

	Scope Of Work	Generation
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Title: **The provision of off-site maintenance, repairs, overhaul, and Routine Testing of all LV Motors at Duvha Power Station on an “as and when required basis” for a five-year period**

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1. INTRODUCTION

Duvha Power Station is needed of maintenance service of all LV Motors both for Units and Outside plant Auxiliary plant. The provision of spares and off-site refurbishment, repairs and overhaul of all these motors at Duvha Power Station on an “as and when required basis” for a five (5) year period.

This will benefit Duvha by;

- Plant reliability, efficiency and available according to design.
- Shorten response time on emergencies
- Reduce UCLF caused by plant failure
- Improved skills for the onsite workforce in the station

2. SUPPORTING CLAUSES

2.1 SCOPE

Duvha Power Station in need of maintenance service for LV Motors. The provision of spares and off-site refurbishment, repairs and overhaul of all LV motors at Duvha Power Station on an “as and when required basis” for a five (5) year period.

2.1.1 PURPOSE

The purpose of the document is to provide a scope of work framework stated under section 2.1 intended to be the input to the NEC Part 3: Scope of Work.

2.1.2 APPLICABILITY

This document is applicable to Duvha Power Station Electrical Engineering, TSS, Electrical Maintenance (EMD), Outage and Materials Management Department.

2.2 NORMATIVE/INFORMATIVE REFERENCES

2.2.1 NORMATIVE

- [1] ISO 9000: Quality Management Systems
- [2] 240-55944466 Supplier Contract Quality Requirement's Specification
- [3] QM 58 Supplier Contract Quality Requirements.
- [4] Occupational Health and Safety Act

2.2.2 INFORMATIVE

Not applicable.

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2.3 DEFINITIONS

Definitions	Description
Spare	is the item required by Eskom and intended to be retained by Duvha at their main store as a backup component to the one in use at the plant
Specification	Is the technical description given by Eskom to describe the stock item required by the business
LV Motors	Motors operation at >1000 Volts

2.3.1 DISCLOSURE CLASSIFICATION

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary)

2.4 ABBREVIATIONS

Abbreviations	Description
NEC	New Engineering Contract
OEM	Original Equipment Manufacture
QC	Quality Control
QCP	Quality Control Plan
SOW	Scope Of Work

2.5 ROLES AND RESPONSIBILITIES

Roles and responsibilities are as follows:

End User/Service Manager

- Responsible for ensuring that the quality checking of the supplied spare is correct and useable prior to the item being binned, including the works by the service provider.
- Must ensure that the supplier is managed in line with this scope and the subsequent NEC document to be developed.
- Must ensure that the quality of maintenance and repairs are as per Eskom’s standard

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Maintenance Manager

- Must ensure plant availability and reliability through his/her oversight duties over the End User/Service Manager

2.6 PROCESS FOR MONITORING

Quality control on incoming product will be done, and all material is to be signed off by the appointed QC personnel/Engineer/End user to ensure the quality of the supplied goods is according to Eskom standard. Furthermore, the End User/Service Manager will manage the delivery of the services in line with the NEC contract clauses and contract management principle.

3. THE WORKS

3.1 DESCRIPTION OF THE WORKS

Duvha Power Station needs maintenance service of LV Motors by a qualified repair company (Armature Winders). The provision of spares and off-site refurbishment, repairs and overhaul of all Motors at Duvha Power Station on an “as and when required basis” for a five (5) year period including issuing test certificates, supporting documents or associated as part of the package of the spare being bought or serviced at the time. Provide onsite technical support by availing at least one OEM Representative technician to site.

3.1.1 GENERAL REQUIREMENTS OF THE WORKS:

Outage Works Information:

Remove from site and repair LV Motors as per work scope developed by Duvha Power Station for a period of five years.

Process to be followed, unless superseded by any other Eskom process during outage maintenance work:

1. Remove LV motor from site.
2. Clean externally.
3. Dismantle Motor.
4. Clean internally.
5. Inspect Stator, Rotor, Bearings, Seals and all other internal components.

