



Kenya Power

ACCESSORIES FOR AERIAL BUNDLED CABLES (ABC).

Part 1: 11 kV ABC ACCESSORIES

— SPECIFICATION



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 1 of 22

TABLE OF CONTENTS

0.1 Circulation List	3
0.2 Amendment Record	4
FOREWORD	5
1. SCOPE	6
2. REFERENCES (NORMATIVE).....	6
3. DEFINITIONS AND ABBREVIATION.....	7
4. REQUIREMENTS.....	7
4.1. Service conditions	7
4.2. General Requirements (Applicable to All Accessories)	7
4.2.1. System Parameters	7
4.2.2. Range of Accessories	8
4.2.3. Materials	8
4.2.4. Protection against Corrosion.....	8
4.2.5. Protection against Ultra-Violet Radiation.....	8
4.2.6. Fire Retardation	8
4.2.7. Finish.....	9
4.2.8. Fasteners	9
4.3. Strain and Suspension Fittings	9
4.3.1. Dead End Clamp	9
4.3.2. Dead End Hook.....	9
4.3.3. Suspension Clamp.....	10
4.3.4. Suspension Hook	10
4.4. Current-Carrying Connectors and Joints.....	10
4.4.1. General	10
4.4.2. Specific Requirements for Crimped Joints and Lugs	11
4.4.3. End Caps	11
4.4.4. Core Separators (in pairs)	11
4.5. Cable Ties.....	11
4.6. Insulated tap off connectors.	12
4.7. MV sleeve joints.....	13

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 2 of 22

4.8. Termination	14
5. TEST REQUIREMENTS	14
6. MARKING AND PACKING	14
6.1. Marking	14
6.2. Packaging	14
APPENDICES	15
APPENDIX A: TESTS AND INSPECTION (NORMATIVE)	15
APPENDIX B: QUALITY MANAGEMENT SYSTEM (NORMATIVE).....	15
APPENDIX C: TECHNICAL DOCUMENTATION (NORMATIVE).....	16
APPENDIX D: GUARANTEED TECHNICAL PARTICULARS (GTPS) — NORMATIVE.....	17

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 3 of 22

0.1 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

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.

© Kenya Power & Lighting Co. Ltd.

Users are reminded that by Section 25 of the Copyright Act, 2001 (Revised 2009) Cap 130 of the Laws of Kenya copyright subsists in all KPLC Standards and except as provided under Section 26 of this act, no KPLC Standard produced by KPLC may be reproduced, stored in retrieval system by any means without prior permission from the Managing Director & CEO, KPLC.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co.
Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 4 of 22

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
1	2011-12-01	clause 4.6: To include insulated tap- off connectors	S. Nguli	G. Gathige
2	2012-12-21	Clause 4.7: To include MV sleeve joint for the messenger	S. Nguli	G. Gathige
Issue 2 Rev 1	2017-12-08	Replaces Issue 2 Rev 0	Rotich Benard	Dr. Eng. P. Kimemia

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 5 of 22

FOREWORD

This specification has been prepared by the Standards Department of the Kenya Power and Lighting Company Limited (Kenya Power) and it lays down requirements for Accessories for 11kV Overhead lines using Aerial Bundled Cables (ABC).

The 11kV accessories shall be used with ABC cables stipulated in the Kenya Power Specification ‘*KP1/6C/4/1/TSP/05/005: 11kV Aerial Bundled Cables (ABC) – Specification*’.

This specification stipulates the minimum requirements for accessories for 11kV Aerial Bundled Cables (ABC) acceptable for use in the company and it shall be the responsibility of the supplier and manufacturer to ensure adequacy of the design, good engineering practice, adherence to the specification, applicable standards and regulations, as well as ensuring good workmanship in the manufacture of the accessories for 11kV Aerial Bundled Cables (ABC) for Kenya Power.

This revision has taken into consideration the use of concrete poles and the need for the accessories to be compatible with these clamps. As per this revision, dead-end hooks, suspension hooks and other accessories for concrete poles shall be compatible with universal clamps stipulated in Kenya Power Specification *KPLC-3CB-TSP-02-004-Specification for Overhead Line Multipurpose Clamps*.

