



Kenya Power

**TRANSFORMER AND AC DIELECTRIC TEST SYSTEM
— SPECIFICATION**

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0.1 Circulation List

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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.

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0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2017-12-13	New Issue	S. Nguli	Dr.(Eng.) Peter Kimemia

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FOREWORD

This specification has been prepared by Standards Department in collaboration with Quality Control Section (Logistics) both of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Transformer and AC Dielectric Test System. It is intended for use by KPLC in purchasing the system.

This equipment is being procured to part of the testing laboratory currently under implementation.

There are no preceding specifications for this equipment.

This specification stipulates the minimum requirements for the Transformer and AC Dielectric Test System acceptable for use in the company and it shall be the responsibility of the supplier and manufacturer to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC. The manufacturer shall exhibit good workmanship and good engineering practice in the manufacture of the Transformer and AC Dielectric Test System for KPLC.

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

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

Name	Division
Stephen Nguli	Infrastructure Development
Simon Kimitei	Supply Chain

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1. SCOPE

- 1.1. This specification is for supply, delivery, installation and commissioning of Transformer and AC Dielectric Test System to be used in testing copper and aluminum wound single and three phase distribution transformers of ratings up to 2500KVA 33kV 50Hz as well as dielectric breakdown and dielectric strength of electrical equipment and insulating materials of ratings up to 36kV 50Hz.
- 1.2. The scope also includes calibration and training on the operation and routine maintenance of the system.
- 1.3. The Transformer and AC dielectric Test System shall be complete with all components, earthing /grounding system, switchgear, controls, metering, instruments, operating and testing software complete with human machine interface, computer and control desk as well as all cabling and connectors required to carry out the following tests as per IEC 60076, IEC 60060, IEEE 4, IEC 60270:
 - a) Excitation Current Measurement
 - b) Excitation Loss (No-Load or Core Loss)
 - c) Impedance Voltage Measurement
 - d) Full Load Current
 - e) Load Loss
 - f) Temperature Rise Test (Heat Run)
 - g) Applied Voltage Test (separate source)
 - h) Induced Over-Voltage Test
 - i) Winding Resistance Measurement
 - j) Turns Ratio and Phase Displacement
 - k) Insulation Resistance
 - l) Dielectric breakdown and dielectric strength of electrical equipment and insulating materials including cables and insulators
- 1.4. The Transformer and AC Dielectric Test System shall be of proven design and it is the responsibility of the Supplier to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC.

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- 1.5. It shall be the responsibility of the Supplier to ensure adequacy of the design, good engineering practice, and adherence to this specification, applicable standards and regulations as well as ensuring good workmanship in the manufacture, installation, grounding (earthing) at site and commissioning of the Transformer and AC dielectric Test System for KPLC.

2. NORMATIVE REFERENCES

The following standards contain provisions 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.

ISO 9001:	Quality Management System: Requirements
ISO/IEC 17025:	General requirements for the competence of testing and calibration laboratories
IEC 60076:	Power transformers, all parts
IEC 60296:	Specification for unused mineral insulating oil for transformers and switchgear.
IEC 60214:	Tap-changers - Part 1: Performance requirements and test methods, Part 2: Application guide
IEC 60512:	Connectors for electronic equipment
IEC 60060:	High - Voltage Test Techniques, Part 2: Measuring Systems
IEEE 4:2013:	IEEE Standard for High-Voltage Testing Techniques
IEC 60270:	High-Voltage Test Techniques – Partial Discharge Measurements

3. DEFINITIONS

For the purpose of this specification the terms and definitions given in the reference standards shall apply.

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4. REQUIREMENTS

4.1. Service Conditions

The Transformer and AC dielectric Test System shall be suitable for use in tropical areas and climatic conditions including areas exposed to:

- a) Altitudes of up to 2200m above sea level and humidity of up to 95%,
- b) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C
- c) Humidity: up to 95%

