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ISO 9001:2000

**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**

(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)

No. HMBP/PUR/2019/962012/EL-001

Dated: 27.11.2019

Due date of submission of technical offer: 05.12.2019

Subject: Expression of Interest for supplying of flame Proof Motors of 2.2 KW Capacity & 7.5 KW capacities

Dear Sir,

HEC intends to procure flame proof motors as per attached specifications & approved data sheets, You are requested to submit your technical offer along with licensing and certification from approved authorities, your credentials (Copies of purchase orders for supplying similar motors to reputed Organizations/PSUs) & technical catalogues etc detailed as below :-

A: For 2.2 KW Motor for Horizontal Sling Door:

SI No.	Description	Quantity in No.s	Reference
1	2.2KW Flame proof Motor (Class- IIB, T4) for Horizontal Sliding Door No. of Starts / hr. & CDF-150 St. / hr.& S4 - 40% CDF RPM (Syn.)- 750 Frame-132M	16 No.s	Please refer Annexure-1 for detailed Technical specification

Note:

1. LICENSING AND CERTIFICATION FROM APPROVED AUTHORITIES:-

- The firm shall have obtained license from Indian standards institution for manufacture of flame proof electrical equipment.
- All electrical equipment shall have been tested and approved for flame proof enclosures by Central Institute of Mining and Fuel Research (CIMFR), Dhanbad. Also approval certificates shall have been obtained from the following authorities:-
 - Chief controller of explosives, Nagpur (C.C.E.).
 - Director General, Factory Advice service and Labour institutes (D.G.F.A.S. & L.I), Mumbai.
 - In case of countries other than India, certificates from equivalent institutions shall be submitted.
- Applicable test reports and test certificates for each of the above mentioned test shall be submitted to the purchaser before inspection of materials. Materials can be dispatched only after approval of test certificates.

2. Following documents to be furnished with response against EOI:



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- a- Technical Data sheet similar to approved data sheets , Approved data sheet enclosed for reference.
- b- Necessary Documents like catalogues, Flame Proof Certificates
- c- List of Clients /Reputed Organizations to whom brand flame proof motors supplied
- d- Licensing And Certification From Approved Authorities as explained above

B. For 7.5 KW motors for folding platform:

SI No.	Description	Quantity in No.s	Reference
1	7.5KW Flame proof Motor (Class- IIB,T4) No of starts/Hr. & CDF=150 St. / hr.& S4 - 40% CDF RPM=1000, Frame=160L.	22	For Detailed Technical Specification, Please refer attached annexure-II

Note:

1. LICENSING AND CERTIFICATION FROM APPROVED AUTHORITIES:-

- a. The tenderer shall have obtained license from Indian standards institution for manufacture of flame proof electrical equipment.
- b. All electrical equipment shall have been tested and approved for flame proof enclosures by Central Institute of Mining and Fuel Research (CIMFR), Dhanbad. Also approval certificates shall have been obtained from the following authorities:-
 - iv. Chief controller of explosives, Nagpur (C.C.E.).
 - v. Director General, Factory Advice service and Labour institutes (D.G.F.A.S. & L.I), Mumbai.
 - vi. In case of countries other than India, certificates from equivalent institutions shall be submitted.
- c. Applicable test reports and test certificates for each of the above mentioned test shall be submitted to the purchaser before inspection of materials. Materials can be dispatched only after approval of test certificates

2. Following documents to be furnished with response against EOI:

- a- Technical Data sheet similar to approved data sheets, Approved data sheet enclosed for reference.
- b- Necessary Documents like catalogues, Flame Proof Certificates
- c- List of Clients /Reputed Organizations to whom brand flame proof motors supplied
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Method & Schedule for submission of Technical offer:

Technical offer for both motors i.e 2.2 KW flameproof motor & 7.5 KW Flame proof motor along with aforesaid all documents to be submitted through email followed by hard copy through courier by **due date of submission i.e. 05.12.2019 by 1.00PM.**

Checklist of documents: Before submission of technical offer, please ensure that all documents as per below checklist are enclosed (This checklist to be enclosed along with technical offer):

Document description	Enclosed/Not enclosed	Enclosed/Not enclosed
license from Indian standards institution for manufacture of flame proof electrical equipment		
Testing and approval for flame proof enclosures by Central Institute of Mining and Fuel Research (CIMFR)		
Approval /certificates from Chief controller of explosives, Nagpur (C.C.E.).		
Approval /certificates from Director General, Factory Advice service and Labour institutes (D.G.F.A.S. & L.I), Mumbai.		
List of Clients /Reputed Organizations to whom brand flame proof motors supplied.		
Copies of Purchase order for supplying similar motors to reputed Organizations/PSUs		

BABLOO SONI
Deputy Manager /PUR
Heavy machine Building Plant
HEC Ltd, Ranchi-4



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Annexure-I (Technical Specification of 2.2 KW Motor)**1. INTRODUCTION :-**

This specification covers the design, manufacture, testing at manufacture's premises and supply of motors FOR HMBP, Ranchi for HSDs of PSLV Integration Facility (PIF), SDSC, SHAR Centre of Indian Space Research Organization (ISRO), Sriharikota, Andhra Pradesh.

2. SCOPE OF SUPPLY :-

The scope of supply against this tender enquiry consists of design, manufacture, testing at manufacture's premises and supply of motors.

Sl. No	Mechanism.	Electrical KW at 50°C ambient Temp.	No. of Starts / hr. & CDF	RPM (Syn.)	Frame	Qty.	Material code
1.	Horizontal Sliding Door	2.2KW Flame proof Motor (Class- IIB, T4)	150 St. / hr. & S4 - 40% CDF	750	132M	16 Nos.	5533303570

3. BASIS AND SITE CONDITIONS :-

1.	Ambient temperature	50°C.
2.	Relative humidity	95% Maximum, However, both maximum ambient and maximum relative humidity may not occur simultaneously.
3.	Altitude	Less than 1000M above MSL.
4.	Hazardous area classification	Zone – I, Gas group IIB.
5.	Temperature Classification	T4 as per IS: 8239 – 76.
6.	Type of enclosure	Flame proof, Ex d.
7.	Power Supply of conditions :-	



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a) Voltage with variation	415V±10%
b) Frequency with variation	50Hz±5%
c) Combined voltage & Frequency variation	10% maximum (absolute sum)
d) Short circuit level	50KA for 1 second
e) System Earthing	Solidly earthed

4. APPLICABLE STANDARDS:-

1.	3 Phase induction motor. – IS :325-1996 / IEC-34
2.	Guide for testing 3 Phase induction motor. – IS :4029-2010
3.	Flame proof enclosures for electrical apparatus – IS :2148-2006
4.	Classification of Hazardous Area (other than mines) for electrical installations. – IS:5572-2009
5.	Guide for selection of electrical equipment for Hazardous Area. – IS: 5571-2009
6.	Classification of maximum surface temperature of electrical equipments for use in explosive atmosphere- IS: 8239 (Latest revision)
7.	The equipment shall also comply with provisions of Indian Electricity Act and Indian Electricity Rules as amended up to date in addition to the statutory requirement of state of Andhra Pradesh.

5. WARRANTY:-

The equipment supplied shall be under warranty for the period of 12 months from the successful commissioning and acceptance by M/s ISRO.

6. LICENSING AND CERTIFICATION FROM APPROVED AUTHORITIES:-

- 6.1. The tenderer shall have obtained license from Indian standards institution for manufacture of flame proof electrical equipment.
- 6.2. All electrical equipment shall have been tested and approved for flame proof enclosures by Central Institute of Mining and Fuel Research (CIMFR), Dhanbad. Also approval certificates shall have been obtained from the following authorities:-

- a) Chief controller of explosives, Nagpur (C.C.E.).
- b) Director General, Factory Advice service and Labour institutes (D.G.F.A.S. & L.I), Mumbai.



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- c) In case of countries other than India, certificates from equivalent institutions shall be submitted.

6.3. Applicable test reports and test certificates for each of the above mentioned test shall be submitted to the purchaser before inspection of materials. Materials can be dispatched only after approval of test certificates.

7. INFORMATION ALONG WITH THE OFFER :-

- 7.1. Point wise confirmation of the enquiry specification, clearly indicating deviations, if any.
7.2. Dimensional GA drg. of the motors.
7.3 Filled up Motor data sheet as per Annexure-A.

8. DRGS. & DOCUMENTS:-

8.1. The following drgs. shall be furnished by the successful tenderer in 5 set within weeks after placement of order :-

- a) Motor GA drg.
- b) Motor data sheet.
- c) Torque – speed characteristics of Motor.
- d) Thermal withstand characteristics.
- e) Current – time characteristics.
- f) Characteristics Curve for P.f. & Efficiency at 100%, 75% & 50% Load.

- g) Valid test certificates for all type tests and over speed test as per IS 325 – 96 for same / identical motors.

- h) Calculation of efficiency of motors as per IS: 325.
- i) Certificate for conformity of the design to specified degree of protection of enclosure.

- j) Any other drg. required by M/s ISRO / M/s Tata Consulting Engineers Ltd for their scrutiny and reference.

8.2. The submission of drawing / documents in 5 sets by the vendor for approval from M/s ISRO / Tata Consulting Engineers Ltd. shall be routed through M/s HEC, but the approval of drawing and documents from M/s ISRO / Tata Consulting Engineers Ltd. shall be responsibility of the tenderer. Any minor changes required by them during drawing approval stage shall be the responsibility of the tenderer and same shall have to be incorporated without any price implications.



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- 8.3. After approval of drgs./ documents, another 5 Sets of all approved drgs. and documents shall be furnished by the manufacturer to M/s ISRO / M/s Tata Consulting Engineers Ltd. for necessary distribution.

All drgs. shall be made in **AUTOCAD of Latest version.**

- 8.4. Required no. of Sets of drgs./ documents for approval of statutory authority (if required) shall be submitted at least 3 months prior to first shipment or sufficiently in advance so as to take care of statutory clearances required at appropriate time.
Obtained statutory clearance from statutory authorities shall be the responsibility of the tenderer.
- 8.5. 5 Sets of prints and softcopies of all drgs. curves etc. incorporating approved changes, if any, shall be supplied to M/s ISRO.
All these drgs. shall be marked as "As Built".
- 8.6. 5 Sets of Operation and Maintenance manual of Motor are also to be submitted.
- 8.7. The instruction manuals shall present the following basic categories of information in a comprehensive manner:-
- a). Instruction manuals for pre commissioning check up, operation, abnormal condition, maintenance and repair.
 - b). Schedule of preventive maintenance.
 - c). Ordering information for spares.

