



KenGen

KENYA ELECTRICITY GENERATING COMPANY LIMITED

KGN-SBP-14-2017

TENDER FOR DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TRAINING
AND COMMISSIONING OF CALIBRATION CENTRE EQUIPMENT.

(OPEN INTERNATIONAL)

Kenya Electricity Generating Company Limited
Stima Plaza Phase III, Kolobot Road, Parklands
P.O. BOX 47936-00100
NAIROBI.

Website: www.kengen.co.ke

December 2017

Tender for Design, Supply, Installation, Training and Commissioning of Calibration Equipment

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SECTION I: INVITATION TO TENDER

Kenya Electricity Generating Company Limited [KenGen] intends to purchase Calibration Centre equipment.

The Company invites sealed tenders from manufacturers and authorized tenderers for the design, manufacture, supply, delivery, installation, training and commissioning of Calibration Centre equipment. The specifications are detailed in the Tender Document.

Interested eligible candidates may obtain further information from and inspect the Tender Documents during official working hours starting at the date of advert at the office of:

Supply Chain Director
Tel: (254) (020) 3666000

Email: tenders@kengen.co.ke; pyego@kengen.co.ke; pwambugu@kengen.co.ke; komar@kengen.co.ke;

Where the tender document may be collected upon payment of a non-refundable fee of **KShs. 1,000.00** paid in cash or through a banker's cheque at any KenGen finance office, where applicable. The document can also be viewed and downloaded from the website www.kengen.co.ke and www.tenderers.treasury.go.ke. Tenderers who download the tender document from the website **are advised to forward their particulars to facilitate any subsequent tender clarifications and addenda**. Downloaded copies are free of charge. Tenderers are advised from time to time to be checking the website for any uploaded further information on this tender.

Unless otherwise stated, tenders **MUST** be accompanied by a security in the format and amount specified in the tender documents and must be submitted in a plain sealed envelope and marked "**Design, Manufacture, Supply, Delivery, Installation, Training and Commissioning of Calibration Centre Equipment**" and addressed to:

Company Secretary & Legal Affairs Director
Kenya Electricity Generating Company Limited
7th Floor, Stima Plaza Phase III
Kolobot Road, Parklands
P O Box 47936 - 00100
NAIROBI, KENYA

On or before: **Monday, 5th February 2018 at 10.00 a.m.** Tenders will be opened on **Monday, 5th February 2018 at 10.30 a.m.** in the presence of the candidates' representatives who choose to attend at Stima Plaza III, Executive Committee Room, 7th Floor. The company reserves the right to vary the quantities.

There will be a **mandatory** pre-tenderers' meeting and site visit on **Tuesday, 16th January 2018, at 10.00 a.m.** at Tana Power Station.

KenGen adheres to high standards of integrity in its business operations. Report any unethical behavior immediately to the provided anonymous hotline service.

- 1) Call Toll Free: 0800722626
- 2) Free Fax: 00800 007788
- 3) Email: kengen@tip-offs.com

SUPPLY CHAIN DIRECTOR

SECTION II: INSTRUCTIONS TO TENDERERS

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2.1 Eligible Tenderers

- 2.1.1 This Invitation for Tenders is open to all tenderers eligible as described in the Invitation to Tender. Successful tenderers shall complete the supply of goods by the intended completion date specified in the Schedule of Requirements (Section VII).
- 2.1.2 The procuring entity's employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.
- 2.1.3 Tenderers shall provide the qualification information statement that the tenderer (including all members of a joint venture and subcontractors) is not associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Procuring entity to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods under this Invitation for tenders.
- 2.1.4 Tenderers shall not be under a declaration of ineligibility for corrupt and fraudulent practices.

2.2 Eligible Goods

- 2.2.1 All goods to be supplied under the contract shall have their origin in eligible source countries.
- 2.2.2 For purposes of this clause, “origin” means the place where the goods are mined, grown, or produced. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially-recognized product results that is substantially different in basic characteristics or in purpose or utility from its components
- 2.2.3 The origin of goods is distinct from the nationality of the tenderer.

2.3 Cost of Tendering

- 2.3.1 The Tenderer shall bear all costs associated with the preparation and submission of its tender, and the procuring entity, will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.
- 2.3.2 The price to be charged for the tender document collected from the Procuring Entity shall not exceed Kshs.1, 000/= . Downloaded copies are free of charge.
- 2.3.3 All firms found capable of performing the contract satisfactorily in accordance with the set prequalification criteria shall be prequalified.

2.4 Pre-Tenderers' Meeting

- 2.4.1 The tenderer’s designated representative is invited to attend a mandatory pre-tenderers' meeting which will take place at the venue and time stated in the Invitation to Tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 2.4.2 Each tenderer shall sign the attendance register during the meeting. The costs of attending the meeting shall be the tenderer’s own responsibility.
- 2.4.3 The tenderer is requested as far as possible to submit any questions in writing, to reach the Employer not later than seven days before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with Clause 2.4.3.
- 2.4.4 Minutes of the meeting, including the text of the questions raised and the responses given together with any responses prepared after the meeting will be transmitted to all purchasers of the tender documents. Any modification of the tender documents which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of a tender notice pursuant to Clause 2.6 and not through the minutes of the pre-tender meeting.
- 2.4.5 The tenderer and any of his personnel or agents will be granted permission by the Employer to enter upon premises and lands for the meeting, but only upon the express condition that the tenderer, his personnel or agents, will release and indemnify the Employer from and against all liability in respect of, and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, costs and expenses however caused, which but for the exercise of such permission, would not have arisen.
- 2.4.6 The tenderer may prepare a short presentation to give the Procuring entity an idea of what they intend to offer. This is not mandatory.

2.5 Contents of Tender Document

- 2.5.1 The tender document comprises the documents listed below and addenda issued in accordance with clause 2.6 of these instructions to Tenderers
- (i) Invitation to Tender
 - (ii) Instructions to tenderers
 - (iii) General Conditions of Contract
 - (iv) Special Conditions of Contract
 - (v) Schedule of requirements
 - (vi) Technical Specifications
 - (vii) Tender Form and Price Schedules
 - (viii) Tender Security Form
 - (ix) Contract Form
 - (x) Performance Security Form
 - (xi) Manufacturer's Authorization Form
 - (xii) Confidential Business Questionnaire

2.5.2 The Tenderer is expected to examine all instructions, forms, terms, and specifications in the tender documents. Failure to furnish all information required by the tender documents or to submit a tender not substantially responsive to the tender documents in every respect will be at the tenderers risk and may result in the rejection of its tender.

2.6 Clarification of Documents

2.6.1 A prospective tenderer requiring any clarification of the tender document may notify the Procuring entity in writing or by post at the entity's address indicated in the Invitation to Tender. The Procuring entity will respond in writing to any request for clarification of the tender documents, which it receives not later than seven (7) days prior to the deadline for the submission of tenders, prescribed by the procuring entity. Written copies of the Procuring entities response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective tenderers that have received the tender document.

(IN THE CASE OF OPEN INTERNATIONAL TENDER 10 DAYS)

2.6.2 The procuring entity shall reply to any clarifications sought by the tenderer **within 3 days** of receiving the request to enable the tenderer to make timely submission of its tender.

2.7 Amendment of Documents

2.7.1 At any time prior to the deadline for submission of tenders, the Procuring entity, for any reason, whether at its own initiative or in response to a clarification requested by a prospective tenderer, may modify the tender documents by amendment.

(IN THE CASE OF OPEN INTERNATIONAL TENDER 5 DAYS PRIOR TO TENDER CLOSURE)

2.7.2 All prospective candidates that have received the tender documents will be notified of the amendment in email and will be binding on them.

2.7.3 In order to allow prospective tenderers reasonable time in which to take the amendment into account in preparing their tenders, the Procuring entity, at its discretion, may extend the deadline for the submission of tenders.

2.8 Language of Tender

2.8.1 The tender prepared by the tenderer, as well as all correspondence and documents relating to the tender exchange by the tenderer and the Procuring entity, shall be written in English language, provided that any printed literature furnished by the tenderer may be written in another language provided they are accompanied by an accurate English translation of the relevant passages in which case, for purposes of interpretation of the tender, the English translation shall govern.

2.9 Documents Comprising of Tender

2.9.1 The tender prepared by the tenderers shall comprise the following components:

- a) A Tender Form and a Price Schedule completed in accordance with paragraph 2.10, 2.11 and 2.12 below.
- b) documentary evidence established in accordance with paragraph 2.1 that the tenderer is eligible to tender and is qualified to perform the contract if its tender is accepted;
- c) documentary evidence established in accordance with paragraph 2.2 that the goods and ancillary services to be supplied by the tenderer are eligible goods and services and conform to the tender documents; and
- d) Tender security furnished in accordance with paragraph 2.15.

2.10 Tender Forms

2.10.1 The tenderer shall complete the Tender Form and the appropriate Price Schedule furnished in the tender documents, indicating the goods to be supplied, a brief description of the goods, their country of origin, quantity, and prices.

2.11 Tender Prices

2.11.1 The tenderer shall indicate on the appropriate Price Schedule the unit prices and total tender price of the goods it proposes to supply under the contract

2.11.2 Prices indicated on the Price Schedule shall include all costs including taxes, insurances and delivery to the premises of the entity.

2.11.3 Prices quoted by the tenderer shall be fixed during the Tender's performance of the contract and not subject to variation on any account. A tender submitted with an adjustable price quotation will be treated as non-responsive and will be rejected, pursuant to paragraph 2.23.

2.11.4 The validity period of the tender shall be **90 days after** the date of opening of the tender.

2.12 Tender Currencies

2.12.1 Prices shall be quoted in Kenya Shillings or in another freely convertible currency.

2.13 Tenderers Eligibility and Qualifications

2.13.1 Pursuant to paragraph 2.1, the tenderer shall furnish, as part of its tender, documents establishing the tenderers eligibility to tender and its qualifications to perform the contract if its tender is accepted.

2.13.2 The documentary evidence of the tenderers eligibility to tender shall establish to the Procuring entity's satisfaction that the tenderer, at the time of submission of its tender, is from an eligible source country as defined under paragraph 2.1.

2.13.3 The documentary evidence of the tenderers qualifications to perform the contract if its tender is accepted shall be established to the Procuring entity's satisfaction;

- (a) that, in the case of a tenderer offering to supply goods under the contract which the tenderer did not manufacture or otherwise produce, the tenderer has been duly authorized by the goods' Manufacturer or producer to supply the goods.
- (b) that the tenderer has the financial, technical, and production capability necessary to perform the contract;
- (c) that, in the case of a tenderer not doing business within Kenya, the tenderer is or will be (if awarded the contract) represented by an Agent in Kenya equipped, and able to carry out the Tenderer's maintenance, repair, and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications.

2.14 Goods Eligibility and Conformity to Tender Documents

2.14.1 Pursuant to paragraph 2.2 of this section, the tenderer shall furnish, as part of its tender documents establishing the eligibility and conformity to the tender documents of all goods which the tenderer proposes to supply under the contract.

2.14.2 The documentary evidence of the eligibility of the goods shall consist of a statement in the Price Schedule of the country of origin of the goods and services offered which shall be confirmed by a certificate of origin issued at the time of shipment.

2.14.3 The documentary evidence of conformity of the goods to the tender documents may be in the form of literature, drawings, and data, and shall consist of:

- (a) a detailed description of the essential technical and performance characteristic of the goods;
- (b) a list giving full particulars, including available source and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods for a period of two (2) years, following commencement of the use of the goods by the Procuring entity (*if applicable*); and
- (c) Clause-by-clause commentary on the Procuring entity's Technical Specifications demonstrating substantial responsiveness of the goods and service to those specifications, or a statement of deviations and exceptions to the provisions of the Technical Specifications.

2.14.4 For purposes of the documentary evidence to be furnished pursuant to paragraph 2.14.3(c) above, the tenderer shall note that standards for workmanship, material, and equipment, as well as references to brand names or catalogue numbers designated by the Procurement entity in its Technical Specifications, are intended to be descriptive only and not restrictive. The tenderer may substitute alternative standards, brand names, and/or catalogue numbers in its tender, provided that it demonstrates to the Procurement entity's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

2.15 Tender Security

2.15.1 The tenderer shall furnish, as part of its tender, a tender security for the amount specified in clause 2.15.2 below.

2.15.2 The tender security shall be in the amount in the Appendix to Instructions to Tenderers.

2.15.3 The tender security is required to protect the Procuring entity against the risk of Tenderer's conduct which would warrant the security's forfeiture, pursuant to paragraph 2.15.7.

2.15.4 The tender security shall be denominated in Kenya Shillings or in another freely convertible currency, and shall be in the form of an on-demand bank guarantee issued by a reputable bank located in Kenya or where the bank is located abroad, it must have a local correspondent bank.

