

DOCUMENT NO.:



**1KV-250AMPS LOW VOLTAGE PORCELAIN  
BUSHING COMPLETE WITH ROD- SPECIFICATION**

A Document of the Kenya Power & Lighting Co. Ltd  
February 2024



**TITLE:**  
**1KV-250AMPS LOW VOLTAGE  
PORCELAIN BUSHING  
COMPLETE WITH ROD**

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Issue No.	1
Revision No.	0
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**0.1 CIRCULATION LIST**

<b>COPY NO.</b>	<b>COPY HOLDER</b>
1	In charge, E/plant workshop
2	

**0.2 AMENDMENT RECORD**

<b>Rev No.</b>	<b>Date (YYYY-MM-DD)</b>	<b>Description of Change</b>	<b>Prepared by (Name &amp; Signature)</b>	<b>Approved by (Name &amp; Signature)</b>
0	2024-02-27	New issue	Linahs Aina Alakara	George Wetimu

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**FOREWORD**

This specification has been prepared by the E/plant workshop of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Low voltage bushing complete with rod

The Low voltage porcelain bushing complete with rod is intended for use by the E/plant workshop during transformer repair and maintenance

This specification was prepared to establish and promote uniform requirements for low voltage porcelain bushing complete with rod to be used at Kenya Power and Lighting Company Ltd.

There are no other specifications in this series.

This specification stipulates the minimum requirements for Low voltage porcelain bushing complete with rod 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 Low voltage bushing complete with rod for KPLC.

Users of Kenya Power specifications are responsible for their correct interpretation and application.

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## 1. SCOPE

- 1.1. This specification is for Low voltage porcelain bushing complete with rod for use by company's E/plant workshop.
- 1.2. The specification covers requirements, design, inspection and tests and schedule of Guaranteed Technical Particulars of low voltage porcelain bushing complete with rod.

## 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.

IEC 62155:

BS 2874

BS 2571

ISO 898

ISO 3573

ISO 4032

ISO 4035

ISO 7089

DIN 125

DIN 127

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### 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 abbreviations.

#### 3.1. ABBREVIATIONS

**KPLC**- Kenya Power and Lighting Company Limited

**ISO** – International Organization for Standardization.

**IEC**- International electrotechnical commission

**Kg** –Kilogram

**KV** - Kilovolt

**LV** – Low Voltage

**EN** – European Standard

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#### **4. REQUIREMENTS**

##### **4.1. GENERAL REQUIREMENT**

##### **4.1.1. CONSTRUCTION**

4.1.2. Low voltage porcelain bushing complete with rod shall consist of the following

- 4.1.2.1. The stem
- 4.1.2.2. Bottom porcelain insulator
- 4.1.2.3. Top porcelain insulator
- 4.1.2.4. Cap
- 4.1.2.5. Internal gaskets (P and O)
- 4.1.2.6. Ring gasket
- 4.1.2.7. Plain gasket M
- 4.1.2.8. Washers( G, Din 125)
- 4.1.2.9. Spring washer
- 4.1.2.10. Nuts( ISO 4032, ISO 4035)

##### **4.2. Technical and specific requirements**

- 4.2.1. The stem shall be made from brass and capable of carrying 250A
- 4.2.2. The nuts and washers shall be made from brass
- 4.2.3. Brass shall have 60% or more of Copper in chemical composition

