



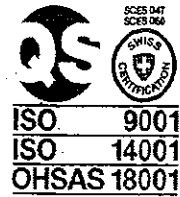
BHARAT PUMPS & COMPRESSORS LTD.

(A Government of India Enterprise)

NAINI, ALLAHABAD - 211010

Phone: 0532 - 2687412, 2687413, FAX : 0532 - 2687075

e-mail : bpclindia@sancharnet.in



ELECTRICAL DOCUMENT FOR RECIPROCATING COMPRESSOR

MODEL : 2HA/1

CUSTOMER : M/s BCPL

OWNER : M/s BCPL

PROJECT : BCPL ASSAM

SITE : ASSAM, INDIA

UNIT : 220 kta LLDPE/HDPE

UNIT No. : 117

SERVICE : ETHYLENE COMPRESSOR

JOB NO. : 6907

**MOTOR KW. : 150 KW, 1500 RPM, 415 V, 3 PH,
INDUCTION MOTOR**

ITEM NO. : 117-KA-930

BPCL S.O.NO. : 302011003-01

**P.O.NO. : 6907-117-KA-PR-5296/535,
Dated 03.05.2011**

Index

List of Electrical documents

A. Main compressors Motor (150 KW Motor) Documents:

1. Motor Datasheet.
2. Motor Outline Dimensional Drawing (OGA)
3. Main Terminal Box Drawing.
4. Speed-Torque curve.
5. Load Vs Eff. & Load Vs P.F. curve.
6. Speed Vs Current & Time Vs current Curve.

B. Lube Oil Pump Motor (1.1 KW Motor) Documents:

1. Motor Datasheet.
2. Motor Outline Dimensional Drawing (OGA)
3. Main Terminal Box Drawing.
4. Speed-Torque curve.
5. Load Vs Eff. & Load Vs P.F. curve.
6. Speed Vs Current & Time Vs current Curve.

C. Other Electrical Documents:

1. OGA of LCS for Main Motor, Lube oil Pump Motor & Cooling Water Pump Motor.
2. OGA of LCS for Lube oil console heater & Cooling Water console Heater.
3. OGA of Lube oil console Heater.
4. OGA of Cooling Water console Heater



CROMPTON GREAVES LTD.
LT MOTORS DIVISION
AHMEDNAGAR

CUSTOMER : BHARAT PUMPS & COMPRESSORS
INDENT NO : NMQ1110004/100
PO NO : 4461-16730611-776
PO DATE : 08/24/2011

Datasheet No.
6907-117-16-50-DS-5297

Rev. 0

Page 1 of 1

MEDIUM VOLTAGE SQUIRREL CAGE INDUCTION
MOTOR

PURCH ORDER

Site conditions		3 Atmospheric condition: Humid & highly corrosive	
Ambient temperature, minimum:	1 °C	4 Altitude:	< 1000 m
maximum:	39.8 °C	5 Location:	Outdoor
design:	40 °C	6	
Relative humidity:	93%		
Technical particulars			
Motor tag no.:	117-KM-935		
Driven equipment name:	Ethylene Compressor		
Voltage:	415, +6%	16 Hazardous area classification:	Zone 1, Div. 1
Phase:	3	17 Gas group/Temp class:	Gas Group-IIA, IIB / Temp. Class T3
Frequency:	50, +3%	18 Type of explosion protection:	Flame Proof End
Fault level:	50 kA for 0.25 s	19 Type of Ingress protection:	IP55
Method of starting:	Direct On Line	20 Color shade:	ADP 632 as per IS-5
Winding connection:	Delta	21 Thermistors:	☐ Required ☒ Not Required
No. of terminals:	6	22 RTD:	☐ Required ☒ Not Required
Cable size:	2 * 3C, 185-MM ²	23 BTD:	☐ Required ☒ Not Required
Cable type:	Al Cond. PVC insulated	24 RTD/BTD monitoring device:	☐ Required ☒ Not Required
Temperature rise:	80 °C		
Cooling:	IC411		
Insulation class:	F with temp rise limited to Class B.	25 Applicable specification:	EIL spec. 6-51-0032

