Kenya Power

SPECIFICATION FOR AC/DC HIGH VOLTAGE TEST SYSTEM

A Document of the Kenya Power & Lighting Co. Ltd

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0.1 CIRCULATION LIST

COPY NO.	COPY HOLDER
1	E/Plant
2	

0.2 AMENDMENT RECORD

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2026-01-19	New issue	George Welimo	

FOREWORD

This specification has been prepared by the Electrical Plant of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for AC/DC High voltage test system.

The AC/DC High voltage test system is intended for use by the Electrical Plant for Testing switchgears.

This specification was prepared to establish and promote uniform requirements for AC/DC High voltage test system 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 AC/DC High voltage test system 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 AC/DC High voltage test system for KPLC.

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

1. SCOPE

1.1. This specification is for AC/DC High voltage test system for use by company's Electrical Plant.

1.2. The specification covers requirements, design, inspection and tests and schedule of Guaranteed Technical Particulars of AC/DC High voltage test system.

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 61557: Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c - Equipment for testing, measuring or monitoring of protective measures - Part 1: General requirements;

IEC 60815: Selection and dimensioning of high voltage insulators intended for use in polluted conditions –Part 1: Definitions, information and general principles

OIML D 11: General Requirements for Measuring Instruments - Environmental Conditions

IEC 61000: Electromagnetic Compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test; – Part 6-2: Generic standards – Immunity for Industrial environment.

IEC 60529: Degrees of protection provided by enclosures (IP code)

ISO 9001: Quality Management systems – Requirements

ISO/IEC 17025: General Requirements for the competence of testing and calibration laboratories

IEC 61010 - Safety requirements for electrical equipment for measurement, control, and laboratory use. During a test, software will perform safety checks before applying full test voltage.

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.

LED –Light Emitting Diode

Kg –Kilogram

KV - Kilovolt

IP – Ingress Protection

LV – Low Voltage

EMC – Electromagnetic Compatibility

EU – European Union

AC-Alternating Current

DC-Direct Current

IEC-

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

4.1.1 The AC/DC High voltage test system shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:

a) Altitudes of up to 2000m above sea level;

b) Humidity of up to 95%;

c) Average ambient temperature of +30ºC with a minimum of -1°C and a maximum of +40°C

d) Pollution: Degree 2

4.2. DESIGN AND CONSTRUCTION

4.2.1. The AC/DC High voltage test system shall be suitable for 50 Hz AC testing 35 kV_{RMS} and DC testing up to 100 kV respectively.

4.2.2. The AC/DC High voltage test system shall consist of two separate units: the control unit and the high-voltage unit.

4.2.3. The AC/DC High voltage test system shall have a control unit consisting of a variac, current/ voltage display instruments, a timer for the test duration and a safety circuit.

4.2.4. The AC/DC High voltage test system shall have an in-built over-current protection

4.3. It shall have the technical particulars as shown in table 1 below:

Table 1: Technical particulars of AC/DC High voltage test system

Parameter	Requirement	
Input Voltage	Mains power supply	220-240 V_{AC} 47-60Hz
Output Voltage	AC Voltage	35kV_{rms} and above
	DC Voltage	100kV and above
Measuring voltage range	0 … 40 kV AC, 0 … 100 kV DC	
Output current	0 … 15mA	
Measuring current range	0 … 500 µA/ 0 … 50 mA	
AC/DC High voltage test system	**Description**	**Quantity**
	AC Mains cable(UK)	1

Parameter	Requirement	
	discharge and earthing rod 100 kV	1
	HV-doubler 100kV DC	1
	Cable bag - backpack	To accommodate all cables supplied
	HV-connection cable 10 m (shielded)	2 sets
	set of cables	1 Set
	rectifier attachment (voltage doubler)	1
	Control unit	1
	HV-transformer 35 kVrms,	1

4.4. DOCUMENTATION AND SUPPORT

4.4.1. Warranty and training

4.4.1.1. The AC/DC High voltage test system shall be backed by a minimum of 12-months factory warranty.

4.4.1.2. Technical support and software upgrade, where applicable shall be provided free of charge to KENYA POWER for a period of not less than 36 months.