4.2. Design and Construction

4.2.1. General

- 4.2.1.1. The Transformer and AC dielectric Test System shall be manufactured to applicable ISO Standards, IEC Standards, Kenya Standards including the standards listed in clause 2 of this specification and the requirements of this specification.
- 4.2.1.2. It shall be complete with all components, earthing/grounding system, switchgear, controls, metering, instruments, operating and testing software complete with human machine interface, computer and control desk as well as all cabling and connectors to carry out all routine tests as per IEC 60076, Temperature Rise test to IEC 60076 and the tests and standards listed in clauses 1.3 and 2.0 respectively.
- 4.2.1.3. The Transformer and AC dielectric Test System shall comprise of a variable power supply, step-up transformer, and high accuracy metering package controlled by an industrial microprocessor and offer ready-to-test solution for a wide range of transformer testing applications.
- 4.2.1.4. The test system shall also have:
 - a) AC Dielectric Test System designed to perform high voltage AC tests by measuring dielectric breakdown and dielectric strength of electrical equipment and insulating materials of ratings up to 36kV 50Hz. The test system shall function in compliance with IEC 60060, IEEE 4 and IEC 60270.
 - b) The AC Dielectric Test System shall be integrated with the transformer test system and shall be complete with components, controls, metering, instruments, operating and testing software, connectors and cabling suitable for testing:
 - i. Power Cables
 - ii. Switchgear (Air, Gas, vacuum)
 - iii. Bushings

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- iv. Distribution Transformers
- v. Instrument Transformers (voltage transformers, current transformers)
- vi. Fuses and Fuse cutouts
- vii. Lightning Arrestors (surge Arrestors)
- viii. Insulation Materials (Oil, Paper)
- ix. Power Capacitors
- x. Insulators

- c) Reactive power compensation to extend the range of the transformer test system with automatic selection adequate for copper wound and aluminum wound distribution transformers of ratings up to 2500KVA 33kV class 50Hz system.
- d) Motor generator set for induced potential testing. The motor generator set shall be integrated with the test system to increase the output frequency to perform induced testing to verify turn-to-turn insulation integrity.
- e) Computerized turns ratio and phase displacement meter of high accuracy and integrated with the testing software for complete remote control and data acquisition.
- f) Winding resistance measurement integrated with the testing software and suitable for range of transformers indicated
- g) Insulation resistance measurement, fully automated and suitable for range of transformers indicated
- h) Remote control console that contains all instrumentation and controls
- i) Partial discharge measurements with typical partial discharge specification of <50 pC at rated voltage. The system shall have three phase partial discharge detectors, RIV meters and coupling capacitors
- j) Tan delta measurement
- k) The motor generator set output current shall be at least 80A

4.2.1.5. The Transformer and AC dielectric Test System shall have special controls and passwords that guarantees the integrity of the test results and prohibits tampering and manipulation of test results.

4.2.1.6. The test system shall be complete with the following:

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- a) Main and control power circuit breakers
- b) Zero Start interlock
- c) Emergency off mushroom switch
- d) Slow-and fast-acting protective devices on power transformer, regulator, measurement system, and other critical components
- e) Raise and Lower pushbuttons with Off Zero indicator
- f) Motorized control of output voltage with adjustable rate of rise
- g) Motorized tap selector with indicators
- h) Auto-ranging wattmeter and voltmeter with direct readout
- i) Four-wire measurement system for accurate readings
- j) Test mode selector with indicator
- k) RMS and AVERAGE responding voltmeters, displayed simultaneously
- l) Provision for external security circuit with indicator
- m) System calibration traceable to the National Standards
- n) Foot switch
- o) Flashing red warning light
- p) Recessed jacks for output leads
- q) Fork truck and overhead lifting provisions
- r) Two copies of operation/maintenance manual (in good English language)
- s) Computer interface with software (data and report writing) for WINDOWS compatible PC
- t) Computer desk with writing table and interconnect cables
- u) The test system shall be supplied complete with necessary controls and computer system complete with relevant software and accessories.
- v) The computer shall be complete with the following minimum configurations and components:
 - i. Intel i7 processor or higher,
 - ii. 8GB RAM or higher, 1TB HDD,
 - iii. DVD-RW,
 - iv. 19 inch LED monitor,
 - v. Printer
 - vi. Keyboard and Mouse and
 - vii. Licensed copies of Windows™ 10/ its newer versions and latest MS office

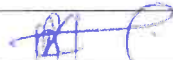
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- viii. The desktop computer shall be installed with the test software compatible with Windows™ 10 and its newer versions. The application system shall be free and upgradable free of charge.
- ix. The test application software package shall allow the operator to conduct a wide range of tests with several arrays of test parameters like types of tests from the PC.

