

DOCUMENT NO.: KP1/13D/4/1/TSP/14/060



Kenya Power

CURRENT LOGGERS-SPECIFICATION

A Document of the Kenya Power & Lighting Company PLC

January 2025



TITLE:
**CURRENT LOGGERS
SPECIFICATION**

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0.1 CIRCULATION LIST

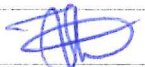

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1	Manager, Standards
2	Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)

REVISION OF KPLC STANDARDS

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 AMMENDMENTS

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
1	2022-02-08	New Issue	John Ng'ang'a	Eng. Simon Kimitei
2	2024-12-02	Inserted two (2) clauses; 4.2.13 & 4.2.14, to include and specify laptop computers features	Eng. Benson Dianga	Dr. Eng. Peter Kimemia
3	2024-12-02	Specified the tolerance range for sensor accuracy in Table 4.3	Eng. Benson Dianga	
4	2024-12-02	Specified on Table 4.3 that current logger license for management software shall be non-expiring	Eng. Benson Dianga	

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0.3 FOREWORD

This specification has been prepared by the Standards Department in collaboration with Installations Management Section in Commercial Services and Sales Division, both of The Kenya Power and Lighting Company Plc (KPLC) and lays down requirements for Current Loggers. It is intended for use by KPLC in purchasing these items.

This Specification was prepared to establish and promote uniform requirements for Current loggers to be used by Kenya Power and Lighting Company Plc in medium voltage overhead lines.

This Specification stipulates the minimum requirements for the items 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, and exhibits good workmanship and good engineering practice in the manufacture.

Users of this KPLC specification are responsible for its correct interpretation and application.

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

Name	Division
Peter Wanyonyi	Commercial Services and Sales
John Nganga	Institute of Energy Studies and Research
Benson Dianga	Institute of Energy Studies and Research
Patricia Ngaanga	Institute of Energy Studies and Research

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1. SCOPE

- 1.1 This Specification is for Current Loggers.
- 1.2 The specification stipulates minimum requirements, inspection and tests of the Current Loggers as well as schedule of Guaranteed Technical Particulars.

2. NORMATIVE REFERENCES


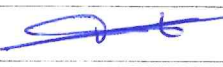
The following standards contain provisions which through reference in this text constitute provisions of this specification. For dated editions the cited edition will apply; for undated editions the latest edition of the referenced document shall apply.

- UL 94: The Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances testing,
- IEC61010-1: Safety requirements for electrical equipment for measurement, control, and Laboratory use -Part 1: General requirements,
- IEC 61869-2: Instrument transformers - Part 2: Additional requirements for current Transformers,
- IEC 60855-1: Live working - Insulating foam-filled tubes and solid rods - Part 1: Tubes and rods of a circular cross-section,
- IEC 61235: Live working - Insulating hollow tubes for electrical purposes,
- EN 50508: Multi-purpose insulating sticks for electrical operations on high voltage Installations,
- ISO 9001:2015 Quality management systems — Requirements.

3. DEFINITIONS AND ABBREVIATIONS

For the purposes of this Specification, the Terms, Definitions and Abbreviations given in the Reference Standards apply, and shall include the following:

- IrDA USB Infrared USB port on current logger.
- IrDA USB cable Infrared USB cable for connection to laptop computer.
- xml format: Extensible Markup Language format.
- csv format: Comma Separated Values format.
- CT: Current Transformer.

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4. REQUIREMENTS

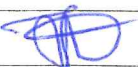

4.1. SERVICE CONDITIONS

The Overhead Current Loggers shall be suitable for use in tropical areas and in harsh climatic conditions including areas exposed to:

- a) At 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, in direct sunlight.
- 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.
- d) Isokeraunic levels of up to 180 thunderstorm days per year.

4.2. DESIGN AND CONSTRUCTION

- 4.2.1 The current loggers shall be designed for use on single-phase or three-phase overhead power lines with voltages up to 66 kV. The loggers shall be designed for simple and efficient procedures for installation, retrieval, and data downloading.
- 4.2.2 The current loggers shall comply with international safety standard IEC 61010-1
- 4.2.3 The housing of the current logger shall be built to operate in tropical conditions and very heavy pollution level. It shall be resistant to shock, repels water, flame resistant meeting UL 94 standard requirements and operates in a wide temperature range.
- 4.2.4 The current loggers shall be equipped with inductive sensors with no magnetic materials and no moving parts.
- 4.2.5 The accuracy class of the CT sensors shall be class 0.2. The CT sensors shall comply with IEC 61869-2 standard.
- 4.2.6 The opening of the sensor shall be electronically closed. All external currents shall be electronically rejected.
- 4.2.7 The current logger shall be used on a range of conductors from 9.3mm to 25mm in diameter.