Other Kenya Power specifications dealing with accessories for Aerial Bundled Cables (ABC) and falling under the Kenya Power specification code *TSP/05/012*, and under the general title *Accessories for Aerial Bundled Conductors/Cables (ABC)* are listed below:

TSP/05/012-2: Specification for Accessories for Low Voltage Overhead Lines Using Aerial Bundled Conductors(ABC).

TSP/05/012-3: Specification for Cold Shrinkable Straight Through Joints and Terminations for 11kV Aerial Bundled Cables

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

Name	Department
Rotich Benard	Standards
Eng. S. Nguli	Standards

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 6 of 22

1. SCOPE

- 1.1. This specification covers the design, manufacture and testing of Accessories for 11kV Aerial Bundled Cables (hereinafter referred to as "ABC" Accessories). The lines are constructed on wooden, pre-stressed and reinforced round concrete poles.
- 1.2. The accessories shall be suitable for 11kV aerial bundled cables consisting of XLPE insulated aluminium phase conductors with a supporting catenary that consists of stranded, galvanized steel wires, PVC covered.
- 1.3. The specification covers the following accessories:
 - a) Strain and Suspension Fittings.
 - b) Current-carrying Connectors and Joints.
 - c) Cable Ties.
 - d) HV ABC Termination kits
 - e) Insulated tap off connections
 - f) MV sleeve joints

2. REFERENCES (NORMATIVE)

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

BS EN 10025:2004: Hot rolled products of structural steels

IEC 60243-1:2013: Electric strength of insulating materials - Test methods. Part 1: Tests at power frequencies

IEC 60695: Fire Hazard Testing – Glowing/Hot wire based test methods.

IEC 60909-0:2016: Short-circuit currents in three-phase a.c. systems - Part 0: Calculation of currents

IEC 61284:1997: Overhead lines -Requirements and tests for fittings

IEC 61442: 2005: Test methods for accessories for power cables with rated voltages from 6 kV ($U_m = 7.2$ kV) up to 30 kV ($U_m = 36$ kV)

ISO 1461:2009: Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 7 of 22

KPLC-3CB-TSP-02-004: Specification for Overhead Line Multipurpose Clamps

KP1/6C.1/13/TSP/05/026-1: Specification for Heat Shrinkable Cable Terminations and Jointing Kits. *Part 1: 11kV & 33kV Kits*

NRS 051: Suspension and Strain Fittings for Insulated Neutral Supporting Conductors used in Medium Voltage Aerial Bundled Conductor Systems.

3. DEFINITIONS AND ABBREVIATION

For this specification, the definitions and abbreviations given in the reference standards shall apply.

4. REQUIREMENTS

4.1. Service conditions

The accessories shall be suitable for continuous operation outdoors in tropical areas and harsh climatic conditions including areas exposed to:

- Altitudes of up to 2200m above sea level
- Humidity of up to 95%
- Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C, in direct sunlight,
- Pollution: Design pollution level to be taken as “*Heavy*” (Pollution level III) for inland and “*Very Heavy*” (Pollution level IV) for coastal applications in accordance with IEC 60815.
- Isokeraunic* levels of up to 180 thunderstorm days per year.

4.2. General Requirements (*Applicable to All Accessories*)

4.2.1. System Parameters

Table 1: System Parameters

a.	Nominal voltage	11 kV
b.	System highest voltage	12 kV
c.	System frequency	50 Hz
d.	Method of earthing	Non-Effectively Earthed
e.	System fault level	13.1 kA
f.	Fault duration	1 s

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 8 of 22

4.2.2. Range of Accessories

The accessories shall be suitable for 11kV Aerial Bundled Cables consisting of XLPE insulated aluminium phase conductors (sizes 70, 95 & 185mm²) and a supporting catenary that consists of stranded, galvanized steel wires, PVC covered (sizes 50 & 70mm²) of the following minimum mechanical characteristics:

Table 2: Range of Accessories

Aerial Bundled Cable (core sizes in mm ²)	Supporting Catenary		
	Size (mm ²)	Number & Size of Wires (No/mm)	Minimum Tensile Strength of each Wire (kN)
3 x 70	50	7/3.00	9.26
3 x 95	50	7/3.00	9.26
3 x 185	70	7/3.63	13.13

4.2.3. Materials

The materials used in the manufacture of accessories covered by this specification shall be:

- Of adequate strength for the intended application of the accessories and free from any defects that impair performance,
- Compatible with the cable materials such that there is no detrimental effect on the cable or the accessories as a result of their association,
- Compliant with the physical and electrical requirements of this specification and retain these characteristics during the normal life of the accessories whilst in an outdoor environment.