##### **4.3. Technical specification**

The arrangement shall be as per the figure below

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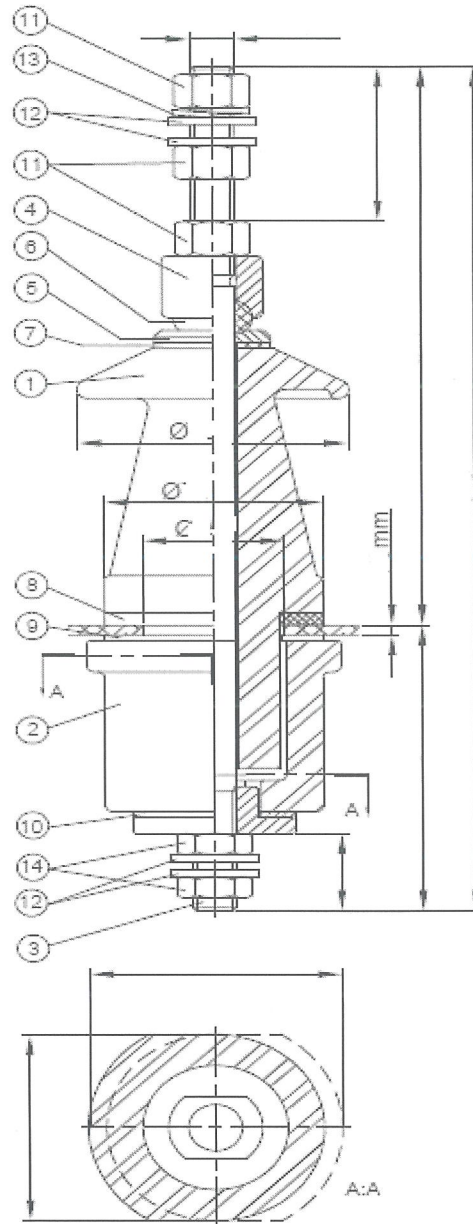
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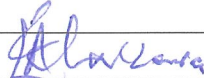
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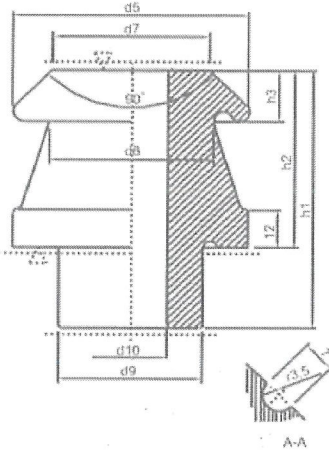
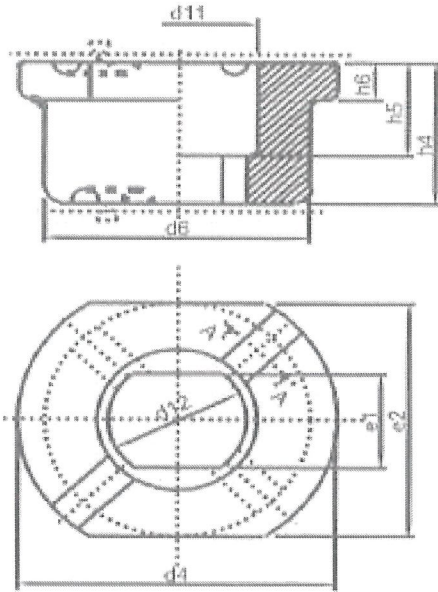


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Item no	Technical description	KPLC requirement
1	Top insulator "A"	Porcelain insulator brown in color 
2	Bottom insulator "b"	Porcelain insulator brown in color 
3	Stem	Made of Brass or copper of 205mm length and M12 in

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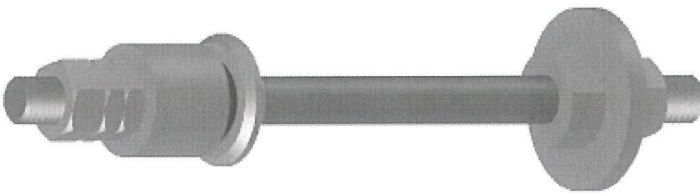
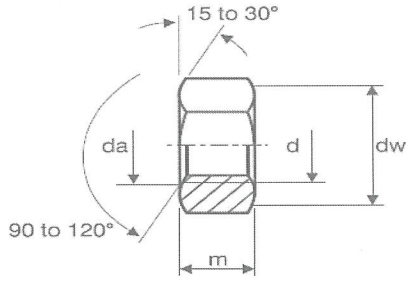
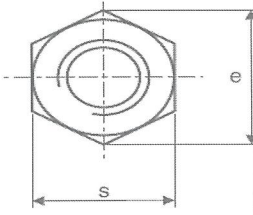
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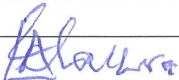
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		diameter	
4	E" cap	Made of brass	
5	G" washer	Made of brass	
6	Ring gasket "j"	synthetic rubber	
7	Plain gasket "m"	Nitrile rubber	
8	Flange gasket "n"	Nitrile rubber	
9	Internal gasket "o"	Nitrile rubber	
10	Internal gasket "p"	Nitrile rubber	
11	Nut iso 4032	Made of brass, size M12 in diameter and be 3 in number	  <p><math>d1=m12, S=18, e_{min}=20.03, m_{max}=10.8</math></p>
12	Washer din125, ISO 7089	Made of brass and will be 4 in number	

