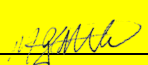




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APPROVALS

QUALITY CONTROLLER		TECHNICIAN		PROJECT LEADER		COMPLIANCE ENGINEER		PED ENGINEER	
NAME	Mahlatse Madisha	NAME	Mpho Ntuli	NAME	Lindiwe Nkonde	NAME	Jonas Mokoena	NAME	Njabulo Makhanya
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
DATE		DATE	04/11/2022	DATE	04/11/2022	DATE	04/11/2022	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

To maintain and repair all Komati Water Scheme MV motors for a period of 24 months.

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	BOSLOOP PUMP STATION LOW LIFT
ORIGINAL MANUFACTURE	ACTOM & GEC SQUIRREL CAGE	ALSTOM SQUIRREL CAGE	ACTOM SQUIRREL CAGE	ACTOM SQUIRREL CAGE	GEC SQUIRREL CAGE
VOLTAGE	3.3 KV	6.6KV	3.3 KV	3.3 KV	3.3 KV
AMPS	614.9A	86A	616A	873A	60A
SPEED	1189 RPM	1484 RPM	1489 RPM	1492 RPM	980 RPM
OUTPUT	3000 KW	830KW	3000KW	4200KW	298KW
MASS	11700KG	3540KG	12060KG	14260KG	
Bearings	White Metal	White Metal	White Metal	White Metal	MJR 5E C3 & MJ 5E C3

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2 MOTOR SCOPE OF WORK

PRE – REFURBISHMENT, REMOVAL			
DESCRIPTION		COMMENT	DATE
1.1	Approved outage plan	Internal	
1.2	Request a Permit To Work	Internal	
1.3	Isolate Motor	Internal	
1.4	Prove positive isolation	Internal	
1.5	Disconnect Motor	Internal	
1.6	Uncouple and Remove motor	Internal	
1.7	Transport Motor to KWS Stores	Internal	
PRE – REFURBISHMENT, DISMANTLING AND TESTING			
DESCRIPTION		COMMENT	PRICE EXCLUDING VAT
2	TRANSPORT		
2.1	Collect Motor from site	Service Provider	R

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DESCRIPTION		COMMENT	PRICE EXCLUDING VAT
3	STRIP & QOUTE		
3.1	Clean motor externally, Dismantle and mark all components	Service Provider	R
3.2	Clean all components and remove all debris from motor internal, ventilation paths, star point internal and cable terminal internal boxes.	Service Provider	R
3.3	Conduct Mechanical assessment by inspecting motor frame and noting all defects	Service Provider	R

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3.4	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
3.5	Perform Stator Winding insulation test	Service Provider	R
3.6	Perform Stator watt loss test	Service Provider	R
3.7	Flux test	Service Provider	R
3.8	Complete Assessment Report	Service Provider	R

POSSIBLE REFURBISHMENT SCOPE OF WORK WITH STANDARD CLIENT REQUIREMENTS

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DESCRIPTION		PRICE EXCL. VAT	YES	NO
4	MOTOR TERMINAL BOXES/LEADS	R		
4.1	Inspect motor terminal bushings for cracks, signs of excessive damage and replace when necessary	R		
4.2	Inspect motor leads for cracks, frays, signs of brittleness and swelling from oil contamination and replace when necessary	R		
4.3	Inspect motor lead lugs for signs of overheating and perform a pull and turn check for loose crimp connections. Ensure that the insulation of the terminal wire is in touch with the lug. Fit new lugs when necessary	R		
4.4	Replace terminal box gaskets/seals. Use cork packing	R		
4.5	Mark motor leads for phasing	R		
5	SPACE HEATERS	R		
5.1	Inspect and test motor space heaters	R		
5.2	Replace defective heaters	R		
5.3	Replace Space heater terminal box gaskets/seals. Use cork packing	R		

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6	PT100 MOTOR WINDING TEMPERATURE			
6.1	Test PT100 motor winding temperature to design specification	R		
6.2	Replace defective PT100 and wire to winding temperature terminal box	R		
6.3	Replace PT100 terminal box gaskets/seals. Use cork packing	R		
7	WHITE METAL BEARINGS DRIVE END & NON-DRIVE END			
7.1	Re-metal the bearing,	R		
7.2	Replace all labyrinth seals as per attached drawing, rubber seals and gaskets.	R		
7.3	Shot blast, clean and paint bearing housings	R		
7.4	Fit new oil site glasses with steel cover plate	R		
7.5	Fit new oil scoop bushes	R		
7.6	Fit new breathers	R		
7.7	Fit new locating pins	R		
7.8	Polish bearing journals	R		