9.0 TECHNICAL SPECIFICATIONS :-

Sl. No.	Description	Specifications
9.1	Driven equipment	Horizontal sliding Door
9.2	Standard	IS:325-1996, IS:4029-2010, IS:5571-2009, IS:5572-2009, IS:2148-2006, IS:5780-2006, IS:8239 (Latest revision), IEC-34 (Latest revision).
9.3	Type	AC Sq. cage, FLP, heavy duty. reversible, TEFC, crane duty motor, outdoor duty.
9.4	Ambient temperature	50°C
9.5	Hazardous area classification	Zone -1, Gas Group – IIB
9.6	Temperature class	T4 as per IS:8239 (latest revision)



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9.7	Type of enclosure	Flame proof, Ex d.
9.8	Specified Duty	150 St./hr, S4 - 40% CDF
9.9	Degree of Protection	IP 55, IS: 4691 (latest revision)
9.10	Rated voltage	415V \pm 10%
9.11	Frequency	50Hz \pm 5%
9.12	Combined voltage & frequency variation	10% Maximum (absolute sum)
9.13	Overload capacity	150% of Full load current for 2 minutes without damage or permanent deformation.
9.14	Max. speed	250% of synchronous speed or 2000 RPM, whichever is less.
9.15	Insulation	Class – F.
9.16	Maximum permissible Temp. rise over an ambient of 50°C	As per class- B limit by resistance method (i.e. 70°C rise over an ambient of 50°C).
9.17	Cooling	IC- 411 as per IS:6362 (Latest revision)
9.18	Winding material	Copper
9.19	Earthing	2Nos. on motor on body & 1No. inside terminal box as per IS:3043.
9.20	Fault withstand current for Terminal Box	50KA for 0.25 second
9.21	Shaft extension	Double, Cylindrical (Motor shaft shall be keywayed and supplied with Key.)
9.22	Location of Terminal Box viewed from DE	i) RHS for 8 Nos. of motors ii) LHS for 8 Nos. of motors <u>Alternatively:</u> - Terminal box on Top of motor for 16Nos. of motors. (FLP Terminal box shall be suitable for rotation of 360° in



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		steps of 90° without disturbing the connections.) Note: - Location of T.B. position shall be decided during detail engg.
9.23	Mounting	Horizontal foot mounted (B3)
9.24	KW rating at S4- 40% CDF & 150 St./hr.	2.2 KW at 50°C
9.25	Frame size	132M
9.26	Starting Torque	The starting torque of motor shall be minimum 210% of rated torque at rated voltage.
9.27	Pullout torque	The Pullout torque of motor shall be minimum 225% of rated torque at rated voltage.
9.28	Bearing Details :	i) Type of D.E. / N.D.E. ii) Size of D.E. / N.D.E. iii) Make
9.29	Motor feet	Integrally with the stator body.
9.30	Body design	Prevent breakage or other failure due to vibrations. Motors shall be designed to operate in the humid air stream, drain plug to be provided.
9.31	Direction of rotation	Bi-directional.
9.32	Method of starting	Direct On Line
9.33	Noise level	The noise level shall be as per IS: 12065-1987.
9.34	Vibration intensity	The vibration intensity shall be limited as per IS: 12075-1986.
9.35	Balancing	Motor shall be dynamically balanced with half key on the shaft end and fan.
9.36	Paint shade	Epoxy paint shade 631 as per IS :5 (Latest revision)
9.37	Starting current with D.O.L starting	Limited to 6 times the rated full load current
9.38	Cable entry (cable glands and lugs to be supplied with motor).	Cable size and OD of cable shall be intimated later.
9.39.1	All parts and clearances adopted shall conform to the latest revision of IS.	
9.39.2	Motor insulation shall be tropicalised by coating with non – hygroscopic coatings suitable for operation in sea shore area.	
9.39.3	Motor winding shall be specifically treated to provide good IR value for long period	



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with fewer operations in the environment mentioned.

10.0 INSPECTION & TESTS: -

- 10.1 Inspection & Tests shall be carried out as per relevant National / International standards and approved QAP.
 - 10.1.1 Type test certificates to be furnished before Inspection.
 - 10.1.2 Routine Tests carried out to be in presence of M/s ISRO / Tata Consulting Engineers Ltd. / HEC.
- 10.2 Inspection and tests shall be carried by M/s ISRO's representative or 3rd party inspection at manufacture's premises.
- 10.3 The Successful tenderer shall conduct all tests required to ensure that the equipment supplied shall conform to the requirement of the specifications and compliance to the requirements of the applicable codes.

Annexure – A

MOTOR DATA SHEET

Sl. No.	Data	To be filled – up by vendor
1	Name of the mechanism	
2	Make of motor	
3	Applicable Standards	
4	Type of motor	
5	Frame size	
6	Ambient temperature	
7	Relative humidity considered	
8	Altitude above sea level considered	
9	No. of phases	
10	Frame KW rating at S4 – 40%, 150 Starts/hr.	
10.1	at 40 °C ambient	



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10.2	at 50 °C ambient	
11	Full load RPM	
12	Degree of protection	
13	Method of cooling as per IS: 6362	
14	Class of insulation	
15	Temperature rise limit -by resistance method	
16	Voltage with variations	
17	Frequency with variations	
18	Combined voltage and frequency variations	
19	No load current	
20	Full load current (A) at frame KW	
21	Starting Torque at rated voltage in KG-M	
22	Rated Torque in KG-M	
23	Pull up Torque in KG-M	
24	Pull out Torque in KG-M	
25	Minimum permissible voltage at motor terminal for starting with full load	
26	Overload capacity for 2 minutes	
27	Maximum speed	
28	Hazardous area classification	
29	Temperature class	
30	Type of Enclosure	
31	Thermal withstand characteristics	
31.1	Hot	
31.2	Cold	



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32	Locked rotor with stand time	
32.1	Hot	
32.2	Cold	
33	Efficiency at rated voltage & frequency at	
33.1	100% Load	
33.2	75% Load	
33.3	50% Load	
34	Power factor at rated voltage & frequency at	
34.1	100% Load	
34.2	75% Load	
34.3	50% Load	
35	GD ² of rotor	
36	Permissible Load GD ²	
37	Type of mountings	
38	Direction of rotation	
39	Shaft extension	
40	Noise level as per IS:12065-1987	
41	Vibration intensity as per IS: 12075-1986	
42	Terminal box position from D. E.	
43	Fault level withstand capacity of Terminal box	
44	Earthing	
45	Stud size for cable termination	
46	Paint shade	
47	Weight of the motor	
48	Dimensional drg. of Motor & Terminal Box.	



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49	Bearing details for D.E. & N.D.E.	
49.1	Make	
49.2	Size	
49.3	Type	
50	Clearance between two phases at terminal.	
51	Clearance between phase to earth at terminal box.	
52	Material of Motor body	
53	Characteristic Curves	



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Annexure-II (Technical Specification of 7.5 KW Motor)**1. INTRODUCTION:-**

This specification covers the design, manufacture, testing at manufacture's premises and supply of motors FOR HMBP, Ranchi for **Folding Platform** of PSLV Integration Facility (PIF), SDSC, SHAR Centre of Indian Space Research Organization (ISRO), Sriharikota, Andhra Pradesh.

2. SCOPE OF SUPPLY :-

The scope of supply against this tender enquiry consists of design, manufacture, testing at manufacture's premises and supply of motors.

Sl. No	Mechanism	Electrical KW at 50°C ambient Temp.	No. of Starts / hr. & CDF	RPM (Syn.)	Frame	Qty.	Material code
1.	Folding Platform	7.5KW Flame proof Motor (Class- IIB,T4)	150 St. / hr. & S4 - 40% CDF	1000	160L	22 Nos. (20 Nos. + 2 Nos. Start-up Spares)	5566406210

3. BASIS AND SITE CONDITIONS :-

1.	Ambient temperature	50°C.
2.	Relative humidity	95% Maximum, However, both maximum ambient and maximum relative humidity may not occur simultaneously.
3.	Altitude	Less than 1000M above MSL.
4.	Hazardous area classification	Zone – I, Gas group IIB.
5.	Temperature Classification	T4 as per IS: 8239 – 76.
6.	Type of enclosure	Flame proof, Ex d.
7.	Power Supply of conditions :-	



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a) Voltage with variation	415V±10%
b) Frequency with variation	50Hz±5%
c) Combined voltage & Frequency variation	10% maximum (absolute sum)
d) Short circuit level	50KA for 1 second
e) System Earthing	Solidly earthed

4. APPLICABLE STANDARDS:-

1.	3 Phase induction motor. – IS :325-1996 / IEC-34
2.	Guide for testing 3 Phase induction motor. – IS :4029-2010
3.	Flame proof enclosures for electrical apparatus – IS :2148-2006
4.	Classification of Hazardous Area (other than mines) for electrical installations. – IS:5572-2009
5.	Guide for selection of electrical equipment for Hazardous Area. – IS: 5571-2009
6	Classification of maximum surface temperature of electrical equipments for use in explosive atmosphere- IS: 8239 (Latest revision)
7.	The equipment shall also comply with provisions of Indian Electricity Act and Indian Electricity Rules as amended up to date in addition to the statutory requirement of state of Andhra Pradesh.

5. WARRANTY:-

The equipment supplied shall be under warranty for the period of 12 months from the successful commissioning and acceptance by M/s ISRO.

6. LICENSING AND CERTIFICATION FROM APPROVED AUTHORITIES :-

- 6.1. The tenderer shall have obtained license from Indian standards institution for manufacture of flame proof electrical equipment.
- 6.2. All electrical equipment shall have been tested and approved for flame proof enclosures by Central Institute of Mining and Fuel Research (CIMFR), Dhanbad. Also approval certificates shall have been obtained from the following authorities:-

- a) Chief controller of explosives, Nagpur (C.C.E.).
- b) Director General, Factory Advice Service and Labour Institutes (D.G.F.A.S. & L.I), Mumbai.
- c) In case of countries other than India, certificates from equivalent institutions shall be submitted.



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- 6.3. Applicable test reports and test certificates for each of the above mentioned test shall be submitted to the purchaser before inspection of materials. Materials can be dispatched only after approval of test certificates.

7. INFORMATION ALONG WITH THE OFFER :-

- 7.1. Point wise confirmation of the enquiry specifications, clearly indicating deviations, if any.
7.2. Dimensional GA drg. of the motors.
7.3 Filled up Motor data sheet as per Annexure-A.
7.4 Characteristics curves

8. DRGS. & DOCUMENTS:-

- 8.1. The following drgs. shall be furnished by the successful tenderer in 5 sets within

two weeks after placement of order :-

- a) Motor GA drg.
- b) Motor data sheet.
- c) Torque – speed characteristics of Motor.
- d) Thermal withstand characteristics.
- e) Current – time characteristics.
- f) Characteristics Curve for P.f. & Efficiency at 100%, 75% & 50% Load.
- g) Valid test certificates for all type tests and over speed test as per IS 325 – 96 for same / identical motors.
- h) Calculation of efficiency of motors as per IS: 325.
- i) Certificate for conformity of the design to specified degree of protection of enclosure.
- j) Any other drg. required by M/s ISRO / M/s Tata Consulting Engineers Ltd for their scrutiny and reference.

- 8.2. The submission of drawing / documents in 5 Sets by the vendor for approval

from M/s ISRO / Tata Consulting Engineers Ltd. shall be routed through

M/s HEC, but the approval of drawing and documents from M/s ISRO / Tata Consulting Engineers Ltd. shall be responsibility of the tenderer. Any minor changes required by them during drawing approval stage shall be the responsibility of the tenderer and same shall have to be incorporated without any price implications.

- 8.3. After approval of drgs./ documents, another 5 Sets of all approved drgs. and documents shall be furnished by the manufacturer to M/s ISRO / M/s Tata Consulting Engineers Ltd. for necessary distribution.

All drgs. shall be made in **AUTOCAD of Latest version.**



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Due date of submission of technical offer: 05.12.2019

- 8.4. Required no. of sets of drgs./ documents for approval of statutory authority (if required) shall be submitted at least 3 months prior to first shipment or sufficiently in advance so as to take care of statutory clearances required at appropriate time.
Obtained statutory clearance from statutory authorities shall be the responsibility of the tenderer.
- 8.5. 5 Sets of prints and softcopies of all drgs. curves etc. incorporating approved changes, if any, shall be supplied to M/s ISRO.
All these drgs. shall be marked as “As Built”.
- 8.6. 5 Sets of Operation and Maintenance manual of Motor shall also be submitted.
- 8.7. The instruction manuals shall present the following basic categories of information in a comprehensive manner:-
- a). Instruction manuals for pre commissioning check up, operation, abnormal condition, maintenance and repair.
 - b). Schedule of preventive maintenance.
 - c). Ordering information for spares.

