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Kenya Power

ELECTRO - HYDRAULIC METAL HOLE PUNCHING MACHINE WITH OR WITHOUT BATTERY - SPECIFICATION

A Document of the Kenya Power & Lighting Co. Plc.

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0.1 CIRCULATION LIST

COPY NO.	COPY HOLDER
1	Manager, Standards
2	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.

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Issued by: Head of Section, Standards Development	Authorized by: Head of Department, Standards
Signed:	Signed:
Date: 2021-02-11	Date: 2021-02-11

0.2 AMENDMENT RECORD

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
Issue 1, Rev 0	2021-02-11	New issue	Eng. J. Ndirangu	Dr. Eng. P. Kimemia

FOREWORD

This specification has been prepared by the Standards Department and Transmission Network Department of The Kenya Power and Lighting Company Plc (KPLC) and it lays down requirements for electro - hydraulic metal-hole punching machines with or without battery.

The electro - hydraulic metal-hole punching machines are intended for use in fabrication of transmission network structures' parts to meet required standards.

A specification in this series is:

(i) KPLC/3CB/TSP/09/069: Specification for Hydraulic Punch Driver Kit

This specification stipulates the minimum requirements for electro- hydraulic metal hole punching machines acceptable for use in the Company and it shall be the responsibility of the suppliers and manufacturer to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC, good workmanship and good engineering practice in the manufacture of the electro - hydraulic metal hole punching machines for KPLC.

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

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

Name	Department
Paul Mungai	Transmission Network
Julius Mwaniki	Transmission Network
Justus Mutwiri	Transmission Network
Eng. Julius Ndirangu	Standards

1. SCOPE

This specification covers the requirements, design, size, test methods, marking and packing of electro - hydraulic metal- hole punching machines with or without battery

2. NORMATIVE REFERENCES

The following standards contain provisions 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.

ISO 630-2:2011: Structural steels — Part 2: Technical delivery conditions for structural steels for general purposes

IEC 62841-1:2014: Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery - Safety - Part 1: General requirements

IEC 60745-1: Hand-held motor-operated electric tools - Safety - Part 1: General requirements

ISO 286-2: Tables of standard tolerance classes and limit deviations for holes and shafts

IEC 62133-2:2017: Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems

IEC/ISO 17025: General requirements for the competence of testing and calibration laboratories

ISO 28927: Hand-held portable power tools — Test methods for evaluation of vibration emission.

ISO 9461: Hydraulic fluid power — Identification of valve ports, subplates, control devices and solenoids

ISO 10763: Hydraulic fluid power — Plain-end, seamless and welded precision steel tubes — Dimensions and nominal working pressures

3. DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification, the definitions and abbreviations given in the reference standards shall apply together with the following:

3.1. ABBREVIATIONS

KPLC- Kenya Power and Lighting Company Plc.

IEC – International Electro Technical Commission

ISO – International Organization for Standardization.

ISO 9001: 2015 - Quality Management Systems- Requirements

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

4.1.1 The electro- hydraulic metal hole punching machines shall be suitable for continuous use in fabrications of outdoor and indoor equipment's within the required specifications such as:

a. Altitudes of up to 2200m above sea level;

b. Humidity of up to 95%;

c. Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C

d. Pollution: Design pollution level to be taken as "Heavy" (Pollution level III) for inland and "Very Heavy" (Pollution level IV) for coastal applications.

e. Isokeraunic levels of up to 180 thunderstorm days per year.

4.2. DESIGN AND CONSTRUCTION

4.2.1 GENERAL

4.2.1.1 The electro - hydraulic metal-hole punching machine shall be designed and constructed in accordance with IEC 62841 and the requirements of this specification.

4.2.1.2 The electro - hydraulic metal-hole punching machine shall be suitable for use in both mild, stainless and high tensile steel parts as per ISO 630-2:2011 standard.

4.2.1.3 The electro - hydraulic metal-hole punching machine shall be suitable for punching round and oblong holes on mild, stainless and high tensile steel channels and plates with characteristics shown in Table 1.