The Tender Security may also be in the form of an on-demand guarantee issued by a reputable insurance company approved by the Authority and in the form provided in the tender documents or another form acceptable to the Procuring entity.

The tender security must be valid for at least thirty (30) days beyond the validity of the tender.

2.15.5 Any tender not secured in accordance with paragraph 2.15.1 and 2.15.3 will be rejected by the Procuring entity as non-responsive, pursuant to paragraph 2.23.

2.15.6 Unsuccessful Tenderer's tender security will be discharged or returned as promptly as possible, but not later than thirty (30) days after the expiration of the period of tender validity prescribed by the Procuring entity.

2.15.7 The successful Tenderer's tender security will be discharged upon the tenderer signing the contract, pursuant to paragraph 2.30 and furnishing the performance security, pursuant to paragraph 2.31.

2.15.8 The tender security may be forfeited:

(a) if a tenderer withdraws its tender during the period of tender validity specified by the procuring entity on the Tender Form; or

(b) in the case of a successful tenderer, if the tenderer fails:

(i) to sign the contract in accordance with paragraph 2.30

Or

(ii) to furnish performance security in accordance with paragraph 2.31

2.16 Validity of Tenders

2.16.1 Tenders shall remain valid for **90 days after** the date of tender opening prescribed by the Procuring entity, pursuant to paragraph 2.16. A tender valid for a shorter period shall be rejected by the Procuring entity as non-responsive.

2.16.2 In exceptional circumstances, the Procuring entity may solicit the Tenderer's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The tender security provided under paragraph 2.15 shall also be

suitably extended. A tenderer may refuse the request without forfeiting its tender security. A tenderer granting the request will not be required nor permitted to modify its tender.

2.17 Format and Signing of Tender

- 2.17.1 The Tenderer shall prepare the **original** and two **copies of the tender**, clearly marking each **“ORIGINAL TENDER”** and **“COPY OF TENDER,”** as appropriate. In the event of any discrepancy between them, the original shall govern.
- 2.17.2 The original and all copies of the tender shall be typed or written in indelible ink and shall be signed by the tenderer or a person or persons duly authorized to bind the tenderer to the contract. **The latter authorization shall be indicated by written power-of-attorney accompanying the tender. All pages of the tender, except for un-amended printed literature, shall be initialed by the person or persons signing the tender.**
- 2.17.3 The tender shall have no interlineations, erasures, or overwriting except as necessary to correct errors made by the tenderer, in which case such corrections shall be initialed by the person or persons signing the tender.

2.18 Sealing and Marking of Tenders

- 2.18.1 The Tenderer shall seal the original and each copy of the tender in separate envelopes, duly marking the envelopes as **“ORIGINAL”** and **“COPY.”** The envelopes shall then be sealed in an outer envelope.
- 2.18.2 The inner and outer envelopes shall:
- (a) Be addressed to the Procuring entity at the address given in the Invitation to Tender:
 - (b) Bear, tender number and name in the Invitation for Tenders and the words, **“DO NOT OPEN BEFORE,” Monday, 5th February 2018 at 10.00 a.m.**
- 2.18.3 The inner envelopes shall also indicate the name and address of the tenderer to enable the tender to be returned unopened in case it is declared “late”.
- 2.18.4 If the outer envelope is not sealed and marked as required by paragraph 2.18.1, the Procuring entity will assume no responsibility for the tender’s misplacement or premature opening.

2.19 Deadline for Submission of Tenders

- 2.19.1 Tenders must be received by the Procuring entity at the address specified under paragraph 2.18.2 no later than **Monday, 5th February 2018 at 10.00 a.m.**
- 2.19.2 The Procuring entity may, at its discretion, extend this deadline for the submission of tenders by amending the tender documents in accordance with paragraph 2.7, in which case all rights and obligations of the Procuring entity and candidates previously subject to the deadline will therefore be subject to the deadline as extended

2.20 Modification and Withdrawal of Tenders

- 2.20.1 The tenderer may modify or withdraw its tender after the tender’s submission, provided that written notice of the modification, including substitution or withdrawal

- of the tenders, is received by the Procuring Entity prior to the deadline prescribed for submission of tenders.
- 2.20.2 The Tenderer's modification or withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of paragraph 2.18. A withdrawal notice may also be sent by cable, telex but followed by a signed confirmation copy, postmarked no later than the deadline for submission of tenders.
- 2.20.3 No tender may be modified after the deadline for submission of tenders.
- 2.20.4 No tender may be withdrawn in the interval between the deadline for submission of tenders and the expiration of the period of tender validity specified by the tenderer on the Tender Form. Withdrawal of a tender during this interval may result in the Tenderer's forfeiture of its tender security, pursuant to paragraph 2.15.7
- 2.20.5 The procuring entity may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.
- 2.20.6 The procuring entity shall give prompt notice of the termination to the tenderers and on request give its reasons for termination within 14 days of receiving the request from any tenderer.

2.21 Opening of Tenders

- 2.21.1 The Procuring entity will open all tenders in the presence of tenderers' representatives who choose to attend on **Monday, 5th February 2018 at 10.30 a.m.** and in the location specified in the Invitation to Tender.

The tenderers' representatives who are present shall sign a register evidencing their attendance.

- 2.21.2 The tenderers' names, tender modifications or withdrawals, tender prices, discounts and the presence or absence of requisite tender security and such other details as the Procuring entity, at its discretion, may consider appropriate, will be announced at the opening.
- 2.21.3 The Procuring entity will prepare minutes of the tender opening.

2.22 Clarification of Tenders

- 2.22.1 To assist in the examination, evaluation and comparison of tenders the Procuring entity may, at its discretion, ask the tenderer for a clarification of its tender. The request for clarification and the response shall be in writing, and no change in the prices or substance of the tender shall be sought, offered, or permitted.
- 2.22.2 Any effort by the tenderer to influence the Procuring entity in the Procuring entity's tender evaluation, tender comparison or contract award decisions may result in the rejection of the tenderers' tender.

2.23 Preliminary Examination of bid submissions

- 2.23.1 The Procuring entity will examine the tenders to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the tenders are generally in order.

2.23.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. If the candidate does not accept the correction of the errors, its tender will be rejected, and its tender security forfeited. If there is a discrepancy between words and figures the amount in words will prevail

2.23.3 The Procuring entity may waive any minor informality or non-conformity or irregularity in a tender which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any tenderer.

2.23.4 Prior to the detailed evaluation, pursuant to paragraph 2.25 the Procuring entity shall carry out a preliminary evaluation to determine completeness of the submissions to enable detailed assessment for the responsiveness.

2.23.5 If a tender is not substantially responsive, it will be rejected by the Procuring entity and may not subsequently be made responsive by the tenderer by correction of the non-conformity.

2.24 Conversion to Single Currency

2.24.1 Where other currencies are used, the procuring entity will convert these currencies to Kenya Shillings using the selling exchange rate on the date of tender closing provided by the Central Bank of Kenya.

2.25 Evaluation and Comparison of Tenders

2.25.1 The Procuring entity will evaluate and compare the tenders which have been determined to be substantially responsive, pursuant to paragraph 2.23.

2.25.2 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.

2.25.3 A tenderer who gives false information in the tender document about its qualification or who refuses to enter into a contract after notification of contract award shall be considered for debarment from participating in future public procurement.

2.26 Preference

2.26.1 Preference where allowed in the evaluation of tenders shall not exceed 15%.

2.26.2 KenGen may at its own discretion conduct due diligence on the eligible tenderers to establish their ability to perform the contract.

2.27 Contacting the Procuring entity

2.27.1 Subject to paragraph 2.21 no tenderer shall contact the Procuring entity on any matter related to its tender, from the time of the tender opening to the time the contract is awarded.

2.27.2 Any effort by a tenderer to influence the Procuring entity in its decisions on tender, evaluation, tender comparison, or contract award may result in the rejection of the Tenderer's tender.

2.28 Award of Contract

(a) Post-qualification

2.28.1 In the absence of pre-qualification, the Procuring entity will determine to its satisfaction whether the tenderer that is selected as having submitted the lowest evaluated responsive tender is qualified to perform the contract satisfactorily.

2.28.2 The determination will take into account the tenderer financial, technical, and production capabilities. It will be based upon an examination of the documentary evidence of the tenderers qualifications submitted by the tenderer, pursuant to paragraph 2.13.3 as well as such other information as the Procuring entity deems necessary and appropriate.

2.28.3 A positive determination will be a prerequisite for award of the contract to the tenderer. A negative determination will result in rejection of the Tenderer's tender, in which event the Procuring entity will proceed to the next lowest evaluated tender to make a similar determination of that Tenderer's capabilities to perform satisfactorily.

(b) Award Criteria

2.28.4 The Procuring entity will award the contract to the successful tenderer(s) whose tender has been determined to be substantially responsive and has been determined to be the lowest evaluated tender, provided further that the tenderer is determined to be qualified to perform the contract satisfactorily.

(c) Procuring entity's Right to Vary quantities

2.28.5 The Procuring entity reserves the right at the time of contract award to increase or decrease the quantity of goods originally specified in the Schedule of requirements without any change in unit price or other terms and conditions

(d) Procuring entity's Right to accept or Reject any or All Tenders

2.28.6 The Procuring entity reserves the right to accept or reject any tender, and to annul the tendering process and reject all tenders at any time prior to contract award, without thereby incurring any liability to the affected tenderer or tenderers or any obligation to inform the affected tenderer or tenderers of the grounds for the Procuring entity's action

2.29 Notification of Award

2.29.1 Prior to the expiration of the period of tender validity, the Procuring entity will notify the successful tenderer in writing that its tender has been accepted.

2.29.2 The notification of award will constitute the formation of the Contract but will have to wait until the contract is finally signed by both parties

2.29.3 Upon the successful Tenderer's furnishing of the performance security pursuant to paragraph 2.31, the Procuring entity will promptly notify each unsuccessful Tenderer and will discharge its tender security, pursuant to paragraph 2.15.

2.30 Signing of Contract

2.30.1 At the same time as the Procuring entity notifies the successful tenderer that its tender has been accepted, the Procuring entity will send the tenderer the Contract Form provided in the tender documents, incorporating all agreements between the parties.

2.30.2 The parties to the contract shall have it signed within **fifteen (15) days** from the date of notification of contract award unless there is an administrative review request.

2.30.3 Within **fifteen (15) days** of receipt of the Contract Form, the successful tenderer shall sign and date the contract and return it to the Procuring entity.

2.31 Performance Security

2.31.1 Within **fifteen (15) days** of the receipt of notification of award from the Procuring entity, the successful tenderer shall furnish the performance security in accordance with the Conditions of Contract, in the Performance Security Form provided in the tender documents, or in another form acceptable to the Procuring entity.

2.31.2 Failure of the successful tenderer to comply with the requirements of paragraph 2.30 or paragraph 2.31 shall constitute sufficient grounds for the annulment of the award and forfeiture of the tender security, in which event the Procuring entity may make the award to the next lowest evaluated Candidate or call for new tenders.

2.32 Corrupt or Fraudulent Practices

2.32.1 The Procuring entity requires that tenderers observe the highest standard of ethics during the procurement process and execution of contracts when used in the present regulations, the following terms are defined as follows;

(i) “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and

(ii) “fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Procuring entity, and includes collusive practice among tenderer (prior to or after tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the Procuring entity of the benefits of free and open competition;

2.32.2 The procuring entity will reject a proposal for award if it determines that the tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.

2.32.3 Further a tenderer who is found to have indulged in corrupt or fraudulent practices risks being debarred from participating in public procurement in Kenya.

