



Business Management System





Bulk Material Service

Scope of Work - MV Motor Maintenance and Repair

Document Identifier	240-123775530	Rev	2
Effective Date	09/04/2021		
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SCOPE OF WORK

APPROVALS

QUALITY OFFICER		SNR SUPERVISOR		PROJECT LEADER		COMPLIANCE ENGINEER		ENGINEER	
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DATE	26/06/2024	DATE	26/06/2024	DATE	25/06/2024	DATE	26/06/2024	DATE	

INTRODUCTION

This document consists of MV motor scope of work of all Komati Water Scheme MV motors with price list and description of service that the contractor should adhere to when maintaining or repairing the motors.

SCOPE OF WORK

Maintenance and Repair of all Komati Water Scheme Medium Voltage Motors for a period of five years, on an as when required basis.


APPLICABILITY

This document shall apply to Komati Water Scheme electrical maintenance and PED engineering for the repairs and maintenance of the MV motors.

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1. MOTOR INFORMATION

INSTALLATION SITE	WINTERSHOEK PUMP STATION	NOOITGEDAGHT PUMP STATION	VYGEBOOM PUMP STATION	BOSLOOP PUMP STATION HIGH LIFT
ORIGINAL MANUFACTURE	ACTOM & GEC SQUIRREL CAGE	ALSTOM SQUIRREL CAGE	ACTOM SQUIRREL CAGE	ACTOM SQUIRREL CAGE
VOLTAGE	3.3 KV	6.6KV	3.3 KV	3.3 KV
AMPS	614.9A	86A	616A	873A
SPEED	1189 RPM	1484 RPM	1489 RPM	1492 RPM
OUTPUT	3000 KW	830KW	3000KW	4200KW
MASS	11700KG	3540KG	12060KG	14260KG
1Bearings	White Metal	White Metal	White Metal	White Metal

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2. MOTOR SCOPE OF WORK

PRE - REFURBISHMENT, REMOVAL			
DESCRIPTION		COMMENT	DATE
2.1	Approved Outage Plan	Internal	
2.2	Request a Permit To Work	Internal	
2.3	Isolate Motor	Internal	
2.4	Prove positive Isolation	Internal	
2.5	Disconnect Motor	Internal	
2.6	Uncouple and Remove Motor	Internal	
2.7	Transport Motor to KWS Stores	Internal	
PRE – REFURBISHMENT, DISMANTLING AND TESTING			
DESCRIPTION		COMMENT	PRICE EXCLUDING VAT
TRANSPORT			
2.8	Collection from site	Service Provider	R
STRIP & QUOTE			

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2.9	Clean motor externally, dismantle and mark all components	Service Provider	R
2.10	Clean all components and remove all debris from motor, ventilation paths, star point and cable terminal internal boxes	Service Provider	R
2.12	Conduct Mechanical assessment by inspecting motor frame and noting all defects	Service Provider	R
2.13	Conduct Electrical assessment by inspecting the stator core, Windings, and stator winding wedges. By inspecting the rotor core for looseness, overheating, loose/cracked rotor & short circuit bars and clamping fingers.	Service Provider	R
2.14	Perform Stator Winding insulation test	Service Provider	R
2.15	Perform Stator watt loss test	Service Provider	R
2.16	Complete Assessment Report	Service Provider	R

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MOTOR TERMINAL BOXES/LEADS**DESCRIPTION****COMMENT****TOTAL EXCL. VAT**

2.17

Inspect motor terminal bushings for cracks, signs of excessive damage and replace when necessary

Service Provider

2.18

Inspect motor leads for cracks, frays, signs of brittleness and swelling from oil contamination and replace when necessary