DRIVEN EQUIPMENT MANUFACTURER'S DATA

Suggested motor rating:	150 kW	9 Torque required, starting: 90% FLT
Manufacturer:	BP&CL	maximum: 100% FLT
BkV at full load:	76 kW	10 GD ² of eqpt., including flywheel: 350 kgm ²
kW at end of curve:	-- kW	excluding flywheel: kgm ²
Speed:	830 RPM	11 Thrust, up: kg
Rotation viewed from coupling end:	CW	down: kg
Driven equipment:	Reciprocating Compressor	12 Starting condition:
Coupling type:	PULLEY / V-BELT	No Load

MOTOR MANUFACTURER'S DATA

1 Rating:	150 kW	17 Efficiency at, 75% voltage: 94 %
2 Manufacturer:	CGL	100% voltage: 85 %
3 No. of poles:	4	18 Power factor at, starting: 0.4
4 Frame designation:	E315L	100% load: 0.87
5 Full load speed:	1490 RPM	19 Moment of inertia / GD ² : 6.24 / 24.97 kgm ²
6 Mounting:	B3	20 NDE bearing type & no.: BALL/8319-C3
7 Full load torque (FLT):	98.05 mkg	21 DE bearing type & no.: ROLLER/NU319-C3
8 Starting torque:	160 % of FLT	22 Type of lubrication: UNIREX-N3
9 Break down or pull out torque:	225 % of FLT	23 Weight of motor: 1752 kg
10 Full load current (FLC):	252 A	24 Thermistors, quantity: NA no.
11 Starting current at 100% voltage:	600 % of FLC	make: NA type: NA
12 Rotation viewed from coupling end:	Clockwise from DE	25 RTD, quantity: NA no.
13 Starting time at, 75% voltage: 4.7 sec.		make: NA type: NA
100% voltage: 2.6 sec.		26 BTD, quantity: NA no.
14 Locked rotor withstand time (cold/hot) at, 75% voltage: 53/27 sec.		make: NA type: NA
100% voltage: 30/15 sec.		27 Shaft voltage: NA V
15 Space heater - voltage & power: SPACE HEATER 60 W X 2, 240 V		28 Critical speed, 1 st /2 nd stage: >125% Synch. RPM
16 Applicable IS/IEC for hazardous area application: IS:1231, IS:12075, IS:12065, IS:325		29 Canopy (FRP): ☐ Required ☒ Not Required

- Starting time calculations shall be based on operating conditions specified on Material Requisition eg. open valve condition/ closed valve condition, at no load/full load, as applicable.
- All blank data shall be filled by vendor

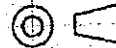
Bharat Pumps & Compressors
Naini, Allahabad

B	18.11.08	ISSUED WITH MR	MHR	SV	
A	08.09.2008	ISSUED WITH MR	MHR	SV	UAP
Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by

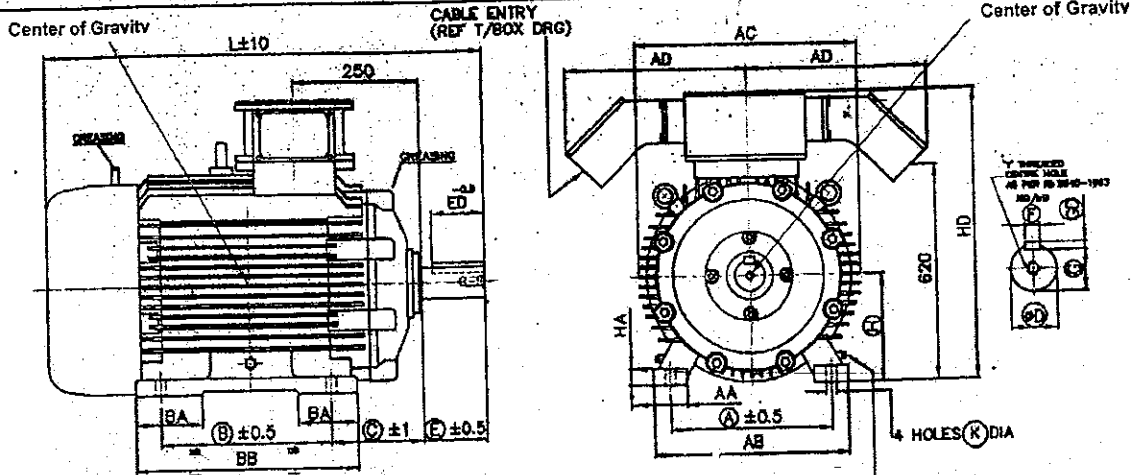
NOTE: 1) ALL PERFORMANCE FIGURES ARE SUBJECT TO IS 325 - 1996 TOLERANCES.
ISSUED BY: Gayatri Muley
LT MOTORS DIVISION, AHMEDNAGAR

