TIME Vs CURRENT



CUSTOMER	BHARAT HEAVY ELECTRICALS LTD		kW	90
P.O.NO	5243126		FRAME	PC280M
IND.NO:	NMXI144059/100		POLE	4
CLIENT:	RRVUNL/Suratgarh, stage V, 2*660MW, Units 7&8		TAG NO.	0
PROJECT:	BHEL			
	NAME	DATE	Rev.	
DRN	PP	14-Aug-15	Dt.	
CHD	SSN	14-Aug-15		
APPROVED	SSN	14-Aug-15		
 Crompton Greaves Limited LT Motors Division Ahmednagar			TITLE	
			CURRENT SPEED & CURRENT TIME CURVE SC200/750	

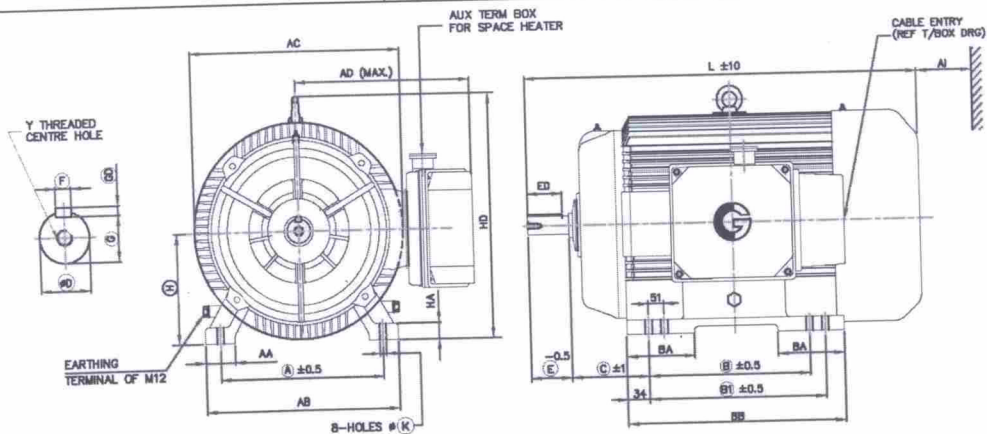
DIMENSION DRAWING OF 3 PH SQUIRREL CAGE TEFC FOOT MOUNTED TB ON RHS (FROM DE) INDUCTION MOTOR

PROJECTION



DO NOT SCALE

PLEASE ASK, IF IN DOUBT



FRAME	FOOT FIXING										OVER ALL					MOTOR wt (kg)	AI**
	A	B	B1	C	H TOL	AA	AB	BA	BB	K TOL	AD	AC	L	HD	HA		
ND280M	457	368	419	190	280 / 279	100	538	160	487	24.0 / 24.5	445	536	1085	642	35	670	120

D END SHAFT EXTENSION AND KEY						
D TOL	E	ED	F TOL	GD TOL	G	Y
75.030 / 75.011	140	110	20.00 / 19.948	12.0 / 11.9	67.5 / 67.3	M20X40

