DOCUMENT NO.: KP1/13D/4/1/TSP/09/043-14

Kenya Power

LIVE LINE TOOLS.

Part 14: CORDLESSS DRILLING & CUTTING TOOLS, BATTERIES AND ACCESSORIES — SPECIFICATION

A Document of the Kenya Power & Lighting Company Plc.

February 2024

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TABLE OF CONTENTS

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
Issue1 Rev 0	2022-05-19	New Issue	Rotich Benard	Eng. S. Kimitei
Issue1 Rev 1	2023-09-27	Added socket spanner 10-32mm as part of the accessories to be supplied with cordless ½" driver	Rotich Benard	Dr. Eng. P. Kimemia
Issue1 Rev 2	2024-02-20	I. Changed the battery charging time of the cordless lithium battery from 60 mins to 50 mins in Clause 4.2.1.4 II. Changed the capacity of Lithium-Ion battery from 18V/4.0Ah to 18V/5.0Ah in Clauses 4.2.1, 4.2.5.3, 4.2.7.3, 4.2.8.10, 4.2.9.2, 4.2.10.5 III. Changed 'Cordless ½" driver' to 'Cordless ½" Impact Wrench' in Clause 4.2.8 V. Amended requirements of cordless chain saw in Clause 4.2.11	Rotich Benard Peter Waweru	Dr. Eng. P. Kimemia

01. Circulation List

COPY NO.	COPY HOLDER
1	Manager, Standards
Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)	

REVISION OF KPLC STANDARDS

In order to keep abreast of progress in the industry, KPLC standards shall be regularly reviewed. Suggestions for improvements to approved standards, addressed to the Manager, Standards department, are welcome.

FOREWORD

This specification has been prepared by the Standards Department and Network Management Division, both of the Kenya Power & Lighting Company Plc (herein called Kenya Power). It lays down requirements for Cordless Drilling & Cutting Tools, Batteries and Accessories for live line work along power lines, substations and electrical installations operated at 50Hz and at different voltages of up to 220kV as specified in Clause 4.1.2. Kenya Power intends it for use in purchasing the items.

This specification stipulates the minimum requirements for the Cordless Drilling & Cutting Tools, Batteries and Accessories for live line work acceptable for use in the company and it shall be the responsibility of suppliers and manufacturers to ensure that the offered design is of the highest quality and guarantees excellent service to Kenya Power.

Users of this Kenya Power specification are responsible for its correct interpretation and application.

The following are members of the team that developed this specification:

No	Name	Department
1.	Richard Kioko	Network Management
2.	Peter Muthua Waweru	Network Management
3.	Rotich Benard	Standards
4.	Angelicah Ruguru Kinyumuh	Network Management
5.	Joan Waweru	Network Management

1. SCOPE

1.1. This specification is for Cordless Drilling & Cutting Tools, Batteries and Accessories for live line work along power lines, in substations and electrical installations operated at 50Hz and at different voltages of up to 220kV as specified in Clause 4.1.2. and shall cover the following:

a) Cordless 18V/5.0Ah Battery
b) Cordless Automotive Battery Charger
c) Cordless Desktop Charger
d) Cordless Angle Grinder
e) Cordless Drill Driver
f) Drill Bits
g) Cordless Impact Drill Set
h) Cordless ½" Impact Wrench
i) Cordless Battery Operated Hydraulic Crimping Tool
j) Cordless Battery Operated Hydraulic Cutting Tool
k) Cordless Chain Saw

1.2. The specification also covers inspection as well as schedule of Guaranteed Technical Particulars to be filled, signed by the supplier and submitted for tender evaluation.

2. NORMATIVE REFERENCES

The following standards contain provision, which, through reference in this text, constitute provisions of this specification. For dated editions, the cited edition will apply; for undated editions, the latest edition of the referenced document shall apply.

BS 7668:	Specification for weld able structural steels. Hot finished structural hollow sections in weather resistant steels
IE 60086/62218:	Specification for Lithium batteries
IEC 60254-1:	General methods for battery chargers
IEC 60335:	General specification for batteries with output less than 120V
IEC 60742-2-1:	Standard Specification for Drills and Impact drills/drivers
IEC 60745-2-22:	Hand-held motor-operated electric tools - Safety - Part 2-22: Particular requirements for cut-off machines
IEC 61472 ed3.0:	Live working –Minimum approach distances for A.C. systems in the voltage range 72.5 kV to 800 kV – A method of calculation;
IEC 62133:	General safety requirements for batteries

ISO 1461: Hot dip galvanizing coatings on fabricated iron and steel articles. Specification and test methods

ISO16089:2015: Particular requirements for abrasive and grinding machine guards

OSHA Regulation; 1910.269: Part J: Live Line Tools

3. DEFINITIONS AND ABBREVIATIONS

3.1. Definitions

For the purpose of this specification, the definitions given in the reference standards and specifications shall apply including the following:

Minimum Approach Distance (MAD): is the minimum air gap or summation of air gaps measured between any part of the operator and live electrical apparatus as given in OSHA guidelines in Table R-6 of the Federal Register.