9.0 TECHNICAL SPECIFICATIONS :-

Sl. No.	Description	Specifications
9.1	Driven equipment	Folding Platform
9.2	Standard	IS:325-1996, IS:4029-2010, IS:5571-2009, IS:5572-2009, IS:2148-2006, IS:5780-2006, IS:8239 (Latest revision), IEC-34 (Latest revision).
9.3	Type	AC Sq. cage, FLP, heavy duty. reversible, TEFC, crane duty motor, outdoor duty.
9.4	Ambient temperature	50°C
9.5	Hazardous area classification	Zone -1, Gas Group – IIB
9.6	Temperature class	T4 as per IS:8239 (latest revision)



एच.ई.सी.

ISO 9001:2000

**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)**No. HMBP/PUR/2019/962012/EL-001****Dated: 27.11.2019****Due date of submission of technical offer: 05.12.2019**

9.7	Type of enclosure	Flame proof, Ex d.
9.8	Specified Duty	150 St./hr, S4 - 40% CDF
9.9	Degree of Protection	IP 55, IS: 4691 (latest revision)
9.10	Rated voltage	415V \pm 10%
9.11	Frequency	50Hz \pm 5%
9.12	Combined voltage & frequency variation	10% Maximum (absolute sum)
9.13	Overload capacity	150% of Full load current for 2 minutes without damage or permanent deformation.
9.14	Max. speed	250% of synchronous speed or 2000 RPM, whichever is less.
9.15	Insulation	Class – F.
9.16	Maximum permissible temp. rise over an ambient of 50°C	As per class- B limit by resistance method (i.e. 70°C rise over an ambient of 50°C).
9.17	Cooling	IC- 411 as per IS:6362 (Latest revision)
9.18	Winding material	Copper
9.19	Earthing	2Nos. on motor on body & 1No. inside terminal box as per IS:3043.
9.20	Fault withstand current for Terminal Box	50KA for 0.25 second
9.21	Shaft extension	Single, cylindrical (Motor shaft shall be keywayed and supplied with Key.)
9.22	Terminal Box	
9.22.1	Location	RHS viewed from DE / On top.
9.22.2	Rotation	FLP Terminal box shall be suitable for rotation of 360° in steps of 90° without disturbing the connections.
9.22.3	Motor Connection	All 6 leads of the windings shall be brought out in the terminal box and connecting link shall be provided for making star / delta connection.



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**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)

No. HMBP/PUR/2019/962012/EL-001

Dated: 27.11.2019

Due date of submission of technical offer: 05.12.2019

9.23	Mounting	Horizontal foot mounted (B3)
9.24	KW rating at S4- 40% CDF & 150 St./hr.	7.5 KW at 50°C
9.25	Frame size	160L
9.26	Starting Torque	The starting torque of motor shall be minimum 210% of rated torque at rated voltage.
9.27	Pullout torque	The Pullout torque of motor shall be minimum 225% of rated torque at rated voltage.
9.28	Bearing Details :	i) Type of D.E. / N.D.E. ii) Size of D.E. / N.D.E. iii) Make
9.29	Motor feet	Integrally with the stator body.
9.30	Body design	Prevent breakage or other failure due to vibrations. Motors shall be designed to operate in the humid air stream, drain plug to be provided.
9.31	Direction of rotation	Bi-directional.
9.32	Method of starting	Direct On Line
9.33	Noise level	The noise level shall be as per IS: 12065-1987.
9.34	Vibration intensity	The vibration intensity shall be limited as per IS: 12075-1986.
9.35	Balancing	Motor shall be dynamically balanced with half key on the shaft end and fan.
9.36	Paint shade	Epoxy paint shade 631 as per IS :5 (Latest revision)
9.37	Starting current with D.O.L starting	Limited to 6 times the rated full load current
9.38	Cable entry (cable glands and lugs to be supplied with motor).	Cable size and OD of cable shall be intimated later.
9.39.1	All parts and clearances adopted shall conform to the latest revision of IS.	



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9.39.2	Motor insulation shall be tropicalised by coating with non – hygroscopic coatings suitable for operation in sea shore area.
9.39.3	Motor winding shall be specifically treated to provide good IR value for long period with fewer operations in the environment mentioned.

10.0 INSPECTION & TESTS: -

- 10.1 Inspection & Tests shall be carried out as per relevant National / International standards and approved QAP.
- 10.1.1 Type test certificates to be furnished before Inspection.
- 10.1.2 Routine Tests carried out to be in presence of M/s ISRO / Tata Consulting Engineers Ltd. / HEC.
- 10.2 Inspection and tests shall be carried by M/s ISRO's representative or 3rd party inspection at manufacture's premises.
- 10.3 The Successful tenderer shall conduct all tests required to ensure that the equipment supplied shall conform to the requirement of the specifications and compliance to the requirements of the applicable codes.

Annexure – A**MOTOR DATA SHEET**

Sl. No.	Data	To be filled – up by vendor
1	Name of the mechanism	
2	Make of motor	
3	Applicable Standards	
4	Type of motor	
5	Frame size	
6	Ambient temperature	
7	Relative humidity considered	
8	Altitude above sea level considered	



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ISO 9001:2000

**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)**No. HMBP/PUR/2019/962012/EL-001****Dated: 27.11.2019****Due date of submission of technical offer: 05.12.2019**

9	No. of phases	
10	Frame KW rating at S4 – 40%, 150 Starts/hr.	
10.1	at 40 °C ambient	
10.2	at 50 °C ambient	
11	Full load RPM	
12	Degree of protection	
13	Method of cooling as per IS: 6362	
14	Class of insulation	
15	Temperature rise limit -by resistance method	
16	Voltage with variations	
17	Frequency with variations	
18	Combined voltage and frequency variations	
19	No load current	
20	Full load current (A) at frame KW	
21	Starting Torque at rated voltage in KG-M	
22	Rated Torque in KG-M	
23	Pull up Torque in KG-M	
24	Pull out Torque in KG-M	
25	Minimum permissible voltage at motor terminal for starting with full load	
26	Overload capacity for 2 minutes	
27	Maximum speed	
28	Hazardous area classification	



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**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)**No. HMBP/PUR/2019/962012/EL-001****Dated: 27.11.2019****Due date of submission of technical offer: 05.12.2019**

29	Temperature class	
30	Type of Enclosure	
31	Thermal withstand characteristics	
31.1	Hot	
31.2	Cold	
32	Locked rotor with stand time	
32.1	Hot	
32.2	Cold	
33	Efficiency at rated voltage & frequency at	
33.1	100% Load	
33.2	75% Load	
33.3	50% Load	
34	Power factor at rated voltage & frequency at	
34.1	100% Load	
34.2	75% Load	
34.3	50% Load	
35	GD ² of rotor	
36	Permissible Load GD ²	
37	Type of mountings	
38	Direction of rotation	
39	Shaft extension	
40	Noise level as per IS:12065-1987	
41	Vibration intensity as per IS: 12075-1986	



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ISO 9001:2000

**HEAVY MACHINE BUILDING PLANT
HEAVY ENGINEERING CORPORATION LIMITED**(A Govt. of India Enterprise)
Ranchi – 834 004 (INDIA)**No. HMBP/PUR/2019/962012/EL-001****Dated: 27.11.2019****Due date of submission of technical offer: 05.12.2019**

42	Terminal box position from D. E.	
43	Fault level withstand capacity of Terminal box	
44	Earthing	
45	Stud size for cable termination	
46	Paint shade	
47	Weight of the motor	
48	Dimensional drg. of Motor & Terminal Box.	
49	Bearing details for D.E. & N.D.E.	
49.1	Make	
49.2	Size	
49.3	Type	
50	Clearance between two phases at terminal.	
51	Clearance between phase to earth at terminal box.	
52	Material of Motor body	
53	Winding Material	
54	Characteristic Curves	

Received on

13.08.19

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT







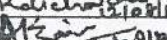

The compliance report, GA drawing Terminal box etc are reviewed and cleared for procurement action.

B. V. Srikanth 13/8/19
(B. V. SRIKANTH)

बी वी श्रीकांत B V Srikanth
परियोजना प्रबंधक Project Manager
ईएस, पीआईएफ परियोजना ES, PIF Project
एसडीएससी शार SDSC SHAR

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

	CUSTOMER: INDIAN SPACE RESEARCH ORGANISATION SATISH DHAWAN SPACE CENTRE, SHAR	
	CONSULTANT: TATA CONSULTING ENGINEERS LIMITED MUMBAI	
 एच. ई. सी.	CONTRACTOR: HEAVY ENGINEERING CORPORATION LTD. RANCHI	
PACKAGE : HORIZONTAL SLIDING DOORS (HSDs) [PSLV INTEGRATION FACILITIES (PIF)]		
PROJECT DRAWING NO :		
 एच. ई. सी.	G.A, TERMINAL BOX, DATA SHEET AND CHARACTERISTIC CURVES OF MOTOR FOR HORIZONTAL SLIDING DOOR FOR PSLV INTEGRATION FACILITY (PIF) BUILDING SDSC, SHAR, ISRO.	2140.91.016 SHEET 1 OF 10
BUREAU CHIEF	T. K. SAHU	
GROUP LEADER	M. B. VERMA	
CHECKED BY	K. C. MAHATO	
COMPILED BY	A. K. SAINI	
REF. DRG. NO.	H.M.B. HEC LTD., RANCHI	
		AUG' 2019
		REV- 01

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

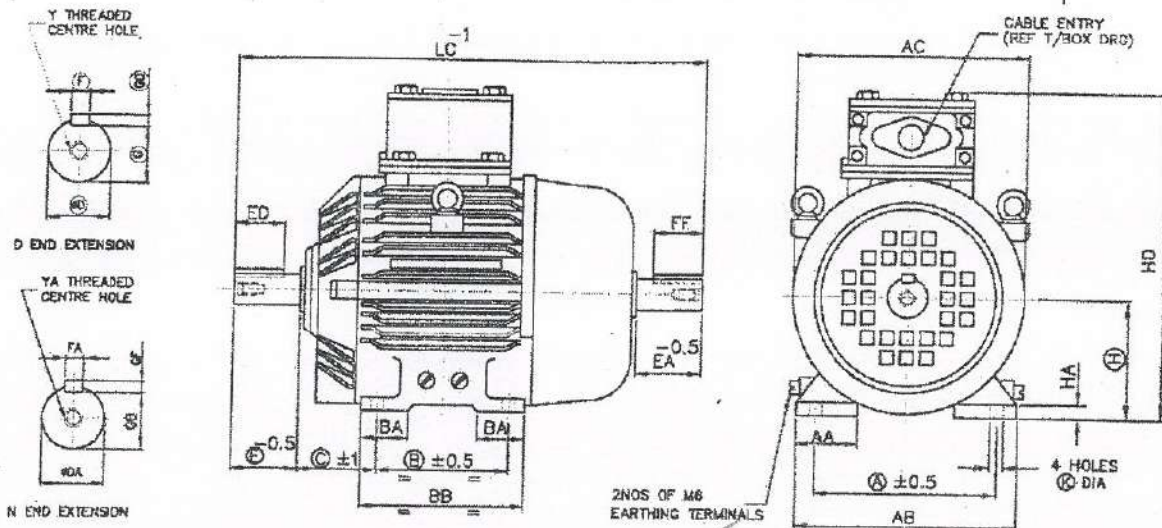
DIMENSION DRAWING OF 3 PH SQUIRREL CAGE TEFC
FLAME PROOF (GROUP IIA/IIB) INDUCTION MOTOR

