

DOCUMENT NO.: KP1/13D/4/1/TSP/14/062



Kenya Power

THREE PHASE ENERGY REFERENCE STANDARD - SPECIFICATION

A Document of the Kenya Power & Lighting Co. Plc

February 2024



TITLE:
**THREE-PHASE ENERGY
 REFERENCE STANDARD -
 SPECIFICATION**

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0.1 CIRCULATION LIST

COPY NO.	COPY HOLDER
1	Manager, Standards
2	Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)

REVISION OF KPLC STANDARDS

In order 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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Users are reminded that by virtue of section 25 of the Copyright Act, 2001 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.

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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)
Issue 1 Rev 0	2024-01-25	New Issue	Eng. F. M. Gicugu	Eng. Benson Dianga

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FOREWORD


This Specification has been prepared by the Standards Department in collaboration with Utility Consultancy Department, both of The Kenya Power and Lighting Company Plc (Kenya Power) and it lays down requirements for a Three-phase Energy Reference Standard, for use in calibration and testing of energy equipment onsite and offsite of the Meter Central Laboratory. It is intended for use in purchasing the equipment.

The specification stipulates the minimum requirements for the Three-phase Energy Reference Standard acceptable for use for use in calibration and testing of energy equipment at the Meter Central Laboratory in Kenya Power. It shall be the responsibility of the supplier and manufacturer to ensure adequacy of the design, good workmanship, good engineering practice and adherence to standards, specifications and applicable regulations, and that the offered design is of the highest quality and guarantees excellent service to Kenya Power.

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

Name	Division/Department
Eng. Faith Gicugu	IESR/Standards
Patricia Ngaanga	IESR/Utility Consultancy
John Kenyanya	IESR/Utility Consultancy

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1.0. SCOPE

- 1.1. This specification is for a Three-phase Energy Reference Standard for testing purposes.
- 1.2. The specification stipulates the minimum requirements of the Three-phase Energy Reference Standard as well as schedule of Guaranteed Technical Particulars.

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2.0. REFERENCES

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

IEC 60529 edition 2.2.2012: Degrees of protection provided by enclosures (IP Code).

IEC 61010-1:2010: Safety requirements for electrical instrument for measurement, control, and laboratory use – Part 1: General requirements

IEC 61010-2-30: Safety requirements for electrical instrument for measurement, control, and laboratory use – Part 2: Particular requirements for testing and measuring circuits

IEC60736 -1-2001: Testing equipment for electrical energy meters

3.0. DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification the definitions given in the reference standards shall apply and the following abbreviations:

IEC: International Electro-Technical Commission

ISO: International Organization for Standardization

LCD: Liquid Crystal Display

KPLC: Kenya Power and Lighting Co. Plc

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4.0. REQUIREMENTS

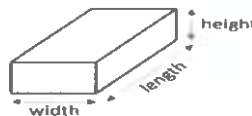
4.1. Service Conditions

The Three-Phase Energy Reference Standard shall be suitable for use indoors in tropical areas and harsh climatic conditions including areas exposed to:

- a) Altitudes of up to 2000m above sea level and humidity of up to 95%,
- b) Average ambient temperature of +30°C with a minimum of -10°C and a maximum of +50°C.
- c) 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.

4.2. Design Features

4.2.1. The Three-Phase Energy Reference Standard shall have dimensions NOT exceeding Height 200mm; length: 600mm and a width: 400mm. It shall have a weight not exceeding 15 kg.



- 4.2.2. The Three-Phase Energy Reference Standard external casing shall be made of a rugged material with thick rubber protectors on the sides to cushion the equipment against vibration and shock.
- 4.2.3. The Three-Phase Energy Reference Standard shall be able to SELF-TEST on startup. It shall have STATUS indicators when powered and switched ON.
- 4.2.4. The Three-Phase Energy Reference Standard shall be designed in such a way as to prevent access to LIVE parts.
- 4.2.5. It shall conform to the degree of protection of IP20 as given in IEC 60529.
- 4.2.6. The Three-Phase Energy Reference Standard shall be equipped with a built in LCD colour screen DISPLAY. The colour screen display shall have a resolution of at least 480 x 200 pixels.
- 4.2.7. It shall have an INTERNAL MEMORY with a minimum storage of 2GB for storage of measurement data.
- 4.2.8. The Three-Phase Energy Reference Standard shall be equipped with BNC Input and Output ports and the associated signal communication cable/s as well as an Input Only Optical port.