DIMENSION DRAWING OF 3 PH SQUIREL CAGE TEFC FOOT MOUNTED TB ON TOP FLAME PROOF (GROUP IIA/IIB) INDUCTION MOTOR

PROJECTION



DO NOT SCALE



RINGED DIMENSIONS ARE AS PER IS: 2223
ALL DIMENSIONS ARE IN mm

FRAME SIZE	FOOT FIXING								OVER ALL					
	A	B	B1	C	HTOL	AA	AB	BA	BB	KTOL	AD	AC	L	HD
E315L	508	508		216	315 / 314	100	597	125	590	28.5 / 28.0	480	710	1380	875

SHAFT AND KEY						
D TOL	E	ED	F TOL	GD TOL	G	Y
90.035 / 90.013	170	140	25.00 / 24.948	14.0 / 13.9	81.0 / 80.08	M24X50

For final approval
[Signature] 05/02/12
Bharat Pumps & Compressor Ltd.
Naini, Allahabad

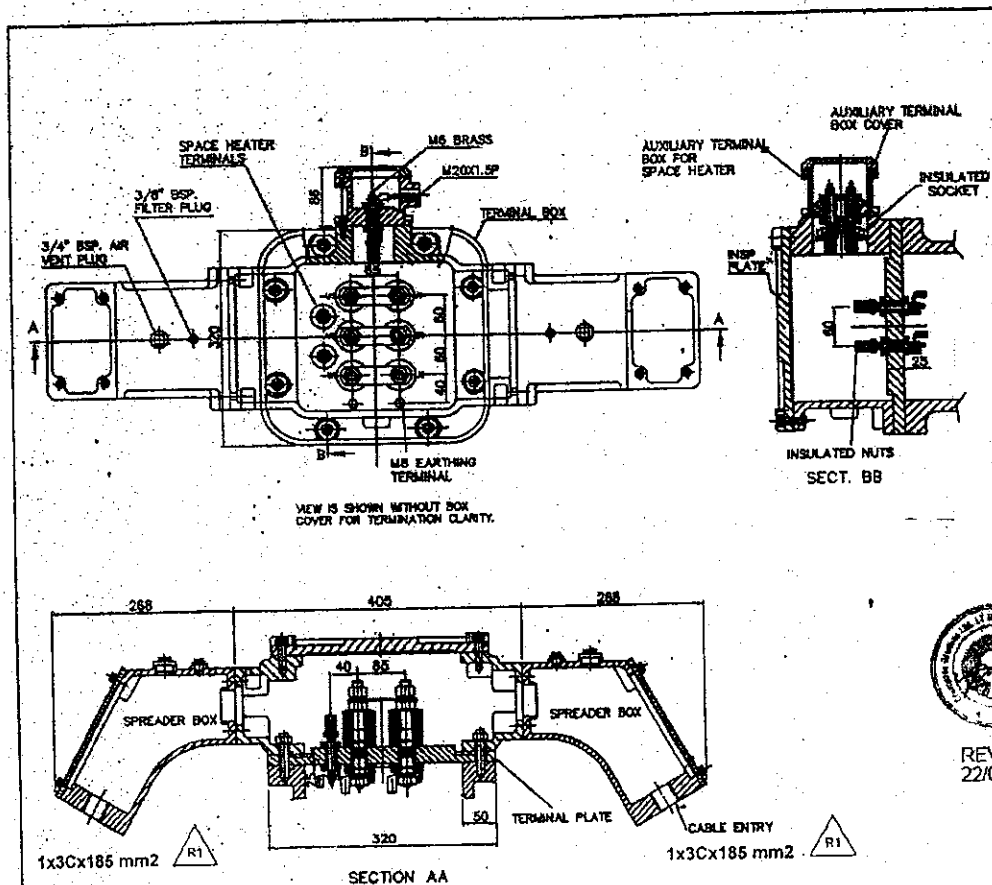
ERTL Test Report ERTL(E)TES/C184/0049/12-07 Dt. 16/01/2008
DGMS Letter No. 83/2809/EHQ Dt. 09/09/2010
DGMS Approval No. 160
CCE Letter No. A/P/HQ/MH/104/1534(P211851) Dt. 14/09/2009---Gas Group IIB
A/P/HQ/MH/104/1534(P211851) Dt. 13/06/2008---Gas Group IIA