4.2.4. Protection against Corrosion

All ferrous parts of accessories shall be hot-dip galvanized (heavy duty) in accordance with ISO 1461. Ferrous parts shall not be electroplated.

4.2.5. Protection against Ultra-Violet Radiation

All components of accessories shall be manufactured from ultra-violet stabilized material. Details of the offered material shall be submitted.

4.2.6. Fire Retardation

All non-metallic components of accessories shall satisfy the glow-wire test requirements as specified in IEC 60695.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 9 of 22

4.2.7. Finish

All accessories shall be free from sharp edges, burrs and swarf. The insulating materials used in the manufacture of the accessories shall be black in colour.

4.2.8. Fasteners

All threaded fastenings that form part of the fittings/accessories shall have ISO metric threads and at least two full threads shall project clear of the locking device when it is tightened.

4.3. Strain and Suspension Fittings

4.3.1. Dead End Clamp

- 4.3.1.1. Dead end clamps shall be used at the terminal poles, section poles and at road crossings to carry the tension at the end of the line.
- 4.3.1.2. The clamp shall be so designed that parts need not be detached when the fitting is being attached to the ABC system; for example, any wedges used shall be captive wedges.
- 4.3.1.3. It shall not be possible to assemble the clamp in an incorrect manner.
- 4.3.1.4. Dead-end clamps shall be suitably designed to anchor the bundled cable on the supporting catenary.
- 4.3.1.5. The clamp shall have at least two bolts for tightening and the hooking end shall be provided with hot dip galvanized nut and bolts with safety lock. The clamps shall be suitable for use in conjunction with the dead-end hooks detailed in 4.3.2.
- 4.3.1.6. The clamp shall not slip or release the supporting catenary during normal use.
- 4.3.1.7. Housing of the dead-end clamp shall be made from weather resisting material. All components shall be unlosable. In all cases, it shall be possible to install the clamp without using any special tool.

4.3.2. Dead End Hook

- 4.3.2.1. Dead end hooks shall be suitable for mounting through wood poles (by single bolt). The diameter of the pole at the point of mounting shall be 170 to 230mm.
- 4.3.2.2. Each dead-end hook for concrete poles shall be anchored to the pole by use of universal (multi-purpose) clamps stipulated in Kenya Power Specification *KPLC-3CB-TSP-02-004-Specification for Overhead Line Multipurpose Clamps* (to be provided with tender documents).

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 10 of 22

4.3.3. Suspension Clamp

- 4.3.3.1. The clamp shall secure the ABC by clamping around the supporting catenary only.
- 4.3.3.2. It shall allow easy attachment to the suspension hook detailed in 4.3.4 and shall be of a type which can be installed without the use of specialized tools.
- 4.3.3.3. The clamp shall hold the supporting catenary without any slippage to within 5% of the specified breaking force of the supporting catenary.
- 4.3.3.4. The clamp shall be designed for use on line deviations of up to 45°.
- 4.3.3.5. The clamp shall not cause any damage to the supporting catenary. The components shall not allow entrapment of water within the clamp assembly.

4.3.4. Suspension Hook

Suspension hooks shall be suitable for mounting through wood poles (by single bolt) and attachment to pre-stressed round concrete poles by use of universal (multi-purpose) clamps. The diameter of the pole at the point of mounting shall be 170 to 230mm.

