



The Kenya Power & Lighting
Co. Ltd.

TITLE:

**SPECIFICATION FOR 33kV
PORCELAIN PIN INSULATORS
(complete with spindle)**

Doc. No. KPLC1/3CB/TSP/04/013

Issue No. 1

Revision
No. 2

Date of
Issue 2010-02-23

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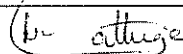
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Issued by: Head of Section, Tech Stds & Specs

Authorized by: Head of Department, R&D

Signed: 

Signed: 

Date: 2010-02-23

Date: 2010-02-24



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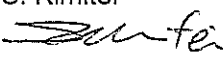

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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Procurement Manager
3	Stores & Transport Manager
4	Chief Manager Distribution
5	Deputy Manager, Technical Audit

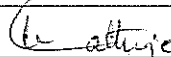
0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
2	2010-02-23	1) Changed title, scope, references & content to PIN type insulators 2) Included letters KPLC in marking	S. Kimitei 	C. K. Gathige 

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FOREWORD

This specification has been prepared by the Research and Development Department of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for 33kV pin type porcelain insulators. It is intended for use by KPLC in purchasing the insulators.

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

1. SCOPE

This specification is for insulators for use on overhead power distribution lines operating at a nominal voltage of 33kV and frequency of 50Hz.

The specification covers 33kV pin type insulators, complete with spindle.

The specification also covers inspection and test of the insulators 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 33kV pin type porcelain insulators acceptable for use in the company and it shall be the responsibility of the Manufacturer to ensure adequacy of the design, good workmanship and good engineering practice in the manufacture of the insulators 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 editions (including amendments) apply.

ISO 1461: Metallic Coatings – Hot dip galvanized coatings on fabricated ferrous products – Requirements.

ISO 1460: Metallic Coatings – Hot dip galvanized coatings on fabricated ferrous metals – Determination of mass per unit area – Gravimetric method.

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IEC 60815: Guide for the selection of insulators in respect of polluted conditions.

IEC 60383: Insulators for overhead lines with a nominal voltage above 1000V.

BS 137: Insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1000V a.c.

BS 3288: Insulators and conductor fittings for overhead power lines.

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 insulators shall be suitable for continuous operation outdoors in tropical areas at altitudes of up to 2200m above sea level, humidity of up to 90%, average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and heavy saline conditions along the coast. The level of galvanizing for all ferrous parts shall be suitable for these conditions.

4.2 MATERIALS AND CONSTRUCTION

4.2.1 The insulating material shall be porcelain.

The porcelain shall be sound, free from flaws and blemishes, thoroughly vitrified, smoothly glazed and of uniform brown colour when finished.

4.2.2 The insulator shall be free from stresses due to expansion and contraction in any part which may lead to deterioration.

No chemical reaction between materials due to contact (e.g. between cement and metal fittings) shall be allowed.

4.2.3 The under surface and grooves of sheds or skirts shall be easy cleaning. Sheds shall be substantially symmetrical in shape without appreciable warping.

4.3 DESIGN AND CONSTRUCTION

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4.3.1 The pin insulator shall have a cemented zinc thimble pin hole thread suitable for large steel head pin in accordance with BS 137 and BS 3288. It shall be supplied complete with the spindle (with spring and round washers) suitable for mounting on steel cross arm.

4.3.2 **The spindle** shall have a stalk length of 305mm, shank diameter and length of 22mm and 50mm respectively and minimum failing load of 10kN. These dimensions correspond to pin reference number 31 as per BS 3288 Part 2.

4.3.3 All ferrous parts shall be hot dip galvanized to ISO 1461.

4.4 RATINGS

The mechanical and electrical characteristics of the insulators shall be as follows:-

Minimum failing load	10 kN
Minimum creepage distance	900mm
Minimum power frequency withstand voltage, wet	95kV (r.m.s.), 50Hz 60s
Minimum lightning impulse withstand voltage, dry	200kV (peak), 1.2/50µs

5. TESTS AND INSPECTION

5.1 Type tests, sampling tests and routine tests shall be done in accordance with the requirements of IEC 60383, BS 3288, BS 137, ISO 1461, ISO 1460 and this specification. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified.

5.2 Copies of previous type test certificates and type test reports 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 (all in English Language). A copy of accreditation certificate for the laboratory shall also be submitted. Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Authority.

5.3 The insulators shall be subject to acceptance tests at the manufactures' works before dispatch. Acceptance tests (routine & sample tests) will be witnessed by two Engineers appointed by The Kenya Power and Lighting Company Limited (KPLC).

5.4 Routine and sample test reports for the insulators to be supplied shall be submitted to KPLC for approval before shipment of the goods.

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5.5 On receipt of the insulators KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The manufacturer shall replace without charge to KPLC, insulators which upon examination, test or use fail to meet any or all of the requirements in the specification.

6. PACKING, MARKING AND LABELLING

6.1 The following information shall be marked indelibly and legibly and in a permanent manner on the porcelain portion of each insulator:

- (a) Name or trade mark of the manufacturer;
- (b) Type Reference Number and Specified Mechanical Failing Load;
- (c) Year of manufacture;
- (d) Batch or serial number;
- (e) The letters 'KPLC'

6.2 The insulators shall be packed in wood crates which are reinforced and held closed by external steel wire bindings. Each crate shall be internally braced to permit stacking and the steel wire bindings shall be designed to keep the crate firmly closed and permit easy and rapid opening at time of installation.

The crates shall then be stacked on sturdy wood pallet. The assembly shall be held tightly in place with steel bands and protected against moisture by a complete covering of heat-shrinkable polyethylene film.

6.3 Instructions for storage, handling and installation shall be included in each package, all in English Language.

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ANNEX A: Guaranteed Technical Particulars (to be filled and signed by the Manufacturer and submitted together with catalogues, brochures, drawings, technical data and certified true copies of previous test reports & certificates for tender evaluation)

TENDER NO.....

	Description	Guaranteed Technical Particulars for insulators offered
1	Name of Manufacturer & Country of Origin of insulators being offered	
2	Type/Model Reference Number	
3	Service conditions	
4	Design standards complied with and materials	
5	RATINGS: Nominal System Voltage & Frequency	
6	Maximum System Voltage	
7	Minimum Failing Load	
8	Creepage Distance	
9	Impulse Withstand Voltage, peak (1.2/50µs, dry)	
10	Power Frequency Withstand Voltage, rms (50Hz 60s, wet)	
11	Marking & Labelling (indicate parameters to be marked & method of marking) Packing	
12	List test type reports submitted (indicate test report numbers, date, Testing Institution and contact addresses)	
13	Manufacturer's Guarantee and Warranty	
14	List copies of manufacturer's catalogues, brochures, technical data, drawings and customer sales records submitted to support the offer	
15	List Acceptance Tests to be witnessed by KPLC Engineers at the factory	
16	Statement of compliance to specification	

Manufacturer's Name, Signature, Stamp and Date

Note: This schedule does not in any way substitute for detailed information required elsewhere in the specification.

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