Appendix to Instructions to Tenderers

The following information regarding the particulars of the tender shall complement supplement or amend the provisions of the instructions to tenderers. Wherever there is a conflict between the provision of the instructions to tenderers and the provisions of the appendix, the provisions of the appendix herein shall prevail over those of the instructions to tenderers

INSTRUCTIONS TO TENDERERS REFERENCE	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
2.11.4 & 2.16.1	Tender validity shall be 120 days from the closing/opening date.
2.15.2	<p>The tenderer shall furnish, as part of its tender, tender security in the amount of:</p> <ul style="list-style-type: none"> • KES. 40,000.00 for Furniture and fittings slotted for phase 1 delivery and • KES. 960,000.00 for Calibration Equipment and services slotted for phase 2 <p style="text-align: center;">OR an easily convertible currency</p> <p>BOTH Valid for 150 days from Tender opening date. The securities MUST be issued by a local corresponding bank.</p>
2.17.1/ 2.18.1	The number of copies of the bid document required one (1) original and two copies.
2.18.1/19.1/21.1	Monday, 5th February 2018 at 10.00 a.m.
2.23.1 / 2.24.1	<p>The following shall be the evaluation Criteria</p> <p>1. Preliminary evaluation Requirements:</p> <ul style="list-style-type: none"> a) Duly completed tender form b) Valid Tender Security c) Duly completed price schedule d) Duly completed Technical Schedule and Technical Data form in Section VII e) Manufacturer's authorization for all equipment supplied f) Certificate of incorporation/registration g) Valid business permit from country of origin h) Valid Tax Compliance Certificate from the country of origin i) Confidential business questionnaire duly completed as provided j) Evidence of attendance of pre-tenderers' meeting k) Pagination of AL pages the bid document, from the first paper/page to the last, including pages already paginated by KenGen and all attachments and <p>Bidders who do not meet all the mandatory requirements will be disqualified at this stage and will not be considered for technical evaluation.</p> <p>2. Technical Evaluation Criteria</p> <p>(a) As a minimum, the equipment must meet stipulated requirements in ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories", IEC 61557/ IEC 62061 international standard or any other applicable traceable International standards.</p>

	<p>(b) As a minimum, the equipment must meet descriptive technical specifications as tabulated in section V below and calibrate the listed KenGen Equipment in Section VI.</p> <p>(c) Proof that equipment manufacturer is globally re-known, is established, has been supplying similar equipment for the past twenty (20) years and is committed to offer technical support, at least 3 years re-calibration support and spares for a period of at least 2 years from commissioning.</p> <p>(d) The technology should not be obsolete at the time of commissioning.</p> <p>(e) Tenderers must attach a catalogue indicating the equipment they intend to supply and highlight the relevant pictures and tabulate a clause by clause description of the items against the specified requirements.</p> <p>(f) Tenderers are advised to strictly adhere to the outlined format in the technical schedule when making an offer; deviations will be deemed to be non-responsive.</p> <p>(g) Indicate the relevant technical characteristics of your offer in an itemized manner as tabulated in the technical schedule.</p> <p>(h) The winning tenderer must supply the brand that is highlighted in the submitted catalogue failure to which will lead to rejection during inspection of the delivery.</p> <p>(i) The equipment will be subjected to factory acceptance tests approval by KenGen at the country of origin manufacturing facility prior to shipment in accordance to agreement following award.</p> <p>(j) All items will be subjected to functional and performance test on delivery prior to acceptance and hand over to KenGen.</p> <p>(k) The winning tenderer will be required to train five (5) KenGen staff for a period of at least 3 weeks at manufacturer's plant, in order to enable client engineers understand the equipment design, operation and maintenance of the equipment successfully. Factory acceptance testing shall proceed after the training.</p> <p>(l) The training shall cover both theory and practical aspects of the calibration equipment. The content of the training will include general theory on calibration and adjustment, specific theory related to particular equipment supplied and practical lessons on operating and maintaining equipment supplied.</p> <p>(m) The experience of the firm: The Tenderer (or in the case of a Joint Venture the lead Partner) shall meet the following minimum criteria:</p> <ol style="list-style-type: none"> i. Performance as prime contractor in the execution of at least five projects of nature, complexity and volume comparable to the proposed contract over the last eight years. Tenderer MUST attach at least five duly signed award and completion certificates of similar projects in value & complexity. Documents attached must show the value and scope of the project. ii. The tenderer MUST have designed, manufactured, installed and commissioned during the last 8 years at least 5 calibration work bench. The tenderer shall provide the names and addresses of the clients who have purchased these systems, and the names, telephone and telefax numbers of a senior manager employed by each client from whom references can be obtained in English language.
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	<p>iii. The tenderer must have a Quality Assurance System implemented according to the requirements in the ISO 9001 standard or equivalent. Tenderers that are not certified to the ISO 9001 standard must submit details of their Quality Assurance System demonstrating their substantive compliance with this standard or equivalent.</p> <p>(n) Deviations from specifications</p> <ol style="list-style-type: none"> i. All deviations from specifications shall be stated in the deviations from specifications form. No deviations from employer specification shall be acceptable unless specifically indicated in the offer in the relevant schedule. All deviations shall be clearly spelt out by the Tenderer and the price implications thereof. ii. Employer shall choose to accept or reject the bid offer if the deviations are beyond what is acceptable by the client. <p>(o) Project preliminary designs The tenderer shall present in the tender document and submit drawings to show;-</p> <ol style="list-style-type: none"> i. How the various components are integrated in the proposal ii. That software is user-friendly and easily upgradable. iii. Modular design. iv. Calibration equipment brochures, workbench and Centre layout drawings. <p>(p) Spare parts and after sales service facilities</p> <ol style="list-style-type: none"> i. Tenderers must offer serviceable items and spare parts. Documentary evidence and locations of such spares must be given. Where a tenderer offers items without such spares in the country, documentary evidence must be given and assurance that adequate spares for items supplied will be provided. ii. The tenderer shall also guarantee supply of maintenance spares and services. iii. The tenderer shall guarantee repair of calibration equipment for a period of 15 years. <p>(q) Warranty A warranty period of not less than 2 years shall be offered by the tenderer.</p> <p>(r) Software and other necessary licenses</p> <ol style="list-style-type: none"> i. Tenderer shall demonstrate that all software, licenses and application programs used by the supplied equipment, required to interrogate supplied equipment or required for testing, maintenance and commissioning of supplied equipment shall be handed over to the client. ii. Tenderer shall demonstrate that all programs/applications developed specifically for the project or required for the working of the products supplied e.g. calibration equipment software, certificate and sticker printer, etc. and the intellectual property associated shall be handed over to the client after commissioning. <p>(s) Financial Capacity</p> <ol style="list-style-type: none"> i. Minimum average annual turnover of USD 1 million, calculated as total certified payments received for contracts in progress or completed, within the last three (3) years. ii. Tenderers are advised to strictly adhere to the format indicated in Section VIII (Price Schedule of Goods and Services); i.e. itemized unit cost of each calibration module and equipment, training package plus applicable charges, freight, tax, duties and total cost DDP to Tana Power Station.
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	<p><u>NOTE: Technical responsiveness shall be determined using PASS or FAIL methodology against ALL the above stated parameters. Bidders must PASS on all to be considered as technically compliant and proceed for price/financial evaluation.</u></p> <p>3. Financial Evaluation Criteria</p> <p>(a) Tenderers are advised to strictly adhere to the format indicated in Section VIII (Price Schedule of Goods and Services); i.e. itemized unit cost of each calibration module and equipment, training package plus applicable charges, freight, tax, duties and total cost DDP to Tana Power Station.</p> <p>(b) Tenderers must quote for ALL items indicated in the technical and financial schedules to be considered responsive; any quote that does not meet this threshold will be considered to be non-responsive and will lead to disqualification.</p> <p>(c) Award shall be to the lowest evaluated bidder of the lot.</p>
2.28.1	KenGen will conduct due diligence on the eligible bidders to establish their ability to perform the contract.

SECTION III: GENERAL CONDITIONS OF CONTRACT

Table of Clauses

- 3.1 Definitions
- 3.2 Application
- 3.3 Country of Origin
- 3.4 Standards
- 3.5 Use of Contract documents and information
- 3.6 Patent Rights
- 3.7 Performance security
- 3.8 Inspection and Tests
- 3.9 Packing
- 3.10 Delivery and documents
- 3.11 Insurance
- 3.12 Payment
- 3.13 Price
- 3.14 Assignments
- 3.15 Sub contracts
- 3.16 Termination for default
- 3.17 Liquidated damages
- 3.18 Resolution of Disputes
- 3.19 Language and law
- 3.20 Force Majeure
- 3.21 Taxes

3.1 Definitions

3.1.1 In this Contract, the following terms shall be interpreted as indicated:-

- (a) “The Contract” means the agreement entered into between the Procuring entity and the tenderer, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- (b) “The Contract Price” means the price payable to the tenderer under the Contract for the full and proper performance of its contractual obligations
- (c) “The Goods” means all of the equipment, machinery, and/or other materials, which the tenderer is required to supply to the Procuring entity under the Contract.
- (d) “The Procuring entity” means the organization purchasing the Goods under this Contract.
- (e) “The Tenderer” means the individual or firm supplying the Goods under this Contract.

3.2 Application

3.2.1 These General Conditions shall apply in all Contracts made by the Procuring entity for the procurement installation and commissioning of equipment.

3.3 Country of Origin

- 3.3.1 For purposes of this clause, “Origin” means the place where the Goods were mined, grown or produced.
- 3.3.2 The origin of Goods and Services is distinct from the nationality of the tenderer.

3.4 Standards

- 3.4.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications.

3.5 Use of Contract Documents and Information

- 3.5.1 The tenderer shall not, without the Procuring entity’s prior written consent, disclose the Contract, or any provision therefore, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Procuring entity in connection therewith, to any person other than a person employed by the tenderer in the performance of the Contract.
- 3.5.2 The tenderer shall not, without the Procuring entity’s prior written consent, make use of any document or information enumerated in paragraph 3.5.1 above
- 3.5.3 Any document, other than the Contract itself, enumerated in paragraph 3.5.1 shall remain the property of the Procuring entity and shall be returned (all copies) to the Procuring entity on completion of the Tenderer’s performance under the Contract if so required by the Procuring entity.

3.6 Patent Rights

- 3.6.1 The tenderer shall indemnify the Procuring entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the Procuring entity’s country.

3.7 Performance Security

- 3.7.1 Within **fifteen (15) days** of receipt of the notification of Contract award, the successful tenderer shall furnish to the Procuring entity the performance security in the amount specified in Special Conditions of Contract.
- 3.7.2 The proceeds of the performance security shall be payable to the Procuring entity as compensation for any loss resulting from the Tenderer’s failure to complete its obligations under the Contract.
- 3.7.3 The performance security shall be denominated in the currency of the Contract, or in a freely convertible currency acceptable to the Procuring entity and shall be in the form of a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in Kenya or abroad, acceptable to the Procuring entity, in the form provided in the tender documents.
- 3.7.4 The performance security will be discharged by the Procuring entity and returned to the Candidate not later than thirty (30) days following the date of completion of the Tenderer’s performance obligations under the Contract, including any warranty obligations, under the Contract.

3.8 Inspection and Tests

- 3.8.1 The Procuring entity or its representative shall have the right to inspect and/or to test the goods to confirm their conformity to the Contract specifications. The Procuring entity shall notify the tenderer in writing in a timely manner, of the identity of any representatives retained for these purposes.
- 3.8.2 The inspections and tests may be conducted in the premises of the tenderer or its subcontractor(s), at point of delivery, and/or at the Goods' final destination. If conducted on the premises of the tenderer or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Procuring entity.
- 3.8.3 Should any inspected or tested goods fail to conform to the Specifications, the Procuring entity may reject the equipment, and the tenderer shall either replace the rejected equipment or make alterations necessary to make specification requirements free of costs to the Procuring entity.
- 3.8.4 The Procuring entity's right to inspect, test and where necessary, reject the goods after the Goods' arrival shall in no way be limited or waived by reason of the equipment having previously been inspected, tested and passed by the Procuring entity or its representative prior to the equipment delivery.
- 3.8.5 Nothing in paragraph 3.8 shall in any way release the tenderer from any warranty or other obligations under this Contract.

3.9 Packing

- 3.9.1 The tenderer shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract.
- 3.9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract.

3.10 Delivery and Documents

- 3.10.1 Delivery of the Goods shall be made by the tenderer in accordance with the terms specified by Procuring entity in its Schedule of Requirements and the Special Conditions of Contract

3.11 Insurance

- 3.11.1 The Goods supplied under the Contract shall be fully insured against loss or damage incidental to manufacturer or acquisition, transportation, storage, and delivery in the manner specified in the Special conditions of contract.

3.12 Payment

- 3.12.1 The method and conditions of payment to be made to the tenderer under this Contract shall be specified in Special Conditions of Contract.
- 3.12.2 Payments shall be made promptly by the Procuring entity as specified in the contract.

3.13 Prices

- 3.13.1 Prices charged by the tenderer for goods delivered and services performed under the Contract shall not, with the exception of any price adjustments authorized in Special Conditions of Contract, vary from the prices by the tenderer in its tender.
- 3.13.2 Contract price variations shall not be allowed for contracts not exceeding one year (12 months).
- 3.13.3 Where contract price variation is allowed, the variation shall not exceed 25% of the original contract price.
- 3.13.4 Price variation request shall be processed by the procuring entity within 30 days of receiving the request.

3.14. Assignment

- 3.14.1 The tenderer shall not assign, in whole or in part, its obligations to perform under this Contract, except with the Procuring entity's prior written consent.

3.15 Subcontracts

- 3.15.1 The tenderer shall notify the Procuring entity in writing of all subcontracts awarded under this Contract if not already specified in the tender. Such notification, in the original tender or later, shall not relieve the tenderer from any liability or obligation under the Contract.