4.4. Current-Carrying Connectors and Joints

4.4.1. General

- 4.4.1.1. Connectors and Joints shall be suitable for use with Aerial Bundled Cables of aluminium construction with conductor cross-section area of 70mm², 95mm² and 185mm².
- 4.4.1.2. The connectors shall be designed to allow them to be fitted without having to dismantle components. All segments of the connector shall be held captive when opened for fitting to the conductors.
- 4.4.1.3. All connectors and joints shall be such that their current-carrying capacity is greater than that of the larger conductor to which they are intended to be connected.
- 4.4.1.4. In addition to Clause 4.1, materials used in the manufacture of the connectors or joints shall be of a quality that ensures that the material does not split and does not deteriorate from its intended state during the application process.
- 4.4.1.5. The connectors shall be designed to withstand physical and chemical processes expected in service i.e. oxidation, corrosion, thermal expansion etc.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.	KP1/6C/4/1/TSP/05/012-1
Issue No.	2
Revision No.	1
Date of Issue	2017-12-08
Page 11 of 22	

4.4.2. Specific Requirements for Crimped Joints and Lugs

Joints and lugs where required shall be in accordance with Kenya Power specification *KP1-6C.1-13-TSP-05-026-1*(to be provided by Kenya Power).

4.4.3. End Caps

- 4.4.3.1. End caps shall be suitable for sealing the open ends of insulated conductors (ABC) against water ingress.
- 4.4.3.2. End caps shall be suitable for conductor sizes 70mm², 95mm² and 185mm²
- 4.4.3.3. End caps shall not require any special tools for installation and shall be held in position by elastic forces only.
- 4.4.3.4. End caps shall be black in colour.

4.4.4. Core Separators (in pairs)

- 4.4.4.1. The core separators shall essentially comprise two wedges to facilitate the installation of connectors on tensioned ABC cable. The two separators shall be joined together with a nylon cord.
- 4.4.4.2. The two separators, which shall be made from rigid plastic, shall be so shaped as to be capable of being positively locked in position. The separators shall be supplied in pairs and complete with relevant nylon cord.

4.5. Cable Ties

- 4.5.1. The cable tie shall be a single piece assembly.
- 4.5.2. The material of the cable tie shall be polyamide, coloured black, weather-stabilized and corrosion resistant.
- 4.5.3. Cable ties shall be of uniform quality and shall be free from sharp edges, irregularities or defects that could affect their performance, reliability or durability.
- 4.5.4. The cable tie shall have a guaranteed minimum serviceable life equivalent to that of the cable.
- 4.5.5. The cable tie shall be of width at least 9mm, have 350mm usable length measured from the inside of the tie clamp and tapered to facilitate insertion into the tie clamp.

Issued by: Head of Section, Standards Development	Authorized by: Head of Department, Standards
Signed:	Signed:
Date: 2017-12-08	Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

ACCESSORIES FOR AERIAL BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 12 of 22

4.6. Insulated tap off connectors.

- 4.6.1. The insulated tap off connectors shall be designed to facilitate loop –in and loop – out connections so that no bare conductors are exposed
- 4.6.2. This shall consist of a metallic base (suitable for vertical or horizontal mounting on a steel cross arm), an insulator, and an aluminium busbar. This shall be of the general shape shown in Fig 1.
- 4.6.3. The insulator shall be of porcelain or polymer with a minimum Creepage distance of 300mm and impulse withstand voltage of 95KV for 1.2/50 μ s.
- 4.6.4. The bus bar shall be of aluminium of adequate dimensions capable of carrying 30% above the rated current of 70-95 mm² Aerial Bundled Cables (ABC) at rated voltage.
- 4.6.5. The insulated tap off connectors shall be designed for four, three and two connections points. These shall be specified in the tender.
- 4.6.6. The insulation of the tap off connectors shall feature high track resistance and be climatically stabilized.
- 4.6.7. The connections shall be of simple bolted type. The connecting bolts shall be provided and shall be suitable for connecting the ABC termination lugs for 70mm² and 95mm² cables.