Table 1: Steel channels and plates characteristics

Particulars	Requirements	
Yield strength, MPA	300	400
Flat bars ,W x T (thickness), mm	80 x 9	100 x 13
Angle line ,L x W x T ,mm	50 x 50 x 5	100 x 100 x 3
Channel L x W x T, mm	125 x 65x 5	300 x 90x 3
T-section, Lx W x T ,mm	125 x 125x 5	450 x 200 x3

4.2.1.4 The electro - hydraulic metal-hole punching machine shall not require pre-drilling or pre-punching.

4.2.1.5 The electro - hydraulic metal-hole punching machine shall be single body, cordless and with no separate hydraulics

4.2.1.6 All metallic parts of the electro - hydraulic metal-hole punching machine shall be resistant to corrosion.

4.2.1.7 The electro - hydraulic metal-hole punching machine shall be supplied fully loaded with hydraulic oil

4.2.1.8 The electro - hydraulic metal-hole punching machine shall have a built in safety valve which bypass oil supply when the maximum pressure is reached.

4.2.1.9 The electro - hydraulic metal-hole punching machine shall be supplied with appropriate accessories including removable handles, punch-die set, adjustment tools, carry case, battery, battery charger, Allen key set and hex wrenches.

The electro - hydraulic metal-hole punching machine shall be AC powered without battery or AC powered with battery as per clause 4.2.2 or 4.2.3 of this specification.

Note: *The specific type to be supplied shall be specified in the tender.*

4.2.2 ELECTRO - HYDRAULIC METAL HOLE PUNCHING MACHINE WITHOUT BATTERY

4.2.2.1 The guaranteed operating characteristics of the electro - hydraulic metal hole punching machine without battery based on IEC 62841 selection formulas shall be complied with during tests, with all the features stated in Table 2.

Table 2: Electro - hydraulic metal-hole punching machine without battery features

Item	Parameters	Units	Value
1.	AC input voltage and frequency	V single phase, Hz	230±10%, 50±10%,
2.	Motor rating	VAC/ W	230±10%/ 1400W
3.	Max.-Hole size (diameter* metal thickness)	mm*mm	24*13
4.	Hole cycle time	secs	≤3
5.	Hole shape		Round/oblong
6.	Force	Tons	≥10.1
7.	Throat depth	mm	≥50
8.	Weight	Kg	≤30

4.2.3 ELECTRO - HYDRAULIC METAL HOLE PUNCHING MACHINE WITH BATTERY

4.2.3.1 The guaranteed operating characteristics of the electro - hydraulic metal hole punching machine with battery based on IEC 62841 selection formulas shall be complied with during tests, with all the features stated in Table 3.

Table 3: Electro- hydraulic metal-hole punching machine with battery features

Item	Parameters	Units	Value
1.	AC input voltage and frequency	V single phase, Hz	230±10%, 50
2.	Motor rating	VDC	18
3.	Battery capacity	VDC, Ah, f (Hz)	18, ≥3.0, 50
4.	Battery charger rating and input voltage range	Watts, V	240, 230±10%
5.	Max.-Hole size (diameter* metal thickness)	mm*mm	24*13

6.	Hole cycle time	secs	≤3
7.	Hole shape		Round/oblong
8.	Force	Tons	≥10.1
9.	Throat depth	mm	≥50
10	Weight (including battery)	Kg	≤13

4.2.3.2 The electro- hydraulic metal-hole punching machine with battery shall have a low battery indication

5 TESTS REQUIREMENTS

The electro - hydraulic metal hole punching machines shall be inspected and tested in accordance with the requirements of ISO 21223:2019, ISO 286-2, IEC 60745-1 60099-5, IEC 60507, IEC 60071-2, IEC 60587, ISO 48, ISO 1461 and the provision of this specification.