3.16 Termination for default

- 3.16.1 The Procuring entity may, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the tenderer, terminate this Contract in whole or in part.
 - (a) If the tenderer fails to deliver any or all of the goods within the period(s) specified in the Contract, or within any extension thereof granted by the Procuring entity.
 - (b) If the tenderer fails to perform any other obligation(s) under the Contract.
 - (c) If the tenderer, in the judgment of the Procuring entity has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.
- 3.16.2 In the event the Procuring entity terminates the Contract in whole or in part, it may procure, upon such terms and in such manner as it deems appropriate, equipment similar to those undelivered, and the tenderer shall be liable to the Procuring entity for any excess costs for such similar goods.

3.17 Liquidated Damages

- 3.17.1. If the tenderer fails to deliver any or all of the goods within the period(s) specified in the contract, the procuring entity shall, without prejudice to its other remedies under the contract, deduct from the contract prices liquidated damages sum equivalent to 0.5% of the delivered price of the delayed items up to a maximum

deduction of 10% of the delayed goods. After this the tenderer may consider termination of the contract.

3.18 Resolution of Disputes

3.18.1 The procuring entity and the tenderer shall make every effort to resolve amicably by direct informal negotiation and disagreement or dispute arising between them under or in connection with the contract.

3.18.2 If, after thirty (30) days from the commencement of such informal negotiations both parties have been unable to resolve amicably a contract dispute, either party may require adjudication in an agreed national or international forum, and/or international arbitration.

3.19 Language and Law

3.19.1 The language of the contract and the law governing the contract shall be English language and the Laws of Kenya respectively unless otherwise stated.

3.20 Force Majeure

3.20.1 The tenderer shall not be liable for forfeiture of its performance security or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

3.21 Taxes

3.21.1 "Taxes" means all present and future taxes, levies, duties, charges, assessments, deductions or withholdings whatsoever, including any interest thereon, and any penalties and fines with respect thereto, wherever imposed, levied, collected, or withheld pursuant to any regulation having the force of law and "Taxation" shall be construed accordingly.

Local Taxation

3.21.2 Nothing in the Contract shall relieve the Contractor and/or his Sub-Contractors from their responsibility to pay any taxes, statutory contributions and levies that may be levied on them in Kenya in respect of the Contract. The Contract Price shall include all applicable taxes and shall not be adjusted for any of these taxes.

3.21.3 The Contractor shall be deemed to be familiar with the tax laws in the Employer's Country and satisfied themselves with the requirements for all taxes, statutory contributions and duties to which they may be subjected during the term of the Contract.

3.21.4 In instances where discussions are held between the Employer and the Contractor regarding tax matters, this shall not be deemed to constitute competent advice and hence does not absolve the Contractor of their responsibility in relation to due diligence on the tax issue as per 3.21.2 above.

Tax Deduction

- 3.21.5 If the Employer is required to make a tax deduction by Law, then the deduction shall be made from payments due to the Contractor and paid directly to the Kenya Revenue Authority. The Employer shall upon remitting the tax to Kenya Revenue Authority furnish the Contractor with the relevant tax deduction certificates.
- 3.21.6 Where the Contractor is paid directly by the Financiers and the Employer is not able to deduct tax, then the Contractor will be required to pay the tax deduction to Kenya Revenue Authority in the name of the Employer and furnish the Employer with an original receipt thereof as evidence of such payment. In absence of the said evidence, the Employer will not process any subsequent payments to the Contractor.

Tax Indemnity

- 3.21.7 The Contractor shall indemnify and hold the Employer harmless from and against any and all liabilities, which the Employer may incur for any reason of failure by the Contractor to comply with any tax laws arising from the execution of the Contract whether during the term of the Contract or after its expiry.
- 3.21.8 The Contractor warrants to pay the Employer (within fourteen (14) days of demand by the Employer), an amount equal to the loss, liability or cost which the Employer determines has been (directly or indirectly) suffered by the Employer for or on account of the Contractor's Tax liability arising from the Contract.
- 3.21.9 Where the amount in 3.21.8 above remains unpaid after the end of the fourteen (14) days moratorium, the Employer shall be entitled to compensation for financing charges.

SECTION IV: SPECIAL CONDITIONS OF CONTRACT

- 4.1. Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, between the GCC and the SCC, the provisions of the SCC herein shall prevail over these in the GCC.
- 4.2. Special conditions of contract as relates to the GCC

REFERENCE OF GCC	SPECIAL CONDITIONS OF CONTRACT															
3.3.2	<i>Indicate Country of origin.</i>															
3.7.1	<i>Performance Security shall be 10% of the Contract Price, in form of a local bank's unconditional guarantee.</i>															
3.7.4	<i>The tenderer shall be required to expressly confirm that the goods supplied shall be under 24months warranty.</i>															
3.9.1	<i>The equipment shall be packed in a non-returnable wooden or plastic crate or any other packaging that will protect the Goods from damage and interference by other parties.</i>															
3.10.1	<p><i>Delivery and Documents</i> <i>Delivery of the project equipment shall be in two phases as specified in the table below. Items scheduled for Phase 1 shall be delivered during the 2017-2018 financial year, which ends in June 2018.</i> <i>Items scheduled for Phase 2 shall be delivered during the 2018-2019 financial year, which commences in July 2018</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Item</i></th> <th style="text-align: center;"><i>Phase</i></th> <th style="text-align: center;"><i>Delivery Period</i></th> </tr> </thead> <tbody> <tr> <td><i>Supply and Assembly of Calibration Centre furniture as per specifications detailed in this Tender</i></td> <td style="text-align: center;"><i>Phase 1</i></td> <td style="text-align: center;"><i>Before June 2018</i></td> </tr> <tr> <td><i>Study, Design, Manufacture, Delivery and Installation of Calibration Equipment and accessories.</i></td> <td style="text-align: center;"><i>Phase 2</i></td> <td style="text-align: center;"><i>After June 2018</i></td> </tr> <tr> <td><i>FAT, Factory and Onsite Training</i></td> <td style="text-align: center;"><i>Phase 2</i></td> <td style="text-align: center;"><i>After June 2018</i></td> </tr> <tr> <td><i>Documentation Delivery</i></td> <td style="text-align: center;"><i>Phase 2</i></td> <td style="text-align: center;"><i>After June 2018</i></td> </tr> </tbody> </table>	<i>Item</i>	<i>Phase</i>	<i>Delivery Period</i>	<i>Supply and Assembly of Calibration Centre furniture as per specifications detailed in this Tender</i>	<i>Phase 1</i>	<i>Before June 2018</i>	<i>Study, Design, Manufacture, Delivery and Installation of Calibration Equipment and accessories.</i>	<i>Phase 2</i>	<i>After June 2018</i>	<i>FAT, Factory and Onsite Training</i>	<i>Phase 2</i>	<i>After June 2018</i>	<i>Documentation Delivery</i>	<i>Phase 2</i>	<i>After June 2018</i>
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<i>Study, Design, Manufacture, Delivery and Installation of Calibration Equipment and accessories.</i>	<i>Phase 2</i>	<i>After June 2018</i>														
<i>FAT, Factory and Onsite Training</i>	<i>Phase 2</i>	<i>After June 2018</i>														
<i>Documentation Delivery</i>	<i>Phase 2</i>	<i>After June 2018</i>														
3.12.1	<p><i>Payment</i> <i>Payment shall be made through an unconfirmed Letter of Credit. The Contractor shall be required to meet the Letter of Credit charges in the Contractor's country where applicable. Any extensions/ amendment charges that may result due to the Contractor's delays or mistakes shall be to the Contractor's account.</i> <i>Local suppliers shall be paid through Electronic Funds Transfer.</i> <i>Payment terms shall be 60 days from the date of invoice.</i> <i>Should the Contractor require a confirmed letter of credit, then all confirmation charges both in and outside Kenya shall be to the Contractor's account.</i></p> <p><i>Breakdown of payment shall be as follows:</i></p> <ol style="list-style-type: none"> <i>i. 5% of Contract Price on delivery of all specified Furniture to site.</i> <i>ii. 45% of Contract Price on delivery of all equipment to site, completion of Factory tests and factory training.</i> <i>iii. 40% of Contract Price upon successful erection, commissioning of the Calibration centre, and onsite training for which a Taking over Certificate has been issued in relation to the works</i> <i>iv. 5% of Contract Price on submission of all Documentation</i> <i>v. 5% of Contract Price on expiry of Warranty period.</i> 															

	<p><i>Applications for Payment may be made by the Contractor to the Engineer as set out below:</i></p> <ul style="list-style-type: none"> <i>i. The application in respect of the shipment shall identify the Equipment shipped, state the amount claimed and be accompanied by such documentation as the Engineer may require including:-</i> <ul style="list-style-type: none"> <i>(a) Original Invoice identifying the amount claimed against the appropriated subdivisions of the Schedule of Prices.</i> <i>(b) Shipping Specification and Packing List.</i> <i>(c) Original Bill of Lading or Air Waybill.</i> <i>(d) Factory inspection Certificate.</i> <i>(e) Clean report of FAT finding.</i> <i>ii. The application in respect of work carried on site shall identify the work done, state the amount claimed and be accompanied by such documentation as the Engineer may require including:-</i> <ul style="list-style-type: none"> <i>(a) Original Invoice identifying the amount claimed against the appropriate subdivisions of the Schedule of Prices.</i> <i>(b) Statement of Work showing the work done.</i> <i>iii. Any other application for payment certificates shall identify the requirement for payment, state the amount claimed and be accompanied by such documentation including:</i> <ul style="list-style-type: none"> <i>(a) Original Invoice identifying the amount claimed against the appropriate subdivisions of the Schedule of Prices.</i> <i>(b) Supporting Documents such as copy of Certificates where applicable.</i> <p><i>Taxes</i> <i>The employer shall withhold any taxes from the contractor's payments as provided for in the Kenyan Tax law and issue the suppliers/contractors with withholding tax certificates.</i></p>
3.13.1	<i>Prices shall remain fixed for the duration of the contract.</i>
3.18.2	<i>Arbitration where necessary shall be by the Chartered Institute of Arbitrators Kenya Chapter or other International body.</i>

SECTION V: SCHEDULE OF REQUIREMENTS

5.1 LIST OF ABBREVIATIONS

AC	Alternating Current
AM	Amplitude Modulation
ASL	Above Sea Level
BNC	Bayonet Neill-Concelman
BS	British Standard
BSP	British Standard Pipe
CDP	Conical Prismatic Screen
CV	Curriculum Vitae
DC	Direct Current
DMM	Digital Multi meters
DUT	Device Under Test
EN	European Standard
ESD	Electrostatic Discharge
EXW	Ex-Works
FAT	Factory Acceptance Test
FM	Frequency Modulation
FSK	Frequency Shift Keying
GB	Giga Byte
HD	High Definition
HDMI	High-Definition Multi Media Interface
IEPE	Integrated Electronic Piezoelectric
ID	Identification
ITS	International Temperature Scale
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MS	Micro Soft
No.	Number
NPT	National Pipe Thread
OS	Operating system
PC	Personal Computer
PDF	Portable Document Format
PTFE	Polytetrafluoroethylene
PM	Pulse Modulation
PWM	Pulse Width Modulation
PTB	Physikalisch-Technische Bundesanstalt
PSI	Pound per Square Inch
RAM	Random Access Memory
RCL	Resistance Capacitance Inductance
RTD	Resistance Temperature Detector
RW DVD	Read Write Digital Versatile Disk
SAT	Site Acceptance Test
SPRT	Standard Platinum Resistance Thermometer
SSD	Solid state Device
TFT	Thin-Film Transistor
UoM	Unit of Measure
UDL	Uniform Distributed Load
USB	Universal Serial Bus
UPS	Uninterruptible Power Supply

5.2 INTRODUCTION

- 5.2.1 KenGen is the largest power generation company in Kenya producing about 70% of the electricity consumed in the country.
- 5.2.2 KenGen power stations have a wide range of test equipment and precision calibration equipment used to ascertain the functionality and accuracy of protection equipment, plant indication and process control instruments. Calibration of equipment and instruments aids the Engineers to determine the status of the instruments under test and also guide in decision making.
- 5.2.3 KenGen is an ISO certified company, hence it is mandatory to calibrate test equipment in order to abide by Quality Management System ISO 9001:2008 that requires measuring equipment to be calibrated so as to ensure valid measurement results.
- 5.2.4 In order to improve calibration processes, KenGen wishes to receive tenders for modular console calibration work bench in line with the detailed specification outlined in this tender document.
- 5.2.5 This tender looks for a calibration workbench package designed to provide KenGen with a turnkey solution to calibrate and if possible adjust instruments and devices to manufactures' specifications for use across industries.
- 5.2.6 The Calibration Centre equipment will consist of an industrial grade workbench with modular consoles that enable the user to perform instrument calibration and testing applications in one workspace, in line with the detailed specification outlined in this tender document.
- 5.2.7 The Calibration bench shall offer efficient and ergonomic facilities for the calibration and maintenance of test equipment.
- 5.2.8 The tender will include training on use and maintenance of the supplied calibration equipment, calibration of equipment outlined in this tender document.
- 5.2.9 Delivery of equipment shall be in two phases as specified in the table below.