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- 4.2.8 The current loggers shall be capable of being deployed and remain operational on the line for a minimum of 90 days.
- 4.2.9 While deployed on the line, the current logger shall record RMS current readings, at user defined intervals. It shall easily attach to the line with a hot stick and once on the line, it shall begin to collect and record the current data.
- 4.2.10 The device shall be equipped with an infrared USB port (IrDA USB port) for transferring the recorded data into the user's computer.
- 4.2.11 Data shall be easily downloaded to a software with a user-friendly interface allowing the user to download, view and analyze the load profile in graphs. It shall be possible to retrieve the data in xml or csv formats for analysis in other data management computer applications
- 4.2.12 The data management software shall be provided by the same manufacturer of the current logger, and shall come with all necessary licenses for at least 3 users per kit without any subsequent subscriptions or charges for software updates. The license shall be non-expiring.
- 4.2.13 The current loggers shall be provided with a laptop computer for downloading the data. The laptop must come preloaded with data management software specifically designed for analyzing the downloaded and recorded current data.
- 4.2.14 The laptop computer specifications shall meet or exceed the minimum requirements detailed below

Table 1

Description	Minimum Requirements
Processor	Intel Core i7-5500 (2.60GHz 1600MHz 3MB, 8 Cores)
RAM	16GB DDR4-2133MHz SODIMM
Operating System	Windows 11 pro 64 bit
Hard Disk	1TB 7200 rpm Hard Drive
Display Panel	15.6" FHD LED Glossy (1920x1080) with integrated Webcam 720p camera
Graphics	Integrated Intel HD Graphics 520
Internal Audio	Integrated HD audio internal speaker (standard) or Stereo with Dolby Audio TM, 1xMic Headphones Combo

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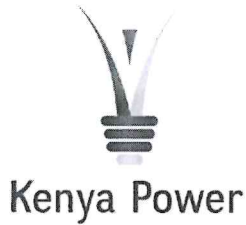
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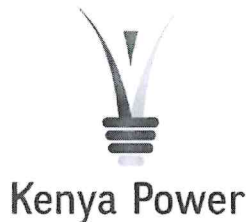
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Communications	GPRS/ HSDPA Modem, Integrated Intel Gigabit Network Connection (10/100/1000 NIC)
Wireless	Intel 802.12 AC WLAN and Bluetooth(R)
Interfaces	VGA, MDP, 4-in-1 Card Reader, Smart Card Reader. RJ-45, Headphone and Microphone Jack, Mechanical Docking, 2 x USB 3.0, W/WAN SIM, Express Card Slot, 1 HDMI port, Bluetooth, Wi-Fi enabled
Pointing Devices	Touchpad with scroll zone, Two Pick Buttons or Pick Stick, Two Pick Buttons
Keyboard	Keyboard with Number Pad – English (Standard)
Mouse	External USB Mouse
Warranty	1 Year
Power	Lithium-ion Battery; External AC adapter
Power Supply	230V AC, 50 Hz, British plugs
Carrying Case	Genuine Leather Carrying Case
Manufacturer's Authorization	Manufacturers Authorization Certificate/ Letter and for the models quoted, the principal (Manufacturer) MUST have an established regional office in Kenya.

- 4.2.15 The recorder must be designed for easy retrieval from the line using a hot stick once the data collection period is complete. It should automatically cease recording after the designated interval, whether hourly, daily, weekly, or any other duration, with a minimum recording capacity of 90 days.
- 4.2.16 It shall be possible to retrieve data from the loggers both while they remain on the line and after they have been retrieved. Once the data has been retrieved, the loggers shall be ready for redeployment, either at the same station or at a different station.
- 4.2.17 The current logger shall be complete with one infrared USB cable, one management software, hot stick, hot stick adaptors and carrying case.
- 4.2.18 The hot stick shall be a telescopic device that has been tested and certified and in compliance with IEC 61235, IEC 60855, and EN 50508 standards.
- 4.2.19 The hot stick shall be suitable for voltages up to 100kV
- 4.2.20 The hot stick shall be made of fiberglass/resin polyester and resin epoxy foam, where applicable. It shall include lockable copper alloy press buttons to securely fasten the extendable sections of the telescopic stick.

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4.2.21 The hot stick shall be equipped with isolating skirts to enhance protection and provide increased resistance to electrical shocks.