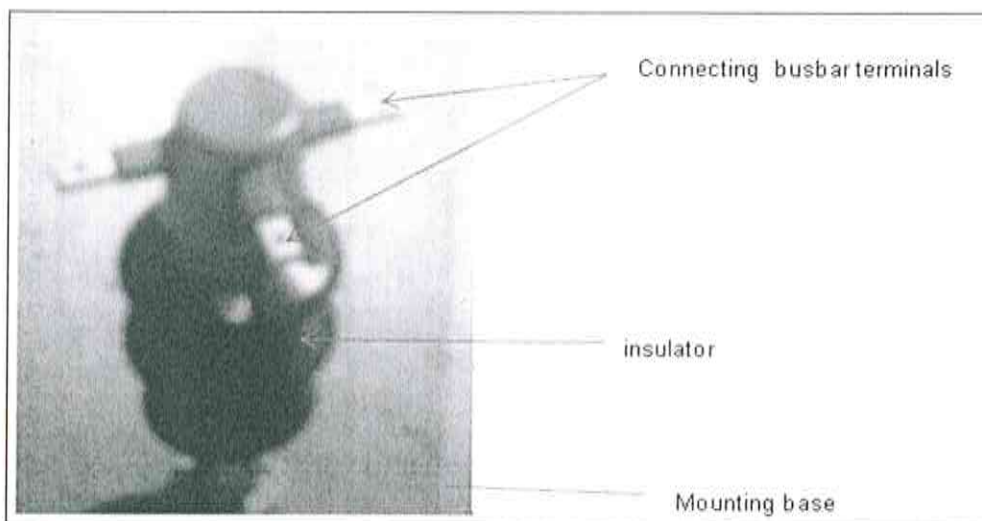


Figure 1: 3-Way Tap Off Connector

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed: *[Signature]*

Signed: *[Signature]*

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

ACCESSORIES FOR AERIAL BUNDLED CABLES (ABC). Part 1: 11 kV ABC ACCESSORIES— SPECIFICATION

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 13 of 22

4.7. MV sleeve joints

4.7.1. The MV sleeve joints shall be used for jointing the galvanized steel wire (Messenger).

4.7.2. The messenger has the following technical characteristics:

Table 3: Messenger Characteristics

Nominal cross-sectional area	Mm ²	50
Stranding	No/mm	7/3.15
Overall diameter	mm	9.45
Minimum breaking load	KN	62

4.7.3. The sleeve joint shall consist of steel sleeve and an insulating heat/cold shrinkable tube as per Fig 2:

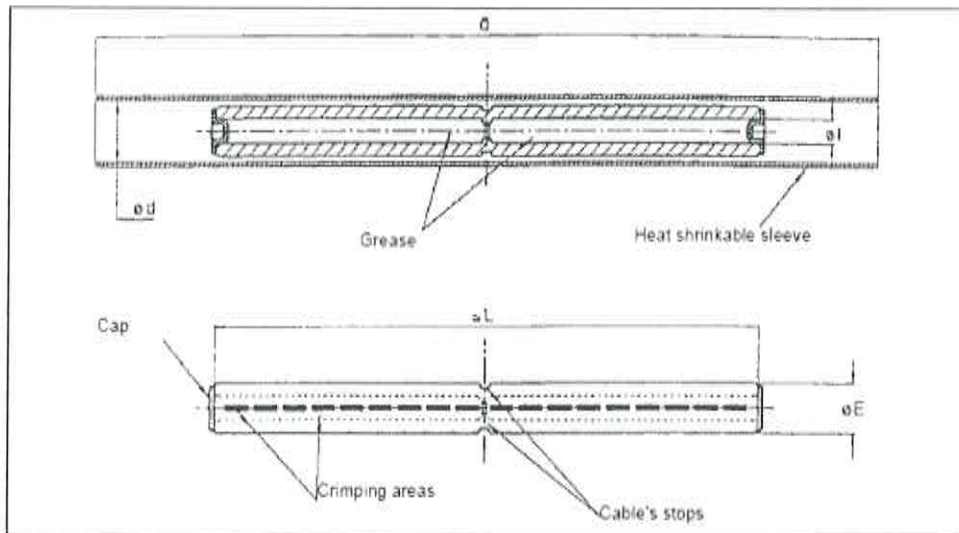


Figure 2: Sleeve Joint

4.7.4. The dimensions in Fig. 2 above shall be as follows: a=350mm, d=25mm, E=20.5 and L=245mm.

4.7.5. The steel sleeve joint shall consist of two adjustable arms to allow for adaptation of the distance between messenger and phases.