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8	STATOR HOUSING, WINDINGS AND CORE LAMINATIONS			
8.1	Inspect, clean and dry stator housing and ensure that the air paths are clean and not contaminated by any foreign objects	R		
8.2	Overhaul canopy	R		
8.3	Re-tap all mounting holes on motor and fit new Jacking bolts	R		
8.4	Inspect and repair Drive End and Non- Drive End landings of the end shields	R		
8.5	Shot blast motor covers and paint	R		
8.6	Do full concentricity check, Skim feet, clean and polish spigot	R		
8.7	Inspect and repair stator core laminations for signs of arching, damaged lamination, and insulation failure	R		
8.8	Steam clean and bake Stator then spray with insulating vanish	R		
8.9	If stator winding has failed, burnt, or completely damaged, remove old windings, clean slots, and rewind stator completely	R		
8.10	Conduct IR and PI tests on stator winding	R		
8.11	Conduct stator core flux to determine hot spots on the motor stator core laminations	R		
9	MOTOR ROTOR			

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9.1	Replace rotor bars and rotor short circuit rings	R		
9.2	Rotor bar to bar test	R		
9.3	Spectrum test on Rotor (ELCID)	R		
9.4	NDT Rotor shaft	R		
9.5	Balance rotor	R		
10	ASSEMBLE MOTOR			
10.1	Assemble motor completely before any mechanical tests, checks and routine testing can be done –	R		
10.2	Measure air gap between stator and rotor	R		
10.3	Mark magnetic centre and add motor weight on the name plate	R		
11	ROUTINE TESTS AND REQUIRED TESTS			
11.1	Carry out Tan – Delta test on stator	R		
11.2	Ultrasonic testing on white metal bearings	R		
11.3	Conduct no load test at full voltage- full bearing run (65 degrees Max) with temperature, winding temperatures and vibration reading (Max 1.5mm/s)	R		
11.4	Factory acceptance test (No oil leaks to be present) and data pack review	R		

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12	SPECIAL CHARGES			
12.1	Emergency repair charge	R		
13	PAINTING OF MOTOR			
13.1	Clean and paint the motor	R		
14	DELIVER TO SITE			
14.1	Deliver motor back to site with new shaft locking device	R		
Total excluding VAT		R		

MOTOR NAMEPLATES

WINTERSHOEK MOTORS 5-9

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GEC SQUIRELL CAGE MOTOR

OUTPUT	2490 KW 3338 HP	RISE	65 0C
VOLTAGE	3300V	ALTITUDE	1600M
AMPS	494A	INSULATION	CLASS F
RPM	1488	RATING	CMR
HZ	3PH. 50HZ	ENCLOSURE	SP/DP
SIZE	IK10780	MASS	
SPEC	BS2613-70	D.E BEARING	6" SLEEVE
N.D.E BEARING	6" SLEEVE	LUBRICATION	BP HLP65

SERIAL NUMBERS: 2LM2812/01; 2LM2812/02, 2LM2813/01; 2LM2813/02, 2LM2813/03

WINTERSHOEK MOTORS 1-4

ACTOM SQUIRELL CAGE INDUCTION MOTOR

Contract	C00S140/01	Spec	IECB0034
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Number			
Size	UCX750/155	Output	3000KW
Stator Voltage	3300V	Stator Current	614.9 A
Speed	1189 r/min	Temperature Rise	65K
Insulation	CLASS F		0 0C ST Ambient 40 0C
Frequency	3 Ph. 50HZ	Altitude	1650 m.a.s.l
Motor Mass	11700Kg	Duty Type	S1
Stator Mass	7100Kg	Enclosure	IP 23
Rotor Mass	2050Kg	Cooling	ICO1
Power Factor	0.88	Mounting	IM 1001