4.2.22 The insulating sticks shall be suitable for use in both wet and dry conditions.

4.2.23 The overall insulating length of the hot stick shall be at least 7m.

4.2.24 The kit shall include hot stick adapters. The adapters shall be compatible with the hot stick's socketing ends.

4.3. CHARACTERISTICS OF CURRENT LOGGER

Table 2

No	Description	Requirement
1	Voltage range	0 to 69kV
2	Current range	1 to 1000A
3	Sensor opening	Up to 3.3cm
4	Resolution:	
	(i) 1 to 99A	0.1A
	(ii) 100 to 1000A	1A
5	Accuracy	± 1%, ± 2 Counts
6	Frequency	50Hz with range 47Hz to 53Hz
7	Weight	Maximum 0.8kg
8	Housing	Shock resistant molded composite material
9	Hot Stick mounting	Universal.
10	Battery	9V Alkaline or Lithium, one each per recorder
11	Data collection space	At least 64,000 data points
12	Software and License	Provide management software with non-expiring license
13	Kit contents	a) Current loggers (Set of three units) b) Infrared USB cable c) Management Software d) Hot Stick e) Hot Stick Adapters f) Carrying Case

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5. TESTS REQUIREMENTS

The Current Logger shall be inspected and tested in accordance with the provisions of this specification and applicable standards.

6. MARKING AND PACKING

6.1 Each current logger shall be marked legibly and indelibly with the following information:

- a) The inscription "KPLC."
- b) Name and trade mark of the manufacturer;
- c) Country of origin;
- d) Standard of manufacture
- e) Manufacturers type designation, serial number and year of manufacture.

6.2 The current logger's kits shall be packaged, in a shockproof and impact proof carrying case, in such a manner as to minimize damage during transportation and handling.

6.3 The hot stick shall be supplied complete with a canvas carrying bag with shoulder straps. The bag shall have an internal pocket for keeping the hot stick adaptors if they do not fit in the carrying case.

APPENDICES

A. TESTS AND INSPECTION (Normative)

A1 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 during tender Submissions. Any limitations shall be clearly specified.

A2 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.

A3 The Current Loggers shall be subject to factory acceptance tests at the manufacturer's works before dispatch. Acceptance tests shall be witnessed at least by two Engineers appointed by The Kenya Power and Lighting Company Plc (KPLC).

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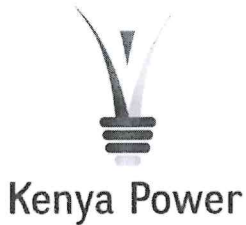
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A4 On receipt of the product, KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the items which upon examination, test or use, fail to meet any of the requirements in the specification.

B. QUALITY MANAGEMENT SYSTEM (Normative)

B1 The bidder shall submit a quality assurance plan (QAP) that will be used to ensure that the items 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.

B2 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.

B3 The bidder shall indicate the delivery time of each type of items, manufacturer's monthly & annual production capacity and experience in the production of the type of current logger 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 of meters 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 (all in English Language) for tender evaluation .The submissions shall include the following:

- a) Fully filled clause by Clause Guaranteed Technical Particulars (GTP) signed and stamped by the manufacturer as indicated in Appendix D
- b) Copies of the manufacturer's catalogues, brochures, drawings and manuals.
- c) Sales records for the last five years and at least four customer reference letters, three outside the country of manufacture
- 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

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h) Manufacturer's letter of authorization, copy of the manufacturer's ISO 9001:2015 certificate, and Testing Laboratory's ISO 17025 certificate.


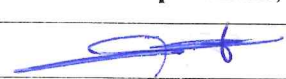
C.2 The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company Plc for approval before manufacture:

- a) Fully filled clause by clause Guaranteed Technical Particulars (GTP) signed by the manufacturer,
- b) Design drawings,
- c) Operation and technical manuals and brochures
- d) 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 9001:2015,
- e) Detailed test program to be used during factory testing,
- f) Marking details and method to be used in marking the items,
- g) 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 current loggers for The Kenya Power & Lighting Company Plc,
- h) Packaging details (including packaging materials and marking and identification of batches).