Service Provider

2.19

Replace terminal box gaskets/seals. Use cork packing

Service Provider

R

2.20

Mark motor leads for phasing

Service Provider

R

SPACE HEATERS

2.21

Inspect and test motor space heaters

Service Provider

R

2.22

Replace defective heaters

Service Provider

R

2.23

Replace Space heater terminal box gaskets/seals. Use cork packing

Service Provider

R

PT100 MOTOR WINDING TEMPERATURE

2.24

Test PT100 motor winding temperature to design specification

Service Provider

2.25


Replace defective PT100 and wire to winding temperature terminal box

Service Provider

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2.26	Replace defective PT100 and wire to winding temperature terminal box	Service Provider	
WHITE METAL BEARINGS DRIVE END & NON-DRIVE END			

2.27	Re-metal the bearing,	Service Provider	
2.28	Replace all labyrinth seals as per attached drawing, rubber seals and gaskets.	Service Provider	
2.29	Shot blast, clean and paint bearing housings	Service Provider	
2.30	Fit new oil site glasses with steel cover plate	Service Provider	
2.31	Fit new oil scoop bushes	Service Provider	
2.32	Fit new breathers	Service Provider	
2.33	Fit new locating pins	Service Provider	
2.34	Polish bearing journals	Service Provider	
STATOR HOUSING, WINDINGS AND CORE LAMINATIONS			
2.35	Inspect, clean and dry stator housing and ensure that the air paths are clean and not contaminated by any foreign objects	Service Provider	
2.36	Overhaul canopy	Service Provider	
2.37	Re-tap all mounting holes on motor and fit new Jacking bolts	Service Provider	
2.38	Inspect and repair Drive End and Non- Drive End landings of the end shields	Service Provider	

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2.39	Shot blast motor covers and paint	Service Provider	
2.40	Do full concentricity check, Skim feet, clean and polish spigot	Service Provider	
2.41	Inspect and repair stator core laminations for signs of arching, damaged lamination, and insulation failure	Service Provider	
2.42	Steam clean and bake Stator then spray with insulating vanish	Service Provider	
2.43	If stator winding has failed, burnt, or completely damaged, remove old windings, clean slots, and rewind stator completely	Service Provider	
2.44	Conduct IR and PI tests on stator winding	Service Provider	
2.45	Conduct stator core flux to determine hot spots on the motor stator core laminations	Service Provider	
MOTOR ROTOR			
2.46	Replace rotor bars and rotor short circuit rings	Service Provider	
2.47	Rotor bar to bar test	Service Provider	
2.48	Spectrum test on Rotor (ELCID)	Service Provider	
2.49	NDT Rotor shaft	Service Provider	
2.50	Balance rotor	Service Provider	
ASSEMBLE MOTOR			

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2.51	Assemble motor completely before any mechanical tests, checks and routine testing can	Service Provider	
2.52	Measure air gap between stator and rotor	Service Provider	
2.53	Mark magnetic centre and add motor weight on the name plate	Service Provider	
ROUTINE TESTS AND REQUIRED TESTS			
2.54	Carry out Tan – Delta test on stator	Service Provider	
2.55	Ultrasonic testing on white metal bearings	Service Provider	
2.56	Conduct no load test at full voltage- full bearing run (65 degrees Max) with temperature, winding temperatures and vibration reading (Max 1.5mm/s)	Service Provider	
2.57	Factory acceptance test (No oil leaks to be present) and data pack review	Service Provider	
PAINTING OF MOTOR			
2.58	Clean and paint the motor.	Service Provider	
DELIVER TO SITE			
2.59	Deliver motor back to site with new shaft locking device.	Service Provider	
TOTAL			

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COSTS SUMMARY

MOTOR	QUANTITY	UNIT PRICE	TOTAL PRICE
Repair & Service of Wintershoek GEC, 2.49MW 3.3KV	2	R	R
Repair & Service of Wintershoek ACTOM, 3MW 3.3KV	4	R	R
Repair & Service of Vygeboom ACTOM, 3MW 3.3KV	4	R	R
Repair & Service of Bosloop HL ACTOM, 4.2MW 3.3KV	2	R	R
Repair & Service of Bosloop HL ACTOM, 3.991MW 3.3KV	2	R	R
Repair & Service of Nooitgedaght ALSTOM, 0.83MW 6.6KV	4	R	R
TOTAL COSTS			

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