VYGEBOOM MOTORS

ACTOM SQUIRELL CAGE INDUCTION MOTOR

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Contract Number	C005393/01	Spec	IEC60034
Size	UCX750/155	Output	3000KW
Stator Voltage	3300V	Stator Current	616 A
Speed	1489 r/min	Temperature Rise	65K by resistance (P)
Insulation	CLASS F		0 °C ≤T Ambient ≤ 40 °C
Frequency	3 Ph. 50HZ	Altitude	1650 m.a.s.l
Motor Mass	12060Kg	Duty Type	S1
Stator Mass	7180Kg	Enclosure	IP 23
Rotor Mass	2420Kg	Cooling	ICO1
Power Factor	0.88	Mounting	IM 1001
Rotation	Bi-directional	Number of stator slots	60
		Number of rotor slots	50

Permissible starting intervals (Hour)

2 starts from hot – Motor runs to rest after each start

3 starts from cold – Motor runs to rest after each start

BOSLOOP PUMP STATION MOTORS

BOSLOOP HIGHLIFT MOTOR 1 -3

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ACTOM SQUIRELL CAGE INDUCTION MOTOR			
Contract Number	C005532/02	Spec	IEC60034
Size	UCX630/150	Output	3991KW
Stator Voltage	3300V	Stator Current	832 A
Speed	1492 r/min	Temperature Rise	65K by resistance (P)
Insulation	CLASS F		0 °C ≤T Ambient ≤ 40 °C
Frequency	3 Ph. 50HZ	Altitude	1600 m.a.s.l
Motor Mass	11760Kg	Duty Type	S1
Stator Mass	6100Kg	Enclosure	IP 23
Rotor Mass	2665Kg	Cooling	IC21
Power Factor	0.865	Mounting	IM 1001
Rotation	Bi-directional	Number of stator slots	72
Efficiency	97.0%	Number of rotor slots	58

BOSLOOP HIGHLIFT MOTOR 4 -6

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ACTOM SQUIRELL CAGE INDUCTION MOTOR

Contract Number	C005525/03	Spec	IEC60034
Size	UCX710/215	Output	4200 KW
Stator Voltage	3300V	Stator Current	873 A
Speed	1492 r/min	Temperature Rise	65K by resistance (P)
Insulation	CLASS F		0 °C ≤T Ambient ≤ 40 °C
Frequency	3 Ph. 50HZ	Altitude	1600 m.a.s.l
Motor Mass	14260Kg	Duty Type	S1
Stator Mass	6900Kg	Enclosure	IP 23
Rotor Mass	2665Kg	Cooling	IC21
Power Factor	0.87	Mounting	IM 1001
Rotation	Bi-directional	Number of stator slots	60
Efficiency	96.8%	Number of rotor slots	68

BOSLOOP LOWLIFT MOTOR 1-4

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GEC SQUIRELL CAGE INDUCTION MOTOR

<u>Contract Number</u>	<u>T/2LM 221/01</u>	<u>Output</u>	<u>298 KW</u>
<u>Stator Voltage</u>	<u>3300V</u>	<u>Stator Current</u>	<u>60 A</u>
<u>Speed</u>	<u>1000 r/min</u>	<u>Insulation</u>	<u>CLASS F</u>
<u>Frequency</u>	<u>3 Ph. 50HZ</u>	<u>Mounting</u>	<u>Vertically Mount</u>
<u>Motor Mass</u>		<u>Bearings</u>	<u>Roller & Ball Bearings</u>

T/2LM 221/01/02/03/04

NOOITGEDAGHT MOTOR

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ALSTOM SQUIRELL CAGE INDUCTION MOTOR

Contract Number	B004779/03	Spec	IEC60034
Size	UC355/112	Output	830 KW
Stator Voltage	6600V	Stator Current	86 A
Speed	1484 r/min	Temperature Rise	80K by resistance (P)
Insulation	CLASS F		0 °C ≤T Ambient ≤ 40 °C
Frequency	3 Ph. 50HZ	Altitude	1600 m.a.s.l
Motor Mass	3540Kg	Duty Type	S1
Stator Mass	2020Kg	Enclosure	IP 23
Rotor Mass	930Kg	Cooling	IC21
Power Factor	0.88 P.U	Mounting	IM 1001
Rotation	Bi-directional	Motor Heaters	700W @240V
Year	2007		

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