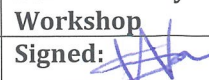
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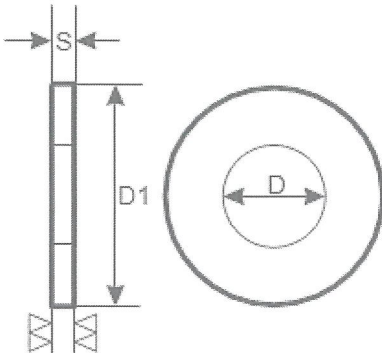
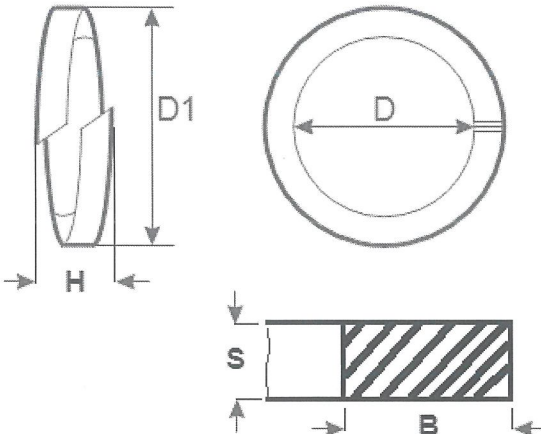
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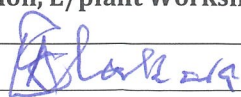
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		 <p><math>D1=24, D=13, S=2.5</math></p>
13	Spring washer	<p>Shall be made of brass and one in number, type B</p>  <p><math>D_{min}=12.2mm \quad D_{max}=12.7mm \quad H_{min}=5mm \quad ,H_{max}=5.9mm</math>  <math>D1=21.1mm \quad S=2.5 \pm 0.15 \quad B=4 \pm 0.2</math></p>
14	Lock nut iso4035	<p>Made of brass, size M12 in diameter and be 2 in number,<math>d1=m12, S=19, e_{min}=21.1 \quad M_{max}=6</math></p>

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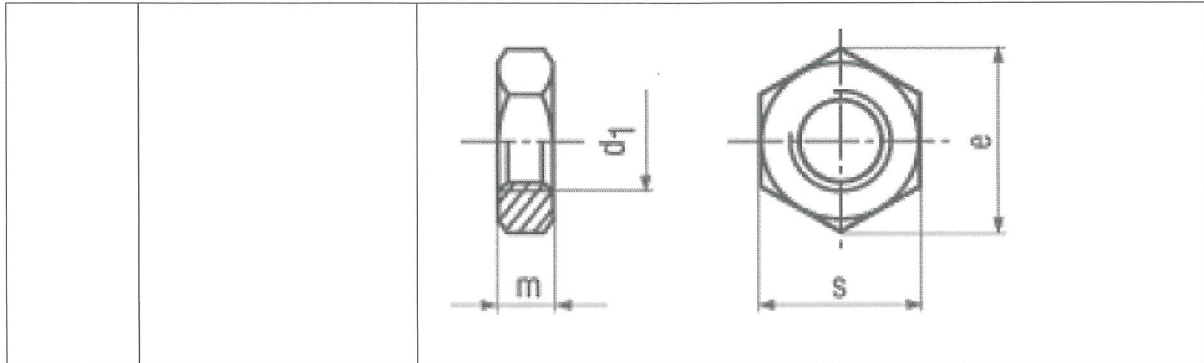
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## 5. TESTS AND INSPECTION REQUIREMENTS

5.1. The Low voltage porcelain bushing shall be inspected and tested in accordance with the requirements of this specification and standard IEC 60137. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified. Tenderers shall confirm the manufacturer's capabilities in this regard when submitting tenders. Any limitations shall be clearly specified.