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4.2.9. The inputs/output ports, and associated accessories shall be clearly marked in English.

4.2.10. The Three-Phase Energy Reference Standard shall have three (3no.) CURRENT inputs: Rlin/RIout; Ylin/YIout and Blin/Blout and colour-coded appropriately (Red, Yellow, Blue). In addition, it shall have three (3no.) current transformer inputs: CT1; CT2 and CT3 and the associated connection accessories.

4.2.11. The Current measurement range shall be 1mA ... 160 A with an Accuracy of 0.01%.

4.2.12. The Three-Phase Energy Reference Standard shall have three phase fused VOLTAGE inputs: V1; V2; V3; with Neutral, VN.

4.2.13. The Voltage measurement range shall be of a minimum of 30 V - 500 V AC; with an Accuracy of 0.01% at 45 Hz to 65Hz.

4.2.14. The Three-Phase Energy Reference Standard shall be supplied with external electrical AC power supply, voltage range of 100V to 250V, 45Hz to 65Hz. The external electrical power supply cable shall be a minimum of 10 meters.

4.2.15. The power cables provided with the three-Phase Energy Reference Standard shall have dimensions as per BS 1363.

4.2.16. The Three-Phase Energy Reference Standard shall have protection for overload and short circuits.

4.3. Communication

4.3.1. The Three-Phase Energy Reference Standard shall have an Ethernet communication port for external laptop/PC control to remotely control the device, export data and upgrade software.

4.3.2. It shall be equipped with Serial Ports of type RS232 and USB. The USB communication port will provide access to printers, mouse, external monitors and USB memory options.

4.3.3. It shall have an Input connector port usable as a Sensor port for infrared and visible LED optical pickup to sense pulses and disk rotations.

4.3.4. The input and output pulse ports and its associated accessories shall be clearly marked.

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4.4. Functionality

4.4.1. The Three-Phase Energy Reference Standard shall be able to carry out the measurements as below:

- a) AC Voltage measurements: Range 30V to 500V; Accuracy of 0.01%
- b) Direct AC Current measurements: Range 1mA to 16A; Accuracy of 0.01%
- c) Indirect AC Current measurements with CT clamps: Range 1mA to 160A; Accuracy of 0.01
- d) Power measurements: Accuracy of 0.01%
- e) Energy measurements: Accuracy of 0.01%
- f) Phase Angle measurements: Accuracy of 0.005°
- g) Power Factor measurements
- h) Frequency measurements

4.4.2. It shall be operated either directly via the in-built display or via the software through a laptop/computer.

4.4.3. The Three-Phase Energy Reference standard shall have a 3-phase calibration/testing and single-phase calibration/testing capability.

4.5. Computer and Software Requirements

4.5.1. The Three-Phase Energy Reference Standard shall be supplied with two laptop computers at no extra cost.

4.5.2. The laptop computers shall be designed and manufactured as per the requirements of IEC 60950 with minimum requirements as per Table 6

Table 1: Technical data for Laptop

No.	Item	Minimum Specification
1.	Processor	Intel@ CoreTM i7-920 Processor
2.	Clock speed	2.2 GHz or higher
3.	Chipset	Compatible
4.	Motherboard	Compatible

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5.	Memory	2GB DDR3, 1333 Mhz or higher
6.	Cache memory	3MB L2 or higher
7.	Graphics	256MB Dedicated DDR3 Memory
8.	Hard disk controller	Serial ATA
9.	Hard disk	500GB or higher
10.	Shock resistant	Anti-shock mounting design to protect screen and hard disk drive from damage and data loss
11.	Keyboard	Spill resistant keyboard
12.	Mouse	2- or 3-button with scroll wheel optical PC Mouse with pad - USB 3.0
13.	Touch pad	Intelligent Touch with configurable vertical and horizontal scroll functions