3.2. Abbreviations

For the purpose of this specification, the abbreviations given in the reference standards and specifications shall apply including the following:

ISO: International Organization for Standardization

OSHA: Occupational Safety and Health Administration

ASTM: American Society for Testing and Materials

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

4.1.1. Physical service conditions

The Cordless Drilling & Cutting Tools, Batteries and Accessories for live line shall be suitable for continuous use outdoors in tropical areas:

a) at altitudes of up to 2200m above sea level,
b) humidity of up to 90%,
c) average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and
d) heavy saline conditions along the coast.

4.1.2. Approach & Insulation Distance Information

The recommended Minimum Approach Distance (MAD) shall be in accordance with OSHA guidelines in Table R-6 of the Federal Register as given below:

Table 1: Live Working Recommended Minimum Distances at a Glance

Nominal Voltage AC (kV) Auto-reclose Distance	Minimum Approach Distance (MAD)	
	Phase to Earth OFF (mm)	Phase to Phase OFF (mm)
11	800	950
33	800	1100
66	900	1300
132	1200	1900
220	1700	2800

4.2. DESIGN AND CONSTRUCTION

4.2.1. Cordless 18V/5.0Ah Battery

4.2.1.1. The cordless battery shall be made of Lithium-Ion and of high efficiency.

4.2.1.2. The cordless battery shall be compact and lightweight, have impact-resistant outer case and shock-absorbing inner-liner to protect the battery.

4.2.1.3. The Cordless battery shall meet following technical requirements

a) Output Voltage shall be 18V±2% Maximum

b) Output Ampere shall be 5.0A ±2%, and

c) Ampere-hour rating shall be 5.0AH.

4.2.1.4. The Cordless battery charging time shall not exceed 50 minutes with on-board charge level indicator to monitor battery charge.

4.2.1.5. The Cordless battery shall be capable of resisting self-discharge and remains ready for use even after long periods of storage.

4.2.1.6. The Cordless battery shall be protected against overloading, over-discharging and over-heating with available modern technologies.

4.2.2. Cordless Automotive Battery Charger

4.2.2.1. The cordless automotive battery charger shall be Lithium-Ion or Ni-MH.

4.2.2.2. The cordless automotive battery charger shall be compact and of high efficiency.

4.2.2.3. The cordless automotive battery charger shall have batteries capable of being charged with 12/24V DC cigarette lighter socket in car, truck or boat.

4.2.2.4. The cordless automotive battery charger shall be protected against overloading, over-charging and over-heating with available modern technologies.

4.2.2.5. The cordless automotive battery charger shall be equipped with optimum charging system for slide-on battery and digital power display to allow users to know the condition of the battery being charged.

4.2.2.6. The cordless automotive battery charger shall meet following technical specifications;

Table 2: Cordless Automotive Battery Charger Requirements

Item	Technical data
Name	Cordless Automotive Battery Charger
Battery cell type	Lithium-Ion/Ni-MH
Battery style	Slide
Input	D.C. 12V – 24V
Output	D.C. 7.0V – 18V
Amp hour (Ah)	1.3 – 5.0

4.2.3. **Cordless Desktop Charger**

4.2.3.1. The cordless desktop charger USB ports shall be universally compatible with electronic devices that use USB port and cable for charging

4.2.3.2. The cordless desktop charger shall be designed with two to three charging USB Ports or pads.

4.2.3.3. The cordless desktop charger shall have 2.1Ampere at 5.0V output from each USB Port.

4.2.3.4. The cordless desktop charger shall have rubber covers to protect USB ports from dust and water and an on/off switch for operator convenience

4.2.3.5. The cordless desktop charger shall meet following technical requirements;

Table 3: Cordless Desktop Charger

No	Description	Technical data
1	Out Ports	2- 4 USB Ports
2	Output Voltage	DC 5V
3	Output Current	2.1A (each port)
4	Input Voltage	12-18V DC
5	Battery Cell type	Lithium-Ion/Ni-MH

4.2.4. Cordless Angle Grinder

4.2.4.1. The cordless angle grinder shall be compact, lightweight.

4.2.4.2. The cordless angle grinder shall be powered by 18V high efficiency Li-ion battery.

4.2.4.3. The cordless angle grinder shall have following safety features;

a) Electric brake and Brushless motor

b) Automatic Speed Control i.e. automatically changes the cutting speed according to load condition for optimum operation

c) Anti-restart function and Soft start feature.

d) Battery fuel gauge and Rubberized soft grip.

e) Electronic current limiter for overload protection.

f) Slide switch conveniently located for one hand operation

4.2.4.4. The cordless angle grinder shall meet following minimum technical specifications;

Table 4: Cordless Angle Grinder minimum Requirements

No	Item	Technical data
1	Battery Type	Lithium-ion
2	Battery Voltage	18V/5.0AH
3	Bore diameter	18-24mm
4	Maximum wheel thickness	5-7mm
5	Maximum wheel diameter	115-125 mm
6	No Load Speed	8000-8,500rpm
7	Vibration: Surface Grinding	7-10 m/sec²
8	Vibration: Disc Sanding	2-3.5 m/sec²
9	Net weight	≤ 3.5Kg

4.2.4.5. The cordless angle grinder shall be supplied complete with following standard accessories.

a) Two 18V Li-ion battery

b) Connector Case

c) Compact charger

d) Grinding wheel

e) Lock nut and Side handle

4.2.5. Cordless Drill Driver

4.2.5.1. The cordless drill driver shall be rugged and compact with a rubberized handle for soft grip to ensure operator's comfort during operation and suitable for all drilling applications both steel and wood.