4.7.6. The steel sleeve joint shall be greased and equipped with two end caps.

4.7.7. The insulating tube shall be UV resistant and heat shrinkable to provide protection against corrosion and moisture ingress.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed: [Signature]

Signed: [Signature]

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 14 of 22

4.7.8. The crimping points shall be clearly marked.

4.8. Termination

Cable terminations where required shall be in accordance with Kenya Power specification *KP1-6C.1-13-TSP-05-026-1* (to be provided by Kenya Power).

5. TEST REQUIREMENTS

The ABC accessories shall be subjected to the following tests, among others, in accordance with IEC 61442 and the relevant standards specified in Clause 2:

- a) Slippage test on the clamp of the suspension assemblies
- b) Voltage tests on sub-assembly suspension clamp and connecting link
- c) Ageing Test
- d) Corrosion test
- e) Hot dip galvanizing test according to BS EN ISO 1461 for tension and suspension brackets.

6. MARKING AND PACKING

6.1. Marking

6.1.1. Each item shall be engraved legibly and indelibly with the following information:

- a) Manufacture's Name
- b) Month and Year of Manufacture
- c) Type Reference Number
- d) Electrical and Mechanical Characteristics (as applicable)
- e) Size
- f) Standards to which the item complies
- g) The words, "**Property of KPLC.**"

6.1.2. The characters used in marking shall be at least 3mm high.


6.2. Packaging


6.2.1. Each item shall be packed in such a manner as to protect it from damage during transportation, handling and storage.

6.2.2. Each package shall contain relevant instructions for handling and use printed in the English Language.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed: 
Date: 2017-12-08

Signed: 
Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 15 of 22

APPENDICES

APPENDIX A: TESTS AND INSPECTION (NORMATIVE)

- A.1. It shall be the responsibility of the manufacturer to perform or to have performed the tests specified in Clause 5, and other tests normally performed at works. Copies of previous test certificates and test reports (for each type of accessory) by the relevant International or National Testing/Standards Authority of the country of manufacture (or ISO/IEC 17025 accredited independent laboratory) shall be submitted.
- A.2. All the manufactured accessories shall be offered for factory acceptance tests (FAT) and inspection in the presence of two (2) Kenya Power engineers. During the FAT at the manufacturer's works, the quantities which will be ready and offered for inspection and tests shall be considered already tested.
- A.3. During delivery of the accessories, Kenya Power shall 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/rectify without charge to KPLC, accessories which upon examination, test or use fail to meet any or all of the requirements in the specification

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 accessories material, workmanship, tests, service capability, etc. 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 9001:2008/2015
- 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: 2008 or 2015 certificate, shall be submitted with the tender for evaluation.
- B.3. The manufacturer shall have at least seven years' experience in the manufacture of the offered accessories and shall have exported similar accessories to at least three utilities. Documentary evidence including customer reference letters, detailed list & contact addresses of previous major customers in the past five years shall be submitted with the tender.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08


Page 16 of 22

APPENDIX C: TECHNICAL DOCUMENTATION (NORMATIVE)

- C.1. The bidder shall submit its tender complete with technical documents required for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:
- a) A sample of each accessory offered.
 - b) Detailed drawings to scale with all dimensions and tolerances including material of manufacture of each accessory part;
 - c) Fully-filled clause by clause Guaranteed Technical Particulars (GTPs)- Appendix D - stamped and signed by the manufacturer.
 - d) Details of the manufacturer's experience;
 - e) Copies of previous test certificates and test reports (for each type of accessory) 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).;
 - f) Marking & Packaging details (including packaging materials).
- C.2. The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:
- a) Detailed drawings to scale with all dimensions and tolerances including material of manufacture of each accessory part;
 - b) Fully filled clause by clause Guaranteed Technical Particulars (GTPs) stamped and signed by the manufacturer (**these are not the ones submitted with the tender**);
 - c) Marking & Packaging details (including packaging materials).
- C.3. Routine and sample test reports for the accessories to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods. KPLC Engineers (2) shall witness these tests at the factory before shipment.
- C.4. Each accessory package shall be supplied with detailed user's installation guide printed in English language that includes the following among other information written in English language to Kenya Power stores. All information shall be unambiguous.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed: 
Date: 2017-12-08

Signed: 
Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 17 of 22

**APPENDIX D: GUARANTEED TECHNICAL PARTICULARS (GTPS) —
NORMATIVE**

(to be filled, stamped 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 test certificates and test reports for tender evaluation or approval, all in English Language, as per clauses C.1 and C.2)

Tender No.

