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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Procurement Manager
Electronic copy (pdf) on Kenya PowerServer (currently :Network-\\stima-fprnt-001\techstd&specs	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)

FOREWORD

This specification has been prepared by the Research and Development Department and E/Plant, Mt. Kenya office both of The Kenya Power and Lighting Company Limited (Kenya Power) and it lays down requirements for Automated Three Phase Current Transformer Analyzer. The specification is intended for use by Kenya Power in purchasing the equipment.

It shall be the responsibility of the supplier to ensure adequacy of the design and good engineering practice in the manufacture of Automated Three Phase Current Transformer Analyzer for Kenya Power. The supplier shall also submit information which confirms satisfactory service experience with products which fall within the scope of this specification.

1. SCOPE

The specifications are for a microcomputer-controlled, intelligent, fully automated (digital) Current Transformer Analyzer. The detailed requirements of the equipment are given in this specification.

2. REFERENCES

N/A

3. TERMS AND DEFINITIONS

N/A

4. REQUIREMENTS

4.1 GENERAL REQUIREMENTS

The instrument shall be used for complete field analysis of Medium and High Voltage Current Transformers, both metering and protection CTs, to ascertain their condition and integrity after installation and before Commissioning.

The Automatic CT Analyzer should allow all types of single and multi-ratio current Transformers to be tested on-site in power system grids.

The Equipment should offer a wide range of measurements, such as:

- CT-ratio and phase-angle accuracy with consideration of nominal and operational burden for various currents.
- Ct winding resistance

- CT excitation/saturation
- Burden impedance
- CT residual magnetism
- Accuracy Limiting Factor (ALF) and Instrument Security Factor (FS), (direct and indirect)

The instrument also shall have Nameplate "Guessing" ability. It should be able to determine the following unknown data without contacting the manufacturer:-

- CT type
- Class
- Ratio
- Knee Point
- Power Factor
- Nominal and operating burden
- Winding resistance (primary and secondary)

4.1.1Construction

4.1.1.1 The equipment shall be portable; rugged, light weight, Shock proof and suitable for use in harsh field conditions.

4.1.1.2 The analyzer shall be fully automated, intelligent and of high accuracy.

4.1.1.3 It shall be self calibrating and diagnosing, no internal circuitry setup required.

4.1.2Operation.

4.1.2.1The CT Analyzer shall be standalone or if laptop controlled, the Laptop shall be supplied complete with all required accessories.

4.1.2.2 Its operating system shall be run on Microsoft windows 7 professional edition, capable of being integrated with other diagnostic and data management software.

4.1.2.3The accuracy of the test results shall not be depended on the quality of the input signal. It shall have in built system for automatic suppression of Electrostatic & electromagnetic interference in power substations.

4.1.2.4 All operating commands shall be by key pad, touch screen, remote laptop or push button, no panel switches.

4.1 2.5 The analyzer sampling frequency shall be within the maximum range that can be attained with the technology now available in the market.

4.1.2.6 The analyzer shall be LCD display that is readable in bright sunlight.

4.1.2.7 The equipment shall have automatic test procedures that are easy and simple to use.

4.1.2.8 It shall be supplied with most recent software for easy operation and data analysis.

4.1. 3 Test results

4.1.3.1The Current Transformer analyzer shall generate test results automatically and display on a back light LCD Screen readable in bright sunlight or laptop via communication serial port.

4.1.3.2The analyzer shall have built-in storage and downloading capabilities via USB Port and RS-232C interface.

4.1.3.3 The analyzer shall be capable of printing the test result by use of in-built printer or external printer via communication interface.

4.1.3.4 The analyzer shall display the test results both in alphanumeric and graphically.

4.2 TECHNICAL AND SPECIFIC REQUIREMENTS

4.2.1 Specific requirements.

4.2.1.The Current Transformer Analyzer shall have CT ratio and Phase measurement with consideration of nominal and connected secondary burden i.e. currents from 1% up to 400 % of the rated value and different burdens (full, ¼,½,⅛ burden) .