5.2. Copies of previous Test Reports issued by own or a third party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 confirming compliance of the Low voltage porcelain bushing offered shall be submitted with the offer for evaluation (all in English Language). A copy of the **accreditation certificate** and the **scope of accreditation** of the testing laboratory shall also be submitted. Any translations of certificates or test reports into English language shall be signed and stamped by the Testing Authority that carried out tests. Copies of test reports for the Low voltage porcelain bushing offered to be submitted for tender evaluation shall include but not limited to the following tests

5.2.1. Chemical composition test

5.2.2. Power frequency withstand voltage

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## 6. MARKING AND PACKING

### 6.1. MARKING

The following information shall be marked legibly and in a permanent manner on the Low voltage porcelain bushing complete with rod:

- a) The manufacturer's name or trade mark;
- b) The voltage rating in kv and current in amps ;
- c) The year of manufacture and month;

### 6.2. PACKING

6.2.1. The Low voltage porcelain bushing complete with rod shall be packed in standard delivery lots with board boxes in strong pressboard cases with four way delivery pallet to protect it from damage during transportation, handling and storage.

6.2.2. The 1kV 250Amps Low voltage porcelain bushings complete with rod shall be assembled inside the dedicated package for easier use and storage and shall include the following.

Item no	description	Requirement(material, size and colour)
1	Top insulator "A"	Porcelain insulator brown in color
2	Bottom insulator "b"	Porcelain insulator brown in color
3	Stem	Made of Brass of 205mm length and M12 in diameter
4	E" cap	Made of brass
5	G" washer	Made of brass
6	Ring gasket "j"	synthetic rubber
7	Plain gasket "m"	Nitrile rubber
8	Flange gasket "n"	Nitrile rubber
9	Internal gasket "o"	Nitrile rubber

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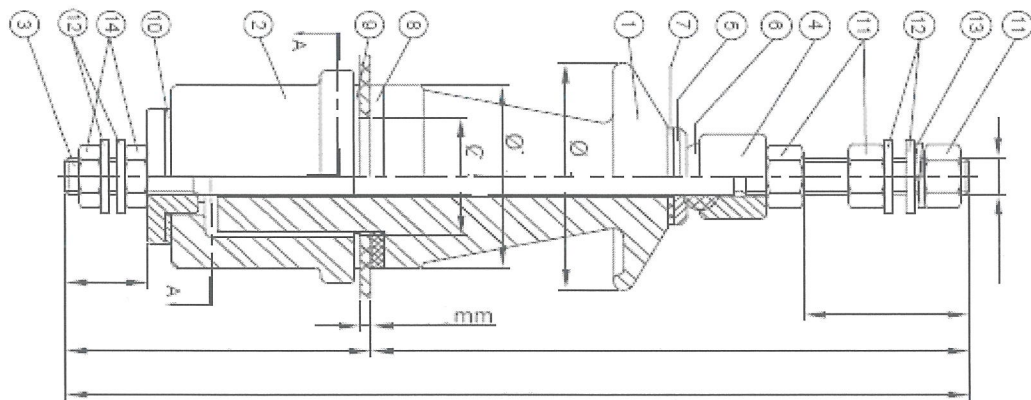
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10	Internal gasket "p"	Nitrile rubber
11	Nut as per ISO 4032	Made of brass, size M12 in diameter and be 3 in number
12	Washer din125, ISO 7089	Made of brass and will be 4 in number
13	Spring washer as per DIN 127	Shall be made of brass and one in number, type B
14	Lock nut iso4035 size M12	Made of brass, size M12 in diameter and be 2 in number