Bidder's name and Address.....

Clause number	KPLC requirement		Bidder's offer
	Manufacturer's Name and address		Specify
	Country of Manufacture		Specify
	Bidder's Name and address		Specify
1.1	Scope		State
1.2	Applicability of the accessories		List
1.3	ABC accessories offered		State
2.	Applicable Standards		Specify
3.	Definitions and abbreviation		Specify
4.	REQUIREMENTS		
4.1	Service conditions		Specify
4.2.1	System Parameters	Nominal voltage	State
		System highest voltage	State
		System frequency	State
		Method of earthing	State
		System fault level	State
		Fault duration	State
4.2.2	Applicable cable types and range, & Cable sizes		State
4.2.3	Materials (a) – c)		Specify
4.2.4	Protection against corrosion		Specify
4.2.5	Protection against UV Radiation		Specify
4.2.6	Fire retardation		List

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 18 of 22

Clause number	KPLC requirement	Bidder's offer
4.2.7	Finish	Specify
4.2.8	Fasteners	Specify
4.3.1.1	Places where dead end clamps are used	Specify
4.3.1.2	Clamp parts need not be detached when the fitting is being attached	Specify
4.3.1.3	Clamp assembling in an incorrect manner is impossible	Specify
4.3.1.4	Clamp suitably designed to anchor the bundled cable on the supporting catenary	Specify
4.3.1.5	The clamp shall have at least two bolts for tightening	Specify
4.3.1.6	Clamp shall not slip catenary during normal use	Specify
4.3.1.7	No special tool needed to install the clamp	Specify
4.3.2.1	The diameter of the pole at the point of mounting	Values
4.3.2.2	Each dead-end hook compatibility with universal/multipurpose clamps	Specify
4.3.3.1	Suspension clamp secures the ABC by clamping around the supporting catenary only	Specify
4.3.3.2	No special tool needed to install the clamp	Specify
4.3.3.3	Clamp holds the supporting catenary without any slippage	Specify
4.3.3.4	Clamp is designed for use on line deviations of up to 45°	Specify
4.3.3.5	clamp does not cause any damage to the supporting catenary	Specify
4.3.4	Compatibility with universal clamps for concrete poles	Specify
4.4.1.1	Aerial Bundled Cables sizes for use with the connectors	Specify
4.4.1.2	Connectors designed to be fitted without having to dismantle components	Specify
4.4.1.3	Connectors' current-carrying capacity is greater than that of the larger conductor to which they are intended to be connected	Specify
4.4.1.4	Connectors or joints materials does not split nor deteriorate	Specify
4.4.1.5	Connectors designed to withstand physical and chemical processes expected in service	Specify
4.4.2	Joints and lugs are as per Kenya Power specification <i>KP1-6C.1-13-TSP-05-026-1</i>	Specify
4.4.3.1	End caps suitable for sealing the open ends of ABC against water ingress	Specify
4.4.3.2	Conductor sizes for the end caps	State
4.4.3.3	End caps do not require any special tools for installation	State
4.4.3.4	Colour of end caps	State
4.4.4.1	Core separators comprise of two wedges	State