4.2.5.2. The cordless drill driver shall be equipped with high efficient brushless motor for longer run time, increased power and speed, and longer life.

4.2.5.3. The cordless drill driver shall be made of all metal gears and gear housing for maximum job site durability

4.2.5.4. The cordless drill driver shall have all metal self-ratcheting chuck for improved bit gripping strength and durability.

4.2.5.5. The cordless drill driver shall be protected against overloading, over-discharging, over-heating, and have an indication gauge for battery charge level.

4.2.5.6. The cordless drill driver shall meet following technical specifications

Table 5: Cordless Drill Driver Minimum Requirements

No	Item	Technical data
1	Battery Type	Lithium-ion
2	Battery Voltage	18V/5.0AH
3	Power type	Cordless
4	Capacity Steel and Wood	At least 13mm and 76mm
5	No load speed (Low and High)	(2Variable Speed) : 0 - 500/ 0 - 2,000 rpm
6	Maximum Lock torque	At least 120N•m
7	Handle type	Piston
8	Chuck capacity	1.5 to 13mm
9	Drill bits	All standard bits

4.2.5.7. The cordless drill driver shall be supplied complete with following standard accessories.

a) Two 18V Li-ion battery
b) Connector Case
c) Compact charger and carrying case
d) Side handle

4.2.6. **Drill Bits**

4.2.6.1. The drill bits shall be suitable for use in all standard 5/8", 3/4" and 1" drill–drivers and shall be a set offering a full range of drilling, driving and fastening solutions designed for use in wood poles.

4.2.6.2. The drill bits shall be made from ASTM A681 S2 modified steel, and heat treated for longer life and black-oxide coated to resist corrosion and remain sharper for long.

4.2.6.3. The drill bits shall have Ultra-Lock 1/4" hex shanks design for fast and easy bit changes to ensure no drill bit spin-out.

4.2.6.4. The drill bits shall have 1350 Split point to prevent drill bit from movement during operation.

4.2.6.5. The drill bit set shall have a combination of all standard sizes bits for power line work. The set shall have at least 12 bits in total. The size of each drill bit shall be clearly embossed on its surface

4.2.6.6. The drill bits shall be supplied complete with hardened PVC carrying case with internal holder/pockets for each bit.

4.2.7. **Cordless Impact Drill Set**

4.2.7.1. The cordless impact drill set shall be suitable for drilling concrete, wood, metal and drive screws with clutch setting.

4.2.7.2. The cordless impact drill set shall be a hybrid 4-function tool with impact, hammer, driver and drill all in one to form an impact drill set. The cordless impact drill set shall have compact and ergonomic design with rubberized soft grip handle to ensure increased comfort on the job.

4.2.7.3. The cordless impact drill set shall be powered by 18V/5.0Ah Lithium-Ion cordless battery.

4.2.7.4. The cordless impact drill set shall have a variable 2-speed (0-600 & 0 - 2100 rpm) for a wide range of drilling, driving and fastening applications on all materials.

4.2.7.5. The cordless impact drill set shall be equipped with protection against overloading, over-discharging and over-heating.

4.2.7.6. The cordless impact drill set shall be equipped with 1/4" hex chuck for quick bit changes capable of accommodating all sizes standard drill bits

4.2.7.7. The cordless impact bit shall be supplied complete with drilling bits (5/8 – 1"), sockets (8-32), Battery and charger (car & socket outlet)

4.2.7.8. The cordless impact drill set shall meet following technical specifications:

Table 6: Cordless Impact Drill Set Minimum Requirements

No	Item	Technical data
1	Tool type	Cordless Impact - 4 function (Set) drill
2	No load Speed	Two Variable (0-600 and 0-2100 rpm)
3	Impacts Per Minute	Variable speed :0 – 3,000 IPM
4	Input Voltage	18V Lithium-Ion battery
5	Maximum Impact Torque	140Nm
6	Battery Charge Time	Less than 45min.
7	Power Type	Cordless
8	Speed power selection	Two
9	Hex Shank Size	1/4"
10	Accessories	Battery and Charger

4.2.8. Cordless ½" Impact Wrench

4.2.8.1. The cordless ½" impact wrench shall be ultra-compact and lightweight in design and not more than 9" in overall length and feature ergonomically design handle with rubberized soft grip for increased comfort.