4.4.1.3. The Bidder shall submit a clause by clause statement of compliance with the specifications together with copies of the manufacturer's catalogues, brochures, technical data and proven test reports clearly marked to support each clause, all in English for evaluation. The manufacturer's type reference/designation of the item offered shall be indicated

5. TESTS REQUIREMENTS

5.1. The AC/DC High voltage test system shall be inspected and tested in accordance with standards 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. Copies of previous Test/calibration Reports issued by own or a third party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 confirming accuracy and compliance of the AC/DC High voltage test system 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/calibrating laboratory shall also be submitted. Any translations of

certificates or reports into English language shall be signed and stamped by the Testing/Calibrating Authority that carried out tests/calibration. Copies of test/calibration reports for the AC/DC High voltage test system offered to be submitted for tender evaluation shall include the following

5.2.1. Measured values of the standard equipment

5.2.2. Indicated values of the unit under test (AC/DC High voltage test system offered)

5.2.3. Expanded Relative uncertainty

5.2.4. Details of standard and reference equipment used in calibration tests.

6. MARKING AND PACKING

6.1. MARKING

The following information shall be marked legibly and in a permanent manner on the AC/DC High voltage test system:

a) The manufacturer's name or trade mark;

b) The type reference number / model number;

c) The serial number;

d) Letters "PROPERTY OF KENYA POWER"

e) The instructions for handling and use (in the English Language).

6.2. PACKING

6.2.1. The AC/DC High voltage test system shall be packed in a carrying case so as to protect it from damage and entry of moisture during transportation, handling and storage.

6.2.2. The carrying case shall shock proof and impact resistant and shall be able to withstand a fall of one meter without damage to AC/DC High voltage test system.

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 Copies of previous Test/calibration Reports of AC/DC High voltage test system issued by own or a third party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate for the testing laboratory shall also be submitted with the tender (all in English Language). Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Authority.

A.3 On receipt of the AC/DC High voltage test system, 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 AC/DC High voltage test system 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 supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the AC/DC High voltage test system physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001: 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 9001:2015 certificate shall be submitted with the tender for evaluation.

B.3 The bidder shall indicate the delivery time of the equipment, manufacturer's monthly & annual production capacity and experience in the production of the AC/DC High voltage test system being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the AC/DC High voltage test system 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.

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:

a) Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;
b) Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions, Wiring diagram / Schematic Diagram 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 test/calibration reports of testing/calibrating laboratory accredited to ISO/IEC 17025;
f) Copy of accreditation certificate to ISO/IEC 17025 for the testing/calibrating laboratory;
g) Manufacturers letter of authorization, ISO 9001:2015 certificate, and other technical documents required in the tender.
h) Manufacturer's warranty and guarantee; subject to 12 months from date of delivery to KPLC stores
i) Operational manual.
j) Service manual.

C.2 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of AC/DC High voltage test system to KPLC Isiolo road stores

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 and address		State
Country of Manufacture		State
Name and model Number		State
1.	Scope	State
2.	Normative References	State
3.	Definitions and Abbreviations	State
3.1.	Abbreviations	State
4.1.	SERVICE CONDITIONS	
4.1.1	The AC/DC High voltage test system shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:	
a)	Altitudes above sea level;	State
b)	Humidity ;	State
c)	Average ambient temperature	state
d)	Pollution:	state
4.2.	DESIGN AND CONSTRUCTION	
4.2.1.	Suitable for 50 Hz AC testing 35 kV_{RMS} and DC testing up to 100 kV respectively.	State
4.2.2.	Consist of two separate units: the control unit and the high-voltage unit.	State
4.2.3.	A control unit consisting of a variac, current/ voltage display instruments, a timer for the test duration and a safety circuit.	State