C.3. The successful bidder shall demonstrate to at least 20 KPLC Staff (in Nairobi) the use of the current loggers

Appendix D (Normative): Guaranteed Technical Particulars for Current Loggers

To be filled and signed by the Manufacturer and submitted together with a sample meter, relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test certificates and type test reports for tender evaluation, all in English Language

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Clause number	KPLC requirement	Bidder's offer
0.1	Manufacturer's Name and address	Specify
0.2	Country of Manufacture	Specify
0.3	Bidder's Name and address	Specify
1.0	Scope	Specify
1.1-1.2		
2.0	Applicable Standards	Specify
3.0	Definitions & Abbreviations	Specify
4.0	Requirements	
4.1	Service Conditions	Specify
4.2	Design and Construction	
4.2.1	Suitable for use on single or three phase overhead power lines of voltages up to 66kV	Specify
	Easy installation, easy retrieval and easy data download	Specify
4.2.2	Designed to conform with international safety standard IEC 61010-1	Specify
4.2.3	The housing of the current logger shall be built to operate in tropical conditions and very heavy pollution level	Specify
	It shall be resistant to electrical shock, repels water, flame resistant meeting UL 94 standard requirements and operates in a wide temperature range	Specify
4.2.4	Equipped with inductive sensors with no magnetic materials and no moving parts.	Specify
4.2.5	The accuracy class of the CT sensors shall be class 0.2. The CT sensors shall comply with IEC 61869-2 standard.	Specify
4.2.6	The opening of the sensor shall be electronically closed. All external currents shall be electronically rejected	Specify
4.2.7	The current logger shall be used on a range of conductors from 9.3mm to 25mm in diameter.	Specify
4.2.8	The minimum duration which current loggers shall be capable of being deployed and remain operational	Specify
4.2.9	While deployed on the line, the current logger shall record RMS current readings, at user defined intervals	Specify
	It shall easily attach to the line with a hot stick and once on the line, it shall be in to collect and record the current data	Specify
4.2.10	The device shall be equipped with an infrared USB port (IrDA USB Port) for sending the recorded data into the user's computer.	Specify
4.2.11	Data shall be easily downloaded to a software with a user-friendly interface allowing the user to download, view and analyze the load profile in graphs.	Specify

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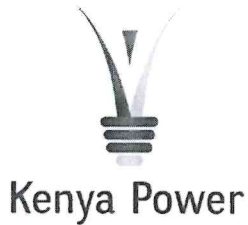
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	It shall be possible to retrieve the data in .xml or .csv formats for analysis in other data management computer applications	Specify	
4.2.12	The management software shall be provided by the same manufacturer of the current logger and shall come with all necessary licenses for at least 3 users per kit without any subsequent subscriptions	Specify	
	The data management software license shall be non-expiring	State	
4.2.13	The logger shall be supplied together with a laptop for downloading and analyzing the current data. Attach Warranty	Provide	
4.2.14	Table 1: Laptop Specifications		
	Processor	Intel Core i7-5500 (2.60GHz 1600MHz 3MB, 8 Cores)	Specify
	RAM	16GB DDR4-2133MHz SODIMM	Specify
	Operating System	Windows 11 pro 64 bit	Specify
	Hard Disk	1TB 7200 rpm Hard Drive	Specify
	Display Panel	15.6" FHD LED Glossy (1920x1080) with integrated Webcam 720p camera	Specify
	Graphics	Integrated Intel HD Graphics 520	Specify
	Internal Audio	Integrated HD audio internal speaker (standard) or Stereo with Dolby Audio TM, 1xMic Headphones Combo	Specify
	Communications	GPRS/ HSDPA Modem, Integrated Intel Gigabit Network Connection (10/100/1000 NIC)	Specify
	Wireless	Intel 802.12 AC WLAN and Bluetooth(R)	Specify
	Interfaces	VGA, MDP, 4-in-1 Card Reader, Smart Card Reader. RJ-45, Headphone and Microphone Jack, Mechanical Docking, 2 x USB 3.0, W/WAN SIM, Express Card Slot, 1 HDMI port, Bluetooth, Wi-Fi enabled	Specify
	Pointing Devices	Touchpad with scroll zone, Two Pick Buttons or Pick Stick, Two Pick Buttons	Specify
	Keyboard	Keyboard with Number Pad – English (Standard)	Specify
	Mouse	External USB Mouse	Specify
	Warranty	1 Year	Specify
Power	Lithium-ion Battery; External AC adapter	Specify	
Power Supply	230V AC, 50 Hz, British plugs	Specify	
Carrying Case	Genuine Leather Carrying Case	Provide	
Manufacturer's Authorization	Manufacturers Authorization Certificate/ Letter and for the models quoted, the principal (Manufacturer) MUST have an established regional office in Kenya.	Provide	