4.2.8.2. The cordless ½" impact wrench shall deliver power and speed in an ultra-compact size for efficient driving and fastening

4.2.8.3. The cordless ½" impact wrench shall be powered by 12V or 18V 5.0Ah a Lithium Ion slide-style battery that drives brushless motor for efficient performance and long run time.

4.2.8.4. The cordless ½" impact wrench shall have in built setting feature that help to eliminate "cam-out" and "cross threading" by driving at low speed until tightening begins.

4.2.8.5. The cordless ½" impact wrench shall have variable 2-speed (0-1,200/0-2,500 rpm & 0-1,500/0-3,600 IPM) for a wide range of fastening applications.

4.2.8.6. The cordless ½" impact wrench shall be equipped with protect against overloading, over-discharging and over-heating.

4.2.8.7. The cordless ½" impact wrench shall come with socket spanner accessories ranging from 10 -32 mm compatible with the driver.

4.2.8.8. The cordless ½" impact wrench shall be supplied complete with battery and charger.

4.2.8.9. The cordless ½" impact wrench shall have Auto-stop system available both in forward/reverse rotation modes (3 modes of reaction time for automatic stop both in forward and reverse rotation modes)

4.2.8.10. The cordless ½" impact wrench set shall meet following technical requirements:

Table 7: Cordless ½" Driver Minimum Requirements

No	Features	Technical data
1	Tool type	Cordless ½" impact wrench
2	No load Speed	Two Variable (0-1,200/0-2,500) rpm
3	Impacts Per Minute	Variable speed :0 – 3,500 IPM
4	Input Voltage	12V or 18V/5.0Ah Lithium-Ion battery
5	Maximum Impact Torque	130Nm
6	Battery Charge time	Less than 45min.
7	Power Type	Cordless
8	Hex Shank Size	1/4"
9	Socket spanner accessories	Ranging from 10 -32 mm range compatible with the driver
10	Accessories	Battery and Charger Plus Carrying case

4.2.9. **Cordless Battery Operated Crimping Tool**

4.2.9.1. The cordless battery operated crimping tool shall be used in live line crimping of all types of Lugs and Connectors.

4.2.9.2. The crimping tool shall be powered by 18V/5.0Ah Li-Ion battery or equivalent.

4.2.9.3. The crimping tool shall accept all semi-circular, hollow slotted dies; common to most 12 tons' tools (U dies).

4.2.9.4. The tool's main application is as follows;

Table 8: Applicable maximum Connector Sizes (mm^2)

AL/CU Lugs and Splices	$400mm^2$
"C" Sleeve connectors	$350mm^2$

4.2.9.5. The crimping tool shall be double speed action with a rapid approach of the dies to the connector then a slower, more powerful speed for crimping.

4.2.9.6. The crimping tool shall be equipped with maximum pressure sensor and pressure relief valve to assure greater precision and repeatability of the pressure cycle.

4.2.9.7. The crimping tool shall display essential real time tool operating information data including:

a) Crimping pressure and force being generated
b) Battery power availability
c) Tool service status.

4.2.9.8. The crimping tool shall be supplied with a set of all sizes of dies required for crimping all standard sizes connectors from $10mm^2$ to $400mm^2$

4.2.9.9. The dies shall be made from high strength special steel, heat treated to ensure a high resistance to wear and damage.

4.2.9.10. The crimping tool shall meet following technical requirements;

Table 9: Cordless Battery Operated Crimping Tool Minimum Requirements

No	Features	Technical data
1	Type of tool	Cordless battery operated Crimping tool
2	Opening of the head	25 mm
3	Battery material	Li-Ion
4	Battery voltage	18 V
5	Battery current	5.0 Ah
6	Length	Not more than 50 cm
7	Weight	Not more than 10 kg.
8	Die sizes	All standard sizes from 10 to $400mm^2$

Figure 1: Typical Cordless Battery Operated Crimping Tool

4.2.9.11. The crimping tool shall be supplied complete with the following accessories:

a) Basic tool with battery and shoulder strap
b) Spare battery
c) 18VDC Charger or AC Charger (230Vac/50Hz) or
d) Plastic carrying case
e) 12 die sets

4.2.10. **Cordless Battery Operated Hydraulic Cutting Tool**

4.2.10.1. The cordless battery operated hydraulic cutting tool shall be used in live line cutting of all types of overhead and underground conductors with maximum overall diameter of 2-9/16".

4.2.10.2. The blades shall be manufactured from high strength special steel, heat treated to ensure a long service life.

4.2.10.3. The head shall be able to rotate through 300 degrees, to enable the operator to work in the most comfortable position, and shall easily be opened to allow cutting of running cables and conductors.

