



**TITLE:**  
**SPECIFICATIONS**  
*For*  
**METER SEALING TOOL**  
**(PLIERS)**

Part 1: Ratchet Type

Doc. No.	KP1/3CB/TSP/14/001-1
Issue No.	1
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**ANNEX A:** *Guaranteed Technical Particulars (to be filled and signed by the supplier and submitted together with copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records and copies of test certificates and reports for tender evaluation)*

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**0.1 Circulation List**

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## FOREWORD

This specification has been prepared by the Research and Development Department in collaboration with the Commercial Services Department both of the Kenya Power & Lighting Company Ltd (abbreviated as KPLC) and it lays down requirements for meter sealing tool (pliers). The specification is intended for use by KPLC in purchasing the equipment.

The supplier shall submit information which confirms satisfactory service experience with products which fall within the scope of this specification.

### 1. SCOPE

This specification covers the requirements of 200mm size meter sealing tool (pliers) suitable for lead/steel seals of maximum diameter 12.5mm using lapped sealing wire of overall diameter not exceeding 1.6mm.

The specification also covers inspection and test of the meter sealing tool (pliers) as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.

The specification stipulates the minimum requirements for meter sealing tool (pliers) acceptable for use in the company (KPLC) and it shall be the responsibility of the supplier to ensure adequacy of the design, good workmanship, good engineering practice and adherence to applicable standards in the manufacture of meter sealing tool (pliers) for KPLC.

The specification does not purport to include all the necessary provisions of a contract.

### 2. REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this specification. Unless otherwise stated, the latest edition of the referenced documents (including any amendments) applies:

ISO 5743: Pliers and nippers - General technical requirements.

ISO 5744: Pliers and nippers – Methods of tests

ISO 2768-1: General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications.

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ISO 1461: Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.

### 3. TERMS AND DEFINITIONS

For the purpose of this specification, the definitions given in the reference standards shall apply.

### 4. REQUIREMENTS

#### 4.1. Service Conditions

The meter sealing tool (pliers) shall be suitable for continuous operation outdoors in tropical areas at:

- i. Altitudes of up to 2200m above sea level,
- ii. Humidity of up to 95%,
- iii. Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and
- iv. Heavy saline conditions along the coast.

#### 4.2. Design and Construction

##### 4.2.1. General requirements

- 4.2.1.1. The meter sealing pliers shall be made in accordance with the requirements of ISO 5743 and tested to ISO 5744.
- 4.2.1.2. It shall be ratchet operated suitable for applications where sealing wire is placed through holes on meter sealing screws or sealing holes used to encapsulate a meter seal onto the sealing wire.
- 4.2.1.3. The sealing pliers in this specification shall use uniquely identified dies for crimping and marking specified seals as shall be provided by KPLC Meter Operating Agents.
- 4.2.1.4. The dies shall not be transferrable and in addition there shall be no duplicate sets of dies.

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- 4.2.1.5. The sealing pliers, dies or specified seals shall not be used other than for sealing. Sealing pliers with dies that do not make legible marks shall not be used.
- 4.2.1.6. The meter sealing tool shall have a section where the tongue-like section of the meter seal will sit. After seal wire is placed in the seal, the plier shall be compressed thereby wrapping around the seal onto the sealing wire until the wire is completely encapsulated. (See the four-stage sealing process illustrated in Figure 2).
- 4.2.1.7. It shall be impossible to pull out the sealing wire once the sealing pliers properly complete the sealing operation by closing the sealing pliers through gradual application of hand pressure.
- 4.2.1.8. A sample seal pliers shall be provided with the tender in order to test the conditions in clauses 4.2.1.5 and 4.2.1.6 with existing sealing wire at evaluation.
- 4.2.1.9. Once the meter seal has completed the encapsulation of the sealing wire, the last pressure applied to the sealing pliers shall emboss the circular section of the seal to identify a 4-digit number that is part of a permanent structure (the die) of the sealing pliers.
- 4.2.1.10. Sealing pliers shall emboss the 4-digit number above letters KPLC Ltd in the centre of the galvanized steel plate. The 4-digit number shall be provided on tender award.
- 4.2.1.11. Sealing pliers shall have a non-return mechanism when wrapping the tongued section of the meter seal around the sealing wire such that the pliers will not release until the embossing of the 4-digit number has been accomplished.
- 4.2.1.12. The seal pliers shall be free from pits, cracks, scale, seams, fins and other defects. They shall be finished smooth all over. The body shall be heavy chrome plated to prevent corrosion with a polished finish as per ISO 5743.
- 4.2.1.13. The other ferrous parts of the pliers shall be hot dip galvanized to a mean coating thickness (minimum) of 80 µm as per ISO 1461 requirements as an anti-corrosive treatment.