PROJECTION



DO NOT SCALE

PLEASE ASK, IF IN DOUBT



FRAME	FOOT FIXING										OVER ALL					MOTOR wt (kg)
	A	B	B1	C	H TOL	AA	AB	BA	BB	KTOL	AD	AC	LC	HD	HA	
E132M	216	178		89	132.0/131.7	41	254	64	218	12.0/12.5		320	580	420	16	110

D END SHAFT EXTENSION AND KEY						
D TOL	E	ED	F TOL	GD TOL	G	Y
38.018 / 38.002	80	60	10.00 / 9.964	8.0 / 7.9	33.0 / 32.8	M12X28
N END SHAFT EXTENSION AND KEY						
DA TOL	EA	EF	FA TOL	GF TOL	GB	YA
38.018 / 38.002	80	60	10.00 / 9.964	8.0 / 7.9	33.0 / 32.8	M12X28

Renewed and Cleared

*B. V. Srikanth 12/18
(B. V. Srikanth)*

बी वी श्रीकांत B V Srikanth
परियोजना प्रबंधक Project Manager
ईएस, पीआईएफ परियोजना ES, PIF Project
एसडीएससी शार SDSC SHAR

NOTES TERMINAL BOX CAN BE ROTATED IN 360 DEG @90 DEG.
ONE EARTHING TERMINAL IS PROVIDED INSIDE MAIN TERMINAL BOX.
MOTOR MAY HAVE ADDITIONAL FOOT HOLES FOR CUSTOMER/SITE FLEXIBILITY

TEST REPORT NO: ERTL(E)TES/C184/0072/11-12
DGMS APPROVAL NO: 103 OF 1975
PESO APPROVAL NO: A/P/HQ/MH/104/5942(P424485)

ALL DIMENSIONS ARE IN mm

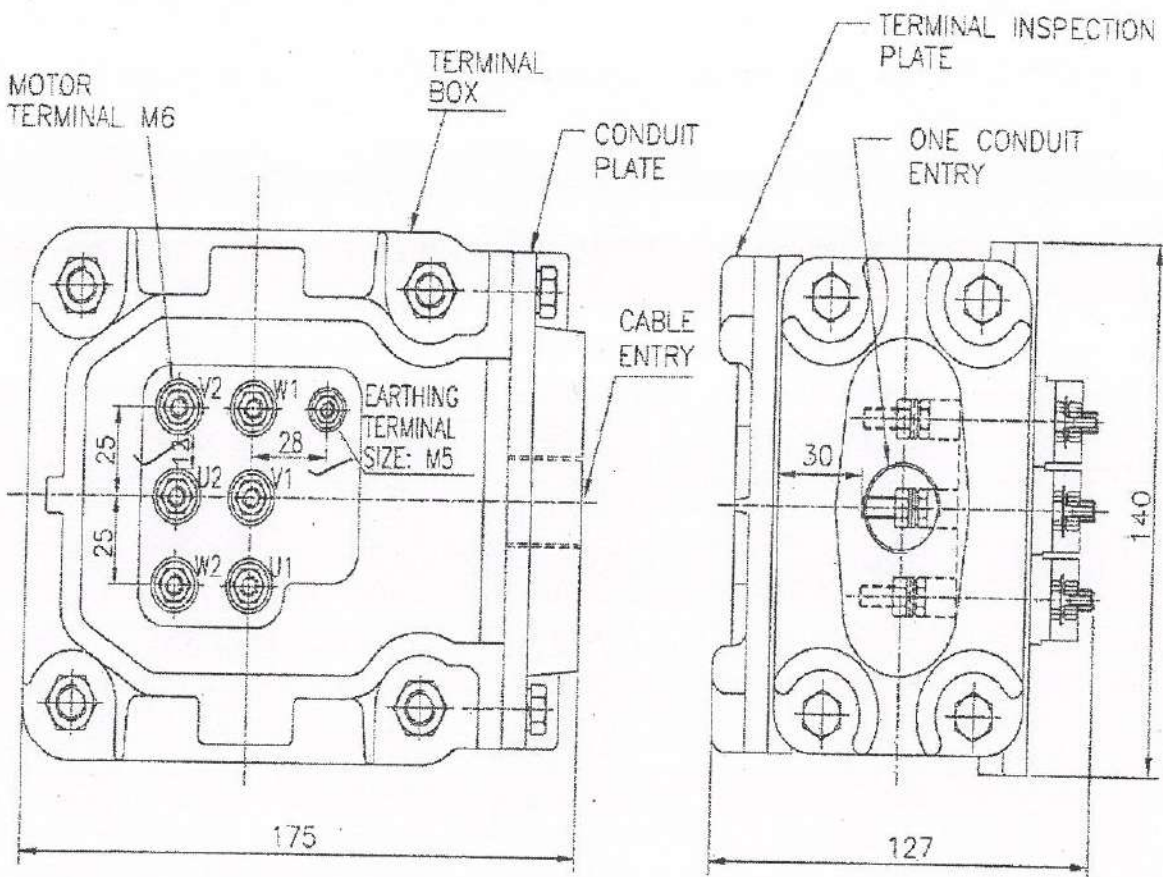
RINGED DIMENSIONS ARE AS PER IS:1231/IEC60072

CUSTOMER	EASTERN TRADE AGENCY		RATED O/P kW	2.2	NO OF POLES	8
P.O. NO.			FRAME	E132M	MAIN CABLE SIZE	1 * 4C,4-MM ²
IND. NO.	QNMLI90016/100		MOUNTING	B3 (HORIZONTAL FOOT)		
CLIENT			TAG NO.			
PROJECT						
DRN	NAME	DATE	REMARKS	TITLE		
CHD	SBK	3-Mar-19		DIMENSIONAL DRAWING		
APPROVED	SSN	3-Mar-19				

CG Power and Industrial Solutions Limited
LT Motors Division
Ahmednagar

DRG NO
QNMLI90016/100-E132M

REV 0



PHASE TO PHASE : 12mm ✓
 PHASE TO EARTH : 28mm ✓

*Reviewed and cleared
 B.V. Srikant 13/8/19
 (B.V. SRUKANTH)*

बी वी श्रीकांत B V Srikanth
 परियोजना प्रबंधक Project Manager
 ईएस. पीआईएफ परियोजना ES, PIF Project
 एसडीएससी शार SDSC SHAR

ACCESSORIES	SPACE HEATER	THERMISTOR	RTD
APPLICABLE	NA	NA	NA
CABLE SIZE (ENTRY)	NA	NA	NA
MAIN CABLE SIZE	1 * 4C, 4-MM ² ✓	CABLE ENTRY	M20X1.5P 1-No.
CUSTOMER	EASTERN TRADE AGENCY		RATED O/P kW
PO No			2.2 Kw at 50°C ✓
INDENT / ENQ No	QNMLI90016/100		NO OF POLES
CLIENT			8
PROJECT		Tag No.	FRAME
			E132M ✓
DRAWN BY	NAME	DATE	ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
CHECKED BY	AMR	27-07-2019	
APPROVED BY	SBK	27-07-2019	
	SRB	27-07-2019	TITLE :
			TERMINAL BOX ARRANGEMENT



CG Power and Industrial Solutions Limited
 LT Motors Division
 Ahmednagar

EW4940-6R2

DRG No :

EXCHW2389B1BL6

sl. No	MOTOR DATA SHEET	
1	Name of the mechanism	Horizontal Sliding Door
2	Make of motor	CG Power and Industrial Soln Ltd
3	Applicable Standards	AS per IS 12615/IS/IEC 60034
4	Type of motor	High Efficiency - flame Proof IE2
5	Frame size	E132M
6	Ambient temperature	50 Deg C
7	Relative humidity considered	0.95
8	Altitude above sea level considered	Less than 1000 m
9	No. of phases	3
10	Frame KW rating at S4 = 40%, 150 Starts/hr.	2.2 KW
10.1	at 40 °C ambient	2.3 KW
10.2	at 50 °C ambient	2.2 Kw
11	Full load RPM	715
12	Degree of protection	IP 55
13	Method of cooling as per IS: 6362	IC411
14	Class of insulation	F Class
15	Temperature rise limit -by resistance method	70°C
16	Voltage with variations	415 +10%
17	Frequency with variations	50 +5%
18	Combined voltage and frequency variations	±10%
19	No load current (A)	3.6 A
20	Full load current (A) at frame KW	5.18 A at 2.2 KW
21	Starting Torque at rated voltage in KG-M	5.4 KG-M
22	Rated Torque in KG-M	3 KG-M
23	Pull up Torque in KG-M	4.3 KG-M
24	Pull out Torque in KG-M	7.5 KG-M
25	Minimum permissible voltage at motor terminal for starting with full load	80% of rated voltage
26	Overload capacity for 2.minutes	150% of full load current for 2 minutes without damaged or permanent deformation.
27	Maximum speed	250% of syn speed or 2000 RPM ,which ever is less for 2min.
28	Hazardous area classification	Zone -1, Gas Group - IIA/IIB
29	Temperature class	T4
30	Type of Enclosure	TEFC
31	Thermal withstand characteristics	
31.1	Hot	8 Sec
31.2	Cold	16 Sec
32	Locked rotor with stand time	
32.1	Hot	8 Sec
32.2	Cold	16 Sec
33	Efficiency at rated voltage & frequency at	
33.1	100% Load	0.81
33.2	75% Load	0.8
33.3	50% Load	0.78
34	Power factor at rated voltage & frequency at	
34.1	100% Load	0.73
34.2	75% Load	0.66
34.3	50% Load	0.59
35	GD ² of rotor	0.29 (kg-m ²)

HEC DRG. NO. - 2140.91.016 , REV. - 01 ,

SHEET NO. - 4 OF 10

बी वी श्रीकांत B V Srikant
परियोजना प्रबंधक Project Manager
ईएस, पीआईएफ परियोजना ES, PIF Project
एसडीएससी शार SDSC SHAR

