



The Kenya Power & Lighting
Co. Ltd.

TITLE:

**SPECIFICATION FOR
11kV REMOTELY
CONTROLLED LOAD
BREAK SWITCH – Part 1:
Air Break Type (with fault
make & load break heads)**

Doc. No.

KPLC1/3CB/TSP/11/107

Issue No.

1

Revision No.

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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Procurement Manager
3	Stores & Transport Manager
4	Telecommunications Manager
5	Operations & Maintenance Manager
6	Design & Construction Manager
7	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)

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FOREWORD

This specification has been prepared by the Research and Development Department in collaboration with the Telecommunications, Operations & Maintenance and Design & Construction Departments all of the Kenya Power & Lighting Company Ltd (KPLC) and it lays down requirements for Remotely Controlled Load Break Switch; Air Break Type. The specification is intended for use by KPLC in purchasing the equipment.

1. SCOPE

This specification is for newly manufactured Remotely Controlled Load Break Switch Air Break Type complete with fault make tips and load break heads but without Remote Terminal Unit.

The specification also covers inspection and test of the switch 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 Remotely Controlled Load Break Switch 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 switch for KPLC.

The specification does not purport to include all the necessary provisions of a contract. It shall be used with tender/contract documents.

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

IEC 62271: High-voltage switchgear and controlgear.

3. TERMS AND DEFINITIONS

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The terms and definitions given in the reference standards shall apply.

4. REQUIREMENTS

4.1 Service Conditions

4.1.1 Operating conditions

The Remotely Controlled Load Break Switch shall be suitable for continuous outdoor operation in tropical areas with the following conditions.

- (a) Altitude: up to 2,200 metres above sea level.
- (b) Temperature: average of +30°C with a minimum of -1°C and max +40 °C
- (c) Humidity: up to 95%,
- (d) Pollution: Design pollution level to be taken as "Heavy" (Pollution level III) according to IEC 815.
- (e) Isokeraunic level: 180 thunderstorm days per year

4.1.2 System characteristics

The switch shall be used on 11kV 50Hz overhead system.

4.2 Design, Materials and Construction

- 4.2.1 The Remotely Controlled Load Break Switch shall be Air Break type and shall be designed and manufactured to all applicable IEC standards including IEC 62271 and the requirements of this specification.
- 4.2.2 The switch shall be a three phase unit and shall be complete with all relevant steel work and hardware for mounting on wooden pole.
- 4.2.3 It shall be suitable for open point, mid circuit applications and routine operational switching for overhead network.
- 4.2.4 The switch shall be equipped with both fault make and load break heads suitable for fast open and close switch operation.
- 4.2.5 The switch shall have mechanism suitable for both local manual operation and automation/remote operation.

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4.2.6 For remote operation, the switch shall be complete with a motorized actuator. Remote Terminal Unit (RTU) and communication network shall be provided/procured by KPLC separately. Compatibility requirements for switch offered shall be stated in the bid.

4.2.7 For local manual operation, a hook stick operating mechanism shall be provided. The hook stick (link stick) and operating head shall be provided by KPLC (the general drawing for operating heads in use in KPLC is attached in Annex B Fig 1A & 1B for information). Confirmation of compatibility shall be stated in the bid. The coupling to hook stick/link stick (fibre glass operating rod) shall be identical to that shown in Fig 1A & 1B Annex B.

The hook stick operating mechanism shall be suitable for mounting high up on the pole to deter unauthorized operation. It shall be complete with padlocking facilities.

4.2.8 All ferrous parts shall be protected against corrosion by hot dip galvanizing to ISO 1461.

4.3 Ratings

The switch shall be of the following minimum ratings:

Description	Requirement
Rated Voltage and Frequency	12kV, 50Hz
Rated Continuous Current	400A
Rated Short Time Withstand Current (3s)	25kA, 3s
Current Breaking Capacity	400A
Fault Make Capacity	25kA
Rated Power Frequency Withstand Voltage (1minute, rms)	38kV
Rated Lightning Impulse Withstand Voltage (+ve peak)	95kV
Creepage Distance of Insulators	300mm

4.4 QUALITY MANAGEMENT SYSTEM

4.4.1 The supplier shall include a quality assurance programme (QAP) that will be used to ensure that the switch design, material, workmanship, tests, service capability, maintenance and documentation, 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.