Clause number	Requirement			Bidder's offer
4.2.4.	Have an in-built over-current protection			State
4.3.	It shall have the technical particulars as shown in table 1 below:			
	Parameter	**Requirement**		
	Input Power	Mains power supply Voltage		Specify
	Output Voltage	Voltage AC		Specify
		DC voltage		Specify
	Measuring voltage range			Specify
	Output current			Specify
	Measuring current range			Specify
	Current and resistance ranges			State
	AC/DC High voltage test system	**Description**	**Quantity**	
		AC Mains cable(UK)	1	Specify
		discharge and earthing rod 100 kV	1	Specify
		HV-doubler 100kV DC	1	Specify
		Cable bag - backpack	To accommodate all cables supplied	Specify
		HV-connection cable 10 m (shielded)	2 sets	Specify
		set of cables	1 Set	Specify
		rectifier attachment (voltage doubler)	1	Specify
		Control unit	1	Specify
		HV-transformer 35 kVrms,	1	Specify
4.4.1.	**Warranty and training**			
4.4.1.1.	The AC/DC High voltage test system shall be backed by a minimum of 12-months factory warranty.			submit
4.4.1.2.	Technical support and software upgrade, where applicable shall be provided free of charge to KENYA POWER for a period of not less than 36 months.			State
4.4.1.3.	The Bidder shall submit a clause by clause statement of compliance with the specifications together with copies of the manufacturer's catalogues, brochures, technical data and proven test reports clearly marked to support each clause, all in English for evaluation. The			state

Clause number	Requirement	Bidder's offer
	manufacturer's type reference/designation of the item offered shall be indicated	
5	**TESTS REQUIREMENTS**	
5.1.	The AC/DC High voltage test system shall be inspected and tested in accordance with standards 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.	State
5.2.	Copies of previous Test/calibration Reports issued by own or a third party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 confirming accuracy and compliance of the AC/DC High voltage test system 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/calibrating laboratory shall also be submitted. Any translations of certificates or reports into English language shall be signed and stamped by the Testing/Calibrating Authority that carried out tests/calibration. Copies of test/calibration reports for the AC/DC High voltage test system offered to be submitted for tender evaluation shall include the following	submit
5.2.1.	Measured values of the standard equipment	submit
5.2.2.	Indicated values of the unit under test (AC/DC High voltage test system offered)	submit
5.2.3.	Expanded Relative uncertainty	submit
5.2.4.	Details of standard and reference equipment used in calibration tests.	submit
6	**MARKING AND PACKING**	
6.1.	**MARKING**	
a)	The manufacturer's name or trade mark;	State
b)	The type reference number / model number;	State
g)	The serial number;	State
h)	Letters "PROPERTY OF KENYA POWER"	State
i)	The instructions for handling and use (in the English Language).	State
6.2.	**PACKING**	
6.2.1.	The AC/DC High voltage test system should be packed in a carrying case so as to protect it from damage and entry of moisture during transportation, handling and storage.	State

Clause number	Requirement	Bidder's offer
6.2.2.	The carrying case shall shock proof and impact resistant and shall be able to withstand a fall of one meter without damage to the AC/DC High voltage test system .	State
	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.	confirm
A.2	Copies of previous Test/calibration Reports of AC/DC High voltage test system issued by own or a third party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate for the testing laboratory shall also be submitted with the tender (all in English Language). Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Authority.	submit
A.3	On receipt of the AC/DC High voltage test system, 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 AC/DC High voltage test system which upon examination, test or use fail to meet any or all of the requirements in the specification.	State
B:	**QUALITY MANAGEMENT SYSTEM (Normative)**	
B.1	The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the AC/DC High voltage test system physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001: 2015.	submit
B.2	The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001:2015 certificate shall be submitted with the tender for evaluation.	submit
B.3	The bidder shall indicate the delivery time of the equipment, manufacturer's monthly & annual production capacity and experience in the production of the AC/DC High voltage test system being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the AC/DC High voltage test system sold in the last five years as well as reference	State

Clause number	Requirement	Bidder's offer
	letters from at least four of the customers shall be submitted with the tender for evaluation.	
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:	
a)	Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;	submit
b)	Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions, Wiring diagram / Schematic Diagram and technical data;	submit
c)	Sales records for the last five years and at least four customer reference letters;	submit
d)	Details of manufacturing capacity and the manufacturer's experience;	submit
e)	Copies of required test/calibration reports of testing/calibrating laboratory accredited to ISO/IEC 17025;	submit
f)	Copy of accreditation certificate to ISO/IEC 17025 for the testing/calibrating laboratory;	submit
g)	Manufacturers letter of authorization, ISO 9001:2015 certificate, and other technical documents required in the tender.	submit
h)	Manufacturer's warranty and guarantee; subject to 12 months from date of delivery to KPLC store	submit
i)	Operational manual.	submit
j)	Service manual.	submit
C.2.	The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the AC/DC High voltage test system to KPLC stores.	State

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Manufacturer's Name, Signature, Stamp and Date