Reviewed and
cleared

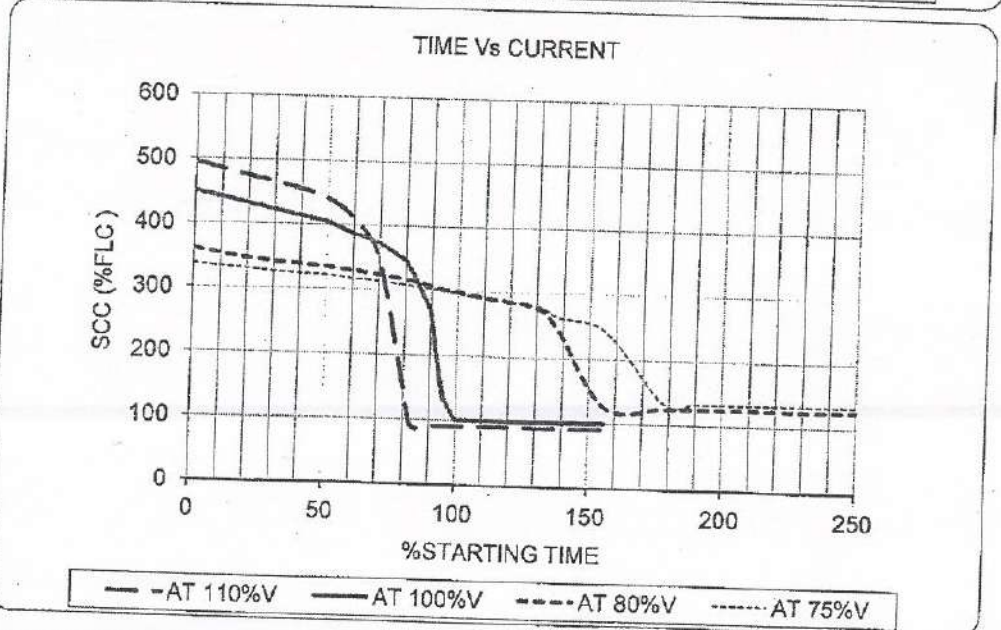
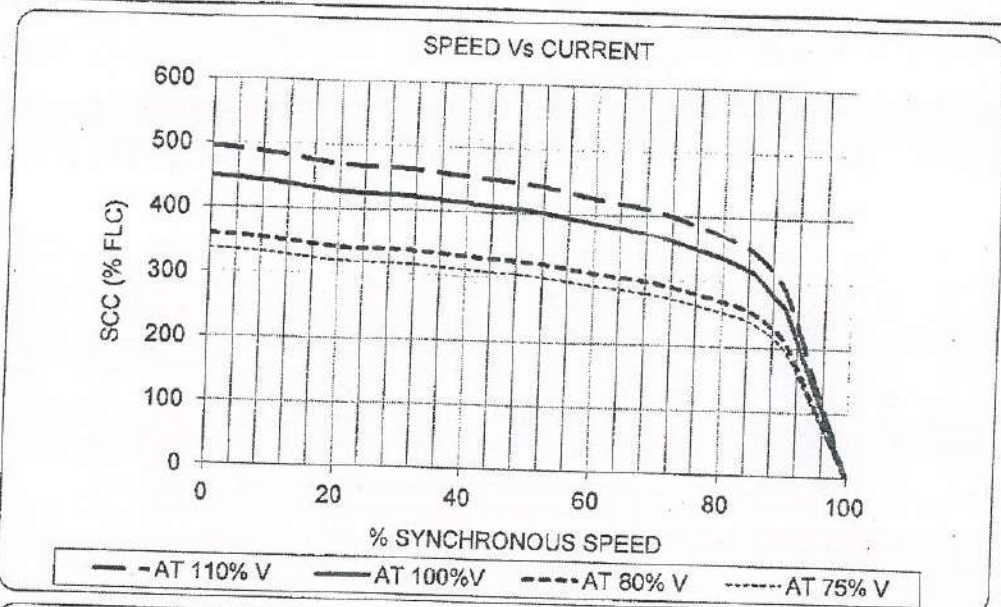
B. V. Srikant 13/8/19

B. V. Srikant (Signature)

36	Permissible Load GD ²	0.29 (kg-m ²)
37	Type of mountings	B3
38	Direction of rotation	Bidirectional
39	Shaft extension	Double Cylindrical Shaft Extension
40	Noise level as per IS:12065-1987	Noted & confirmed
41	Vibration Intensity as per IS: 12075-1986	Noted & confirmed
42	Terminal box position from D. E.	TOP
* 43	Fault level withstand capacity of Terminal box	50KA FOR 0.25 SEC WITH BACK UP HRC FUSE
44	Earthing	1 No. on motor body and 1No. inside terminal box below 160 frame as per IS:3043.
45	Stud size for cable termination	Refer TBA drg. - EW4940-6R2
46	Paint shade	ACP 631 Light Grey
47	Weight of the motor	110 Kg approx
48	Dimensional drg. of Motor & Terminal Box.	attached
49	Bearing details for D.E. & N.D.E.	
49.1	Make	SKF
49.2	Size	6308ZZ / 6308ZZ
49.3	Type	Antifriction ball bearing
50	Clearance between two phases at terminal.	Refer TBA drg.
51	Clearance between phase to earth at terminal box.	Refer TBA drg.
52	Material of Motor body	Cast Iron
53	GA Drawing of Motor	QNMLI90016/100-E132M
54	Details of FLP Double Compression Cable Glands	To be furnished later (Type No)
55	Copper Cable Lugs	To be furnished later (Type No)

Reviewed and
cleared
B.V. Srikanth 13/8/15
(B.V. SRIKANTH)

बी वी श्रीकांत B V Srikanth
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CUSTOMER	EASTERN TRADE AGENCY	RATED O/P KW	2.2
P.O.NO	4500003950	NO OF POLES	8
IND.NO:	QNMLI90016/100	FRAME	E132M
CLIENT:	-	TAG NO.	0
PROJECT:	-		

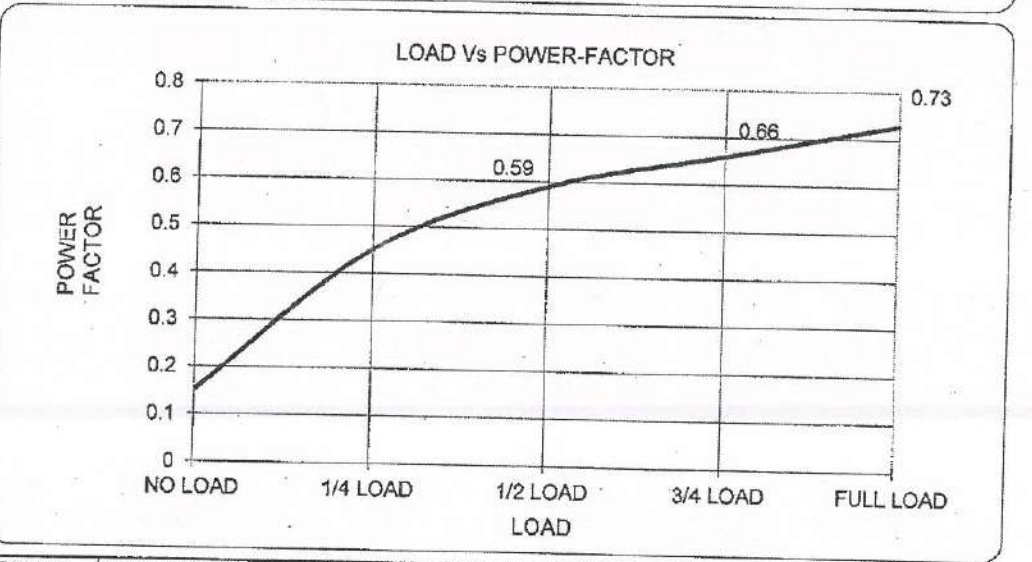
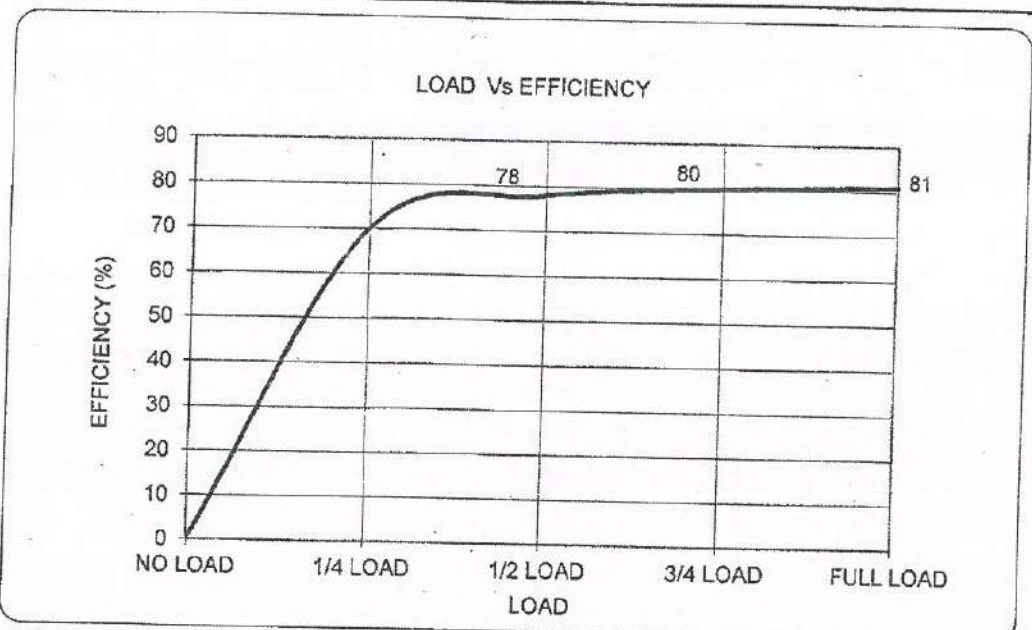
DRN	NAME	DATE	TITLE
DRN	PLP	10-Jul-19	CURRENT SPEED & CURRENT TIME CURVE SC715/100
CHD	PLP	10-Jul-19	
APPROVED	RGV	10-Jul-19	



CG Power and Industrial Solutions Limited
 LT Motors Division
 Ahmednagar

बी वी श्रीकांत B V Srikanth
 परियोजना प्रबंधक Project Manager
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 एसडीएससी शार SDSC SHAR

*Reviewed and
 Cleared
 B.V.Srikanth
 (B-V-SRIKANTH)*



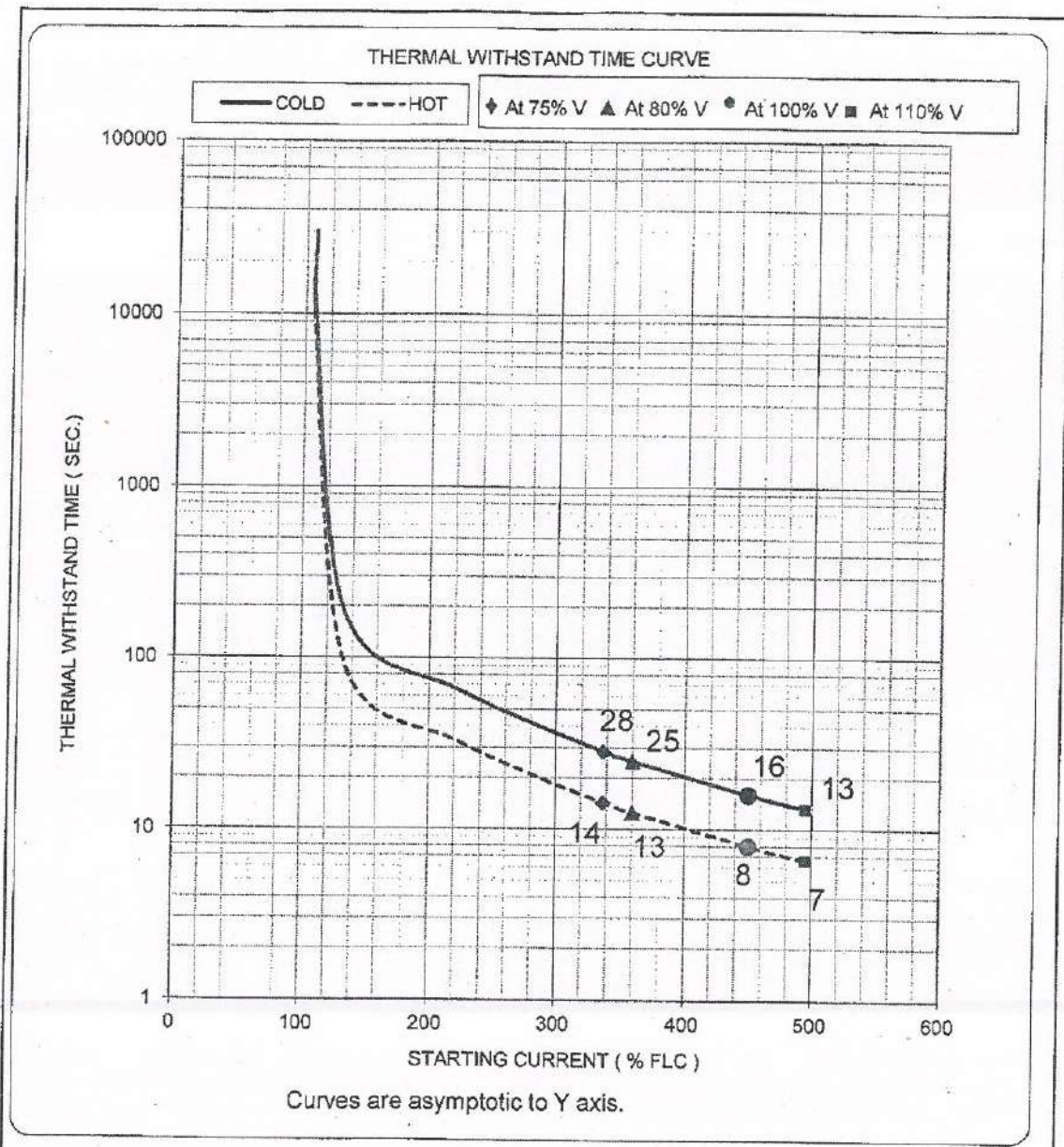
CUSTOMER	EASTERN TRADE AGENCY		RATED O/P kW	2.2
P.O.NO	4500003950		NO OF POLES	8
IND.NO:	QNML190016/100		FRAME	E132M
CLIENT:	-		TAG NO.	0
PROJECT:	-			
	NAME	DATE	TITLE	
DRN	PLP	10-Jul-19	LOAD Vs EFFICIENCY & POWER FACTOR CURVE SC81.00/0.73	
CHD	PLP	10-Jul-19		
APPROVED	RGV	10-Jul-19		