- 4.5.3. The laptop computer shall be loaded with a Windows – based Operating System, preferably Windows 10, or higher as well as latest, licensed version of an Anti – Virus Software.
- 4.5.4. The laptop computer shall be pre - loaded with Software that allows connection and communication with the Three-Phase Energy Reference Standard via the provided communication ports.
- 4.5.5. The laptop computer shall display the measurement values indicated in the Three-Phase Energy Reference Standard when in operation. The displayed parameters shall be configurable and selectable by the software.
- 4.5.6. The software shall allow the user to perform tests on the utility under test (UUT). Access to the Three-Phase Energy Reference Standard parameters and programming information shall only be through User-level password(s). It shall support two access levels:
- a) Low-level security - The level of security would allow users with the appropriate password to read specified data fields in the energy reference standard.
 - b) High-level security - The level of security would allow users with the appropriate password to reconfigure the Three-Phase Energy Reference Standard with a new program.
- 4.5.7. The software shall be able to calibrate the Three-Phase Energy Reference Standard. It shall also be capable of tracking user access.
- 4.5.8. The software shall identify a fault in the system by indicating where the fault is i.e. Troubleshooting capability.
- 4.5.9. The software shall have the following functions:

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- c) Automatic control: this function allows the user to perform tests automatically.
- d) Manual control: This function allows the user to perform tests on manual mode.
- e) Parallel Manual control: This function allows the user to define groups of power supplies connected in parallel and work with them simultaneously in the display monitor.
- f) Automatic parallel control: This function allows the user to perform preprogrammed test with a group of power supplies connected in parallel.

4.5.10. The software shall allow the user to save and view test results in an uneditable format.

4.5.11. The software shall allow customization of the test reports (e.g. utility log, name date, etc.) and to exporting of the test results for analysis in excel.

4.5.12. The software shall allow for Retrieval and printing of the results.

4.6. Calibration of the Equipment

4.6.1. The Calibration procedure of the Three-phase Energy Reference Standard shall be provided.

4.6.2. The Test points for calibration of the equipment shall be defined.

4.6.3. The Calibration kit and accessories associated with the calibration of the Three-Phase Energy Reference Standard shall be provided.

4.6.4. The Calibration and Measurement Capability (CMC) values shall be defined in the Calibration certificate provided for the Three-Phase Energy Reference Standard.

4.6.5. The various test points of the Three-Phase Energy Reference Standard in the calibration certificate shall have the defined values of the Uncertainty of Measurement.

4.7. Supply Voltage

4.7.1. The 3 Phase Energy Reference Standard shall be operated from main power with reference values of: 100V to 250V, 45Hz to 65Hz

5.0. Tests Requirements

5.1.1. The Three-Phase Energy Reference Standard shall be inspected and tested in accordance with the requirements of IEC 62052-11 and other relevant standards and provisions of this specification.

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6.0. Marking, Labelling and Packing

6.1. The Three-Phase Energy Reference Standard shall be marked legibly and indelibly in English with the following information:

- a) Name or trade mark of the manufacturer;
- b) Country of origin;
- c) Type/model;
- d) Serial no;
- e) The inscription "Property of K.P. & L. Co PLC
- f) Year of manufacture.

6.2. The Three-Phase Energy Reference Standard shall be packaged in such a manner as to minimize damage and entry of moisture during transportation and handling.

6.3. The Three-Phase Energy Reference Standard shall be housed in a hard plastic ragged transportation case with wheels and handle for pulling.

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APPENDICES

A. TESTS AND INSPECTION (Normative)

- A.1. It shall be the responsibility of the manufacturer to perform or to have performed all the specified tests on the Three-Phase Energy Reference Standard in accordance with IEC 62052-11. Tenderers 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.
- A.3. The Three-Phase Energy Reference Standard shall be subject to acceptance tests at the manufacturer's premises before dispatch. Acceptance tests shall be witnessed by at least two Engineers/Technicians appointed by The Kenya Power and Lighting Company Limited (Kenya Power).
- A.4. During delivery of the Three-Phase Energy Reference Standard, KPLC representatives shall inspect and perform the relevant tests in order to verify compliance with the specification.
- A.5. Testing Facility**
- A.5.1. The bidder shall provide current e-mail address, fax and telephone numbers and contact person at the Testing Laboratory where Type Tests and Special Tests were carried out.
- A.5.2. All test and measuring equipment to be used during acceptance testing shall have been calibrated and copies of valid calibration certificates shall be provided to KPLC Engineers. A detailed list of workshop tools, test/measuring equipment and list of tests that can be carried out by the manufacturer shall be submitted with the tender for evaluation.
- A.6. Test reports for the Three-Phase Energy Reference Standard shall be submitted to The Kenya Power and Lighting Company for approval before shipment.