4.2.1.7. All components of the test system including fabrication of the cabinet, winding of the power transformer, regulator construction, assembling of the components, programming, and final pre-shipment testing shall be done in one location that is certified to ISO 9001 and ensures optimum standards of quality are met through each step of the process resulting in a superior test system with an excellent service life.

4.2.2. Controls and Metering

4.2.2.1. The Transformer and AC Dielectric Test System shall have latest development in computer assisted controls and Human Machine Interface (HMI) that allows the programming of automation features of the test set.

4.2.2.2. The test system shall have easy step-by-step instructions that guide the operator through each test procedure. Set-up maps for each test shall be provided to reduce costly connection mistakes. The system shall calculate corrected losses, efficiency, regulation, and percent impedance.

4.2.2.3. All output meters shall be displayed on the LCD screen. Data acquisition and report generation of the test results shall be performed via computer and testing software with all required interface cables included.

4.2.2.4. In addition to the test results database, the system shall be equipped with a recipe database that allows recall of a previously entered testing template reducing testing time and increasing efficiency.

4.2.2.5. The Transformer and AC Dielectric Test System shall include calibration and service modes. All adjustments needed for yearly recalibration shall simply be made by adjusting a few numbers in the software.

4.2.2.6. The service mode shall assist and simplify maintenance, and help in the diagnosis of failed components in the cases that may be necessary. The system shall generate calibration certificate authorized by the factory at no cost to KPLC for a period of ten (10) years

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4.2.3. Instrumentation

4.2.3.1. The test system shall have inbuilt high precision microprocessor-based measuring system that enables accurate measurement of power, voltages, and currents.

4.2.3.2. The metered information shall be displayed on the HMI, values displayed on the HMI performed as a function of the programmable logic controller (PLC).

4.2.3.3. The following metering measurements shall be displayed (Table 1):

Table 1: Metering measurements to be displayed

	Display	Range	Accuracy
Voltmeter	Six 5-digit displays showing True RMS and Average readings simultaneously	0-100kV	±0.5% of reading +LSD
Ammeter	Three 5-digit displays showing True RMS reading	0-20./200./2000 /4000A	±0.5% of reading +LSD
Wattmeter	5-digit display	25kW	±0.5% of reading +LSD at 1.0 pF ±1.5% of reading +LSD at 0.3 pF ±3.0% of reading +LSD at 0.1 pF
Temperature	One 4½-digit display	10-120°C	Accuracy: ±0.5°C

4.2.4. Input

4.2.4.1. The available incoming power supply is 230/420V 50Hz ac via cable

4.2.4.2. The test system shall be complete with switchgear and control gear panel comprising input isolation, main circuit breaker and control power circuit breakers

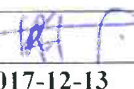
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4.2.5. Transformer sizes to be tested (Table 2):

Table 2: Transformer sizes to be tested

Highest/ Lowest Rating	Primary Voltage	Secondary Voltage	Minimum short-circuit impedance as per IEC 60076-5	Phases
2500KVA	33kV	420V	5%	3 -phase
25KVA		242V	4%	1 phase
2500KVA	11kV	420V	5%	3 -phase
5KVA		242V	4%	1 phase

4.2.6. Test Report Generation

- 4.2.6.1. The Transformer and AC Dielectric Test System shall generate and print test reports automatically in a specific template. The Template shall have KPLC logo.
- 4.2.6.2. Each Test Report shall be automatically (computer) generated, with a unique Test Report number, time and date, and Test Engineer login credentials. These parameters shall not be editable.
- 4.2.6.3. The customer details, Test Job details and test to be carried (selectable from a menu) shall be provided in the software.

5. TESTS REQUIREMENTS

- 5.1. The Transformer and AC Dielectric Test System shall be inspected and tested in accordance with the requirements of this specification. It shall be the responsibility of the supplier to test or to have all the relevant tests performed.
- 5.2. Copies of previous test reports by a third-party testing laboratory accredited to ISO/IEC 17025 shall be submitted with the offer for 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.

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- 5.3. KPLC shall witness factory acceptance tests before shipment. Test certificates and calibration certificates for the Transformer and AC Dielectric Test System to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods.
- 5.4. On receipt of the Transformer and AC Dielectric Test System, KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification.
- 5.5. The supplier shall replace without charge to KPLC, any component of the Transformer and AC Dielectric Test System which upon examination / inspection, test or use fail to meet any of the requirements in the specification.
- 5.6. The supplier shall provide detailed training to KPLC personnel on satisfactory operation and maintenance of the system as per clause 9 of this specification

6. MARKING AND PACKING

6.1. Marking

- 6.1.1. The following information shall be marked legibly and in a permanent manner on major components of the test system:

- The manufacturer's identity;
- Model Number;
- The words **"Property of KPLC"**.