6 MARKING AND PACKING

6.1 MARKING

The following information shall be marked indelibly and legibly on a nameplate permanently attached to each electro - hydraulic metal hole punching in English language:

a) AC input voltage and frequency
b) Motor rating;
c) Weight;
d) Dimensions (L x W x H, mm);
e) Max. throat depth, mm;
f) Punching capacity; mild steel, high yield steel and stainless steel;
g) Max.-Hole size (diameter* metal thickness)
h) Rated Battery capacity;
i) Battery charger rating and input voltage range
j) The manufacturer's name or trade mark;
k) Type and identification of the complete punching machine;
l) The year of manufacture;
m) The letters, "**Property of the Kenya Power & Lighting Co. Plc**".

6.2 PACKING

6.2.1 The electro - hydraulic metal hole punching machines shall be supplied packed in plastic hard carrying cases with foam.

6.2.2 Accessories such as removable handles, punch-die set, adjustment tools, hex wrenches, batteries and battery charger shall be packaged in plastic cases separately.

6.2.3 A set of three (3) technical manuals (in English language) for the electro -hydraulic metal hole punching machines shall be supplied with the equipment. Technical details on the batteries, battery charger and accessories shall also be submitted for tender evaluation and during delivery.

APPENDICES

A: TESTS AND INSPECTION (Normative)

A.1 It shall be the responsibility of the supplier to test or to have all the relevant tests performed.

A.2 Copies of Type Test Certificates and Type Test Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 and ISO 28927 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate for the testing laboratory shall also be submitted with the tender (all in English Language).

Copies of type test reports to be submitted with the tender for evaluation shall be as stated below:

a. Altitude Simulation
b. Thermal Test
c. Vibration
d. Shock
e. External Short Circuit
f. Impact
g. Overcharge
h. Forced Discharge

In addition, the following test reports shall be submitted.

a. Noise test
b. Vibration test

NOTE: Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Authority.

A.3 Routine and sample test reports for the electro-hydraulic metal hole punching machines to be supplied shall be submitted to KPLC before delivery. KPLC Engineers will witness tests at the factory before delivery. Tests to be witnessed by KPLC Engineers at the factory

before delivery shall be in accordance with IEC 62133, IEC 62841, IEC 60745 and this specification and shall include the following:

a) Battery capacity, charging and discharge test;
b) Hole cycle time;
c) Measurement of punching thickness capability of the machine;
d) Noise levels;
e) Vibration test;

A.4 On receipt of the electro-hydraulic metal hole punching machines, KPLC will inspect them and may perform any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to KPLC, any electro-hydraulic hole punching machine which upon examination, test or use fail to meet any or all of the requirements in the specification.

B: QUALITY MANAGEMENT SYSTEM (Normative)

B.1 The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the electro-hydraulic metal hole punching machines physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001.

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

C: 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 (GTP) signed and stamped by the manufacturer;

b) Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions and technical data;

c) Sales records for the last five years and at least four customer reference letters;

d) Details of manufacturing capacity and the manufacturer's experience;

e) Copies of required type test reports by a third party testing laboratory accredited to ISO/IEC 17025.

f) Copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;

g) Contacts and address of third party testing laboratory;

h) Manufacturers letter of authorization, ISO 9001 certificate and other technical documents required in the tender.

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 (GTP) stamped and signed by the manufacturer **(these are not the ones submitted with the tender)** ;

b) Design Drawings with details of the electro- hydraulic metal-hole punching machine to be manufactured for KPLC;

c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001;

d) Marking details and method to be used in marking the electro-hydraulic metal hole punching machines;

e) Packaging details (including packaging materials).