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 19 of 22

Clause number	KPLC requirement		Bidder's offer
4.4.4.2	separators supplied in pairs and complete with relevant nylon cord		Specify
4.5.1	Cable tie is a single piece assembly		State
4.5.2	Cable tie material and colour		Specify
4.5.3	Cable ties is free from sharp edges, irregularities or defects		Specify
4.5.4	Guaranteed minimum serviceable life of cable tie		Value
4.5.5	Cable tie dimensions measured from the inside		State
4.6.1	Insulated tap off connectors facilitate loop –in and loop – out connections		Specify
4.6.2	Insulated tap off connectors consist of a metallic base, an insulator, and an aluminium busbar as shown in Fig. 1		Specify
4.6.3	Insulator material		State
	Minimum Creepage distance		State
	Impulse withstand voltage		State
4.6.4	Busbar material and ampacity		State
4.6.5.	Number of Tap-offs in the tap off connectors supplied		State
4.6.6	Insulation of the tap off connectors features high track resistance and are climatically stabilized		Specify
4.6.7	Connections type and suitability		Specify
4.7.1	MV sleeve joints application		Specify
4.7.2	Technical characteristics of the messenger	Nominal cross-sectional area	State
		Stranding	State
		Overall diameter	State
		Minimum breaking load	State
4.7.3	Sleeve joint components		State
4.7.4	Dimensions of the sleeve joint		State
4.7.5	Steel sleeve joint consist of two adjustable arms to allow for adaptation of the distance between messenger and phases		Specify
4.7.6	Steel sleeve joint is greased and equipped with two end caps		Specify
4.7.7	Insulating tube is UV resistant and heat shrinkable		Specify
4.7.8	crimping points is clearly marked		Specify
4.8.	Terminations designed and manufactured to Kenya Power specification <i>KP1-6C.1-13-TSP-05-026-1</i>		Specify
5	Test and standards for carrying out tests		List
6.1	Marking		

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 20 of 22

Clause number	KPLC requirement	Bidder's offer
6.1.1	Information to be marked legibly and indelibly:	List
6.1.2	Height of characters used in marking	Specify
6.2	Packing	
6.2.1	Dispatch condition	Specify
6.2.2	Relevant instructions for handling and use, printed in the English Language, are contain in each package.	State
APPENDICES		
A	TESTS AND INSPECTION (NORMATIVE)	
A1	Tests to be performed	State
A2	All manufactured accessories shall be offered for factory acceptance tests (FAT) and inspection in the presence of two (2) Kenya Power engineers at the manufacturer's works	State
A3	Supplier shall replace without charge to KPLC items that don't meet specification	Specify
B	QUALITY MANAGEMENT SYSTEM (NORMATIVE)	
B1	QAP	State
B2	Manufacturer's Declaration of Conformity to applicable standards and Copies of quality management certifications attached	State
B3	Delivery time, Production capacity & experience of the manufacturer	State
C	TECHNICAL DOCUMENTATION (NORMATIVE)	
C1	Technical documents to be submitted with tender documents	
	a. A sample of each accessory offered	state
	b. Detailed drawings to scale with all dimensions and tolerances including material of manufacture of each accessory part	
	c. Fully-filled clause by clause Guaranteed Technical Particulars (GTPs)- Appendix D - stamped and signed by the manufacturer	state
	d. Details of manufacturing experience & capacity	state
	e. Copies of required test reports by a third-party testing laboratory accredited to ISO/IEC 17025 and a copy of accreditation certificate to ISO/IEC 17025 for the third-party testing laboratory	State
	f. Marking and Packaging details (including packaging materials).	State
C2	Fully filled clause by clause Guaranteed Technical Particulars (GTPs)	
	a. Detailed drawings to scale with all dimensions and tolerances including material of manufacture of each accessory part	

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08



Kenya Power

Kenya Power & Lighting Co. Ltd.

TITLE:

**ACCESSORIES FOR AERIAL
BUNDLED CABLES (ABC).
Part 1: 11 kV ABC ACCESSORIES—
SPECIFICATION**

Doc. No.

KP1/6C/4/1/TSP/05/012-1

Issue No.

2

Revision No.

1

Date of Issue

2017-12-08

Page 21 of 22

Clause number	KPLC requirement	Bidder's offer
	b. Fully filled clause by clause Guaranteed Technical Particulars (GTPs) stamped and signed by the manufacturer (these are not the ones submitted with the tender)	State
	c. Marking & Packaging details (including packaging materials)	State
C3	Routine and sample test reports for the accessories shall be submitted to KPLC for approval before shipment/delivery of the goods	State
C4	Each accessory package is supplied with detailed user's installation guide printed in English language	Specify

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

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

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2017-12-08

Date: 2017-12-08