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6. To be visually verified, assessed to determine final scope of each LV Motor by Eskom delegated representatives including technical support services Personnel, that are also custodians of quality control
7. Submit report and quote for repairs to *Service Manager*.
8. Replace defective components as per Eskom instructions.
9. Re-assemble motors.
10. Fill with clean oil and/or grease where required.
11. Bench test and submit results for each for each motor in the presence of Eskom representatives and vibration specialist.
12. Transport to site.
13. Assist with commissioning (Where Required).
14. Technical assistance required for the initial start of the unit – up for approximately 24 hours (Where Required).

Points of note and will apply to both normal and outage maintenance situations:

- Upon the issue of a Task Order by the *Service Manager*, the *Contractor* must collect the specified LV Motor from the site, transport it to the *Contractor's* workshop, strip the motor and assess the condition. The *Contractor* must then compile a list of all the items that are not in good condition together with the work that will be necessary to repair the motor (with reference to the activity schedule prices). This list must immediately be submitted to the *Service Manager* for his assessment. Only after the Service Manager's go-ahead can the *Contractor* proceed with required repair work.
- The *Contractor* must only fit new parts/spares to the motors in bad condition; any deviation from this must be discussed with the Service Manager for acceptance.
- The refurbished motor is delivered to site following the successful test run and acceptance of all test certificates, QCP's and guarantees.
- Work on a motor will be covered by one Task Order. The sum-total time to perform the work, or the sum-total of time for delays and the sum total of costs of all the Task Orders associated with an motor will form the basis for determining delay damages.
- The total time between collecting a motor and delivery of the same motor shall not be more than 3 weeks.
- Any machining that is required on the motor shaft or rotor in terms of new evolving situation or condition and installation plates should be manufactured and machined by the *Contractor*. The *Contractor* will provide a quote to the client for the works, and the client shall approve accordingly.

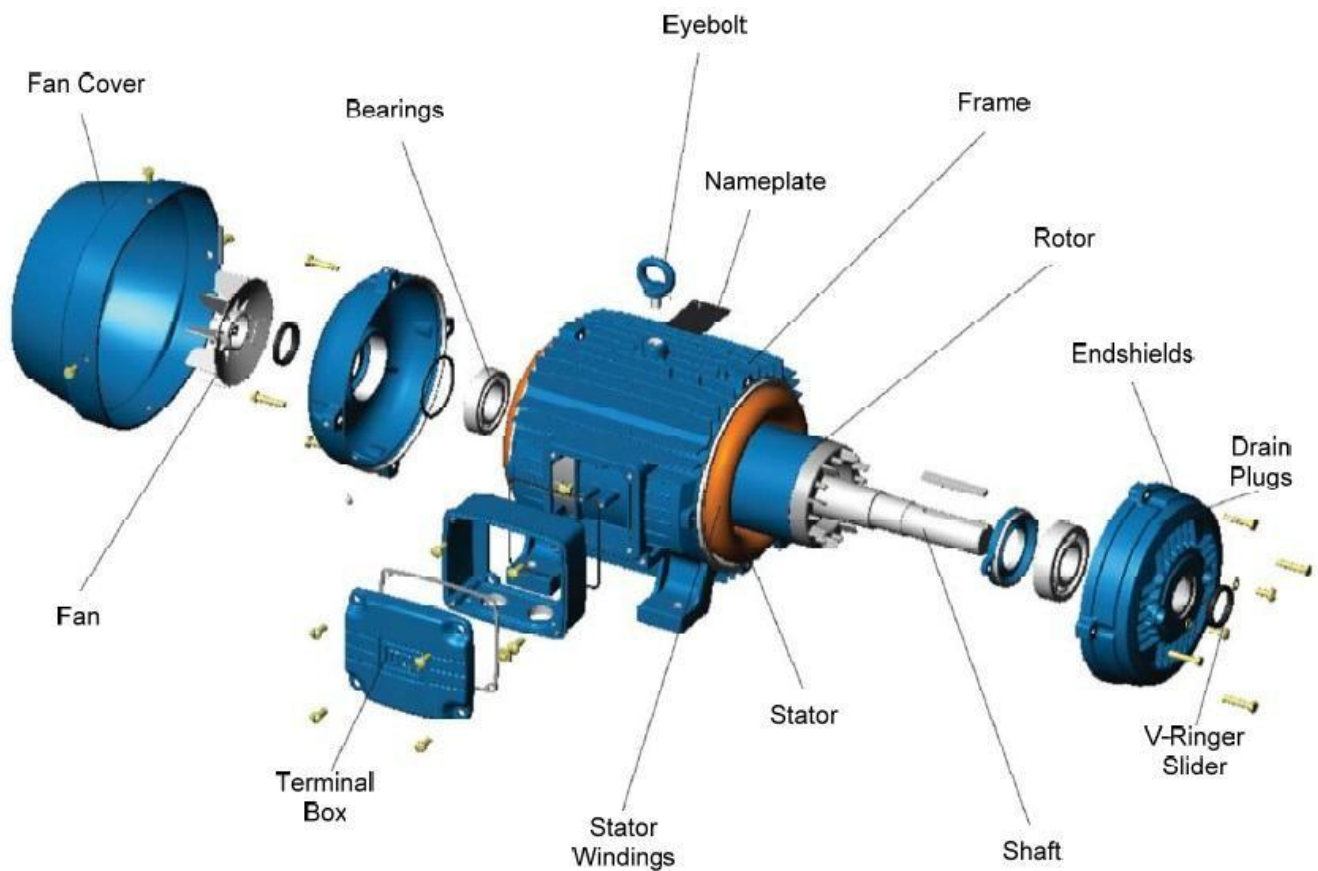
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- The completion date of a motor overhaul will only be considered if the following documentation is available to and has been accepted by the *Service Manager*:
 1. *Test certificates of all tests done*
 2. *Calibration certificates of all the instruments used*
 3. *A statement on guarantees applicable to the motor new actual capabilities*
 4. *Inspection and completion certificate.*
 5. *Joint inspection to be carried out by the Contractor and Service Manager by means of an agreed check list (QCP)*
 6. *All Technicians to have valid certification and authorized to work on the respected equipment.*
 7. *No person to exceed his or her authorized competencies.*
 8. *Eskom quality representative to certify that the Contractor renders the correct levels of service and quality.*
 9. *Service Manager to certify technician authorisation on the respected equipment.*