4.2.10.4. The hydraulic system shall be double speed action to ensure greater cutting speed and cutting force.

4.2.10.5. The cutting tool shall be powered by 18V/5.0Ah Li-Ion battery or equivalent.

4.2.10.6. The battery shall be equipped with led indicators that indicate the remaining battery life at any time.

4.2.10.7. The cutter shall be fitted with a maximum hydraulic pressure valve.

4.2.10.8. The tool shall meet following technical requirements;

Table 10: Cordless Battery Hydraulic Cutting Tool Minimum Requirements

No	Features	Technical data
1.	Type of tool	Cordless hydraulic cutting tool
2.	Maximum cutting diameter	At least 60 mm
3.	Nominal pressure	At least 650 Bars
4.	Impulse voltage	18 V
5.	Battery current	5.0 Ah
6.	Length	Less than 15 cm
7.	Weight	Less than 10 kg

4.2.10.9. The tool shall be supplied with following accessories;

a) Battery and shoulder strap
b) Spare battery and Plastic carrying case
c) DC or 230VAc/50Hz Battery charger

Figure 2:Typical Cordless Battery Hydraulic Cutting Tool

4.2.11. **Cordless Chain Saw**

4.2.11.1. The cordless chain saw shall have a Bucket Mounted Scab Board

4.2.11.2. The cordless chain saw shall be rugged compact, with zero emissions, lower noise, and considerably less maintenance.

4.2.11.3. The cordless chain saw shall be powered by two 18V/5.0Ah or one 36V/8.0Ah high efficiency Lithium-Ion batteries

4.2.11.4. The cordless chain saw shall be designed with at least 13.5" guide bar and high efficient power brushless motor with a variable speed trigger of 0-3800 FPM for easy operation.

4.2.11.5. The cordless chain saw shall employ rear Handle Design for Optimum Performance and, Built-in lock-off lever to prevent the blade from accidentally engaging.

4.2.11.6. The cordless chain saw shall have integrated seals designed to channel away dust and water for increased durability and longer tool life.

4.2.11.7. The cordless chain saw shall be equipped with latest technology to monitors conditions during use, to protect against overloading, over discharging and overheating.

4.2.11.8. The cordless chain saw shall not use engine oil, spark plug, air filter or muffler, it shall also feature Convenience "tool-less" chain adjustments, a front hand guard designed to actuate chain brake when engaged, an electric brake for maximum productivity, or equivalent of such convenient features.

4.2.11.9. The cordless chain saw shall incorporate built-in L.E.D. on/off switch with auto power-off function; to automatically shut off the saw when operation is delayed for long.

4.2.11.10. The cordless chain saw shall meet following technical requirements:

Table 11: Cordless Chain Saw Minimum Requirements

No	Features	Technical data
1	Motor type and design	Outer rotor Brushless Motor direct-drive system
2	Design	Rear handle design
3	Speed	Variable speed trigger (0-3,800 FPM)
4	Auto-delay shut off switch	In-built (Optional)
5	Input power	36V/8.0Ah
6	Guide bar length	400 mm or equivalent sized guide bar.
7	Guide Bar Cover	Provide
8	Overall Length	Not more than 900 mm
9	Chain Speed	At least 3,800 FPM
10	Chain Pitch	At least 3/8''/ 10 mm
11	Chain Gauge	At least 1.1mm(0.043'') or 1.3mm(0.050'')
12	Low noise level	Less 105 dB

Figure 3: Typical Cordless Chain Saw with Bucket Mounted Scab Board

4.2.11.11. The cordless chain Saw shall be supplied complete with following accessories;

a) Guide Bar 3/8"- 0.043"
b) Chain 3 no. and Guide Bar Cover
c) Battery and battery charger

5. TESTS AND INSPECTION

The cordless tools and cordless batteries and their accessories shall be inspected and tested in accordance with be in accordance with IEC 61230, NEMA WC 74, ASTM F855, ASTM F711 and OSHA Regulation 1910.269 standards and this specification. It shall be the responsibility of the supplier to perform or to have performed the tests specified and whatever other tests he normally performs at works.

6. MARKING AND PACKING

6.1. MARKING

The Cordless tools and batteries shall be marked in a permanent manner with the following information (in English Language):

a) Marking on Cordless batteries and Chargers
   i. Current and Voltage rating
   ii. AH rating
   iii. Continuous current rating
   iv. Short circuit current
   v. Optimal Operating temperature
b) Marking on Cordless drill and driver tools
   i. Tensile/Mechanical strength
   ii. Current rating and Voltage

iii. Battery charging rate
iv. Optimal working Speed
v. Saw blade size
vi. Chain Pitch
vii. Chain Gauge

c) General Markings.

i. the manufacturer and year
ii. Tool model no and serial no.
iii. The standard of manufacture
iv. Warning or notices if applicable for specific tools.
v. Words **"PROPERTY OF KPLC".**

6.2. PACKING

6.2.1. The packaging for the cordless tools and batteries shall be on an easy-to-see, bright-yellow protective bag made of double vinyl-laminated open-weave nylon cloth which shall be lightweight and durable with nylon stitching throughout.

6.2.2. It shall have a plywood bottom which is covered inside and out with metal skids on the bottom of the bag and a full-separating closure constructed with heavy-duty snaps and heavy webbing handles.