Items scheduled for Phase 1 shall be delivered during the 2017-2018 financial year, which ends in June 2018.

Items scheduled for Phase 2 shall be delivered during the 2018-2019 financial year, which commences in July 2018.

Item	Phase	Delivery Period
Supply and Assembly of Calibration Centre furniture as per specifications detailed in this Tender	Phase 1	Before June 2018
Study, Design, Manufacture, Delivery and Installation of Calibration Equipment and accessories.	Phase 2	After June 2018
FAT, Factory and Onsite Training	Phase 2	After June 2018
Documentation Delivery	Phase 2	After June 2018

- 5.2.10 The calibration bench shall be capable of calibrating:
- 5.2.10.1 Electrical/ frequency parameters: digital multimeters, AC/DC signal sources, clamp meters, data loggers, tachometers, ohmmeters, resistance decade boxes, RCL meters, conductance meters, inductance meters, phase rotation meters, power meters and analyzers, function generators, insulation testers, oscilloscopes, frequency meters, frequency counters, timer counters, non-contact voltage detectors.
 - 5.2.10.2 Pressure: pressure Gauges, pressure calibrators, transducers, transmitters, indicators, switches, valves, pressure controllers, manometers, and chart recorders.
 - 5.2.10.3 Temperatures: temperature sensors, indicators, thermocouple and RTD transmitters, recorders, temperature controllers, thermometers, process calibrators and thermistors.
- 5.2.11 Detailed technical proposals must be submitted with the bid and separate tender form.

5.3 SCOPE OF PROJECT

The scope of the project shall include the design, manufacture, factory acceptance testing, and supply to site, installation and commissioning of Calibration Centre equipment. Technical support and Training shall also be part of the scope.

The scope of this tender shall include but not limited to the listed functions:

- 5.3.1 Study of KenGen's calibration needs.
- 5.3.2 Design of Calibration Centre equipment modules. These shall incorporate power supply modules, AC/DC Multi-functional calibrators, Insulation resistance Tester Calibrator, micro-ohm meter calibrator, temperature calibrator, pressure calibration modules, function generator modules, flow meter calibration modules, vibration sensor/transducer module, accessories and any other necessary module as per the study.
- 5.3.3 Manufacture & supply of Calibration Centre equipment to meet KenGen Calibration needs specified in this specification.
- 5.3.4 Factory training for client engineers at manufacturer's factory prior to factory acceptance testing
- 5.3.5 Factory acceptance testing by client engineers at manufacturer's factory of calibration equipment and fully assembled calibration workbench.
- 5.3.6 Packing for transport; insuring; shipping & delivering to Site of the calibration workbench and furniture in the two phases specified in 5.2.9
- 5.3.7 Supply of all accessories which are necessary for satisfactory operation of the calibration equipment though not individually or specifically mentioned herein.

- 5.3.8 Installation, Testing and commissioning of the assembled calibration workbench and furnishing of test certificates.
- 5.3.9 On job training and after commissioning training as detailed in the specifications.
- 5.3.10 Preparation of drawings and technical documentation as detailed in the specifications and furnishing to the client in softcopy as well as hardcopy (both A3 & A4 sizes for drawings).
- 5.3.11 Provision of all final documentation and warranty for supplied calibration equipment.
- 5.3.12 Provision of computers and a color laser jet multifunctional printer.
- 5.3.13 Supply of software with licenses for all calibration modules and computers supplied. This shall include software required for interrogating the calibration modules via a portable computer, software loaded in the calibration modules & computers and all application programs made specifically for the project running on the calibration modules & computers.
- 5.3.14 Technical support for a period of at least two (2) years. This shall include but not be limited to telephone and email support, on-site repairs, software updates and maintaining of licenses.
- 5.3.15 Provision of annual calibration services for three (3) years.
- 5.3.16 Provision of spare parts, and consumables specified in this tender document.
- 5.3.17 Any other works and supply which are not specified above but are necessary to complete the job shall be the responsibility of the contractor. The contractor shall itemize these equipment and services in the offer.

5.4 TECHNICAL REQUIREMENTS

REQUIRED SPECIFICATIONS
<p>GENERAL ITEM DESCRIPTION</p> <p>The tenderer shall provide calibration and testing equipment, with pre-installed relevant software in a laptop, colour laser jet multifunctional printer, mandatory spares, furniture and annual calibration services for the supplied equipment for three (3) years.</p> <p>The calibration equipment shall be designed to ensure continuity of operation under all working conditions and to facilitate inspection, maintenance and repairs.</p> <p>All reasonable precautions shall be taken in the design of the equipment to ensure safety of all personnel concerned with the operation and maintenance of the equipment.</p> <p>The supplied equipment shall be installed within a maximum space of 10m x 10m which will be contained in a larger warehouse. The tenderer will be responsible for partitioning and conditioning the room according to ISO/IEC 17025 standard.</p>

The equipment shall withstand, without impairing the component function, the following ambient conditions:

- a) Operating Temperature range: +5 °C to + 40°C
- b) Storage Temperature range: -10°C to 50°C
- c) Maximum Relative humidity: 85 % at 40°C
- d) Operating Altitude: 2000m ASL

The dew-point shall not be reached. If necessary, special measures shall be taken [cooling, fanning].

Application

The calibration centre equipment will consist of industrial grade workbench with modular consoles containing various testing and calibration equipment that enable the user to perform instrument calibration and testing applications in one workspace.

The calibration bench shall be capable of calibrating:

- Electrical/ frequency parameters: digital multimeters, AC/DC signal sources, clamp meters, data loggers, tachometers, ohmmeters, resistance decade boxes, RCL meters, conductance meters, inductance meters, phase rotation meters, power meters and analysers, function generators, insulation testers, oscilloscopes, frequency meters, frequency counters, timer counters, non-contact voltage detectors.
- Pressure: pressure Gauges, pressure calibrators, transducers, transmitters, indicators, switches, valves, pressure controllers, manometers, and chart recorders.
- Temperatures: temperature sensors, indicators, thermocouple and RTD transmitters, recorders, temperature controllers, thermometers, process calibrators and thermistors.

Standards

The Tenderer shall specifically state the Precise Standard, complete with identification number, to which the various equipment are manufactured.

Ratings, characteristics, tests and test procedures, etc. for the electrical equipment encompassed by this Specification shall comply with the provisions and requirements of British standards (BS) and standards of the International Electro-technical Commission (IEC) Or International Electrical & Electronic Engineers (IEEE) unless otherwise stated in Particular Technical Specifications.

Other recognized national and international standards

- a) American National Standards Institute -ANSI
- b) International standardization organization - ISO
- c) Japanese Industrial Standards – JIS
- d) Japanese Electro-technical Commission – JEC
- e) German DIN
- f) American Society of Mechanical Engineers Relevant Test Codes and Appendices – ASME
- g) American Society for Testing and Materials –ASTM

Work bench Characteristics

The calibration bench shall have a console, a perforated panel section and bench with back plates and drawers. A wide range of modules shall be fitted to the primary console creating a highly flexible system that is both functional and easy to use.

To allow for future expansion, five (5) extra slots shall be provided on the workbench console in positions that will be approved during design phase.

Calibration equipment and control screen display shall be mounted flush on front of panel of primary console.

Calibration work bench shall have a mains power on/off switch to provide isolation for the entire bench.

The calibration bench worktop surfaces shall be hard wearing, resistant to water, oils and chemicals. They shall be made of particle board core with 1.2mm zinc coated steel cladding.

Each Calibration workbench shall be protected from Electrostatic discharge, using ESD workstation kits and mats.

All metallic parts of the bench shall be connected to mains earth.

The workbench finishing shall be in RAL7035 light grey.

The work bench shall be equipped with an ergonomic padded under worktop tray system with a slide away feature to keep the keyboard and mouse off the work surface. The keyboard tray shall allow easy angle adjustment and locking mechanism.

The perforated panel section shall be equipped with:

- shelves to provide convenient storage areas for tools and parts
- a kit containing single hooks, double hooks and spring clips
- spanner holder
- screwdriver holders
- Allen-key holder
- A4 document holder

Workbench lighting

The workbench shall have under console lighting fitted with LED luminaire of approximately 1000lux.

It shall be fitted with CDP screen and shall be glare and flicker free.

The lighting shall have a lifetime of at least 50,000hrs.

A lighting switch shall be supplied to provide separate control of the worktop lighting (under console).

Workbench drawer units

One workbench shall have a suspended five (5) drawer unit made of reinforced welded steel, while the other workbench shall be a premium grade combination drawer and cabinet unit for industrial use.

Each drawer unit shall come lined with rubber matting.

Each drawer shall have recessed handles for flash finish with a trigger lock mechanism.

The drawer unit finishing shall be done using RAL7035 light grey and RAL 4006 Purple and/or RAL2000 Yellow Orange Drawer front. This shall be approved during design phase.

The 5 drawer unit shall have a central locking system.

The cabinet shall have one internal shelf lined with rubber matting.

Drawer divider kits shall be provided to partition the inside of drawers. The divider kits shall be configured in to 3, 6 and 9 compartments respectively for three of the drawers.

Workbench temperature calibrator bath holder

An under worktop fitting shall be provided for each workbench to house the temperature calibrator baths.

They shall be ergonomically positioned for easy access.

Calibration Module Specifications

The Calibration modules shall be supplied by 220V-240V AC, 50Hz.

Calibration modules shall have voltage and current overload protection.

The calibration modules shall have standard 4mm shrouded output sockets.

The calibration modules shall do a self-test on start up.

The calibration modules shall have standard interfaces, IEEE-488, RS232, USB interface, situated at the rear of the calibration bench console.

The calibration modules settling time shall be less than 5seconds for all functions and ranges.

Calibration Module Specifications; by function

a) Power Supply Module

The Single phase power supply module (240V) shall be used for powering devices under test.

The power supply module shall have at least two (2) front panel BS 1363 three-pin (rectangular) sockets.

The power supply module shall have Digital volt meter (0 to 300V).

b) AC/DC Multifunctional Calibrator

The module shall be capable of Multifunctional instrument and device testing.

The multi instrument calibrator shall consist of a multifunctional calibrator (source), Digital Multi meter (measure) and internal PC.

The multifunctional calibrator (source) shall provide a wide range of calibrated outputs for AC/DC voltage and current, RTD and thermocouple simulation, a range of resistance and frequency functions.

The integral 7.5 digit multi meter shall measure DC voltages to 1000V, AC voltages to 750V, resistance to 100M Ω , and frequency to 300kHz.

The multifunctional calibrator module shall be provided with below minimum specifications.

The BEST one year guaranteed accuracy specification of each function shall be the same as that stated below or of better accuracy:

<u>Source</u>		
Function	Range	Accuracy
Voltage DC	0 to $\pm 1050V$	$\pm 15ppm$ of setting
Current DC	0 to $\pm 22A$	$\pm 80ppm$ of setting
Voltage AC	1mV to 1050V (10Hz to 1MHz, sine-wave)	$\pm 0.005\%$ of setting
Current AC	10 μA to 22A (20Hz to 1kHz, sine-wave)	$\pm 0.05\%$ of setting
Capacitance	1nF, 10nF, 100nF, 1 μF , 10 μF , 100 μF (100V max)	$\pm 0.25\%$ of setting
Inductance	1mH, 1.9mH, 5mH, 10mH, 19mH, 50mH, 100mH, 190mH, 500mH, 1H, 10H	$\pm 0.1\%$ of setting
Resistance	1 Ω to 120M Ω variable	$\pm 100ppm$ of setting
Thermocouple Simulation	-270 to 1000 $^{\circ}C$	$\pm 0.10^{\circ}C$
PT100 Simulation	-180 to 850 $^{\circ}C$	$\pm 0.2^{\circ}C$
<u>Measure: Resolution 7.5Digits</u>		
Function	Range	Accuracy
Voltage DC	0 to 1000V	0.0035%rd + 0.0005%rg
Current DC	0 to 10A	0.05%rd + 0.005%rg
Voltage AC	0 to 750V	0.06%rd + 0.04%rg
Current AC	0 to 10A	0.1%rd + 0.04%rg
Resistance	0 to 100M Ω	0.01%rd + 0.001%rg
Frequency	3Hz to 300kHz	0.01%rd
Thermocouple	-270 to 1000 $^{\circ}C$	$\pm 0.5^{\circ}C$
PT100	-180 to 850 $^{\circ}C$	$\pm 0.08^{\circ}C$
Where 10,000 ppm = 1%		

c) Insulation Resistance Tester Calibration

The IR tester Calibration module shall be capable of calibrating and testing general purpose insulation testers and Mega-ohmmeters with test voltages up to 10kV.