3.1.2 GENERAL LV MOTOR EXPLODED DIAGRAM FOR INTERNAL SPARES LIST

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A typical 3-phase induction motor [Courtesy of Electromotors WEG SA, Brazil]

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Generic SOW for Each Type

Frame size / description: KDX 71							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							

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Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							

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Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							

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Compile and supply report as per the requirements under Reports listed in the Contract Conditions.							
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Frame size / description: KDX 80							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							

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Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							

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Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							

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Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: D90 S.L. 1.5kW, 2.2 kW							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							

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Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							

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Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired:							

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Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under Reports listed in the Contract Conditions.							

Frame size / description: DX 100 L 3kW							
Description	Normal repair time	% Increase in Price for a Break down	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and							

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compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							

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Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							

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Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: DX 112 M 4kW

Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							

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Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							

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Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							

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Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							

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Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: Unelec 8 kW Frame LFA160M							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							

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Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							

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Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Supply and fit new brushes							
Remove old commutator							
Supply new commutator							
Fit new commutator							
Repair brush gear to standard							
Slot stator feet							
NDT rotor test							
Rewind Stator							
Manufacture new brush gear , box , springs , column clamps and rocket ring							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							

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Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: DX 180 M,L 15 - 22 kW							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended							

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repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							

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Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							

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Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

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Frame size / description: D 200 L 30 KW							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							

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Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							

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Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute							

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equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: D 225 S,M; 45kW; 11 KW 12 pole extended shaft 600mm Ash crusher motor;							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 12 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							

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Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							

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Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor (high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							

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Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

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Frame size / description: D 250 S,M 55KW, 75 KW							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							

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Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							

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Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							

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Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: D 280 S 90kW, 110kW and 75 KW seal air fan motor with double impellers

Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							

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Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							

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Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							

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Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

Frame size / description: D 315 S,M,MX,MXB,MXL 132kW; 150kW; 160kW; 185 KW							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							

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Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							

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Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							

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Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Supply new gears							
Supply , fit pinion and lock nut							
Supply and fit new brake							
Supply and fit new PT 100							
Slot stator feet							
Supply and fit new ant condensation heaters							
NDT Rotor							
Supply and fit new shaft							
Supply and fit new feet							
Manufacture new screen covers							
Replacement of motor name plate							
Supply and fit new wave washers							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							

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Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							
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Frame size / description: Maudsley Ltd. 3 kW DC 220/340 volt. Frame 160Q194							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							

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Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							