CG Power and Industrial Solutions Limited
 LT Motors Division
 Ahmednagar

Review and cleared
 B. V. Srikant
 (B. V. SRIKANTH) 13/8/19

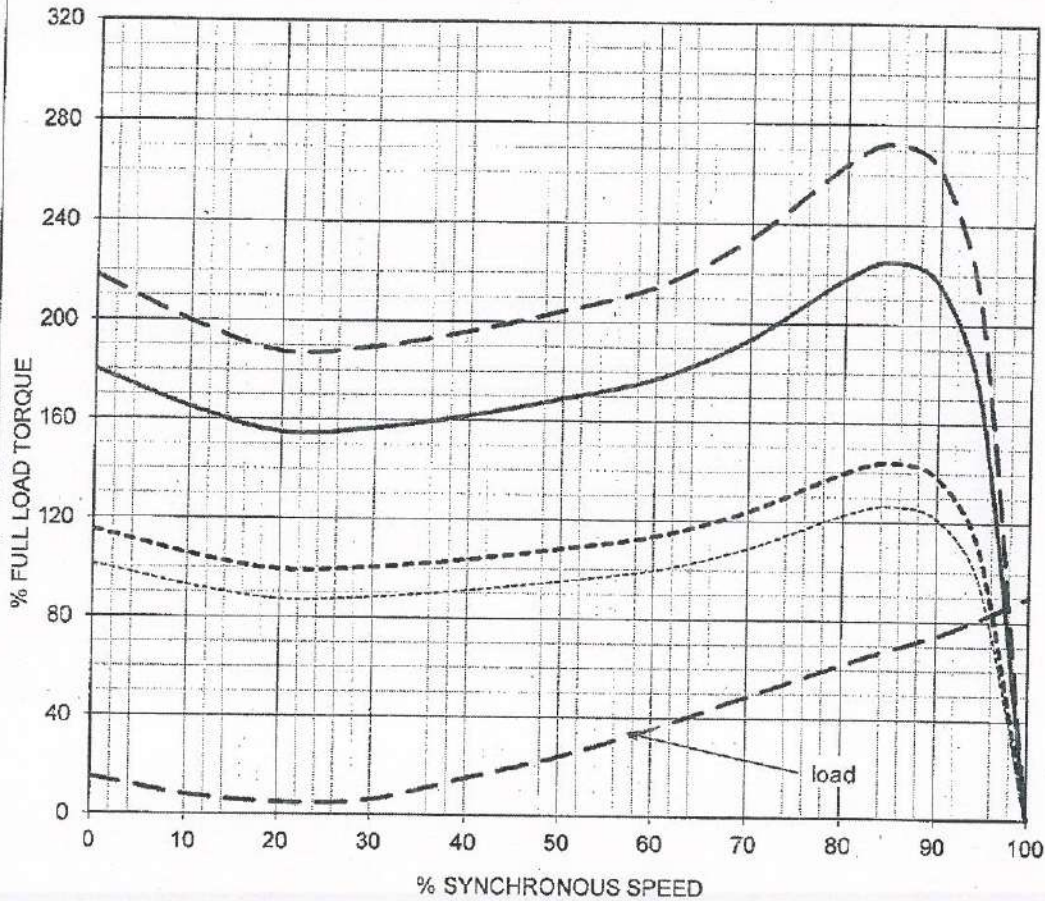
बी वी श्रीकांत B V Srikant
 परियोजना प्रबंधक Project Manager
 ईएम, पीआईएफ परियोजना ES, PIF Project
 एसडीएससी शार SDSC SHAR



CUSTOMER	EASTERN TRADE AGENCY	RATED O/P KW	2.2
P.O.NO	4500003950	NO OF POLES	8
IND.NO:	QNMLI90016/100	FRAME	E132M
CLIENT:	-	TAG NO.	0
PROJECT:	-		
	NAME	DATE	TITLE
DRN	PLP	10-Jul-19	THERMAL WITHSTAND TIME CURVE SC8/16/450
CHD	PLP	10-Jul-19	
APPROVED	RGV	10-Jul-19	
CG Power and Industrial Solutions Limited LT Motors Division Ahmednagar			

Reviewed and Cleared
 B.V.Srikanth 13/8/19
 (B.V.SRIKANTH)
 बी वी श्रीकांत **B V Srikanth**
 परियोजना प्रबंधक Project Manager
 ईएस. पीआईएफ परियोजना ES, PIF Project
 एनडीएससी शार SDSC SHAR

SPEED VS TORQUE



- - - AT 110% V — AT 100% V - · - · - AT 80% V · · · · · AT 75% V - - - load T-N

CUSTOMER	EASTERN TRADE AGENCY		RATED O/P KW	2.2
P.O.NO	4500003950		NO OF POLES	8
IND.NO:	QNMLI90016/100		FRAME	E132M
CLIENT:	-		TAG NO.	0
PROJECT:	-			
DRN	NAME	DATE	TITLE	
CHD	PLP	10-Jul-19	SUPERIMPOSED TORQUE SPEED CURVE	
APPROVED	RGV	10-Jul-19		
			SC180/450	



CG Power and Industrial Solutions Limited
 LT Motors Division
 Ahmednagar

Reviewed and
 Cleared
 B. V. Srikanth
 B. V. Srikanth

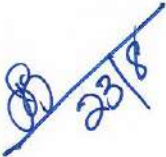
Date:22.08.2019

PSLV Integration Facilities (PIF)

Sub: Comments on GA, Terminal box, Data sheet and Characteristic curves of Motor for Folding Platform for PIF Building

Ref: Drawing No. 2140.91.125, Revision 01 of 08 sheets

The GA, Terminal box, Data sheet and Characteristic curves of 3 phase squirrel cage TEFC foot mounted Terminal box on top Flameproof (Group IIA / IIB) 7.5 kW induction Motor for Folding Platform for PIF Building submitted by M/s HEC Ltd, Ranchi have been studied by Project and the drawings were cleared for procurement action. The approved drawings also attached for reference.



JOSE CL
DPD-E&CS, PIF


B V SRIKANTH
PM-ES, PIF

To
DPD-SE, PIF

CCTO;
PD, PIF ---for kind information





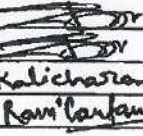
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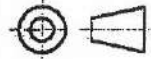
The GA Drawing, Terminal box, Data sheet and characteristics curves of motor for folding Platform for PIF building are reviewed and cleared for procurement action.

बी वी श्रीकांत B V Srikanth (B.V. SRIKANTH)
 परियोजना प्रबंधक Project Manager B.V. Srikanth 22/8
 ईएस, पीआईएफ परियोजना ES, PIF Project
 एसडीएससी शार SDSC SHAR

	CUSTOMER: INDIAN SPACE RESEARCH ORGANISATION SATISH DHAWAN SPACE CENTRE, SHAR		
	CONSULTANT: TATA CONSULTING ENGINEERS LIMITED MUMBAI		
	CONTRACTOR: HEAVY ENGINEERING CORPORATION LTD. RANCHI		
PACKAGE : FOLDING PLATFORM [PSLV INTEGRATION FACILITIES (PIF)]			
PROJECT DRAWING NO :			
	GA, TERMINAL BOX, DATA SHEET AND CHARACTERISTICS CURVES OF MOTOR FOR FOLDING PLATFORM FOR PIF BUILDING, SDSC, SHAR, ISRO, ANDHRA PRADESH		2140.91.125 SHEET 1 OF 8
एच.ई.सी.	BUREAU CHIEF GROUP LEADER CHECKED BY DESIGNER	T. K. SAHU M. B. VERMA K. C. MAHARAJ R. GAUTAM	
REF. DRG. NO.	H.M.B. HEC LTD., RANCHI		AUG' 2019 REV- 0

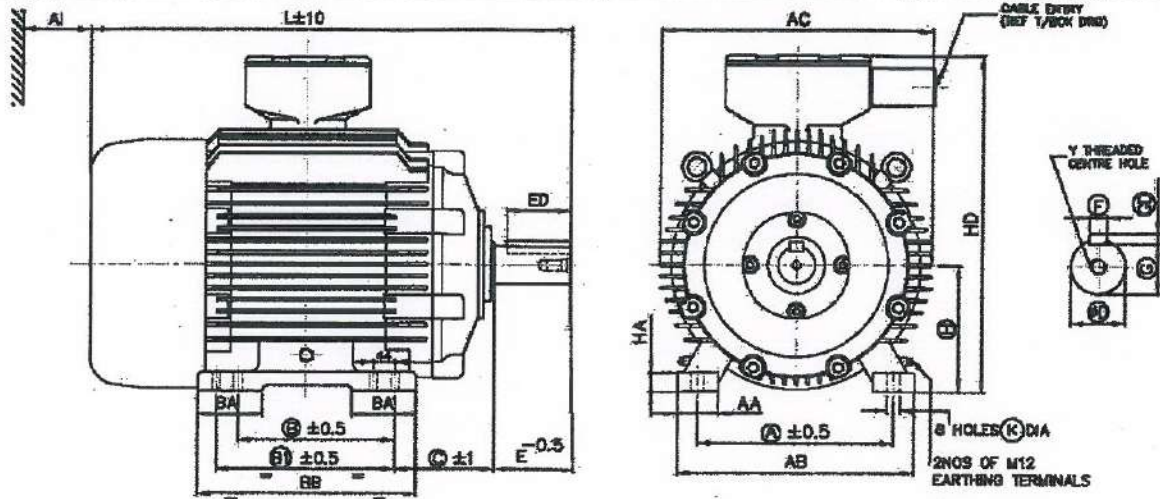
DIMENSION DRAWING OF 3 PH SQUIRREL CAGE TEFC FOOT MOUNTED TB ON TOP FLAME PROOF (GROUP IIA/IIB) INDUCTION MOTOR

PROJECTION



DO NOT SCALE

PLEASE ASK, IF IN DOUBT



FRAME	FOOT FIXING										OVER ALL					MOTOR wt (kg)	AI**
	A	B	B1	C	HTOL	AA	AB	BA	BB	K TOL	AD	AC	L	HD	HA		
E160L	254	210	254	108	160.0 / 159.5	54	298	101	298	15.0 / 15.5		320	655	505	22	188	90

D END SHAFT EXTENSION AND KEY						
D TOL	E	ED	F TOL	GD TOL	G	Y
42.018 / 42.002	110	80	12.00 / 11.957	8.0 / 7.9	37.0 / 36.8	M16X32