The calibration module shall be able to test for open circuit voltage and short circuit current.

The calibration module shall calibrate resistance (insulation) from the range of 100K Ω to 10G Ω and low resistance values (1 Ω to 10K Ω) for verification of the low ohm ranges and continuity.

The calibration module shall be provided with below minimum specifications:

Function	Range	Accuracy
Low ohm resistance	1 Ω , 10 Ω , 100 Ω , 1K Ω	1%
Insulation Resistance	100K Ω to 10G Ω	1%
Insulation Resistance	10G Ω to 100G Ω	5%
(accuracies specified between 15 $^{\circ}C$ and 25 $^{\circ}C$)		

d) *Micro-ohm meter Calibrator*

The calibrator shall incorporate high current standard resistors to allow for precision calibration.

The calibrator shall have extra-large (adequately sized) terminals for current connection, supplied complete with appropriate test leads.

The internal resistance standards shall provide good long term stability and temperature coefficients.

The operating range shall be 0.2, 2, 20, 200, 2000mΩ and shall have basic accuracy of 0.1%

Gold plated terminals shall be used to reduce contact resistance and thermal e.m.f.

Micro-ohm meter Calibrator shall have the following minimum requirements:

Range	Continuous Rated Current (AC/DC)	Accuracy
50, 100, 150, 200μΩ	200A	0.8%
0.5, 1, 1.5, 2mΩ	100A	0.5%
5, 10, 15, 20mΩ	30A	0.2%
50, 100, 150, 200mΩ	10A	0.1%
0.5, 1, 1.5, 2Ω	3A	0.1%

e) *Temperature Calibration*

(i) *Standard Platinum Resistance Thermometers (SPRT)*

The tenderer shall provide Two (2) reference thermometers for calibration of KenGen temperature calibrators.

The reference thermometers shall be Standard Platinum Resistance Thermometers (SPRT)

They shall meet the International Temperature Scale of 1990 (ITS-90) ratio requirements for SPRTs.

The SPRTs shall be made of completely strain-free platinum.

The SPRTs shall have 4 sensor wires and a grounding wire.

They shall have a drift rate of less than 0.006°C per year.

The SPRTs shall be of metal sheathed type.

The SPRT shall have a temperature range, accuracy, reproducibility and stability indicated in the table below as a bare minimum.

Function	Range	Accuracy	Reproducibility	Stability
Temperature	(-)200 ... +670°C	±0.001 °C	±0.001 °C	±1 mK

(ii) *Temperature Baths*

The temperature bath shall have a combined dry block and liquid bath.

One of the baths shall have a temperature range of -45°C to 155°C, and the other bath shall have a temperature range of 33°C to 660°C.

Shall have a minimum accuracy of ±0.06°C, and a stability of ±0.005°C.

Shall have multi-hole insert kits; that will accommodate sensors of different diameters; including imperial, metric and undrilled. The imperial insert kits shall have a minimum of 9holes, and the metric insert kits a minimum of 14holes.

The bath inputs shall be: RTD, Thermocouple, current, voltage and sensor-under-test.

The bath shall have the following reference inputs: external precision reference sensor, and Dynamic Load Compensation.

The bath shall have auto-calibration feature, and the equipment shall come loaded with the calibration software.

The bath shall have an easy to read colour display with user-friendly navigation.

It shall have the following communication interfaces: USB and Ethernet.

The equipment shall be delivered with: USB cable, Tool for insertion tubes, test cables, traceable certificate, support rod, solid protective carrying case complete with trolley and any other required accessories.

f) Pressure Calibration

Four pressure calibration modules shall be provided. They shall combine high accuracy with simple operation to ensure pressure gauges, switches and transmitter calibration.

The tenderer shall supply four (4) calibration modules with the following minimum specifications:

	Calibration Module	Range	Accuracy at 23°C ±5°C	Resolution	Maximum Line Pressure
1.	Gauge Pressure	0 to 200bar	0.004% FS	0.01bar	230bars
2.	Vacuum	-0.95 to 2bar	0.04% FS	0.001bar	10bars
3.	Differential	0 to ±10bar	0.04% FS	0.0001bar	10bars
4.	Absolute (with barometric reference option)	-1 to 100bar	0.025%	0.0001bar	110bars

The Pressure Calibrator modules shall be pneumatic with a regulator.

The modules shall have pressure measurement input with at least 5 selectable pressure units: bar, mbar, PSI, kPa, mmHg.

The modules shall have a piezo-resistive stainless steel diaphragm sensor

The modules' wetted parts shall be made of 316L stainless steel.

The modules shall have 30micron filter element in each pressure port.

The modules shall have a zeroing switch.

The modules shall have Quick Release connections.

The Pressure Calibrator modules shall have over-pressure alarm for safety. The modules shall issue over pressure audio and visual (on LCD) warning at 120% of full scale range.

The modules shall have a USB Communication interface.

Pressure Calibration Module Accessories

As a bare minimum, the following accessories shall be provided together with the calibration modules to enable smooth calibration.

- a. Two bench-top pneumatic pressure calibration pumps:
 - Pressure range: 0.95bar vacuum to (at least) 40bar
 - Pressure resolution: 0.1mbar
 - Test gauge connection: 1/4" BSP
 - Reference gauge connection: 1/4" BSP
 - Finger-tight connectors
 - To be supplied complete with high accuracy digital pressure gauge

- b. Pressure adaptor and fittings kit complete with:
 - Multiple adaptors for metric, BSP parallel, taper threads and NPT (male and female) as per *Appendix I*.
 - Coupling connectors allowing any two adaptors to be connected together
 - 1/4" BSP fittings for 4mm and 6mm external hose diameter
 - Nylon hose set with quick release connectors
 - Minimes 1620 test point (Test 20) adaptors micro bore hose
 - 10" adjustable spanner and PTFE tape
- c. Electrical vacuum pump to generate vacuum of up to 28"Hg.
 - It shall have 1/4"NPT (F) Port.

g) Function Generator Module

The calibration bench modules shall be supplied with a function generator module which shall have the following specifications:

Function	Range	Resolution
Frequency	0.001mHz to 50MHz	1μHz

The function generator shall be a true pulse generator with variable delay and variable rise/fall times.

It shall be capable of generating arbitrary waveforms of up to 128K points at up to 125MS/s.

It shall be able to generate standard waveforms: sine, square, ramp, pulse, sin(x)/x, noise, arbitrary, exponential & logarithmic.

The module shall be capable of comprehensive internal & external digital modulations including AM, FM, PM, PWM & FSK.

Sweep, Burst and Gated modes of operation shall be available using either an external trigger signal or internal trigger generator.

The module shall be capable of generating Gaussian white noise.

The module shall have a large high resolution graphic LCD with simultaneous text & waveform display.

It shall be possible to control all functions of the generator from the USB interface.

It shall be possible to store waveform via USB flash drive.

h) Flow meter Calibrator

The calibrator shall be capable of calibrating ultrasonic flow meters for liquid, gas and steam, flow meters used in fuel oil applications and multivariable mass flow transmitters that are used for two phase fluid measurement, in particular saturated steam.

The calibrator shall have Primary standard liquid and gas calibrators with uncertainty of $\pm 0.05\%$

The calibrator shall have extensive fluid blending capability to match actual process fluid viscosity for improved accuracy.

The calibrator shall have separate temperature sensors for the cylinder and test section to correct changes in volume.

It shall have long test sections that can accommodate two turbine flowmeters with flow straighteners in tandem for a round robin calibration check.

The calibrator shall have three rate-control valves for course, medium and fine flow rate control.

It shall provide automatic temperature control using a fluid heater plus connections for a chilled water flow loop.

The calibrator shall have an interface module with preinstalled calibration software capable of performing calibrations, and recording data.

The run and return valves shall be activated automatically by software commands.

The tenderer shall provide, as a bare minimum, all the necessary accessories for calibration of all the aforementioned flow meters.

i) Vibration sensor/Transducer Calibrator

The calibrator shall be a self-contained calibration system to provide rapid and easy calibration and fault detection of vibration sensors and instruments, in units of acceleration, velocity and displacement.

The calibrator shall be traceable to PTB standard.

The calibrator shall be capable of determining amplitude response at various user selected frequencies.

The calibrator shall have a test amplitude of $1 \text{ m/s}^2 \text{ rms}$.

The calibrator shall be capable of measurement of vibration frequency response from 70Hz to 10kHz.

The calibrator shall have Internal signal conditioner for charge, IEPE and voltage.

The calibrator shall have built-in signal conditioner with transducer sensitivity display.

The calibrator shall have an agitator/exciter to generate oscillations complete with support rod and clamp to secure the DUT.

Sensor types: proximity probes and accelerometers.

It shall have software for calibration and display inclusive of sensor database.

It shall come complete with an LCD graphics Display.

It shall have a USB interface for PC controlled calibration.

j) Soldering Station

The calibration bench shall have a soldering and Rework section.

The soldering and Rework section shall have at least three simultaneously powered ports for soldering, de-soldering and hot air re-work and a built-in pump for vacuum and air flow so no external pressure source will be required.

The soldering module shall be supplied complete with two (2) soldering iron, two (2) de-soldering tools, two (2) hot-air pencils, with accompanying work stands and tip-trays. De-soldering nozzles, rework nozzles and solder tips shall also be provided (two of each).

The soldering irons shall have a temperature range of 200°C - 450°C.

The de-soldering tools shall have a temperature range of 350°C - 450°C.

The hand piece for hot-air rework shall have a temperature range of 100°C - 550°C.

The tenderer shall supply an assortment of 10No rolls high grade solder wire of 3ft each.

Industrial PC

The primary console of each calibration bench shall incorporate an industrial PC loaded with programs and well established calibration software that integrates with the bench modules.

The calibration bench shall be mounted with a screen control that indicates the measured voltages, currents, resistance, frequency, and other measured parameters.

The control screen shall have as a minimum a 12.1' capacitive LCD touchscreen display, 64bit processor, Windows 8 OS or higher, 16GB RAM or higher, 120GB Solid State Hard disk or higher, 4No USB ports and 1No fast Ethernet Port.

The PC shall be supplied with a USB Keypad and mouse, RW DVD, numeric keypad, 4port USB hub.

Laptop Specifications

Two (2) laptops shall be provided preloaded with the calibration software.

Below are the minimum hardware and software requirements:

- RAM:16GB
- Processor: Intel 4870HQ Quad-Core
- OS: Microsoft Windows 10 Professional
- Inbuilt hard disk: 512 GB SSD or better
- External hard disk: 2TB
- Screen size:15.4", TFT LCD
- Graphics card: 2GB or more
- Resolution: 2880×1800 or better
- WIFI: 802.11ac standard
- HD Webcam
- Battery: two hot swappable dual Lithium batteries
- Connectivity: HDMI, 2 USB (3.0) ports, Ethernet port, and 1No. Serial port
- Bluetooth technology: Embedded Bluetooth
- Stand-Alone Power Requirements: (AC Power) Normal Operating Voltage: 18.5V_{Max} Operating power: < 90 W or < 120 W.

Software Specifications

The software shall assist in documenting, planning, analysing and optimizing calibration work and storing of calibration results in a traceable and auditable manner.

The software shall be able to produce certificates and reports to ISO17025, ISO9001 and any other International Quality Standards.

The calibration software shall provide direct error readout for the device under test.

The calibration software shall Communicate and control all the calibration modules on the workbench.

The calibration software shall Calibrate multiple devices and instruments.

The calibration software shall have network compatibility for multi-station and site calibration.

The calibration software shall have an automated planning and scheduling system.

The calibration software shall print, email, and store certificates as required.

The calibration software shall produce calibration labels.

The calibration software shall quickly generate procedures and templates using wizards.

Shall create uncertainty tables for site works.

As a minimum the industrial PC and laptop shall be equipped with:

- Back up of appropriate well established calibration software from the equipment manufacturer preferably a perpetual license or license with maintenance. Tenderers must indicate clearly their offer and attach relevant proof of purchase and agreement with the software developer and clearly outline detailed end user terms of use.
- Reporting writer that documents the calibration data and print previews on the screen.
- Utility/ application software: MS Office, Adobe Acrobat.
- Equipped with configurable log report in the latest PDF reader format via print manager
- Equipped with relevant statistical software that easily integrates with the measuring unit.