NOTES

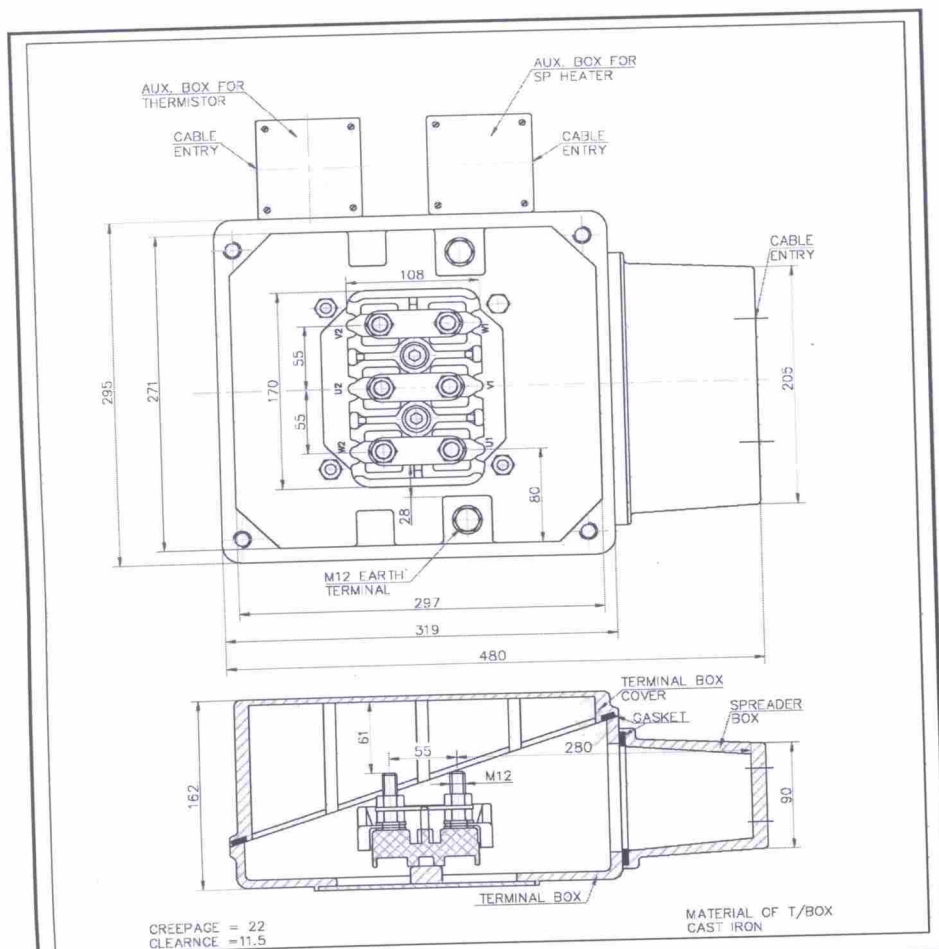
TERMINAL BOX CAN BE ROTATED IN 360 DEG @90 DEG.
TWO EARTHING TERMINAL IS PROVIDED INSIDE MAIN TERMINAL BOX.
MOTOR MAY HAVE ADDITIONAL FOOT HOLES FOR CUSTOMER/SITE FLEXIBILITY
**MINIMUM DISTANCE FOR EFFICIENT COOLING OF MOTOR TO BE MAINTAINED BY USER


CABLE ENTRY IS ON TOP SIDE

ALL DIMENSIONS ARE IN mm

RINGED DIMENSIONS ARE AS PER IS:1231/IEC60072

CUSTOMER	BHARAT HEAVY ELECTRICALS LTD	kW	90
P.O. NO.	5243126	FRAME	ND280M
IND. NO.	NMX1144059/100	POLE	4
CLIENT	BHEL	TAG NO.	
PROJECT	RRVUNL/Suratgarh, stage V, 2*660MW, Units 7&8		
	NAME	DATE	
DRN	SBK	14-Aug-15	
CHD	SBK	14-Aug-15	
APPROVED	SSN	14-Aug-15	
		TITLE	NMX1144059/100-ND280M
		DIMENSION DRAWING	REV:1



ACCESSORIES	SPACE HEATER	THERMISTOR	RTD
APPLICABLE	YES	YES	NA
CABLE SIZE (ENTRY)	1X2CX2.5mm ² (M20X1.5P 1No)	1X2CX2.5mm ² (M20X1.5P 1No)	NA
MAIN CABLE SIZE	2 * 3C,240-MM ² M40X1.5P 2-Nos.		
CUSTOMER	BHARAT HEAVY ELECTRICALS LTD		KW
PO No	5243126		FRAME
INDENT / ENQ No	NMXI144059/100		POLE
CLIENT	BHEL		4
PROJECT	RRVUNL/Suratgarh, stage V, 2*660MW, Units 7&8		Tag No.
	NAME	DATE	ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
DRAWN BY	AMR	14-08-15	SCALE : NTS
CHECKED BY	SBK	14-08-15	Rev.
APPROVED BY	SRB	14-08-15	
			TITLE :
			TERMINAL BOX ARRANGEMENT
			STEAG257-3R1
			DRG No :

61913116