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**APPENDICIES**

**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 On receipt of the Low voltage porcelain bushing complete with rod Kenya Power will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to Kenya Power, any low voltage porcelain bushing complete with rod 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 bidder shall indicate the delivery time of the equipment

**C: DOCUMENTATION AND DEMONSTRATION (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:

- Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;
- Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions, and technical data;
- Bidder's warranty and guarantee; subject to 12 months from date of delivery to KPLC stores

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

- a) Fully filled clause by clause guaranteed technical particulars (GTP) stamped and signed by the manufacturer;
- b) Design Drawings with details of the Low voltage porcelain bushing complete with rod to be supplied to KPLC.
- c) Product manuals, operation manuals and brochures,
- d) All documentation necessary for safety of the product.
- e) Packaging details (including packaging materials).

C.3. The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the Low voltage porcelain bushing complete with rod to KPLC stores.

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**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	Requirement	Bidder's offer	
Manufacturer's Name		State	
Country of Manufacture		State	
Name and model Number		State	
1.	Scope	State	
2.	Normative References	State	
3.	Definitions and Abbreviations		
3.1.	Abbreviations	State	
4.	Requirements		
4.1	General Requirement	State	
4.1.1	Construction	State the parts of Low voltage porcelain bushing complete with rod	
4.2.1	Stem rod	State material and current rating	
4.2.2	nuts and washers	Specify material	
4.2.3	Brass chemical composition	State and attached test report	
4.3			
	Low voltage porcelain bushing complete with	Attach drawing	
	Item no. 1, Top insulator "A"	State material and attach drawing showing size	
	Item no. 2 ,Bottom insulator "b"	State material and attach drawing showing size	
	Item no 3,Stem	State material and attach	

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Clause number	Requirement	Bidder's offer	
		drawing showing size	
	Item no. 4, E" cap	specify material and size	
	Item no. 5 , G" washer	specify material and size	
	Item no. 6, Ring gasket "j"	specify material and size	
	Item no. 7, Plain gasket "m"	specify material and size	
	Item no. 8, Flange gasket "n"	specify material and size	
	Item no. 9, Internal gasket "o"	specify material and size	
	Item no. 10, Internal gasket "p"	specify material and size	
	Item no. 11, Nut iso 4032	specify material and size	
	Item no. 12, Washer din125, ISO 7089	specify material and size	
	Item no. 13, Spring washer	specify material and size	
	Item no. 14, Lock nut iso4035	specify material and size	
5	Test Requirements		
5.1	Tests and inspection	State	
6	Marking and Packing		
6.1	Marking	Specify	
6.2	Packing	Specify	
6.2.1	Provide packaging lots	Yes/No	
6.2.2	Product Assembly	Yes/No	
6.2.3	Package	Provide	
A.4	Inspection at the stores and replacement of rejected items	State compliance	
B	Quality Management System		
B.1	Delivery time of the product	Provide	
C	Documentation and demonstration		
C.1	Documents submitted with tender	State	
C.2	Documents to be submitted by supplier to KPLC for approval before supply	State	
C.3	Documents to be submitted during delivery at the store	State	

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**Authorized by: Head of Department, E/plant Workshop**

**Signed:**

**Signed:**

**Date: 2024-02-27**

**Date: 2024-02-27**





**TITLE:**  
**1KV-250AMPS LOW VOLTAGE  
PORCELAIN BUSHING  
COMPLETE WITH ROD**

<b>Doc. No.</b>	
<b>Issue No.</b>	<b>1</b>
<b>Revision No.</b>	<b>0</b>
<b>Date of Issue</b>	<b>2024-02-27</b>
<b>Page 20 of 19</b>	

Clause number	Requirement	Bidder's offer	
	Statement of compliance to specification (indicate deviations if any & supporting documents)	State compliance	

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

**Issued by: Head of Section, E/plant Workshop**

**Signed:**

**Date: 2024-02-27**

**Authorized by: Head of Department, E/plant Workshop**

**Signed:**

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