Printer

A suitable and integrated full colour multifunctional laser printer shall be provided.

The printer shall be capable of printing, copying and scanning of calibration certificates

The printer shall be provided with a USB printer cable for interface with the laptop and industrial PC.

The tenderer shall supply replacement LaserJet toner cartridges of each type.

Label printer

This shall be suitable for printing ID labels to be placed on the calibrated equipment. This shall be supplied with durable laminated sticky labels.

The printer shall also have an automatic tape-cutter.

Certification

All test equipment shall be supplied with traceable certificates from an internationally accredited body.

The calibration certificate must meet the general requirements as per ISO/IEC17025.

Calibration Centre Furniture

Operator chairs

Three jet black chairs shall be provided.

They shall be heavy duty suitable for both technical and office work.

They shall have ESD protection which conforms to EN61340-5-1: 2001.

The chairs shall be height adjustable: 500 – 750mm

They shall be fitted with swivel castors for mobility.

They shall be extra padded seat and back rest.

An under bench foot rest shall be provided.

Storage Cupboards

The tenderer shall provide Two (2) heavy duty cupboards for storing equipment and tools.

The storage cupboards shall have the following dimensions: Height 2000mm x Width 1000mm x Depth 550mm

These shall be made of robust steel with RAL7035 Light Grey housing and RAL3028 Red front.

They shall have internal galvanised shelves which shall be durable and scuff resistant, with 50kg U.D.L capacity. Positioning of the shelves shall be adjustable on 25mm pitch.

One storage cupboard shall have four (4) shelves and three (3) drawers of varying sizes, while the other cupboard shall have four (4) shelves only.

The cupboards shall be fitted with central locking.

Trolleys

Two (2) mobile maintenance trolley cabinets made of welded steel with the top sections lined with hard laminate industrial inlaid mat and anti-roll-off formed edges shall be provided.

They shall be fitted with two rubber tyre swivel castors and two fixed castors and one brake.

They shall have two push-pull handles.

They shall have the following dimensions (minimum): Height 925mm x width 750mm x depth 550mm.

The trolley finishing shall be done using RAL7035 light grey and RAL 4006 Purple.

It shall have perforated side panels for hanging tools and accessories.

Trolley Tool Case

The trolley tool case shall comprise of a five (5) drawer roll-cab, constructed using heavy gauged steel, with tough composite top to be used as a work station.

The trolley tool case shall be rust and solvent resistant and powder coated paint finish.

It shall have an inbuilt single tumbler lock and full height rear locking mechanism.

The tool kit shall come with at least 200 pieces of commonly used tools, such as: digital multimeter, electrician's screwdrivers, a combination of socket/ open/ fixed/ ring spanners, circlip pliers, pliers, adjustable wrench set, ratchet spanners, crimping tools, side cutters, Allen keys etc. each with their own tool tray. See attached *Appendix II* for more specifications.

Roll-cab dimensions shall be as follows: height 835mm x width 685mm x depth 465mm.

It shall be fitted with two rubber tyre swivel castors with large toe locks and two fixed castors.

It shall have two rubber-grip push-pull handles.

Test Leads and Connectors

The general purpose 4mm test leads be at least 1.2m long, with safety shrouded and retractable banana connectors.

The leads shall be silicon insulated and come in assorted colours.

The test leads set shall comprise of:

	TYPE	Rating	Qty
1.	General purpose 4mm test leads	1000VDC/AC rms, 32A	30
2.	Low Thermal 4mm test leads and clips	60VDC/ 30VAC, 3A	10
3.	4wire screened, 4mm test leads	60VDC/ 30VAC, 3A	10
4.	BNC test leads	300V CAT III	5
5.	4mm Sockets to BNC	500V AC/DC	5
6.	BNC to 4mm Plug	60VDC/ 30VAC	5
7.	4mm Test lead couplers	1000V CAT III	5
8.	4mm to spade adapters	60VDC/ 30VAC	5
9.	4mm to mini thermocouple	60VDC/ 30VAC	5
10.	Thermocouple male to male CU	60VDC/ 30VAC	5

	CLIPS	Rating	Qty
1.	4mm Insulated, multi-contact Crocodile Clips with banana socket:	1000V, CAT II, 32A	20
2.	4mm insulated test-hook set with banana socket: – mini, micro and macro	1000V, CAT II, 32A	10 each
3.	Bare Spade lug with banana connector terminal	1000V, CAT II, 32A	10
4.	Test prod	1000V, CAT II, 32A	10
5.	Pinch Style Clip Test lead with banana connector	1000V, CAT II, 32A	10

UPS

The UPS rating shall be 10kVA Single phase Input/ Output system with integral maintenance free batteries, to match the loading of the centre.

It shall be of modular construction.

The UPS shall have a wide input voltage window, without depleting the battery.

It shall have an operating frequency 50Hz \pm 5Hz.

The UPS shall have an autonomy time of 10min at 100% loading.

It shall give an output voltage of 240Vac \pm 5V with an efficiency of >91% and output Power factor be greater than 0.8.

It shall be equipped with overload protection.

It shall have a graphical LCD display with backlight. It shall have an audible alarm for warning and LED Warning light.

The UPS shall be supplied complete with lead acid maintenance free batteries.

Attach list of mandatory Spare parts list and consumables likely to be used during the initial 2 years period of operation.

Technical documentation

The following are the minimum requirements;

- Four (4) coloured user manuals in hard and soft copies with Set up and safety remarks in English and set up-plan. Detailed instruction for commissioning, operation, preparation and maintenance. The hard copies should be printed and bound for workshop shop floor use.
- Single line diagrams, drawings, control cabinet and connection plans according to EN 60204 or equivalent.
- Technical Data for the equipment specifying power, kilowatts, voltage, amperage, temperature, flow etc. characteristic curves for the equipment. Detailed description of the equipment: individual components, relevant clearances, tolerances, allowable temperatures, settings etc.
- Manufacturer catalogues and technical data sheets for all components and devices.
- Software manuals detailing how to use the software, installation, license key, support, upgrading & updating, system requirements, troubleshooting etc.
- Complete instructions for ordering replacement parts in a manner that would prevent errors or misunderstanding. Recommended forms for tabulating replacement part information and instructions for returning materials to the factory shall be included.
- Maintenance instructions manuals split into:
 - i. Manuals for preventive maintenance indicating periodic inspections, tests, cleaning, and other routine maintenance. A clear concise document with CHECKLISTS detailing tests and inspections to be done after duration of time e.g. monthly, annual etc.
 - ii. Repair manuals describing fault location, dismantling, re-assembly etc.
- Detailed instructions for programming settings and configuration of all software configurable devices. Instructions for downloading, uploading and backing up settings & configurations.

- Calibration documents by certified and recognised body traceable to applicable international standards.
- Factory Acceptance Test (FAT) report and commissioning (SAT) report shall be included in the final documentation. Tabulated results of all tests carried out.

Warranty

At least 2 year warranty from handing over after installation, testing and commissioning.

Any repairs or replacements costs as a result of damage to the equipment by the tenderer before the handover shall be fully borne by tenderer.

The tenderer shall meet all costs associated with replacement of faulty or defective parts.

The tenderer shall attach a manufacturer's commitment to provide after sales support on future spares/accessories inquiries, off site and onsite technical support when required by KenGen including software for a period of at least 2 years from the date of purchase. Attach proof that equipment manufacturer is globally re-known, is established, has supplied similar equipment in the past and is committed to offer technical support and spares for a period of at least 2 years from commissioning. The technology should not be obsolete at the time of commissioning.

Attach a separate current price list of selected recommended consumable spare parts likely to be used during the initial 2 years period of operation and the respective vendors and part numbers.

Note: *The recommended consumable spare parts list is for technical information only to KenGen and should not be construed to be part of the price schedule.*

Training Requirements

The Contractor shall submit a detailed training syllabus and schedule for approval for training of the client's engineers at the factory.

After approval by the Client, the Contractor shall invite the Client's engineers for training and factory acceptance tests. A period of at least one month shall be from date of invitation to the date of departure to the contractor's country of manufacture to allow enough time for travelling preparations.

Training of at least 3 weeks period at manufacturer's plant shall be provided, in order to enable client engineers understand the equipment design, operation and maintenance of the equipment successfully. Factory acceptance testing shall proceed after the training.

The training shall cover both theory and practical aspects of the calibration equipment. The content of the training will include general theory on calibration, specific theory related to particular equipment supplied and practical lessons on operating and maintaining equipment supplied.

At least five client's Engineers shall attend the training.

During the installation and commissioning periods, the Contractor's site manager, commissioning engineers/supervisors shall give Two week 'on the job' instruction /training to the client engineers. The Contractor's Engineer/supervisor shall train the client's engineers in such disciplines as;

- (a) Maintenance and test procedures and techniques on the Equipment using test equipment provided by contractor.
- (b) Operational techniques relative to the Equipment both for local and remote operation as appropriate.
- (c) Step by step procedure in pre-commissioning and commissioning of the Equipment into operation.

SECTION VI: KENGEN LIST OF EQUIPMENT

Equipment description	Range	Accuracy	Resolution															
Secondary Voltage and current Injection sets																		
KoCos Artes 440 Automatic Relay Test System	(3 x 300 V, 3 x 32 A)	I: <0.05% V: <0.05% f: <0.01%	V:13mV I:1mA f:0.001Hz															
Omicron CMC 156 3 Phase Voltage and Current Amplifier	(3 x 250 V, 3 x 25 A)	I: <0.1% V: <0.1% f: ±0.5ppm	f:5µHz															
Omicron CMC 356 3 Phase Voltage and Current Amplifier	(3 x 250 V, 6 x 25 A)	I: <0.15%rd +0.05rg V: <0.08% rd +0.02%rg f: ±0.5ppm	f:5µHz															
ISA - TD 1000 Plus Relay Test Set	I: 10A, 40A,100A V: 250VAC, 300VDC f: 15-499.999Hz	I: 1%rd+0.05%rg VAC: ± (1%+50mV) VDC: ± (0.5%+50mV) f: ± (1%+1mHz)	I: 0.01%rg VAC:1mV VDC:10mV f: 1mHz															
ISA DRTS 64	I: 6X15A, 1X90A V:1X250VAC,4X125V, 300VDC f: 0-2000Hz	I: < ±0.1% V: <0.1% rd +0.02%rg f: ±0.5ppm (25 µHz)	I: 230µA V:1.9mV/3.8 mV f: 0.1mHz															
SVERKER 750/780 Relay Test Unit	0 – 6A 0.0 – 600.0 V Cos φ–0.99 (cap) to +0.99 (ind)	0 – 0.6A AC: ±(1% + 20 mA) 0 – 6A AC: ±(1% + 20 mA) 0 – 0.6A DC: ±(0.5% + 2 mA) 0 – 6A DC: ±(0.5% + 20 mA) AC, ±(1% + 200 mV) DC, ±(0.5% + 200 mV) Cos φ: ±0.04 Timer: 0 – 9.999s 10 –99.99s 100 – 999.9s	1 mA Cos φ: 0.01															
Resistance Testers																		
Megger BM11 Insulation Tester	Up to 5kV test voltage																	
Megger MIT 300, 500V	500V test voltage																	
2500VDC FLUKE 1550C Insulation Tester for IR Values	Test voltage: 250V, 500V, 1000V, 2500V	<u>2500VDC Test voltage at 35°C</u> 200 kΩ to 50 GΩ: 5 % 50 GΩ to 500 GΩ: 20 % Test voltage accuracy: -0 %, +10 % at 1 mA load current																
Megger MIT520/2EN Insulation tester	50 to 5kV test voltage	Accuracy from 1MΩ to(at 23°C) <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>5kV</td> <td>2.5kV</td> <td>1kV</td> <td>500V</td> </tr> <tr> <td>±5%</td> <td>1TΩ</td> <td>500GΩ</td> <td>200GΩ</td> <td>100GΩ</td> </tr> <tr> <td>±20%</td> <td>10TΩ</td> <td>5TΩ</td> <td>2TΩ</td> <td>1TΩ</td> </tr> </table>		5kV	2.5kV	1kV	500V	±5%	1TΩ	500GΩ	200GΩ	100GΩ	±20%	10TΩ	5TΩ	2TΩ	1TΩ	
	5kV	2.5kV	1kV	500V														
±5%	1TΩ	500GΩ	200GΩ	100GΩ														
±20%	10TΩ	5TΩ	2TΩ	1TΩ														
Earth Resistivity Tester Chauvin Arnoux	R: 0.01Ω to 1500Ω L: 10µH to 500µH Ground V:0.1V to 75V	R: ± (1.5%+r) L: ± (5%+r)	0.001Ω 1 µH															

