



**Kenya Power**

**SPECIFICATION FOR 20A WINDING RESISTANCE TEST MODULE**

A Document of the Kenya Power & Lighting Co. Ltd  
January 2024



**TITLE:20A DC BOOSTER  
WINDING RESISTANCE TEST  
MODULE - SPECIFICATION**

**Doc. No.**

**Issue No.**

**1**

**Revision No.**

**0**

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**2024-01-26**

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**0.1 CIRCULATION LIST**

<b>COPY NO.</b>	<b>COPY HOLDER</b>
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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	2024-01-26	New issue	Darius Akinyi 	George Welimo 

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**FOREWORD**

This specification has been prepared by the E/plant workshop of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for 20A Winding Resistance Test Module

The 20A Winding Resistance Test Module is intended for use by the e/plant workshop for testing Winding resistance for Power transformer using STS 5000.

This specification was prepared to establish and promote uniform requirements for 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module for KPLC.

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

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## 1. SCOPE

- 1.1. This specification is for 20A Winding Resistance Test Module for use by company's E/plant workshop.
- 1.2. The specification covers requirements, design, inspection and tests and schedule of Guaranteed Technical Particulars of 20A Winding Resistance Test Module.

## 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

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### 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

**PPM**-Parts per million

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**4. REQUIREMENTS**

**4.1. SERVICE CONDITIONS**



4.1.1 The 20A DC Booster Winding Resistance Test Module shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:

- a) Altitudes of up to 2200m above sea level;
- b) Humidity of up to 95%;
- c) Average ambient temperature of +30°C 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 20A DC Booster Winding Resistance Test Module shall be used to perform resistance tests on a PT with a current up to 20 A DC, instead of the 6 A DC provided by STS 5000

4.2.2. The 20A DC Winding Resistance Test Module shall be complementary module of STS 5000.

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4.3. It shall be supplied with the following particulars as shown in table 1 below:

**Table 1: Technical particulars of 20A Winding Resistance Test Module**

Parameter	Requirement	
Accessories for each 20A Winding Resistance Test Module	Description	Quantity
	20A DC STCS Booster	1

**4.4. DOCUMENTATION AND SUPPORT**

**4.4.1. Warranty and training**

- 4.4.1.1. The 20A DC Booster Winding Resistance Test Module 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 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module offered shall be submitted with the offer for evaluation (all in English Language). A copy of the **accreditation certificate** and the **scope of**

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**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 20A Winding Resistance Test Module 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 (20A Winding Resistance Test Module 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 20A Winding Resistance Test Module:

- 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 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module.

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**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 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module, 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 20A Winding Resistance Test Module which upon examination, test or use fail to meet any or all of the requirements in the specification.

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**B: QUALITY MANAGEMENT SYSTEM (Normative)**

- B.1 The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the 20A Winding Resistance Test Module 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.

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**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 20A Winding Resistance Test Module to KPLC Isiolo road stores

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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. ....**

**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 20A Winding Resistance Test Module shall be suitable for use outdoors in tropical areas and harsh climatic conditions including areas exposed to:	
a)	Altitudes of up to 2200m above sea level;	State
b)	Humidity of up to 95%;	State
c)	Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C	state

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Clause number	Requirement	Bidder's offer
d)	Pollution: Degree 2	state
4.2.	DESIGN AND CONSTRUCTION	
4.2.1.	The 20A Winding Resistance Test Module shall be designed to perform 20A Winding Resistance measurements, dissipation factor and capacitance of transformer and Bushing at the frequency of the mains or in a wide frequency range	State
4.2.2.	The 20A Winding Resistance Test Module shall be complementary module of STS 5000	state
4.3.	It shall be supplied with the following particulars	
	Parameter	Requirement
	Accessories for each 20A Winding Resistance Test Module	Description 20A DC STCS Booster
		Quantity 1
4.4.1.	<b>Warranty and training</b>	
4.4.1.1.	The 20A Winding Resistance Test Module 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 manufacturer's type reference/designation of the item offered shall be indicated	state
5	<b>TESTS REQUIREMENTS</b>	
5.1.	The 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module offered shall be submitted with the offer for evaluation (all in English Language). A copy of the	submit

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	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 20A Winding Resistance Test Module offered to be submitted for tender evaluation shall include the following	
5.2.1.	Measured values of the standard equipment	submit
5.2.2.	Indicated values of the unit under test (20A Winding Resistance Test Module offered)	submit
5.2.3.	Expanded Relative uncertainty	submit
5.2.4.	Details of standard and reference equipment used in calibration tests.	submit
6	<b>MARKING AND PACKING</b>	
6.1.	<b>MARKING</b>	
a)	The manufacturer's name or trade mark;	State
b)	The type reference number / model number;	State
c)	Units of the measured quantity;	State
d)	Ranges of measurement;	State
e)	Type of battery and polarity of connection in the battery compartment	State
f)	Standard of manufacture;	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.	<b>PACKING</b>	
6.2.1.	The 20A Winding Resistance Test Module should be packed in a carrying case so as to protect it from damage and entry of moisture during transportation, handling and storage.	State
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 20A Winding Resistance Test Module .	State
	<b>APPENDICIES</b>	
A:	<b>TESTS AND INSPECTION (Normative)</b>	
A.1	It shall be the responsibility of the supplier to test or to have all the relevant tests performed.	confirm

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Clause number	Requirement	Bidder's offer
A.2	Copies of previous Test/calibration Reports of 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module, 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 20A Winding Resistance Test Module which upon examination, test or use fail to meet any or all of the requirements in the specification.	State
B:	<b>QUALITY MANAGEMENT SYSTEM (Normative)</b>	
B.1	The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the 20A Winding Resistance Test Module 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 20A Winding Resistance Test Module being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the 20A Winding Resistance Test Module 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.	State
C:	<b>DOCUMENTATION AND DEMONSTRATION (Normative)</b>	

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Clause number	Requirement	Bidder's offer
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 stores	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 20A Winding Resistance Test Module to KPLC Isiolo road stores.	State

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

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