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

5. TESTS AND INSPECTION

5.1 The switch shall be inspected and tested in accordance with the requirements of IEC standards including IEC 62271 and this specification. 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 Certified true copies of previous Type Test Certificates and Type Test Reports issued by the relevant International or National Testing/ Standards Authority or ISO/IEC 17025 accredited laboratory shall be submitted with the offer for evaluation (all in English Language). A copy of the 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.

Copies of type test certificates and reports for the switch to be submitted for tender evaluation shall include all the relevant Type Tests to IEC 62271.

5.3 The switch shall be subject to acceptance tests at the manufactures' works before dispatch. Acceptance tests shall be witnessed by two Engineers appointed by The Kenya Power and Lighting Company Limited (KPLC) and shall include the following:

5.3.1 All the routine tests listed in the relevant part of IEC 62271.

5.3.2 Visual Inspection (verification of auxiliaries, fittings & accessories, markings & nameplates, paintwork, workmanship and finish).

5.3.3 Galvanizing Test.

5.4 Testing Facility

The supplier shall provide current e-mail address, fax and telephone numbers and contact person at the Testing Facility of the country where the switch is manufactured and tested. A list of tests which can be carried out at the manufacturer's facilities shall also be indicated in the bid.

5.5 Test reports for each switch (including its individual components) shall be submitted to The Kenya Power and Lighting Company for approval before shipment.

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5.6 On receipt of the switch, KPLC will inspect it 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, equipment which upon examination, test or use fail to meet any or all of the requirements in the specification.

6. MARKING, LABELLING AND PACKING

6.1 The switch and associated components shall be packed in a manner as to protect it from any damage in transportation and handling.

6.2 Each assembly and package of items associated with the switch shall be suitably marked.

6.3 In addition to markings and labels required elsewhere in the specification, each equipment and component shall be marked in accordance with the relevant IEC standards. Each switch shall be provided with a rating plate of weatherproof material, fitted in a visible position, showing the appropriate details listed in the relevant part of IEC 62271. The entries on the plate shall be indelibly marked (either by etching, engraving or stamping). The marking shall include the following information:

- Name of Manufacturer and Country
- Model /Type Reference Number
- Standard of Manufacture
- Ratings: rated normal current and temperature rise, rated short time current and duration, rated voltage, rated frequency, rated lightning impulse withstand voltage, rated power frequency withstand voltage, rated fault making current.
- Serial number

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ANNEX A: Guaranteed Technical Particulars and Statement of Compliance (to be filled and signed by the Manufacturer and submitted together with Manufacturer's catalogues, brochures, drawings, technical data, sales records, copies of ISO/IEC 17025 accreditation certificates and certified true copies of type test certificates and type test reports for tender evaluation)

	Description	Guaranteed Technical Particulars for Remotely Controlled Switch offered
1	Name of Manufacturer & Country of manufacture of the switch being offered	
2	Type & Model Number	Type
		Model Number/Reference Number
		Drawing Number
3	Service Conditions	
4	Design standards complied with	
5	Operating Mechanism	Remote Operation
		Actuator
		Compatibility with RTU of KPLC's choice
		Manual Operation
		Compatibility with hook stick operating head in use by KPLC
		Hook stick operating head to be provided by supplier
6	Number of Phases	Mounting (position on pole)
7	List relevant steel work and hardware to be provided for mounting complete switch on wooden pole	
8	Fault make and load break heads suitable for fast open and close switch operation	
9	Protection against Corrosion	
10	RATINGS	
		Rated Voltage and Frequency (Volts, Hz)
		Rated Continuous Current, A
		Rated Short Time Withstand Current, kA (3s)
		Rated Fault Make Current, kA
	Rated Power Frequency Withstand Voltage (kV, rms)	