Reviewed and cleared

(B.V. SRIKANTH)

*B.V. Srikanth
22/8*

- NOTES**
- TERMINAL BOX CAN BE ROTATED IN 360 DEG @90 DEG.
 - ONE 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.
 - TEST REPORT NO: ERTL(E)TES/C184/0073/11-12
 - DGMS APPROVAL NO: 119 OF 1976
 - PESO APPROVAL NO: AP/HQ/MH/104/5942(P424485)

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ALL DIMENSIONS ARE IN mm

RINGED DIMENSIONS ARE AS PER IS:1231/IEC60072

CUSTOMER	EASTERN TRADE AGENCY		RATED O/P kW	7.5
P.O. NO.			NO OF POLES	6
IND. NO.	QNMLI90044/100		FRAME	E160L
CLIENT			MOUNTING	B3
PROJECT			TAG NO.	
	NAME	DATE	REMARKS	TITLE
DRN	SBK	17-Jun-19		DIMENSIONAL DRAWING
CHD	SBK	17-Jun-19		
APPROVED	SSN	17-Jun-19		



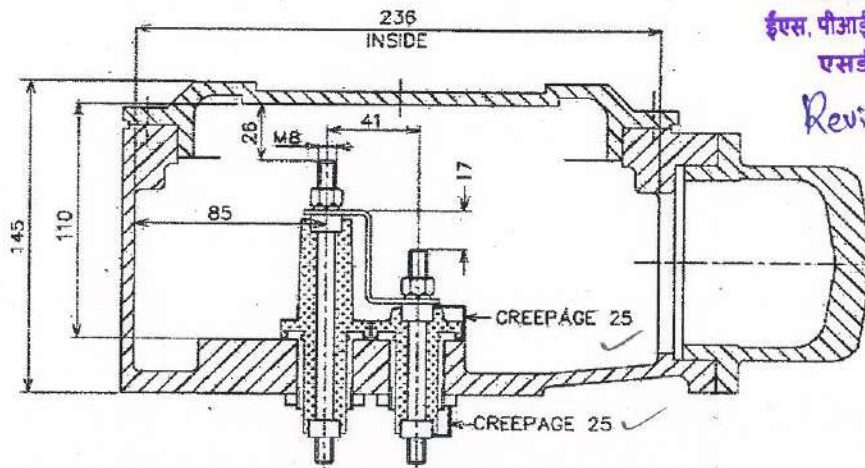
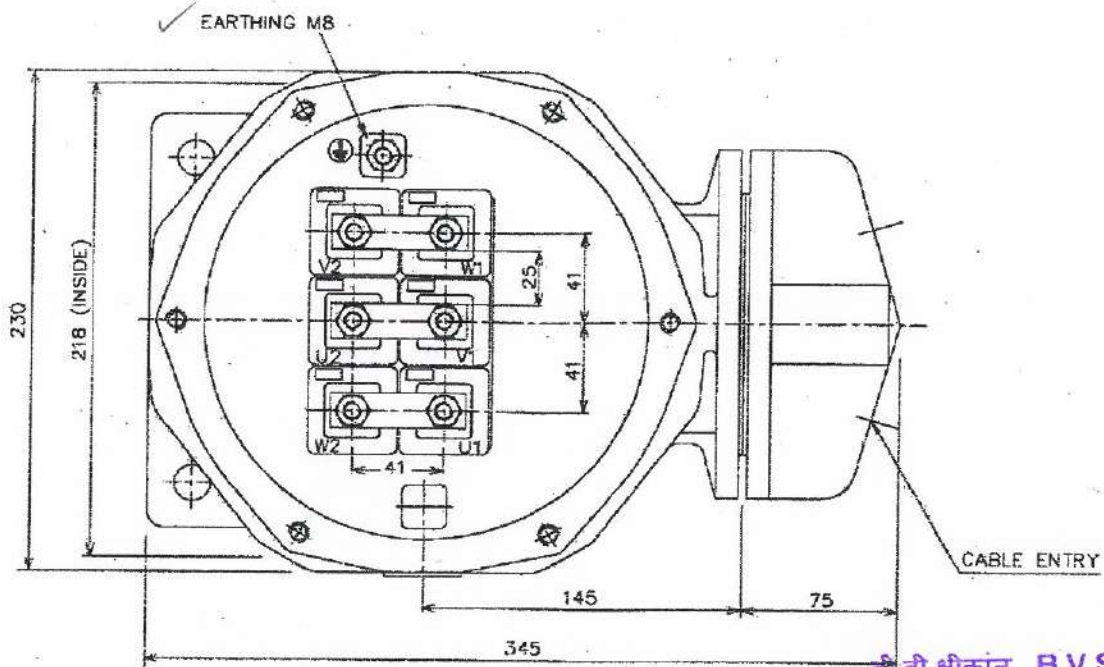
CG Power and Industrial Solutions Limited
LT Motors Division
Ahmednagar

DRG NO

QNMLI90044/100-6

REV 0

HEC DRG.NO. - 2140.91.125, REV.-0; SHEET 2 OF 8



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 B-v-subcut 22/8

MATERIAL OF T/BOX
 CAST IRON

ACCESSORIES	SPACE HEATER	THERMISTOR	RTD
APPLICABLE	NA	NA	NA
CABLE SIZE (ENTRY)	NA	NA	NA
MAIN CABLE SIZE	2 * 3C,25-MM ² ✓	CABLE ENTRY	M25X1.5P 2-Nos.
CUSTOMER	EASTERN TRADE AGENCY		RATED O/P kW 7.5 ✓
PO No			NO OF POLES 6 ✓
INDENT / ENQ No	QNMLI90044/100		FRAME E160L
CLIENT	Tag No.		
PROJECT			
DRAWN BY	NAME	DATE	ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED TITLE : TERMINAL BOX ARRANGEMENT
CHECKED BY	AMR	17-06-2019	
APPROVED BY	SBK	17-06-2019	
	SRB	17-06-2019	



CG Power and Industrial Solutions Limited
 LT Motors Division
 Ahmednagar

EA2591R2

DRG No :

HEC DRG No. - 2140.91.125, REV.0 ; SHEET 3 OF 8

65131193

Sl. No.	Data	17.06.19
1	Name of the mechanism	Folding Platform
2	Make of motor	CG Power and Industrial Soln Ltd
3	Applicable Standards	IS12615/IS/IEC 60034
4	Type of motor	High Efficiency - Flame Proof IE2
5	Frame size	E160L
6	degree of protection	50°C
7	Relative humidity considered	95% Maximum
8	Altitude above sea level considered	Less than 1000M above MSL.
9	No. of phases	3 Phase
10	Frame KW rating at S4 - 40%, 150 Starts/hr.	
10	at 40 °C ambient	7.8 KW
10	at 50 °C ambient	7.5 Kw
11	Full load RPM	1000
12	Degree of protection	IP55
13	Method of cooling as per IS: 6362	IC411
14	Class of insulation	F
15	Temperature rise limit -by resistance method	50°C/70°C
16	Voltage with variations	415 +-10%
17	Frequency with variations	50 +-5%
18	Combined voltage and frequency variations	10% maximum (absolute sum)
19	No load current	8.5 A (Max)
20	Full load current (A) at frame KW	14 A
21	Starting Torque at rated voltage in KG-M	225
22	Rated Torque in KG-M	7.49 (kg-m)
23	Pull up Torque in KG-M	200
24	Pull out Torque in KG-M	275
25	Minimum permissible voltage at motor terminal for starting with full load	80% of rated voltage
26	Overload capacity for 2 minutes	150% of Full load current for 2 minutes without damage or permanent deformation.
27	Maximum speed	250% of synchronous speed or 2000 RPM, whichever is ess.
28	Hazardous area classification	Zone - I, Gas group IIB.
29	Temperature class	T4 as per IS: 8239 - 76.
30	Type of Enclosure	Flame proof, Ex d.
31	Thermal withstand characteristics	
31	Hot	10 sec
31	Cold	20 sec
32	Locked rotor with stand time	
32	Hot	10 sec
32	Cold	20 sec
33	Efficiency at rated voltage & frequency at	
33	100% Load	87.20%
33	75% Load	87%
33	50% Load	87%
34	Power factor at rated voltage & frequency at	
34	100% Load	0.84
34	75% Load	0.76
34	50% Load	0.64
35	GD ² of rotor	
36	Permissible Load GD ²	0.50 (kg-m ²)
37	Type of mountings	B3
38	Direction of rotation	Bidirectional
39	Shaft extension	Single, cylindrical (Motor shaft shall be keywayed and supplied with Key.)
40	Noise level as per IS:12065-1987	yes
41	Vibration intensity as per IS: 12075-1986	yes
42	Terminal box position from D. E.	Top
43	Fault level withstand capacity of Terminal box	50KA for 0.25 second
44	Earthing	1 Nos. on motor on body & 1No. inside terminal box as per IS 3043

HEC DRG. NO-2140.91.125, REV.-0; SHEET 4 OF 8 *Reviewed and cleared*

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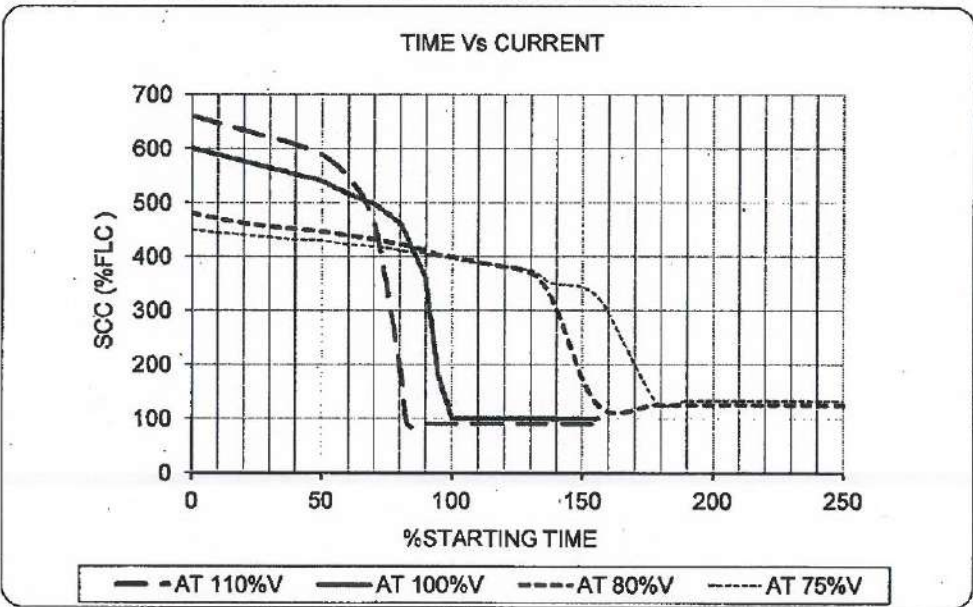
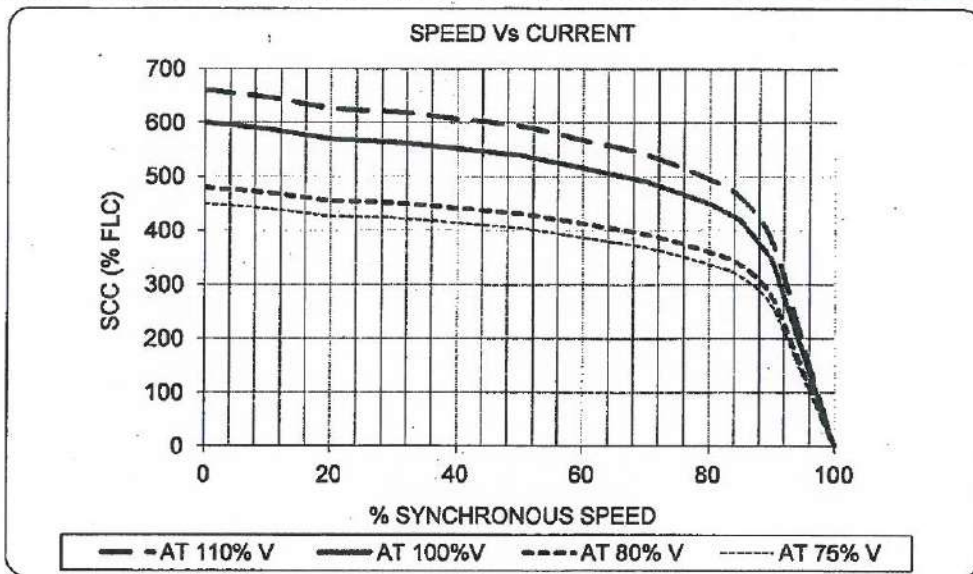
45	Stud size for cable termination	2 * 3C,25-MM ✓
46	Paint shade	ACP 631 Light Grey ✓
47	Weight of the motor	188 ✓
48	Dimensional drg. of Motor & Terminal Box.	Drawings attached
49	Bearing details for D.E. & N.D.E.	
49	Make	SKF
49	Size	6309-ZZ / 6309-ZZ (Ball /Ball) ✓
49	Type	Sealed Bearing. No Lubrication Required ✓
50	Clearance between two phases at terminal.	25mm / Refer TBA drg. ✓
51	Clearance between phase to earth at terminal box.	Refer TBA drg. ✓
52	Material of Motor body	Cast Iron ✓
53	Winding Material	Copper ✓
54	Characteristic Curves	Attached