4.2.1.2 The equipment shall display graphical and statistical representations of the computed results where possible. It shall also automatically carry out all the unit conversions.

4.2.2 Testing Capability.

The CT analyzer shall be capable of testing following:-

- CT ratio and phase measurement with consideration of nominal and connected secondary burden.
- CT winding resistance measurement, (primary and secondary).
- CT excitation curve (unsaturated and saturated).
- CT phase and polarity check

- Secondary burden measurement
- Automatic demagnetization of the CT after the test
- Short testing time due to fully automatic testing
- "Nameplate guesser" functions for CTs with unknown data.
- Remote control interface
- Quick Test: Manual testing interface
- Display readable in bright light
- Simulation of measured data with different burdens and currents
- Easily adaptable reports (customizable)
- Knee-point voltage from 1V to 30KV can be measured
- Should be capable of determining transient dimensioning factor
- Measurement of transient behavior of TPS, TPX, TPY and TPZ type CTs
- Automatic assessment for accuracy class> 0.1

4.3 Technical Specifications

Item No.	Technical description	KENYA POWER Technical Requirements
1	**Current Ratio Accuracy**	
	Ratio 1 to 2000	0.02 %(typical), 0.05 % (guaranteed)
	Ratio 2000 to 5000	0.03 %(typical), 0.1 % (guaranteed)
	Ratio 5000 to 10000	0.05 %(typical), 0.2 % (guaranteed)
2	**Phase Displacement**	
	Resolution	0.1 min

4.41.6 After tender award, factory inspection and certification by at least two Kenya Power's engineers shall be carried out before shipment of the Equipment.

5. TESTS AND INSPECTION

5.1 Copies of previous certificates by the relevant National Testing/Standards Authority of the country of manufacture (or ISO/IEC 17025 accredited laboratory) shall be submitted with the offer for evaluation (all in English Language).

5.2 Relevant certificates (calibration/test) shall be submitted together with the equipment during delivery.

6.0 MARKING AND INSTRUCTIONS

6.1 The following information shall be marked indelibly and legibly on the CT Analyzer:

i) Manufacturer's Name or Trademark;
ii) Type reference
iii) Letters "PROPERTY OF KENYA POWER "
iv) Operating Voltage

6.2 Operating and technical manuals shall be supplied together with the equipment during delivery (all in English language).

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ANNEX A: Guaranteed Technical Particulars *(to be filled and signed by the Manufacturer and submitted together with copies of manufacturer's catalogues, brochures, drawings, technical data, sales records and copies of certificates/test reports for tender evaluation)*

Tender No. .....

Clause number	**Bidder's offer** (indicate full details of the offered equipment for each requirement of the specification)
1. Scope	
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4.1 General Requirements	
4.1.1 Construction	
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4.1.1.2	
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4.2.1 Specific Requirements	
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4.4.1 Warranty and Training	
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5 Test and Inspection		
5.1		
5.2		
4.3 Technical specifications		
1	**Current Ratio Accuracy**	
	Ratio 1 to 2000	
	Ratio 2000 to 5000	
	Ratio 5000 to 10000	
2	**Phase Displacement**	
	Resolution	
	Accuracy	
3	**Winding Resistance**	
	Resolution	
	Accuracy	
4	**Power Supply**	
	Input Voltage	
	Frequency	
	Input Power	
5	**Output**	
	output voltage	
	Output Current	
	Output power	
6	**Environmental Conditions**	
	Operating Temperature	
	Storage Temperature	

	Humidity	
7	**International Standards**	
8	**Laptop**	
9	**Accessories**	
10	**Warranty on Equipment**	
11	**Analyzer Operation**	
12	**Operation and Maintenance Manual**	
13	**Installation**	
14	**Theoretical and Practical training**	
15	**Factory inspection**	

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Manufacturer's Name, Signature, Stamp and Date