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4.2.15	The current recorder shall be easily retrieved from the line with a hot stick once the period of data collection is over and it shall stop recording data, be it hourly, daily, weekly or any time interval up to a minimum of 90 days	Specify	
4.2.16	It shall be possible to retrieve data while the current loggers are on the line or when they have been retrieved.	Specify	
	Once the data is retrieved, they shall be ready for deployment at same station if still not retrieved or at a different station	Specify	
4.2.17	The current logger shall be complete with one infrared USB cable, one management software with open license, hot stick adaptors and carrying case	Specify	
4.2.18	The hot stick shall be a telescopic stick tested and in compliance to IEC-61235, IEC-60855 and EN 50508.	Specify	
4.2.19	The hot stick shall be suitable for voltages up to 100kV.	Specify	
4.2.20	The material of manufacture of the hot stick shall be fibre glass/resin polyester and resin epoxy foam and have lockable copper alloy press buttons to secure the extendable telescopic sticks.	Specify	
4.2.21	The hot stick shall have isolating skirts to provide further protection and resistance to shocks.	Specify	
4.2.22	The insulating sticks shall be suitable for use in both wet and dry conditions.	Specify	
4.2.23	The overall insulating length of the hot stick shall be at least 7m.	Specify	
4.2.24	The kit shall include hot stick adaptors. The adaptors shall be compatible with the hot stick's socketing ends	Specify	
4.3	Table 2: Characteristics of Current Logger		
4.3.1	Voltage range	0 to 69kV	Specify
4.3.2	Current range	1 to 1000A	Specify
4.3.3	Sensor opening	U to 3.3cm	Specify
4.3.4	Resolution	1 to 99A	Specify
		100 to 1000A	Specify
4.3.5	Accuracy	± 1 % , ±2 Counts	Specify
4.3.6	Frequency	50Hz with range of 47Hz to 53Hz	Specify
4.3.7	Weight	Maximum 0.8kg	Specify
4.3.8	Housing	Shock resistant molded composite material	Specify
4.3.9	Hot Stick mounting	Universal.	Specify
4.3.10	Battery	9V Alkaline or Lithium, one each per recorder	Specify

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4.3.11	Data collection s ace	At least 64,000 data points	Specify
4.3.12	Software and License	Provide management software with necessary lifetime license	Specify
4.3.13	Kit contents	Current 10er (Set of 3 units)	Specify
		Infrared USB cable	Specify
		Management Software	Specify
		Hot Stick	Specify
		Hot Stick Adapters	Specify
		Carrying Case	Specify
5.0	Test Requirements		
6.0	Marking and Packing		
6.1	a) The inscription "KPLC.",		State
	b) Name and trade mark of the manufacturer;		State
	c) Country of origin;		State
	d) Standard of manufacture		State
	e) Manufacturers type designation, serial number and year of manufacture.		State
6.2	The current loggers kits shall be packaged, in a shockproof and impact proof carrying case, in such a manner as to minimize damage during transportation and handling		State
6.3	The hot stick shall be supplied complete with a canvas-carrying bag with shoulder straps. The bag shall have an internal pocket for keep in the hot stick adaptors if they do not fit in the carrying case.		State
	APPENDICES		
A	Tests and Inspection		
A1	Responsibility of carrying out tests		State
A2	Copies of Type Test Reports submitted with tender		State
A3	Acceptance tests to be witnessed by KPLC at factory before shipment		State Compliance
A4	Inspection at the stores and replacement of rejected items without charge		State
B	Quality Management Systems		
B.1	Quality Assurance Plan		Provide
B.2	Copy of ISO 9001: 2015		Provide
B.3	Manufacturers Experience		Provide
	Manufacturers Capacity(Units Per Month)		Provide
	List of Previous Customers		Provide
	Customer References		Provide
C	Documentation and demonstration		
C1	Documents submitted with tender		List

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C2	Documents to be submitted by Supplier to KPLC for Approval before manufacture.	List
C3	A demonstrate to least 20 KPLC staff in Nairobi the use of current loggers	State Compliance
	Statement of Compliance to Specifications	Provide

NOTE:

- 1) *Bidders shall give full details of the items on offer as per the specification and applicable standards. The details provided shall conform to the test reports and their certificates, as well as labelled drawings complete with dimensions, catalogues and/or brochures for the purpose of tender evaluation.*
- 2) *Bidders should note that the above Guaranteed Technical Particulars Schedules must be fully completed and submitted with the bid. Wherever there is conflict between the GTPs and the clauses in the specification, the clauses in the specification take precedence. Failure to complete the schedules shall lead to rejection of the bid.*
- 3) *Guaranteed values shall be specified. Words like 'agreed', 'confirmed', 'As per KPLC specifications', etc. shall not be accepted and shall be considered non-responsive.*

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

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Signed:

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