REV01
22/01/2012

Code-1
[Signature]
20/2/12

CUSTOMER	BHARAT PUMPS & COMPRESSORS	KW	150
P.O. NO.	4461-16730611-776	FRAME	E315L
IND. NO.	NMQ110004/100	POLE	4
CLIENT	M/S B.C.P.L THRU M/S EIL N. Delhi	TAG NO.	117-KM-935
PROJECT	BAHMAPUTRA PETROCHEMICAL COMPLEX	ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED	
DRN	SBK		
CHD	SBK		
APPROVED	DNB		
Crompton Greaves Limited LT Motors Division Ahmednagar		TITLE OUTLINE DIMENSION DRAWING	
		E315LB3.V6TOP	



REV.1
22/01/2012

Code-12
Unik
20/2/12

Cable UAD - 38.89 mm
OAD - 40.49 mm
OD - 45 mm
Tolerance - ± 2 mm

CLEARANCE: 24
CREEPAGE 30

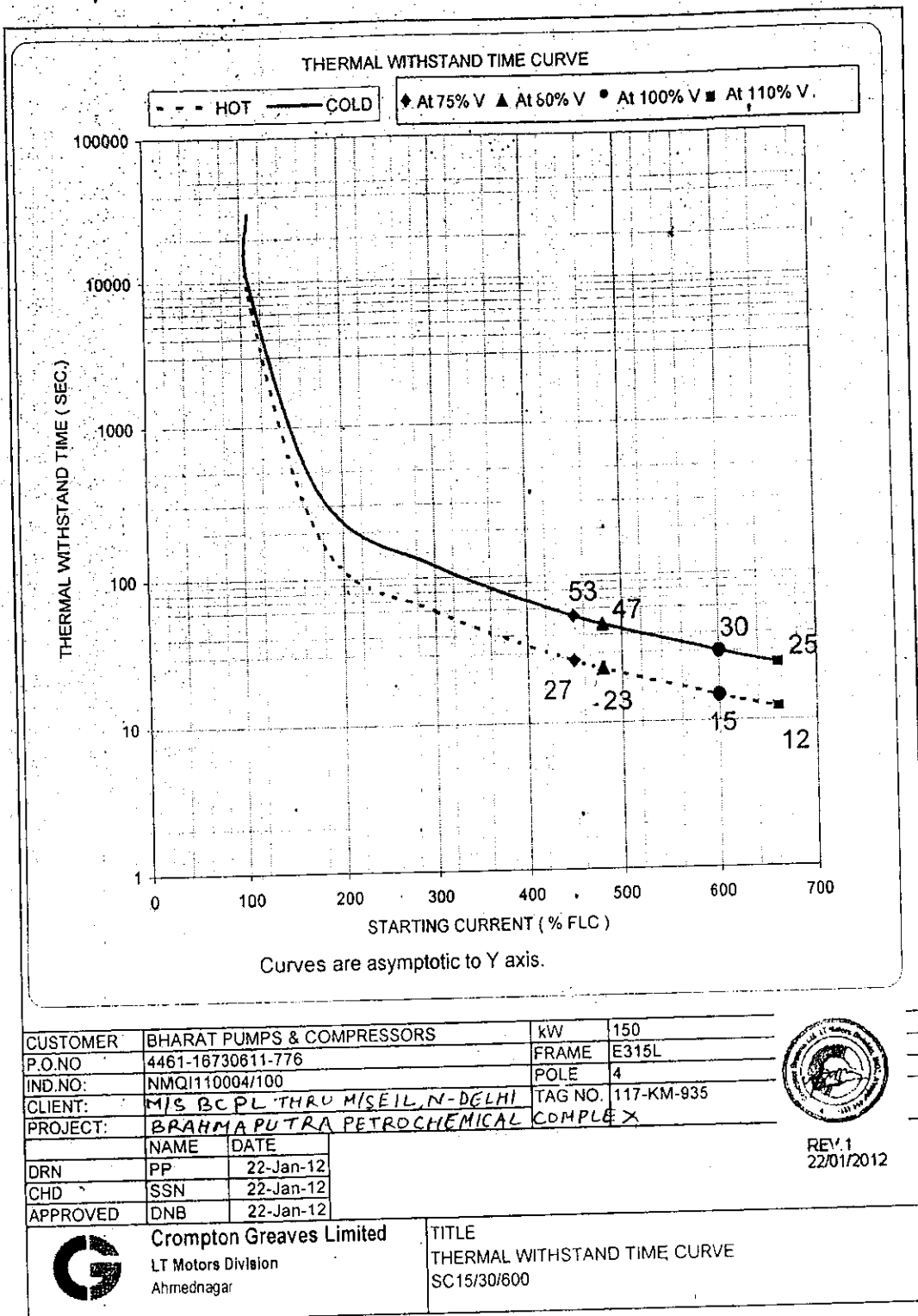
TB DESIGN
2.3C.185CI
2.3.5C.150CI

	SPACE HEATER	THERMISTOR	ET SIZE	RTD	
PROVIDED	YES	NA		NA	
CABLE SIZE	1X3CX2.5mm ²	NA	M20X1.5P	NA	
MAIN CABLE SIZE:	2 * 3C,185-MM ²		M50X1.5P 2-Nos.		
CUSTOMER:	BHARAT PUMPS & COMPRESSORS		KW	150	
P.O.NO	4461-16730611-776		FRAME	E315L	
IND.NO:	NMQ1110004/100		POLE	4	
CLIENT:	M/S BCPL THRU M/S EIL, N. DELHI Tag No. 117-KM-935				
PROJECT:	BRAHMA PUTRA PETROCHEMICAL COMPLEX				
	NAME	DATE	ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED SCALE: NTS		
DRN	SBK	22/01/12			
CHD	SBK	22/01/12			
APPROVED	DNB	22/01/12			
 Crompton Greaves Limited LT Motors Division Ahmednagar			TITLE TERMINAL BOX ARRANGEMENT		SQA6967R2