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**4.2.2. Material composition**

- 4.2.2.1. The meter sealing pliers shall be made from a soft annealed ledeburitic 12 % chrome steel, hardened and tempered with very high resistance against abrasive and adhesive wear.
- 4.2.2.2. The chemical composition of the steel shall be 84.75% - iron, 1.55% - carbon, 12.00% - chromium, 0.80% - molybdenum and 0.90% - vanadium.
- 4.2.2.3. The hardness of the body of the pliers (gripping surfaces) shall be 350 – 510 HV (35 – 50 HRC) offering a traction resistance 357.1 N/mm<sup>2</sup>.
- 4.2.2.4. The adjuster mechanism shall be chrome vanadium plated with the moving parts being assembled with pivot pins or rivets.
- 4.2.2.5. It shall be cut and shaped into the form and approximate dimensions as per Figure 1. The main body of the pliers shall have the serial number on the die branded in numbers of not less than 4mm figure height.
- 4.2.2.6. The embossed die with serial numbers shall be made from the same material but shall be hardened to 750-800 HV (62-64 HRC).

**4.2.3. Performance Requirements**

- 4.2.3.1. The meter sealing pliers shall be capable of performing under conditions stated in clauses 4.2.1.2 – 4.2.1.11 and specifically designed for the task.
- 4.2.3.2. The requirements for sealing equipment shall be to crimp specified seals onto a steel wire rope with diameter not exceeding 1.6mm, sufficiently to withstand a tensile load of not less than 200N, in order to secure equipment so as to prevent accidental breaking or removal of the seal or wire rope.

**4.2.4. Drawings and Manuals**

The following drawings and information (all in English) shall be submitted with the tender:

- a) Meter sealing pliers drawing giving all the relevant dimensions and shall resemble Fig. 1.
- b) Description leaflet and user's instruction manual/brochure
- c) Sample routine test reports & certificates.

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d) A sample seal pliers for evaluation.



200 mm



**Fig. 1: Approximate dimensions and shape of sealing pliers**

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<p><b>STEP 1</b> – Insertion of seal into sealing pliers</p>	<p><b>STEP 2</b> –Apply the wire. Rest wire in curve at the end of the tongue.</p>
<p><b>STEP 3</b> – Apply pressure to pliers which will wrap the tongue of the seal onto seal wire.</p>	<p><b>STEP 4</b> – open the pliers to release the seal. Check for proper encapsulation.</p>

**Fig. 2: Steps towards meter sealing.**

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**4.3. Quality Management System**

- 4.3.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the meter sealing pliers physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- 4.3.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications shall be submitted with the tender for evaluation.
- 4.3.3. The bidder shall indicate the delivery time of the items, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the meter sealing pliers sold in the last five years as well as reference letters from at least four of the customers shall be submitted with the tender for evaluation.