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A.7. During delivery of the items, KPLC 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/rectify without charge to KPLC, failure of the equipment to meet any or all of the requirements in the specification.

B. QUALITY MANAGEMENT SYSTEM (Normative)

B.1. The bidder shall submit a quality assurance plan (QAP) that will be used to ensure that the Three-Phase Energy Reference Standard's 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 9001:2015 or later.

B.2. The Manufacturer's Declaration of Conformity to applicable standards, this specification 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 Three-Phase Energy Reference Standard. A detailed list and contact addresses (including e-mail) of the manufacturer's previous customers outside the country of manufacture for exact or similar equipment sold in the last five years shall be submitted with the tender for evaluation.

C. DOCUMENTATION AND DEMONSTRATION (Normative)

C.1. The bidder shall submit their tender complete with technical documents for the Three-Phase Energy Reference Standard. 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) signed and stamped by the manufacturer,
- b) Copies of the manufacturer's catalogues, brochures, drawings and technical data showing description leaflet, programming details and manuals,
- 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,

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- g) Manufacturer's warranty and guarantee; subject to 18 months warranty and 10 years guarantee from date of acceptance by KPLC.
 - h) Manufacturer's letter of authorization, copy of the manufacturer's ISO 9001:2015 certificate.
- 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) signed and stamped by the manufacturer.
 - b) Design drawings and wiring diagrams of the test system with an integrated current and voltage source,
 - c) Software manuals and operation manuals for the test system with an integrated current and voltage source,
 - d) Quality assurance plan (QAP) that will be used in the design and manufacture of the equipment,
 - e) Detailed test program to be used during factory testing,
 - f) Marking details and method to be used in marking the test system,
 - g) Packaging details (including packaging materials).
 - h) 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 3 Phase Energy Reference Standard for The Kenya Power & Lighting Company.
- C.3. The successful bidder and manufacturer shall conduct demonstrations on operation of the Three-Phase Energy reference Standard to at least two KPLC staff at the manufacturer's factory.
- C.4. The supplier shall conduct training on the use of the Three-phase Energy Reference Standard in Nairobi Kenya for a minimum of 10 No. staff.

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D. SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS (GTPs)

(to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data & calculations, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience, copies of complete type test reports and accreditation certificate to ISO/IEC 17025 for the testing laboratory for tender evaluation, all in English Language)

TENDER NO.BIDDER'S NAME & ADDRESS

CLAUSE NO.	DESCRIPTION	KPLC REQUIREMENT	BIDDER'S OFFER
	Name and address of the Bidder	State	
	Name and address of the Manufacturer	State	
	Country of manufacture	State	
	Manufacturer's Letter of Authorization	Provide	
1	Scope		
1.1	This specification is for a three-phase energy reference standard for testing purposes	State	
1.2	The specification stipulates the minimum requirements of the three-phase energy reference standard as well as schedule of Guaranteed Technical Particulars.	State	
2	Applicable standards	State	
3	Definitions and Abbreviations	State	
4.0	Requirements		
4.1	Service conditions		
a)	Altitude	State	
b)	Humidity	State	
c)	Temperature	State	
d)	Design pollution level	State	
4.2	Design Features		
4.2.1	Dimensions (HxWxD)	State	
	Weight (kg)	State	
4.2.2	External casing material shall be rugged to cushion against vibration and shock	Specify	
4.2.3	SELF-TEST on startup	Specify	
	Has STATUS indicators as long as it shall stay ON	Specify	
4.2.4	Designed in such a way as to prevent access to LIVE parts	Specify	
4.2.5	Degree of protection as per IEC 60529	Specify	
4.2.6	Equipped with a built in LCD colour screen DISPLAY	Specify	