6.2.3. The cases shall be furnished with an illustrated operating and maintenance instructions for the items.

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APPENDICES

APPENDIX A: TESTS AND INSPECTION (NORMATIVE)

A.1. Copies of previous Test Reports for the tools issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. The accreditation certificate for the third party testing laboratory shall also be submitted with the tender (all in English Language).

A.2. Copies of test reports to be submitted with the tender (by bidder) for evaluation shall include the following:

a) Voltage test.
b) Insulation resistance tests where application.
c) Fatigue and humidity penetration tests on cable with end fittings
d) Tension and mechanical tests
e) Speed test on chain saw, drill-driver and drills.
f) Short circuit current tests.
g) Battery capacity test
h) Battery discharge test

A.3. After manufacture of the items, they shall be subjected to factory acceptance tests (FAT) before shipment/delivery of the goods that shall be witnessed by two Kenya Power engineers at the factory. Supplier shall invite KPLC in adequate time to facilitate good preparation for the exercise.

A.4. Tests to be witnessed by KPLC Engineers at the factory before shipment shall be in accordance with IEC 61230, NEMA WC 74, ASTM F855, ASTM F711 and OSHA Regulation 1910.269 and this specification and shall include the following:

a) Dye penetration test
b) Visual and dimensional inspection
c) Durability of marking
d) Voltage and current test.
e) Insulation resistance tests
f) Discharge and capacity tests.
g) Robustness and mechanical tests
h) Tension, speed and mechanical tests
i) Motor drive electrical tests

A.5. On receipt of the cordless tools at stores, Kenya Power shall inspect and may perform tests in order to verify compliance with the specification and relevant standards. The supplier shall

replace without charge to KPLC any tools, batteries & accessoriess which fail to meet any of the requirements during inspection/test at stores.

APPENDIX B: QUALITY MANAGEMENT SYSTEM (NORMATIVE)

B.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, and documentation, will fulfil the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfil the requirements of ISO 9001:2015

B.2. The Manufacturer's Declaration of Conformity to reference standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2015 certificate shall be submitted with the tender for evaluation.

APPENDIX C: TECHNICAL DOCUMENTATION (NORMATIVE)

C.1. The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

a) Fully-filled clause by clause Guaranteed Technical Particulars (GTPs)- Appendix D - stamped and signed by the manufacturer.

b) Design Drawings and technical data with details of the tools, batteries & accessories to be manufactured for KPLC

c) Copies of the Manufacturer's catalogues, brochures;

d) Details of the manufacturer's experience; Sales records for the last five years and at least four customer reference letters. Detailed test program to be used during factory testing;

e) Marking details and method to be used in marking the tools, batteries & accessories.

f) Copies of previous test certificates and test reports (As given in Clause A.2) by the relevant International or National Testing/Standards Authority of the country of manufacture (or ISO/IEC 17025 accredited independent laboratory) shall be submitted with the offer for evaluation. A copy of accreditation certificate for the laboratory shall also be submitted (all in English Language);

g) Marking & Packaging details (including packaging materials).

C.2. The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company Plc. for approval before manufacture:

a) Fully filled clause by clause Guaranteed Technical Particulars (GTPs) stamped and signed by the manufacturer **(these are not the ones submitted with the tender)**;

b) Design Drawings with details of the tools, batteries & accessories to be manufactured for KPLC

c) Detailed test program to be used during factory testing;

d) Marking details and method to be used in marking the tools, batteries & accessories.

e) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfil the requirements stated in the contract documents, standards, specifications and regulations.

C.3. The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery to KPLC stores

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APPENDIX D: GUARANTEED TECHNICAL PARTICULARS (GTPS) — NORMATIVE

(to be filled and signed by the Supplier and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of suppliers' capacity and experience; and copies of complete type test certificates and test reports for tender evaluation, all in English Language)

Tender No. .....

Bidder's name and Address.....

Clause	Description	KPLC REQUIREMENTS	**Bidder's offer** (indicate full details of the values offered)
	Bidder's Name and address		State
	Name of Manufacturer		State
	Country of manufacture		State
	Models/type of item being supplied		State
1.1	Scope		Specify
	List of the items being supplied		List
2	Manufacturing standards applicable		State
3	Definitions and abbreviation		State
4	**Requirements**		
4.1.1	Physical service conditions - compliance		State conditions applicable
4.1.2	Recommended Minimum Approach Distances		Specify
4.2	**Design & Construction**		
4.2.1	**Cordless Battery**		
4.2.1.1	Type of battery		Specify
4.2.1.2	Cordless battery design		Specify
4.2.1.3	Output Voltage		State
	Output Ampere		State
	Ampere-hour rating		State
4.2.1.4	Cordless battery charging time		Specify
	Cordless battery has on-board charge level indicator to monitor battery charge		Specify
4.2.1.5	Cordless battery is capable of resisting self-discharge		State
	Cordless battery remains ready for use even after long periods of storage		State