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	Description	Guaranteed Technical Particulars for Remotely Controlled Switch offered
	Rated Lightning Impulse Withstand Voltage (kVp, +ve)	
	Creepage Distance of Insulators (mm)	
	Clearances	
	Phase to Phase (mm)	
	Isolating Distance (mm)	
11	Marking (indicate information to be marked on the switch and method of marking)	
12	Quality Assurance Programme (QAP)	
13	Copy of relevant and valid ISO 9001 Certificate submitted	
14	Manufacturer's Declaration of Conformity to Reference Standards	
15	List copies of Type Test Certificates and Type Test Reports to IEC 62271 submitted with offer for tender evaluation	
16	List Tests to be witnessed by KPLC Engineers during factory acceptance tests	
17	Address and contact person for Testing Facility where type tests were carried out	
18	Manufacturer's test capability	
19	Copy of ISO/IEC 17025 accreditation certificate for Laboratory	
	Type tests	
	Manufacturer's Laboratory	
20	Guarantee and Warranty	
	By Supplier	
	By Manufacturer	
21	List copies of Manufacturer's catalogues, brochures, technical data, drawings and customer sales records submitted to support the offer (showing model and type of switch offered)	
22	Packing	
23	Inspection for acceptance to KPLC stores/site	
24	Statement of Compliance to Tender Specifications (indicate deviations if any and supporting documents submitted)	

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

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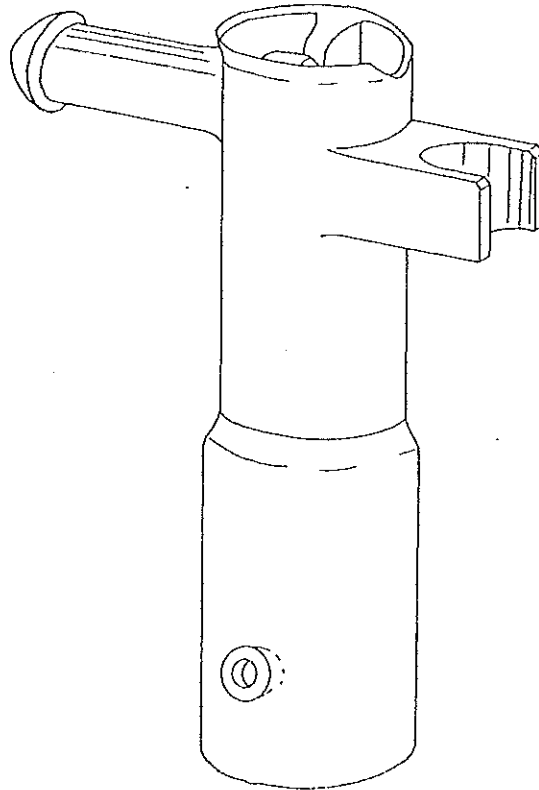
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ANNEX B: Hook Stick Operating Heads currently in use in KPLC



Material Aluminium alloy casting

Fig 1A: Expulsion Fuse Cutout/Solid Link Isolator Operating Head – TYPE 1

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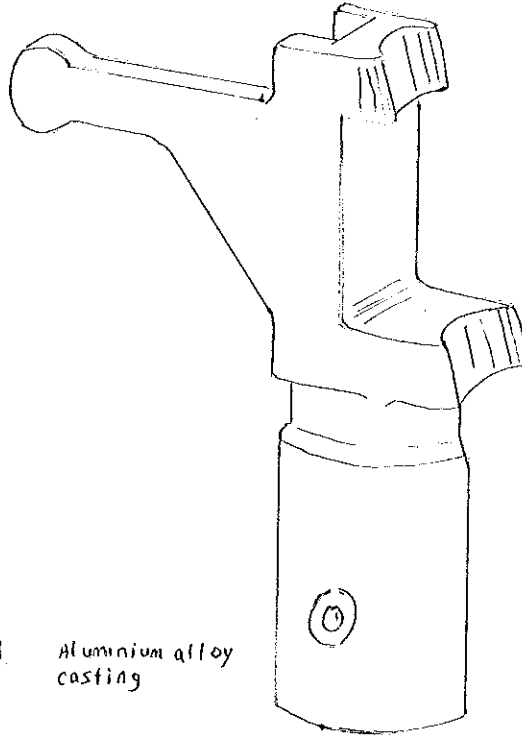
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Material Aluminium alloy
casting

Fig 1B: Expulsion Fuse Cutout/Solid Link Isolator Operating Head – TYPE 2

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