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CLAUSE NO.	DESCRIPTION	KPLC REQUIREMENT	BIDDER'S OFFER
	Screen display resolution	Specify	
4.2.7	INTERNAL MEMORY minimum storage capacity	Specify	
4.2.8	equipped with BNC Input and Output ports	Provide	
	associated signal communication cable/s	Provide	
4.2.9	Input Only Optical port		
	inputs/output ports, and associated accessories shall be clearly marked in English	Specify	
4.2.10	No. of Current inputs appropriately colour-coded	Specify	
	No. of Current transformer inputs	Specify	
	Associated connection accessories	Specify	
4.2.11	Current measurement range	Specify	
4.2.12	Has three-fused (3no.) VOLTAGE inputs	Specify	
4.2.13	Voltage & Frequency measurement Accuracy	Specify	
	Voltage measurement accuracy	Specify	
4.2.14	External electrical AC power supply, voltage range	Specify	
	Length of external electrical power supply cable	Specify	
4.2.15	power cables dimensions as per BS 1363	Specify	
4.2.16	Protection for overload and short circuits	Specify	
4.3	Communication		
4.3.1	Ethernet Communication Port for external laptop/PC control	Provide	
4.3.2	Equipped Serial Ports (RS232 and USB)	Provide	
	USB communication port for printers, mouse, external monitors and USB memory options.	Provide	
4.3.3	Input connector port usable as a Sensor port for infrared and visible LED optical pickup to sense pulses and disk rotations	Provide	
4.3.4	clearly marked input and output pulse port and its associated accessories	Provide	
4.4	Functionality		
4.4.1	Measurements	Provide	
a)	AC Voltage Range: 30 V – 500 V	Specify	
	Accuracy – 0.01%		
b)	Direct AC Current Range: 1mA – 16 A	Specify	
	Accuracy – 0.01%		
c)	Indirect AC Current CT clamps range: 1 mA – 160 A	Specify	
	Accuracy – 0.01%		
d)	Power measurement: accuracy of 0.01%	Specify	

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Kenya Power

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REFERENCE STANDARD -
SPECIFICATION**

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CLAUSE NO.	DESCRIPTION	KPLC REQUIREMENT	BIDDER'S OFFER
e)	Energy measurement: accuracy of 0.01%	Specify	
f)	Phase angle measurement: accuracy of 0.005°	Specify	
g)	Power factor measurement	Specify	
h)	Frequency measurements	Specify	
4.4.2	Operation directly via the in-built display or via the software through the extension laptop	Specify	
4.4.3	3-phase calibration/testing capability	Specify	
	Single-phase calibration/testing capability	Specify	
4.5	Computer and Software Requirements		
4.5.1	Supplied with two laptop computers at no extra cost	Provide	
4.5.2	Laptop designed and manufactured as per IEC 60950	Specify	
	Minimum Requirements for laptop		
	<i>Item</i>	<i>Minimum Specification</i>	
	Processor	Intel@ CoreTM i7-920 Processor	Specify
	Clock speed	2.2 GHz or higher	Specify
	Chipset	Compatible	Specify
	Motherboard	Compatible	Specify
	Cache memory	3MB L2 or higher	Specify
	Graphics	256MB Dedicated DDR3 Memory	Specify
	Hard disk controller	Serial ATA	Specify
	Hard disk	500GB or higher	Specify
	Shock resistant	Anti-shock mounting design to protect screen and hard disk drive from damage and data loss	Specify
	Keyboard	Spill resistant keyboard	Specify
	Mouse	2- or 3-button with scroll wheel optical PC Mouse with pad - USB 3.0	Specify
	Touch pad	Intelligent Touch with configurable vertical and horizontal scroll functions	Specify
4.5.3	Loaded with Windows-based Operating System	Specify	
	Pre - loaded with the latest, licensed version of an Anti - Virus Software	Specify	
4.5.4	Pre - loaded with software that allows connection and communication via provided communication ports	Specify	
4.5.5	Display the values indicated in the 3-phase energy reference standard when in operation	Specify	

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CLAUSE NO.	DESCRIPTION	KPLC REQUIREMENT	BIDDER'S OFFER
	Display parameters shall be configurable and selectable by software	Specify	
4.5.6	The software shall perform tests on the utility under test (UUT)	Specify	
	Access to the 3-phase Energy Reference Standard parameters only via User-level password(s)		
	a) Low-level security		
	b) High-level security		
4.5.7	The software shall be able to calibrate the 3-phase energy reference standard	Specify	
	The software shall be capable of tracking user access	Specify	
4.5.8	The software shall identify a fault in the system - Troubleshooting	Specify	
4.5.9	Software functions	Specify	
	a) Automatic control - perform tests automatically	Specify	
	b) Manual control - tests on manual mode	Specify	
	c) Parallel Manual control	Specify	
	d) Automatic parallel control	Specify	
4.5.10	The software shall allow the user to save and view test results in an uneditable format	Specify	
4.5.11	The software shall allow customization of the test reports	Specify	
4.5.12	The software shall allow for Retrieval and printing of the results	Specify	
4.6	Calibration of the Energy test System		
4.6.1	Calibration procedure of the equipment	Provide	
4.6.2	Test points for calibration shall be defined	Provide	
4.6.3	Calibration kit and accessories	State & Provide	
4.6.4	Calibration and Measurement Capability (CMC) values shall be defined in the Calibration certificate provided for the equipment	Provide	
4.6.5	Various test points of the energy reference standard in the calibration certificate shall have the defined values of the Uncertainty of Measurement	Provide	
4.7	Supply Voltage		
4.7.1	Mains power supply voltage	Specify	
5.0	Test Requirements		
5.1	Provisions for Inspection and Testing of 3-phase Energy Reference standard	State	
6.0	Marking, Labelling and Packing		