4.2.1.6	Mode of protection against overloading, over-discharging and over-heating		State
4.2.2	**Cordless Automotive Battery Charger**		
4.2.2.1	Type of battery		Specify
4.2.2.2	Battery charger design		State
4.2.2.3	Charger's batteries charger voltage and charging input type		Specify
4.2.2.4	Mode of protection against overloading, over-discharging and over-heating		Specify
4.2.2.5	Charger has optimum charging system for slide-on battery		State
	Chargers has digital power display to allow users to know the condition of the battery being charged		State
4.2.2.6	cordless automotive battery Charger details	Battery cell type	State
		Battery style	State
		Input	State
		Output	State
		Amp hour (Ah)	State
4.2.3	**Cordless Desktop Charger**		
4.2.3.1	Charger design		Specify
4.2.3.2	No of USB ports/pads		Specify
4.2.3.3	Charging port amperage and voltage		Specify
4.2.3.4	How USB ports are protected from dust and water		Specify
4.2.3.5	Cordless desktop charger details	Out Ports	State
		Output Voltage	State
		Output Current	State
		Input Voltage	State
		Battery Cell type	State
4.2.4	**Cordless Angle Grinder**		
4.2.4.1	Cordless angle grinder design		Specify
4.2.4.2	Type and voltage of battery of the grinder		Specify
4.2.4.3	Grinder's safety features	Electric brake and Brushless motor	State
		Automatic Speed Control i.e. automatically changes the cutting speed according to load condition for optimum operation	State
		Anti-restart function and Soft start feature.	State
		Battery fuel gauge and Rubberized soft grip.	State
		Electronic current limiter for overload protection.	State
		Slide switch conveniently located for one hand operation	State
4.2.4.4		Battery Type	Specify
		Battery Voltage	State

	Grinder minimum Requirements	Bore diameter	Specify
		Maximum wheel thickness	State
		Maximum wheel diameter	Specify
		No Load Speed	State
		Vibration: Surface Grinding	Specify
		Vibration: Disc Sanding	State
		Net weight	Specify
4.2.4.5	Standard accessories to be supplied with the grinder		List
4.2.5	**Cordless Drill Driver**		
4.2.5.1	Cordless drill driver's design and application		Specify
4.2.5.2	Drill driver's motor design		Specify
4.2.5.3	Gears and housing material		Specify
4.2.5.4	Drill driver's has all metal gears and gear		Specify
4.2.5.5	Mode of protection against overloading, over-discharging and over-heating		Specify
4.2.5.6	Cordless Drill Driver Minimum Requirements	1) Battery Type	State
		2) Battery Voltage	State
		3) Power type	State
		4) Capacity Steel and Wood	State
		5) No load speed (Low and High)	State
		6) Maximum Lock torque	State
		7) Handle type	State
		8) Chuck capacity	State
		9) Drill bits	State
4.2.5.7	Standard accessories to be supplied with the drill diver		List
4.2.6	**Drill Bits**		
4.2.6.1	Drill bits applicability		State
4.2.6.2	Drill bits material		State
4.2.6.3	Drill bit has Ultra-Lock		Specify
4.2.6.4	Drill bit has 1350 Split point to prevent drill bit from movement during operation		Specify
4.2.6.5	Standard range sizes of the bits and marking		State
4.2.6.6	Standard accessories to be supplied with the drill bits		List
4.2.7	**Cordless Impact Drill Set**		State
4.2.7.1	Cordless impact drill set applicability		State
4.2.7.2	Drill set design		State
4.2.7.3	Type and voltage of battery of the drill set		Specify
4.2.7.4	Drill set's variable speed range		State

4.2.7.5	Mode of protection against overloading, over-discharging and over-heating		Specify
4.2.7.6	Drill set's hex chuck's size		State
4.2.7.7	Standard accessories to be supplied with the drill diver		List
4.2.7.8	Cordless Impact Drill Set Minimum Requirements	1. Tool type	State
		2. No load Speed	State
		3. Impacts Per Minute	State
		4. Input Voltage	State
		5. Maximum Impact Torque	State
		6. Battery Charge Time	State
		7. Power Type	State
		8. Speed power selection	State
		9. Hex Shank Size	State
		10. Accessories	State
4.2.8	**Cordless ½" Impact Wrench**		
4.2.8.1	Impact wrench's design		Specify
4.2.8.2	Impact wrench's is compact		Specify
4.2.8.3	Type and voltage of battery of the driver		Specify
4.2.8.4	Has in built setting feature that help to eliminate "cam-out" and "cross threading" by driving at low speed until tightening begins		State
4.2.8.5	Impact wrench's variable speed ranges		State
4.2.8.6	Mode of protection against overloading, over-discharging and over-heating		Specify
4.2.8.7	Socket spanner accessories to be supplied with the driver		List
4.2.8.8	Supplied complete with battery and charger		Specify
4.2.8.9	Shall have Auto-stop system available both in forward/reverse rotation modes		Specify
4.2.8.10	Impact wrench's Minimum Requirements	1. Tool type	State
		2. No load Speed	State
		3. Impacts Per Minute	State
		4. Input Voltage	State
		5. Maximum Impact Torque	State
		6. Battery Charge time	State
		7. Power Type	State
		8. Hex Shank Size	State
		9. Socket spanner accessories	State
		10. Accessories	State
4.2.9	**Cordless Battery Operated Crimping Tool**		
4.2.9.1	Crimping tool applicability		State
4.2.9.2	Type and voltage of battery		Specify