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Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Supply and fit new brushes							
Remove old commutator							
Supply new commutator							
Fit new commutator							
Repair brush gear to standard							
Slot stator feet							
NDT rotor test							
Rewind Stator							
Manufacture new brush gear , box , springs , column clamps and rocket ring							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							

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Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							
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Frame size description: Siemens. 25 kW. DC 220 volt. 126 amps. Type 1HA3253-6ZZ24-Z							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							

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Repair and file stator core							
Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							

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Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Supply and fit new brushes							
Remove old commutator							
Supply new commutator							
Fit new commutator							
Repair brush gear to standard							
Slot stator feet							
NDT rotor test							
Rewind Stator							
Manufacture new brush gear , box , springs , column clamps and rocket ring							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							

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Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

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Frame size / description: Bosch DC 24 volt. Frame EHP24							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							

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Clean stator core and prep for assembly							
Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							

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Repair rotor journal (each)							
Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Supply and fit new brushes							
Remove old commutator							
Supply new commutator							
Fit new commutator							
Repair brush gear to standard							
Slot stator feet							
NDT rotor test							
Rewind Stator							
Manufacture new brush gear , box , springs , column clamps and rocket ring							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							

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Test motor as repaired. Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as repaired: Separate losses and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

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Frame size / description: Maudsley Ltd. DC shunt. 45 kW 220 volt 224 amps							
Description	Normal repair time	% Increase in Price for a Breakdown	Time period to return a motor on a Breakdown (Emergency)	Price per 2 pole	Price per 4 pole	Price per 6 pole	Price per 8 pole
Assessment scope of work							
Transport cost							
Test motor as received: Measure insulation resistance and determine polarization index result.							
Test motor as received: Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as received: Perform no-load test, and record no-load current, no-load power factor.							
Determine efficiency as received:							
Separate losses, and determine efficiency.							
Test stator core as received.							
Test rotor bar continuity and core condition as received.							
Collection, dismantling, assessment and compile recommended repair scope of work and failure report.							
Repair scope of work							
Overhaul motor (wash, clean and dry)							
Dynamic balancing of the rotor							
Sandblast motor							
Repair and file stator core							
Clean stator core and prep for assembly							

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Re-tap all stator mounting holes							
Polish rotor core and check ovality							
Polish all stator spigots and landings							
Polish all journals and seal landings							
Re-sleeve DE endshield							
Re-sleeve NDE endshield							
Weld and machine shaft extension and cut keyway							
Replace / fit new bearings (DE & NDE)							
Supply and fit new circlip (each)							
Supply and fit new oil seals (each)							
Supply and fit new gaskets							
Rewinding of stator							
Supply and fit motor DE end shield							
Supply and fit motor NDE end shield							
Supply and fit motor flange shield							
Supply and fit motor DE grease cap and grease nipple							
Supply and fit motor NDE grease cap and grease nipple							
Supply and fit motor terminal box							
Supply and fit motor terminal box cover							
Supply and fit motor terminal block							
Supply and fit motor cooling fan							
Supply and fit motor fan cowl							
Supply and fit motor dust cover seal							
Supply and fit bearing oil seals (each)							
Supply and fit motor feet							
Skim motor feet							
Repair rotor journal (each)							

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Supply and fit new rotor shaft							
Replace complete rotor							
Re-stack stator core							
Rewind armature, VPI, bake and replace binders							
Skim, undercut and bevel armature							
Recondition brush-gear							
Perform a full concentricity on the motor(high no-load vibration)							
Re-assembly of motor							
Spray painting motor							
Replacement of motor name plate							
Supply and fit new brushes							
Remove old commutator							
Supply new commutator							
Fit new commutator							
Repair brush gear to standard							
Slot stator feet							
NDT rotor test							
Rewind Stator							
Manufacture new brush gear , box , springs , column clamps and rocket ring							
Test motor as repaired: Measure insulation resistance and determine polarization index result.							
Test motor as repaired. Perform locked rotor test, and record starting current, power factor, starting torque, impedance, and compute equivalent copper resistance.							
Test motor as repaired. Perform no-load test, and record no-load current, no-load							

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power factor.							
Determine efficiency as repaired: Separate losses, and determine efficiency.							
Test stator core as repaired.							
Test rotor bar continuity and core condition as repaired.							
Compile and supply report as per the requirements under <i>Reports</i> listed in the Contract Conditions.							

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