65752295

For final approval
[Signature] 05/02/12

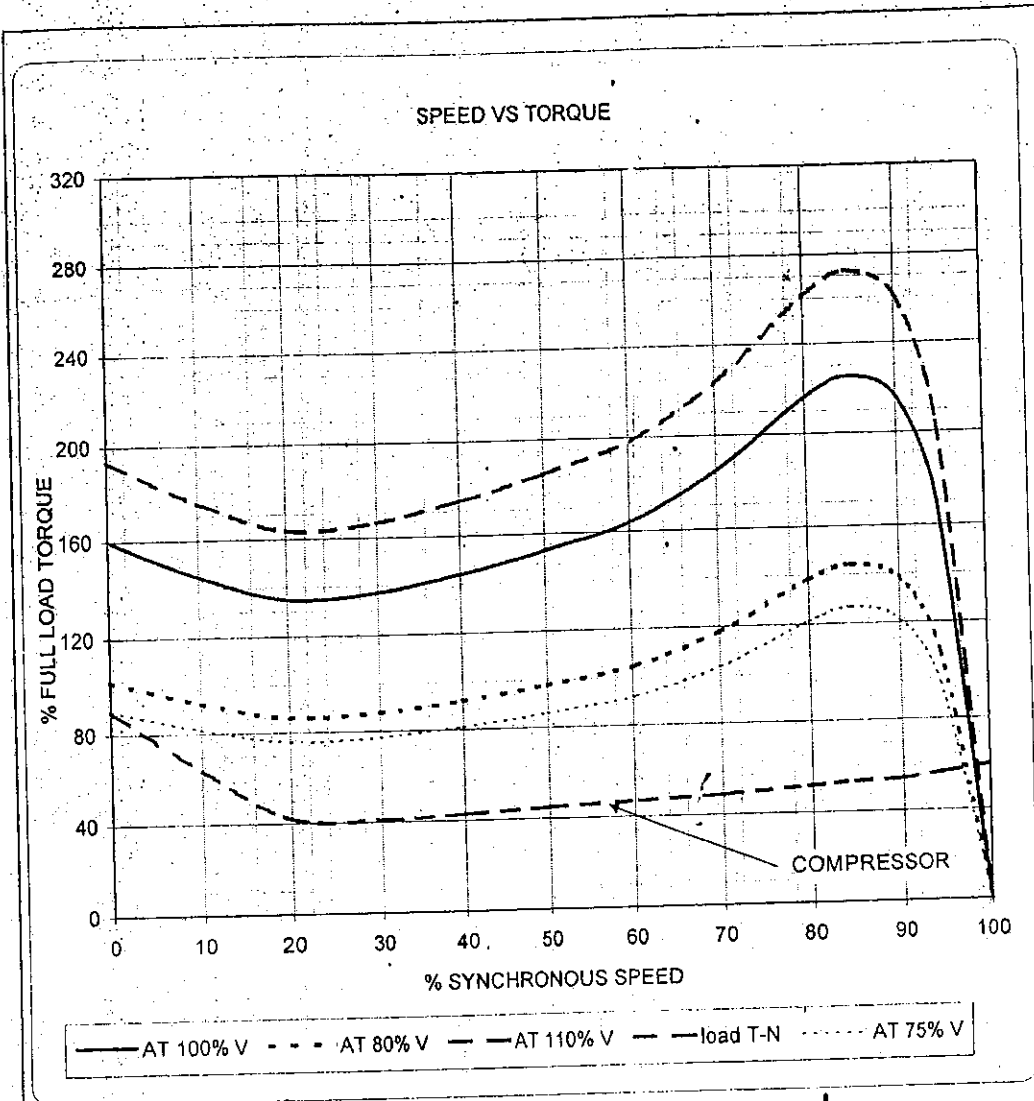
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Naini, Allahabad



Code-R
Link
20/4/12

For reference
& Record

Aug 05/02/12
Bharat Pumps & Compressor Ltd
Naini, Allahabad



CUSTOMER	BHARAT PUMPS & COMPRESSORS		kW	150
P.O.NO	4461-16730611-776		FRAME	E315L
IND.NO:	NMQ1110004/100		POLE	4
CLIENT:	MIS BCPL / MISEIL, N-DELHI		TAG NO.	117-KM-935
PROJECT:	BRAHMAPUTRA PETROCHEMICAL COMPLEX			
	NAME	DATE		
DRN	PP	22-Jan-12		
CHD	SSN	22-Jan-12		
APPROVED	DNB	22-Jan-12		



REV 1
22/01/2012



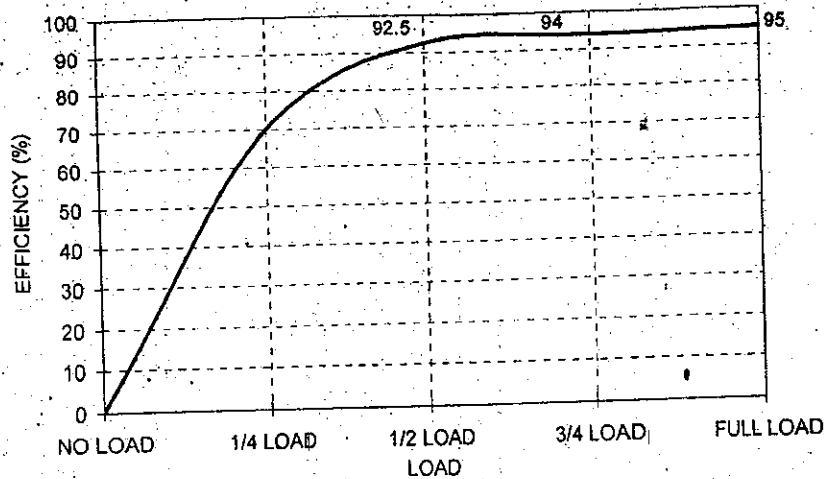
Crompton Greaves Limited
LT Motors Division
Ahmednagar