**5.0. TESTS AND INSPECTION**

- 5.1. The meter sealing tool (pliers) shall be inspected and tested in accordance with the requirements of ISO 5743, ISO 5744 and ISO 1461 standards. 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.
- 5.2. Copies of previous Type Tests Reports 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 to ISO/IEC 17025 for the same third party testing laboratory used shall also be submitted with the tender document (all in English Language)
- 5.3. Copies of type test reports to be submitted with the tender (by bidder) for evaluation shall be as stated below:
  - a) Tube gripping test
  - b) Shock test
  - c) Torsion test
  - d) Handle load test
  - e) Hardness test
  - f) Ladle Analysis

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- 5.4. Routine and sample test reports for the meter sealing tool (pliers) to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods. KPLC Engineers will witness tests at the factory before shipment.
- 5.5. On receipt of the goods KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the meter sealing tool (pliers), which upon examination, test or use; fail to meet any of the requirements in the specification.
- 5.6. Tests to be witnessed before shipment shall be in accordance with ISO 5743, ISO 5744 and ISO 1461 standards. and this requirements of this specification and shall include the following:
- a) Tube gripping test
  - b) Shock test
  - c) Torsion test
  - d) Handle load test
  - e) Hardness test
  - f) Handle load test
  - g) Galvanization test.

**6.0. MARKING AND PACKING**

- 6.1. The meter sealing tool (pliers) shall be varnished or coated with mineral jelly reduced with turpentine oil to protect them from corrosion before packing.
- 6.2. Each tool shall be wrapped in waxed paper and then suitably parked in a cardboard carton bearing the designation and nominal size of the tool and the manufacturers name and initials and trade-mark.
- 6.3. The seal pliers shall be clearly and legibly stamped with the name **PROPERTY OF KPLC**, unique four (4) digit identification number issued by KPLC at tender award, manufacturer's name, initials and/or recognized trade-mark and year of manufacture.

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**7. DOCUMENTATION**

7.1. The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Copies of the Manufacturer's catalogues, brochures, drawings 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) Manufacturers letter of authorization, copies of quality management certifications and other technical documents required in the tender.

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

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Design Drawings with details of meter sealing tool (pliers) 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.
- d) Detailed test program to be used during factory testing;
- e) All documentation necessary for safety of the equipment.
- f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the meter sealing tool (pliers) for The Kenya Power & Lighting Company;
- g) Packaging details (including packaging materials).

7.3 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the meter sealing tool (pliers) to KPLC stores

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**ANNEX A:** *Guaranteed Technical Particulars (to be filled and signed by the supplier and submitted together with copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records and copies of test certificates for tender evaluation)*

**Tender No .....** **Bidder's Name & Address .....**

	Description	Bidder's Offer
1	Name of the manufacturer and country of origin	Specify
	Type Reference Number or Designation Number	Specify
2	<b>Reference Standards</b>	Specify
3	<b>Terms and Definitions</b>	Specify
4	Requirements	
4.1	Service conditions	Specify
4.2	<b>Design and Construction</b>	
4.2.1	General requirements	
	4.2.1.1 – 4.2.1.13	Specify
4.3	<b>Material composition</b>	
	4.2.2.1 – 4.2.2.6	Specify
4.4	<b>Performance requirements</b>	
	4.2.3.1 – 4.2.3.2	Specify
4.4.2	Drawing and manuals	Provide
4.6	<b>Quality Management System</b>	
	4.6.1 – 4.6.3	
5.0	<b>Tests and Inspection</b>	
	5.1 – 5.6	Specify
6.0	<b>Marking and packing</b>	
	6.1 – 6.3	Specify
7.0	<b>Documentation</b>	
	7.1 – 7.2	Specify
8.0	Manufacturer's Guarantee and Warranty	Specify
9.0	List catalogues, brochures, technical data and drawings submitted to support the offer.	Specify
10.0	List customer sales records submitted to support the offer.	Specify
11.0	List Test Certificates submitted with tender	Specify
12.0	List test & calibration reports to be submitted to KPLC for approval before shipment	Specify
13.0	Statement of compliance to specification (indicate deviations if any & supporting documents)	Specify

.....  
**Manufacturer's Name, Signature, Stamp and Date**

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