6.2. Packing

- 6.2.1. The Transformer and AC Dielectric Test System shall be packed in a manner so as to protect it from damage during transportation and storage.
- 6.2.2. A set of three (3) installation and technical manuals for the Transformer and AC Dielectric Test System shall be submitted during delivery.
- 6.2.3. Each package shall have a packing list and in addition, shall be labeled with, among others, the following information in English Language.
- Descriptive name
 - Label **"Property of KPLC"**

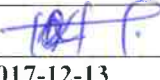
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7. PRESENTATION AND DRAWINGS APPROVAL

- 7.1. Drawings and technical data for the Transformer and AC Dielectric Test System to be supplied shall be submitted to KPLC for approval before manufacture.
- 7.2. The successful bidder shall do a presentation to KPLC Staff (in Nairobi) on the use of the Transformer and AC Dielectric Test System and explain the features that guarantee excellent service. This shall be done at the drawings approval stage.

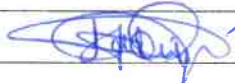

8. MANUFACTURERS' RECOMMENDED SPARES

- 8.1. The manufacturer shall provide a detailed list of recommended spare parts to ensure that the Transformer and AC Dielectric Test System shall provide at least 5 years of continuous service.
- 8.2. The cost of the recommended spares shall be indicated separately on the bid as an option. The cost of each unit of recommended spare(s) shall be indicated, as well as the total price.
- 8.3. The purchaser shall decide whether to accept all, part or none of the offered spares. The offered cost of the spares shall be binding for the next 2 years, should the purchaser choose to purchase the spares from the manufacturer/supplier. The manufacturer/supplier shall provide this commitment in the bid.
- 8.4. The list of recommended spares shall also show the mean time between failures for each item

9. TRAINING

9.1. Training at The Manufacturer's Premises

- 9.1.1. During the factory acceptance testing (FAT), the manufacturer shall conduct complete training for the complete Transformer and AC Dielectric Test System for five KPLC Engineers and Technicians.
- 9.1.2. This shall include theory on how the equipment works followed by practical demonstrations. All the operational, protection and control features of the equipment shall be exhaustively explained and demonstrated, including the operation of the software
- 9.1.3. The manufacturer shall plan adequate time for the training separate from the FATs.
- 9.1.4. The duration of the training shall however not be less than three (3) eight hour working days. The employer may send a separate team from the team witnessing the FATs to attend the training. The duration and the total cost of the training shall be indicated in the bid.

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9.1.5. The Training shall be considered to have been successful once the engineers/Technicians are able to:

- a) Competently carry out all the operations on the Transformer and AC Dielectric Test System
- b) Correctly carry out tests and documentation on the tests objects
- c) Establish communication from a computer to the equipment and carry out complete parameter settings and download and analyze data
- d) Trouble shoot and analyze and rectify any minor breakdowns that may occur, including safe replacement of parts/modules/cards and recommissioning of the equipment back to service.

9.1.6. The manufacturer shall conduct evaluation tests and give a feedback report on the training to the employer for each of the Engineers/Technicians. The Engineers/Technicians shall receive relevant Competency/Authorization certificates to carry out the said works.

9.2. Local Training (in Kenya)

9.2.1. Following the delivery of the equipment, and successful installation, testing and commissioning, the manufacturer shall conduct complete training on the complete equipment to KPLC Engineers/Technicians, in Nairobi Kenya. The training shall be conducted in two sessions of 15 engineers/technicians each. Each session shall last at least one day (eight hours).

9.2.2. The Training shall include theory on how the equipment works followed by practical demonstrations on operation and protection and control configuration and parameter settings. All the operational and control features of the equipment shall be exhaustively explained and demonstrated, including the operation of the software.