TITLE
SUPERIMPOSED TORQUE SPEED CURVE
SC160/600

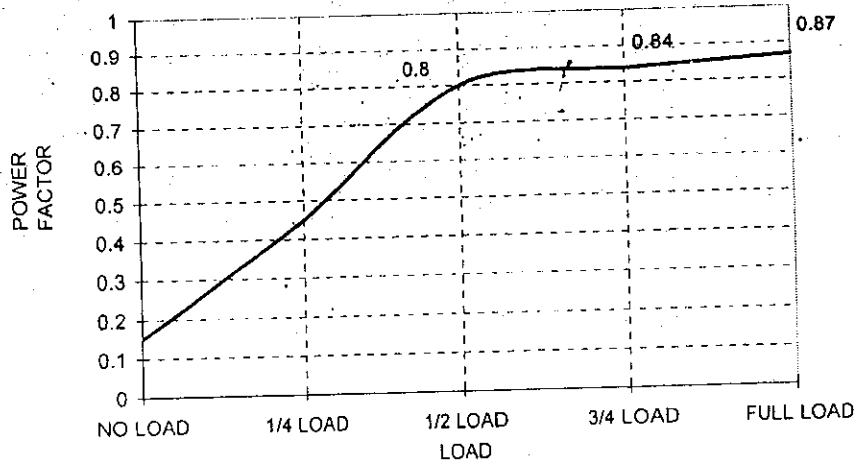
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Naini, Allahabad

LOAD Vs EFFICIENCY

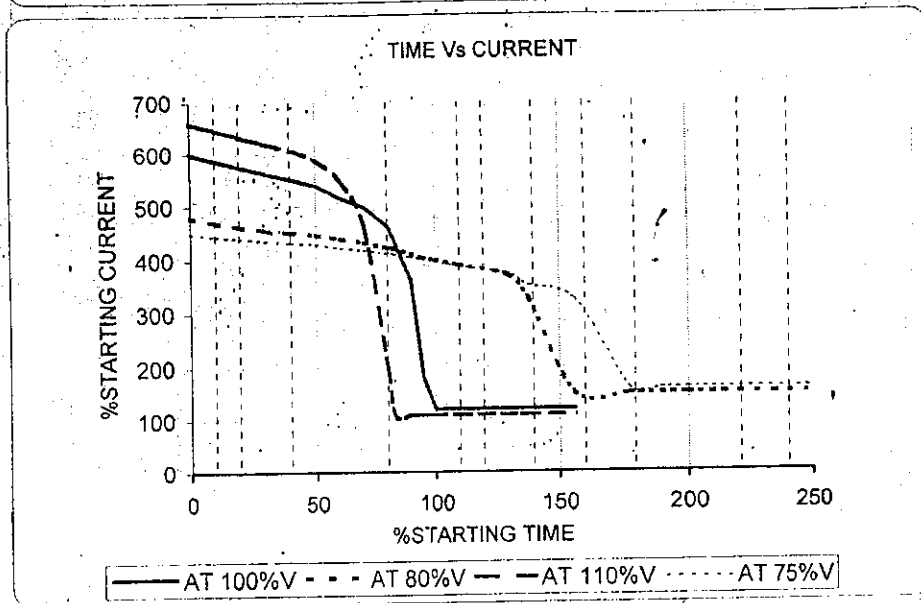
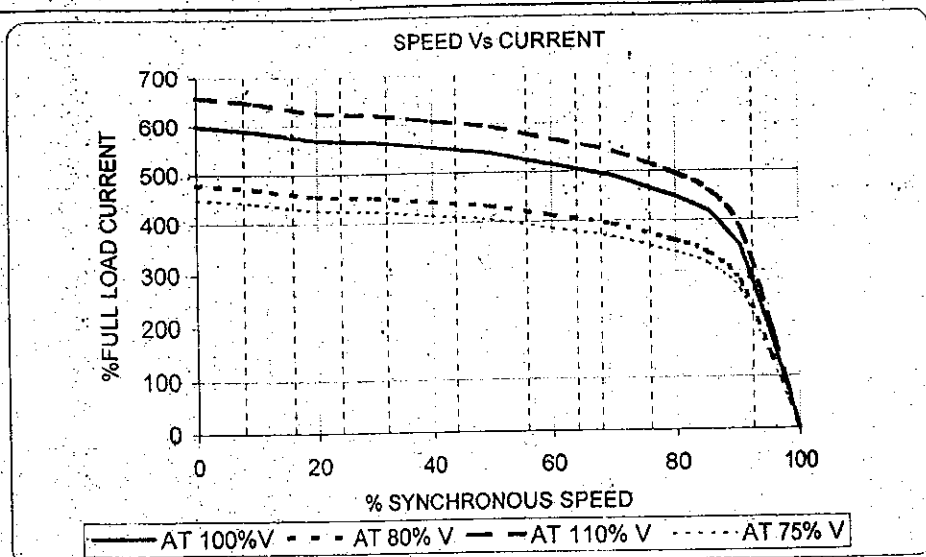