C.3 Statement of compliance to specification (indicate deviations if any provide supporting documents)

NOTE: *The drawings to be submitted by the supplier to KPLC for approval before manufacture shall be in standard format clearly indicating the drawing number, parts list with material details and quantities, standard of manufacture, ratings, approval details and identity of the manufacturer (as per manufacturer's authorization submitted during tendering).*

D: GUARANTEED TECHNICAL PARTICULARS (Normative)

To be filled and signed by the Manufacturer 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 number	KPLC Requirements		Bidder's offer
Manufacturer's Name and address			Specify
Country of Manufacture			Specify
Name and model Number			Specify
1.	Scope		State
2.	Normative References		State
3.	Definitions and Abbreviations		
3.1.	Abbreviations		State
4.	Requirements		
4.1.1	Service conditions		State
4.2	Design and Construction		
4.2.1	General		
4.2.1.1	Standard of manufacture		State
4.2.1.2	Suitable for punching round and oblong holes on mild, stainless and high tensile steel channels as per ISO 630-2:2011		State
4.2.1.3	Type of holes	Round and oblong	State
	Applicable Steel channels and plates characteristics	Steel yield strength, MPa	State
		Flat bars ,W x T (thickness), mm	State
		Angle line ,L x W x T ,mm	State
		Channel L x W x T, mm	State
		T-section, Lx W x T ,mm	State
4.2.1.4	Shall not require pre-drilling or pre-punching		State
4.2.1.5	Single body cordless and with no separate hydraulics		List
4.2.1.6	All metallic parts resistant to corrosion		State
4.2.1.7	Supplied fully loaded with hydraulic oil		State

Clause number	KPLC Requirements	Bidder's offer
4.2.1.8	Built in safety valve which bypass oil supply when the maximum pressure is reached.	State
4.2.1.9	Accessories	State
4.2.1.10	AC powered without battery or AC powered with battery	State
4.2.2	**Electro - hydraulic metal-hole punching machine without battery**	
4.2.2.1	AC input voltage and frequency, V single phase, Hz	State
	Motor rating, VAC/ W	State
	Max.-Hole size (diameter* metal thickness),mm*mm	state
	Hole cycle time, s	State
	Hole shape	specify
	Force, Tons	State
	Throat depth, mm	State
	Weight, kg	State
4.2.3	**Electro- hydraulic metal-hole punching machine with battery**	
4.2.3.1	AC input voltage and frequency, V single phase, Hz	State
	Motor rating, VDC	State
	Battery capacity, VDC, Ah, f (Hz)	State
	Battery charger rating and input voltage range, Watts, V	State
	Max.-Hole size (diameter* metal thickness), mm*mm	State
	Hole cycle time, sec	State
	Hole shape	Specify
	Force, Tons	State
	Throat depth, mm	State
	Weight (including battery), kg	State
4.2.3.2	Low battery indication	State
6	**Marking and Packing**	
6.1	Details marked indelibly and legibly on nameplate	specify
6.2	**Packing**	
6.2.1	Supplied packed in plastic hard carrying cases with foam.	State
6.2.2	Accessories packed in plastic cases separately	List
6.2.3	Set of three (3) technical manuals (in English language)	Provide
A	**Tests and Inspection**	
A1	Responsibility of the supplier to test or to have all the relevant tests performed	State
A2	Copies of type test reports submitted for evaluation	list
A3	Tests to be witnessed by KPLC Engineers at the factory	List
A.4	Inspection at the stores and replacement of rejected items	State compliance
B	**Quality Management System**	

Clause number	KPLC Requirements	Bidder's offer
B.1	Quality Assurance Plan	Provide
B.2	Copy of ISO 9001:2015 Certificate	Provide
C	**Documentation**	
C.1	Documents submitted with tender	Provide
C.2	Documents to be submitted by supplier to KPLC for approval before manufacture	Provide
C.3	Statement of compliance to specification (indicate deviations if any & supporting documents)	State compliance

NOTE:

1) Bidders shall give full details of the item(s) on offer as per the specification and applicable standards. The details provided shall conform to the test reports and their certificates, as well as labeled drawings complete with dimensions, catalogues and/or brochures for the purpose of tender evaluation.

2) Bidders should note that the above Guaranteed Technical Particulars Schedules must be fully completed and submitted with the bid. Wherever there is conflict between the GTPs and the clauses in the specification, the clauses in the specification take precedence. Failure to complete the schedules shall lead to rejection of the bid.

3) Guaranteed values shall be specified.

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

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Manufacturer's Name, Signature, Stamp and Date