9.2.3. The Training shall be considered to have been successful once the Engineers/Technicians are able to: -

- a) Competently carry out all the operations on the equipment
- b) Establish communication from a computer to the equipment and carry out complete configuration, parameter settings and download and analyze data from the equipment.
- c) Trouble shoot and analyze and rectify any minor breakdowns that may occur

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- 9.2.4. To ensure that the installation and commissioning of the equipment is carried out correctly, the manufacturers' Technical staff shall supervise the installation of the equipment in Kenya.

Note: All the cost of conducting the training including the venue, refreshments and meals shall be borne by the manufacturer/Supplier. Costs incurred by the staff will be catered for by the KPLC.

9.3. Installation (Normative)

- 9.3.1. The installation work shall be guided and supervised by the Manufacturer's representative who is an expert in the field installation and operation of the equipment.
- 9.3.2. The control desk shall be located on the first floor overlooking the test area on ground floor.
- 9.3.3. The supplier shall provide and install all the equipment and cabling necessary for testing.
- 9.3.4. The supplier shall provide all materials, install and test adequate earthing/grounding for the entire system.

APPENDICES

A. TESTS AND INSPECTION (Normative)

- A.1. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified. Bidders shall confirm the manufacturer's capabilities in this regard when submitting tenders. Any limitations shall be clearly specified.
- A.2. Copies of Type Test Certificates and Type Test Reports issued by a third-party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate to ISO/IEC 17025 for the testing laboratory shall also be submitted. Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Laboratory that carried out the tests.

B. QUALITY MANAGEMENT SYSTEM (Normative)

- B.1 The bidder shall submit a quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, maintenance and documentation of the Transformer and AC Dielectric Test System to fulfil the requirements stated in the contract

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documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfil the requirements of ISO 9001:2008 or later.

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 certificate shall be submitted with the tender for evaluation.

B.3 The bidder shall indicate the delivery time of the test system, manufacturer's monthly and annual production capacity and experience in the production of the type of Transformer and AC Dielectric Test System being offered. A detailed list and contact addresses (including e-mail) of the manufacturer's previous customers outside the country of manufacture for exact or similar rating items sold in the last five years shall be submitted with the tender for evaluation.

C. DOCUMENTATION (Normative)

C.1 The bidder shall submit its tender complete with technical documents required by Appendix D (Guaranteed Technical Particulars) for tender evaluation. The 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) stamped and signed by the manufacturer,
- b) Copies of the manufacturer's catalogues, brochures, drawings 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 type test certificates and type test reports by a third-party testing laboratory accredited to ISO/IEC 17025,
- f) Copy of accreditation certificate to ISO/IEC 17025 for the third-party testing laboratory,
- g) Manufacturer's warranty and guarantee;
- h) Manufacturer's letter of authorization, copy of the manufacturer's ISO 9001:2008 or 2015 certificate, ISO/IEC 17025(2005) certificate.

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 Kenya Power	TITLE: TRANSFORMER AND AC DIELECTRIC TEST SYSTEM - SPECIFICATION	Doc. No.	KP1/6C/4/1/TSP/10/104
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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 and construction details of the Transformer and AC Dielectric Test System including 3-D views,
- c) Quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, maintenance 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 9001:2008 or later,
- d) Detailed test program to be used during factory testing,
- e) Marking details and method to be used in marking the Transformer and AC Dielectric Test System
- f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the Transformer and AC Dielectric Test System for The Kenya Power & Lighting Co. Ltd.
- g) Packaging details (including packaging materials and marking and identification of batches).

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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.

Clause	KPLC requirement	Bidder's offer
	Manufacturer's Name and address	Specify
	Country of Manufacture	Specify
	Bidder's Name and address	Specify
	Model & Type reference No.	Specify
1.	Scope	
1.1	Testing range, calibration and training	Specify
1.2	Components and Tests	List
1.3	Design Model	Specify
1.4	Adequacy of design and engineering	Specify
2.	Applicable Standards	Specify
3.	Terms & Definitions	Specify
4.	Requirements	
4.1	Service Conditions	Specify
4.2	Design and Construction	
4.2.1	General	
4.2.1.1	Standards of manufacture	State
4.2.1.2	Components and switchgear offered for the system	List
4.2.1.3	Components and switchgear offered for the system	List
4.2.1.4	Test system components, Accessories and components	List
4.2.1.5	Integrity & prohibition of tampering & manipulation	Specify
4.2.1.6	Test system requirements (a) – (v)	List