LOAD Vs POWER-FACTOR



CUSTOMER	BHARAT PUMPS & COMPRESSORS		kW	150
P.O.NO	4461-16730611-776		FRAME	E315L
IND.NO:	NMQ1110004/100		POLE	4
CLIENT:	M/S BCPL / M/S EIL, N-DELHI		TAG NO.	117-KM-935
PROJECT:	BRAHMAPUTRA PETROCHEMICAL COMPLEX			
	NAME	DATE		
DRN	PP	22-Jan-12		
CHD	SSN	22-Jan-12		
APPROVED	DNB	22-Jan-12		

REV.1
22/01/2012Crompton Greaves Limited
LT Motors Division
AhmednagarTITLE
LOAD Vs EFFICIENCY & POWER FACTOR CURVE
SC95.00/0.87For reference
& RecordBharat Pumps & Compressor Ltr
Naini, Allahabad



CUSTOMER	BHARAT PUMPS & COMPRESSORS	kW	150
P.O.NO	4461-16730611-776	FRAME	E315L
IND.NO:	NMQ110004/100	POLE	4
CLIENT:	M/S BCPL / M/S EIL, N-DELHI	TAG NO.	117-KM-935
PROJECT:	BRAHMAPUTRA PETROCHEMICAL COMPLEX		
	NAME	DATE	
DRN	PP	22-Jan-12	
CHD	SSN	22-Jan-12	
APPROVED	DNB	22-Jan-12	



REV.1
22/01/2012



Crompton Greaves Limited
LT Motors Division
Ahmednagar

TITLE
CURRENT SPEED & CURRENT TIME CURVE
SC160/600

For reference
& records.

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Naini, Allahabad

STARTING TIME CALCULATION (DIRECT ON LINE)

Equip.:	Load GD ² =	
Curve Number : as given	350	
Motor kW	150	
Load GD ² referred to motor shaft (kgm ²)	62.57150579	Load GD ² * (load RPM ² / Motor RPM ²)
LOAD RPM	630	From load T-N curve
Load Average Torque(kgm)	18.07	From load T-N curve
Motor GD ² (kgm ²)	24.97	
Load Full load torque(kgm)	98.05	From load T-N curve or equal to motor FLT
Motor RPM	1490	
Motor FLT (kgm)	98.05	974 * motor kW / motor RPM
Motor starting torque (%FLT)	160	
Motor pullup torque (%FLT)	128	
Motor pullout torque (%FLT)	225	
Motor average torque (kgm)	150.27	Motor flt * (stg+put+pot+100)/400

Voltage available at motor terminals (k = factor for % Rated Voltage)	at 100% V 1	at 80% V 0.80	at 110% V 1.10
Motor average torque = Motor flt * (stg+put+pot+100)/400*k	150.27	96.17	181.82
Load Average torque (taken from curve) (kgm)	18.07		

Starting time on DOL (second) =	$\frac{(\text{load GD}^2 + \text{motor GD}^2) * \text{motor RPM}}{375 (\text{Motor average torque} - \text{load average torque})}$		
=	2.6	4.5	2.1



Thermal Withstand Time (second)	15	23	12
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REV. 1
22/01/2012

Comment:

CGL Offer no. : NMQI110004 / 100

Prep.By : Gayatri Muley

Customer : BHARAT PUMPS & COMPRESSORS

Date : 22/01.2012

For reference
& record. *[Signature]* 05/02/12

Bharat Pumps & Compressor Ltd
Naini, Allahabad