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6.1	Legibly and indelibly marked in English	Specify	
	Marking information	Specify	
6.2	Packaging to minimize damage and moisture during transportation	Specify	
6.3	Housed in a hard plastic rugged transportation case with wheels and handle for pulling		
A.	Test and Inspection		
A.1.	Responsibility of testing transformer & manufacturer's capability	State	
	Manufacturer's capability to conduct the tests	State	
	Any limitations to conducting required tests	State	
A.2.	Copies of type test certificates and reports to IEC 62052-11 issued by a third party testing laboratory accredited to ISO/IEC 17025	Submit	
	Copy of the accreditation certificate to ISO/IEC 17025 for the testing laboratory	Submit	
A.3	Acceptance tests at manufacturers premises witnessed by appointed KPLC representatives	State	
	Routine tests to be done during factory acceptance testing	List	
A.4.	KPLC shall inspect and perform the relevant tests in order to verify compliance on Delivery	State compliance	
A.5	Testing facility		
A.5.1	Contact details for testing authority	Submit	
A.5.2	Calibration of test and measuring equipment	Submit	
	A detailed list of workshop tools, test/measuring equipment	Submit	
A.6	Complete test reports for approval before shipment	Submit	
A.7	Inspection or test by KPLC during delivery before acceptance to stores	State compliance	
	Replacement/Repair of the test system without charge to KPLC in case of failure	State compliance	
B.	Quality management system		
B.1	Quality assurance plan (QAP)	Submit	
	Copy of ISO 9001: 2015 certificate	Submit	
B.2	Manufacturer's Declaration of Conformity to reference standards	Submit	
B.3	Production capacity (monthly & annual)	Submit	
	List & contact addresses (including e-mail) of the manufacturer's customers in the last 5 years	Submit	

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CLAUSE NO.	DESCRIPTION	KPLC REQUIREMENT	BIDDER'S OFFER
C.	Documentation and Demonstration (Normative)		
C.1.	Documents to be submitted with tender for evaluation	List & Submit	
a)	Guaranteed Technical Particulars (GTP)	Submit	
b)	Manufacturer's catalogues, brochures, drawings and technical data	Submit	
c)	Sales records for the last five years	Submit	
	Four customer reference letters	Submit	
d)	Manufacturing capacity	Submit	
	Manufacturer's experience	Submit	
e)	Copies of required type test certificates and type test reports	Submit	
f)	ISO/IEC 17025 for the third party testing laboratory	Submit	
g)	Manufacturer's warranty (18 Months)	Submit	
	Manufacturer's guarantee (10 Years)	Submit	
h)	Manufacturer's letter of authorization	Submit	
	Manufacturer's ISO 9001:2015 certificate	Submit	
C.2.	Documents to be submitted by manufacturer for approval before manufacture	List and Submit	
a)	Guaranteed Technical Particulars (GTP)	Submit	
b)	Design drawings and wiring diagrams	Submit	
c)	Software manuals and operation manuals	Submit	
d)	Quality assurance plan (QAP)	Submit	
e)	Detailed test program to be used during factory testing	Submit	
f)	Marking details and method to be used in marking the test system	Submit	
g)	Packaging details (including packaging materials)	Submit	
h)	Manufacturer's undertaking to ensure adequacy of the design	Submit	
C.3.	Demonstration of equipment operation to Kenya Power staff at the factory	State compliance	
C.4.	Training on the use of the Three-Phase Energy Reference Standard in Nairobi Kenya for a minimum of 10 No. staff	State compliance	
	Deviations from tender specifications (indicate supporting documents submitted)	State	

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Manufacturer's Name, Signature, Stamp and Date

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