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Clause	KPLC requirement	Bidder's offer
	Details of processor used for the computer	
4.2.1.7	Requirements for location of manufacture, assembly, testing	Specify
4.2.2	Controls and metering	
4.2.2.1- 4.2.2.6	Computer controls and HMI for programing	Specify
4.2.3	Instrumentation & measuring equipment including accuracies	List
4.2.4	Input power, KVA, Voltage and frequency	Specify
4.2.5	Transformer sizes to be tested	Specify
4.2.6.1	Generation of Test reports and template with KPLC logo	Specify
4.2.6.2	Test report details and editing	Specify
4.2.6.3	Customer and test job details on test report	Specify
5	Test requirements	Specify
5.1	Test standard and responsibility for testing	Specify
5.2	Type Tests reports submitted with the bid	List
5.3	KPLC shall witness Factory Acceptance Testing before shipment of the Transformer AC and Dielectric Test system	Specify
5.4	KPLC shall inspect the Transformer AC and Dielectric Test system at stores and the manufacturer shall replace and component found non-compliant to standards and specification without charge to KPLC.	Specify
5.5	Training both at manufacturer premises and locally at KPLC premises (after successful installation, testing and commissioning)	Specify
6	Marking and packing	
6.1	Markings	
6.1.1	The following information shall be marked legibly and in a permanent manner on major components of the test system, in English Language. a) Manufacturer's identity; b) Model number; c) The words " Property of KPLC "	Specify
6.2	Packing	

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Clause	KPLC requirement	Bidder's offer
6.2.1	The Transformer and AC Dielectric Test System shall be packed in a manner so as to protect it from damage during transportation and storage.	Specify
6.2.2	A set of three (3) installation and technical manuals for the Transformer and AC Dielectric Test System insulators shall be submitted during delivery	Specify
6.2.3	Each package shall have a packing list and in addition, shall be labeled with, among others, the following information in English Language: a) Descriptive name b) Label "Property of KPLC"	Specify
7.1	Drawings and technical data to be submitted for approval before manufacture	Specify
7.2	Presentation to KPLC in Nairobi on features that guarantee excellent service after contract award	Specify
8.1 – 8.4	Recommended Spares for 5 years services as per clauses 8.1-8.4	List and indicate unit price
9	TRAINING	
9.1	Training at The Manufacturer's Premises	
	Training during FAT, Theory and Practical & Trouble shooting and installation procedures, installation during FAT	State compliance and specify duration of training. Provide provisional training schedule with Topics and durations
9.2	Local Training (In Kenya)	
9.2.1 – 9.2.4	Local Training: For Engineers and Technicians Theory, Trouble shooting and installation procedures	State compliance and specify duration of training. Provide provisional training schedule with Topics and durations.

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Clause	KPLC requirement	Bidder's offer
	Evaluate and give feedback on the trained teams	State compliance
9.3	Installation (clause 9.3.1-9.3.4)	Specify
APPENDICES		
A	Tests and Inspection	
A1	Responsibility to perform tests Applicable Test Standards	State
A2	Type Test Certificates submitted with tender	List
	Copy of Accreditation Certificate as per ISO/IEC 17025 of Testing Laboratory. Provide name, valid address, email, Telephone contacts of the Testing Laboratory	Provide
	List routine tests to be witnessed during FAT by KPLC engineers	List
B	Quality Management System	
B1	Quality Assurance Plan and ISO 9001:2008 or later certification	Submit with bid
B2	Manufacturers Declaration of Conformity	Submit with bid
B3	Delivery Time of the test system.	Submit with bid
	Manufacturing Experience and capacity	Over 15 years
	List of previous similar customer with addresses	At least 5 (five) reference letters for overseas customers)
C	Documentation	
C1	List documents submitted with bid to support the offer	List
Warranty		
	The supplier/manufacturer to warrant KPLC that goods supplied under this contract shall have no defect arising from design, materials or workmanship.	Submit warranty as per tender
	Warranty period	State warranty period as per specification
C2	Documentation	
	Successful bidder to submit documents/details for approval before manufacture	State compliance
	Deviations	State (if) any deviations

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NOTE:

The Bidders should note that the above Guaranteed Technical Particulars schedules must be fully completed and submitted with the bid. Failure to complete the schedules shall lead to rejection of the bid.

Guaranteed values Must be specified. Words like "noted and fulfilled ", Yes, 'comply' etc shall be treated as non-compliant and the bid shall be rejected.

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

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