4.2.9.3	Type of dies used		State
4.2.9.4	Applicable maximum Connector Sizes (mm2)	AL/CU Lugs and Splices	State
		"C" Sleeve connectors	State
4.2.9.5	Crimping tool is double speed action with a rapid approach of the dies to the connector then a slower, more powerful speed for crimping		Specify
4.2.9.6	Crimping tool is equipped with maximum pressure sensor and pressure relief valve to assure greater precision and repeatability of the pressure cycle		State
4.2.9.7	Essential real time tool operating information data display		List
4.2.9.8	Range of dies supplied with the tool		State
4.2.9.9	Material of manufacture of the dies		State
4.2.9.10		Opening of the head	State
		Battery material	Specify
		Battery voltage	State
		Battery current	Specify
		Length	State
		Weight	Specify
		Die sizes	State
4.2.9.11	Standard accessories to be supplied with the crimping tool		List
4.2.10	**Cordless Battery Operated Hydraulic Cutting Tool**		
4.2.10.1	Applicability of the cutting tool		Specify
4.2.10.2	Material of manufacture of the cutting tool's blades		State
4.2.10.3	Angle of rotation of the head		State
4.2.10.4	Hydraulic system's design		State
4.2.10.5	Type and voltage of battery		Specify
4.2.10.6	Remaining battery life indication		Specify
4.2.10.7	Presence of hydraulic pressure valve		State
4.2.10.8	Cordless Battery Hydraulic Cutting Tool Minimum Requirements	Maximum cutting diameter	State
		Nominal pressure	State
		Impulse voltage	State
		Battery current	State
		Length	State
		Weight	State
4.2.10.9	Standard accessories to be supplied with the cutting tool		List
4.2.11	**Cordless Chain Saw**		
4.2.11.1	cordless chain saw shall has a Bucket Mounted Scab Board		Specify
4.2.11.2	Saw's design		State
4.2.11.3	Type and voltage of battery		Specify
4.2.11.4	Guide bar dimensions		Specify
	Type of power motor		Specify

	Variable trigger speed		Specify
4.2.11.5	Chain saw employs rear Handle Design for Optimum Performance and, Built-in lock-off lever to prevent the blade from accidentally engaging		Specify
4.2.11.6	Cordless chain saw has integrated seals		State
4.2.11.7	chain saw is equipped with latest technology that monitors conditions during use, and to protect against overloading, over discharging and overheating		State
4.2.11.8	Chain saw does not use engine oil, spark plug, air filter or muffler		Specify
4.2.11.9	Chain saw has built-in L.E.D. on/off switch with auto power-off function; to automatically shuts off the saw when operation is delayed for long		Specify
4.2.11.10	Cordless Chain Saw Minimum Requirements	1. Motor type and design	Specify
		2. Design	Specify
		3. Speed	Specify
		4. Auto-delay shut off switch	Specify
		5. Input power	Specify
		6. Guide bar length	Specify
		7. Guide Bar Cover	Specify
		8. Overall Length	Specify
		9. Chain Speed	Specify
		10. Chain Pitch	Specify
		11. Chain Gauge	Specify
		12. Low noise level	Specify
4.2.11.11	Standard accessories to be supplied with the chain saw		List
5	**TESTS AND INSPECTION**		
5.1	Test standards and responsibility of carrying out tests		Provide
5.2	Responsibility of carrying out tests		Specify
6	**MARKING AND PACKING**		
6.1	Marking		State
6.2	**Packing**		
6.2.1	Mode of packing		State
6.2.2	Storage container details		Provide
6.2.3	Information printed on the packaging		Provide
	APPENDICES		
A	**TESTS AND INSPECTION**		
A1	Copies of test certificates and certificates be submitted		List the Report Nos
A2	Lists of tests in the submitted test reports		List
A3	Factory acceptance tests (FAT) before shipment/delivery of the goods		Agree
A4	Tests to be witnessed during FAT		List

A5	Supplier shall replace without charge to KPLC items that don't meet specification	State
B	**QUALITY MANAGEMENT SYSTEM**	
B1	QAP	State
B2	Submit ISO 9001:2015	State
C	**TECHNICAL DOCUMENTATION**	
C1	Technical documents to be submitted with tender documents	List
C2	Documents to be submitted for approval before manufacture	List
C3	Recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the lugs to KPLC stores shall be submitted	Specify

** Words like 'agreed', 'confirmed', 'As per KPLC specifications', etc. shall not be accepted and shall be considered non-responsive.*

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Manufacturer's Name, Signature, Stamp and Date