Reviewed and checked
(B.V. SRIKANTH)

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HEC. DRG. NO. - 2140.91.125, REV. - 0, SHEET 5 OF 8.



CUSTOMER	EASTERN TRADE AGENCY	RATED O/P KW	7.5
P.O.NO	4500003950	NO OF POLES	6
IND.NO:	QNMLI90044/100	FRAME	E160L
CLIENT:	-	TAG NO.	0
PROJECT:	-		
	NAME	DATE	TITLE
DRN	PLP	17-Jun-19	CURRENT SPEED & CURRENT TIME CURVE SC975/100
CHD	PLP	17-Jun-19	
APPROVED	RGV	17-Jun-19	



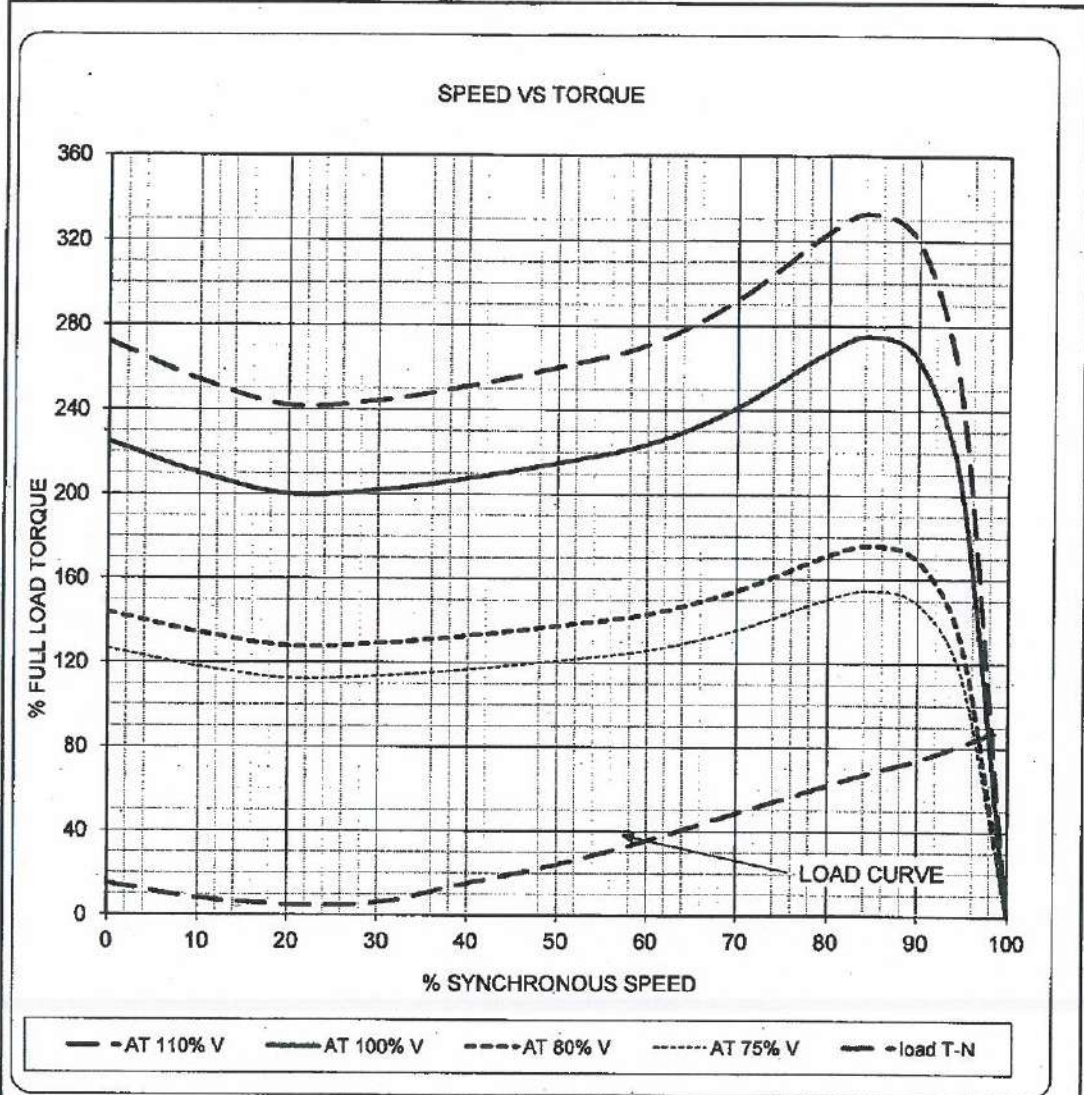
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LT Motors Division
Ahmednagar

Reviewed and cleared

(B.V. SRIKANTH)
B.V. Srikanth

HEC. DRG. NO. - 2140.91.125. REV.-0; SHEET 6 OF 8

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CUSTOMER	EASTERN TRADE AGENCY	RATED O/P KW	7.5 ✓
P.O.NO	4500003950	NO OF POLES	6
IND.NO:	QNMLI90044/100	FRAME	E160L ✓
CLIENT:	-	TAG NO.	0
PROJECT:	-		

	NAME	DATE	TITLE
DRN	PLP	2-Jul-19	SUPERIMPOSED TORQUE SPEED CURVE SC225/600
CHD	PLP	2-Jul-19	
APPROVED	RGV	2-Jul-19	

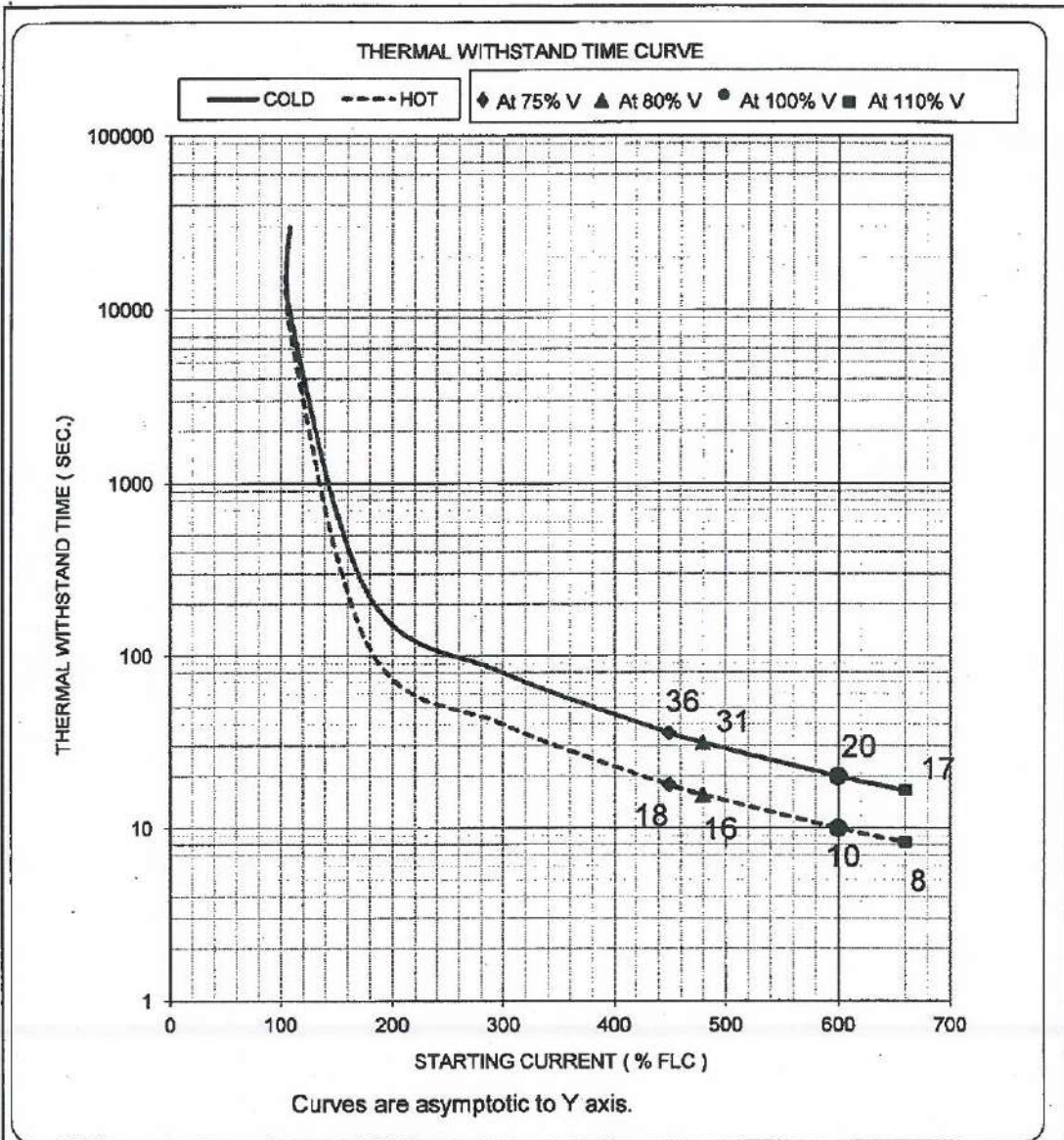


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HEC, DRG. NO. - 2140.91.125. REV.-0: SHEET 7 OF 8

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(B.V. SRIKANTH)
B.V. Srikanth
22/8



CUSTOMER	EASTERN TRADE AGENCY	RATED O/P kW	7.5
P.O.NO	4500003950	NO OF POLES	6
IND.NO:	QNMLI90044/100	FRAME	E160L
CLIENT:	-	TAG NO.	0
PROJECT:	-		

	NAME	DATE	TITLE
DRN	PLP	17-Jun-19	THERMAL WITHSTAND TIME CURVE SC10/20/600
CHD	PLP	17-Jun-19	
APPROVED	RGV	17-Jun-19	



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 LT Motors Division
 Ahmednagar

HEC DRG. NO. - 2140.91.125 REV.-0 SHEET 8 OF 8

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