CA 6250 Microhmmeter	1 $\mu\Omega$ to 2,500 Ω	5m Ω : 0.15 % + 1.0 $\mu\Omega$ 25m Ω to 250 Ω : 0.05 % + 0.3m Ω	1 $\mu\Omega$
PROGRAMMA MICROOHMMETER MOM600A - Contact Resistance Tester for CBs	0 – 1999 $\mu\Omega$ Current 0 – 600 A DC Open circuit voltage 5.2 V DC Current shunt output 10 mV / 100 A \pm 0.5	\pm 1% of reading + 1 digit (at 100 – 600 A test current)	1 $\mu\Omega$
F6150 Doble Power system Simulator	6 \times 1A, 3 \times 2A, 1X6A AC 6 \times 0.707A, 3 \times 1.41A, 1X4.24A 6 \times 150V, 3 \times 300V, 1X600V		0.0001A 0.01V
EDS 165 Insulation Fault Evaluator	RCM Mode:10mA-10A, EDS Mode: 5mA Rated insulation voltage; 250V	RCM Mode: \pm 10% EDS Mode: \pm 2mA	
Multimeters & mA calibrators			
METRA Hit TRMS Multimeters	60 mV to 600V 600 μ A to 10 A 600 Ω - 60 M Ω 60 nF - 600 μ F 600 Hz - 1 MHz -200-850 $^{\circ}$ C (Pt100/Pt 1000) -250- 1372 $^{\circ}$ C (Type K)	V: 0.02% + 15 D IDC: 0.1% + 20 D IAC: 0.5% + 25 D R: 0.2% + 5 D C: 1% + 6 D f: 0.05% + 5 D	1 μ V 10 nA 10 m Ω 10 pF 0.01 Hz
Multimeter Fluke 179 RMS	400mA, 10A AC, 600V	VAC:1%rd +3counts VDC:0.09%rd +2counts Ω : 0.9%rd +1counts I AC:1.5%rd +3counts	
Fluke 789 Process meter	400mV to 1000V 30mA to 1A 400 to 40M Ω 0.5Hz to 20kHz	VAC:0.7%rd +2LSD VDC:0.1%rd +1LSD Ω : 0.2%rd +1LSD I AC:1%rd +2LSD IDC: 0.2%rd +2LSD f: 0.005%rd +1LSD	4digits f: 5digits
MY-64 Digital Multimeter	200mV/2V/20V/200V DC 1000V DC 2V/20V/200VAC 750V AC 2mA to 10A AC/DC 200 Ω to 200M Ω 2nF/20nF/200nF/2 μ F 100 μ F -20 $^{\circ}$ C~0 $^{\circ}$ C 1 $^{\circ}$ C~400 $^{\circ}$ C 401 $^{\circ}$ C~1000 $^{\circ}$ C	\pm (0.5%+2) \pm (0.8%+2) \pm (0.8%+3) \pm (1.2%+3) \pm (3.0%+7) \pm (6.0%+10) \pm (4.0%+3) \pm (6.0%+10) \pm (5.0%+4) \pm (2.0%+3) \pm (2.0%+5)	

Digital clamp meter	0-600A, 0-600V 0 - 400Ω 20-400Hz	IAC: ±1.9% ±7 digits IDC: ±1.5% ±10 digits VAC: ±1.0% ±5 digits VDC: ±0.7% ±2 digits R: ±1% ±3 digits f: ±0.1 % ±2 digits	f: 1Hz
Fluke 754 Documenting Process Calibrator	<u>Measurement</u> 0– 100mV and 0 – 300V 0 – 30mA and 0 – 110mA 10Ω,100Ω,1000Ω,1000 0Ω 1-50kHz <u>Source</u> 100mV – 15VDC 0 - 22mA 10Ω,100Ω,1000Ω,1000 0Ω 1-50kHz	<u>Measurement</u> 100mVDC: 0.02% + 0.005 mV 300VDC: 0.05% + 0.05 V 3VAC: 0.5% + 0.002 V 300VAC: 0.5% + 0.2 V 30mA: 0.01% + 5 uA 110mA: 0.01% + 20 uA 10/100Ω: 0.05% + 50 mΩ 1000Ω: 0.05% + 500 mΩ 10000Ω: 0.1% + 10 Ω <u>Source</u> 100mVDC: 0.01% + 0.005 mV 22mA: 0.01% + 0.003 mA 10: 0.01% + 10 mΩ 1000Ω: 0.02% + 3Ω	
Chauvin Power quality Analyzer	2V to 1000V 50mA to 100A 40Hz to 69Hz		
CT Analyzer			
EZCT 20008 Current Transformer Tester	CT ratio measuring range 0.8 to 5,000A Test voltage range (50V at 10A, 200V at 10A, 1,200V at 1.5A)		
Temperature & oil testers			
Ametek Calibration Reference/Professional Temperature Calibrator	-100 to 700°C	Accuracy: ±0.040C Stability: ±0.0050C	0.001°C
Fluke 9171 Metrology well	-30 to 155°C at 23°C ambient	Accuracy: ±0.10C Stability: ±0.0050C	0.001°C
Fluke 9173 Metrology well	50to700°C	Accuracy: ±0.2°C Stability: ±0.005°C (50-100°C) Stability: ±0.01°C (100-425°C)	0.001°C
Oil Temperature Controller	(0-120 °C)		
Megger OTS100AF/3 Dielectric Tester	breakdown voltage up to 100kV		
Aquamax KF- Moisture Analyzer	Moisture range: 1ppm		

Others			
Fluke 810 Vibration Tester Tachometer	6 to 99,999rpm	0.01% (6 to 6000rpm) 0.05% (6000 to 99,999rpm)	0.1rpm
Digital Tachometer Optical	2.5~99999.9 rpm Range		0.1rpm
MDX 180 50 MHz Function Generator	50MHz		
PSA 3012 Clamp-on Current Probe diameter 12 mm	DC to 100MHz, 30A AC/DC		
PSA 3054 Clamp-on Current Probe diameter 54 mm	DC to 2Mhz, 500A AC/DC		
SM 2730 Handy Power Mains	200 W 230 V AC RMS		
Energy Reference Meter Tester (Zera) MT786	Accuracy: 0.05		
Phase rotation indicator	Voltage range: 40-700 V Frequency range: 15-400 Hz		
Pressure Calibrators			
WIKA Wally Box III CPH7600 Portable Pressure Calibrator	P: -0.8 to +20bar I: 0 to 24mA V: 0 to 30VDC	P: 0.025%rd ±0.01%rg I: 0.015%rd ±2 µA simulation and measurement V:0.015%rd±2mV(measuremen)	P: 5digit I: 1µA V: 1mV
GE DPI620 Genii advanced modular calibrator	25mbar to 400bar	At 25mbar at 20°C: 0.09%rg At 0 to 200bar at 20°C: 0.005%rg	4 to 7digits
Messer Pressure Test Equipment	Up to 300bar		
Vacuum gauge	0 to 760mmHg (absolute)	0.1%rg	
Pressure gauges	0 to 2.5bar 0 to 10bar 0 to 40bar 0 to 100bar	0.6% rg 0.6% rg 1.6%rg 0.6% rg	
Multivariable flow transmitter	0 to 600 t/h		

SECTION VII: TECHNICAL SCHEDULE AND DATA

7.1 Technical Schedule

Tenderers shall complete the technical schedules in their entirety at the time of tendering. The schedules are extracted from the main specifications. Refer to the main specification and annexes for details.

Note 1

The tenderer is expected to indicate, as the case may apply,

- Equipment rating, features, standards used, etc.
- Whether the offer complies with the specified clause of the tender document (Compliant or Not Compliant)

Note 2

The contractor shall provide layout drawings, detailed drawings, brochures, datasheets as reference documents that shall clearly show the equipment offered, associated features indicated in the technical schedule.

Item Description	Tenderer's Guaranteed offer	Reference in bid offer (indicate page)
Tenderer to provide a detailed description of the offer clearly showing how the works shall be undertaken.		
Scope		
1. Time duration required for study of calibration needs		
2. Time duration required for design of workbench and calibration equipment		
3. Time duration required for assembly, integration, and manufacture		
4. Attendance of Client staff at Factory Tests and Training: Give details of training and FAT activities.		
5. Installation and Commissioning Services: List activities		
6. Instruction/Training on Site for maintenance and test procedures.		
7. Training topics to be covered by the training		
8. No. of days necessary for fruitful training detailed in the specifications		
9. Provide list of Technical documents & drawings in the project to be provided		
10. List of Spares and consumables to be provided during the 24 Months Warranty Period		
11. Warranty period (years)		
12. After sales Calibration services. Give proposal how this will be carried out.		
13. Technical Support services. Give proposal how this will be carried out.		

14.	Calibration Equipment modules: Provide List and type of equipment offered		
15.	Workbench type of cooling		
16.	Electrostatic discharge protection method		
17.	Modules output socket types		
	Micro-ohm meter calibration module		
18.	Method of reducing contact resistance (Material of Terminals)		
	Temperature baths		
19.	Bath inputs – provide datasheet		
20.	Reference inputs – provide datasheet		
21.	Details of multi-hole insert kits – provide datasheet		
22.	Accessories – provide list and datasheets		
	Pressure calibration module		
22.	Over-pressure guaranteed safety precautions		
23.	Pressure units – provide details		
24.	Sensor type and Material		
25.	Material of wetted parts		
26.	Accessories – pressure and fittings kit – provide details and datasheets		
	Function Generator Module		
27.	List waveform generated		
28.	List Comprehensive internal & external digital modulations		
29.	Modes of operation- provide details		
30.	Display- provide details		
	Flow meter Calibrator		
31.	Provide datasheet/brochure/catalogue		
32.	Provide details of fluids to be calibrated		
33.	Provide details of the automatic temperature control		
34.	Provide details of the temperature sensor		
35.	Provide details of the calibration software		
	Vibration Sensor/Transducer Calibrator		
36.	Provide datasheet/brochure/catalogue		
37.	Provide details of sensor types to be calibrated		
38.	Provide details of the agitator/ exciter		
39.	Provide details of the calibration software		
40.	Provide details of the display		
	Industrial PC		
41.	Provide details of Processors		
	Laptop		
42.	Provide catalogue of the laptop		
	Software		
43.	List all the Calibration software provided		
44.	Provide detail of the software		
45.	Proof of Purchase and agreement with Software developer of license renewal		

46.	Provide list of application/ utility software		
	Printer		
47.	List capabilities of the printer		
48.	Provide datasheet/ brochure/ catalogue		
	Label Printer		
49.	List capabilities of the label printer		
50.	Provide datasheet/ brochure/ catalogue		
	Certification		
51.	Proof of traceability to an International Standard		
	Furniture		
	a) Operator Chairs		
52.	Provide brochure/catalogue with descriptive literature		
53.	Provide proof of ESD protection		
	b) Storage Cupboards		
54.	Provide brochure/catalogue with descriptive literature		
	c) Trolleys		
55.	Provide brochure/catalogue with descriptive literature		
	Trolley Tool case		
56.	Provide brochure/catalogue with descriptive literature of the tool case		
57.	Provide brochure/catalogue with descriptive literature of the tools(Highlight tools for supply)		
	Test Leads and Connectors		
58.	Provide brochure/catalogue with descriptive literature (highlight). Specify length, size, rating		
	UPS		
59.	Provide brochure/catalogue with descriptive literature		
60.	Provide details of construction type of the UPS		
61.	Provide details of UPS protection and alarming system		
62.	Provide details of the display		

7.2 Technical Data

Tenderers must provide the technical data on all the equipment and systems to be supplied in the sheets below.

	Technical data by Tenderer	Unit	Data
Workbench			
	Equipment operating temperature	°C	
	Workbench mains supply voltage	V	
	Workbench mains supply frequency	Hz	
	Under-console workbench illumination	LUX	
	Under-console workbench lighting lifetime	Hours	
	Modules' settling time	Seconds (s)	
Power Supply Module			
	Output voltage	V	
	Output Frequency	Hz	
	Type of Socket		
	Number of Sockets		
	Digital Voltmeter range	(V)	
Multifunction Calibrator			
	Range of AC voltage generated	(V)	
	Range of DC voltage generated	(V)	
	Range of current AC generated	(A)	
	Range of current DC generated	(A)	
	Range of AC voltage measured	(V)	
	Range of DC voltage measured	(V)	
	Range of current AC measured	(A)	
	Range of current DC measured	(A)	
	Thermocouple Simulation range	(°C)	
	Thermocouple measurement range	(°C)	
	PT100 Simulation range	(°C)	
	PT100 measurement range	(°C)	
	Frequency measurement range	(Hz)	
	Insulation resistance calibration range	(Ω)	
	Module parameter resolution	Digits	
	Best one year guaranteed accuracy for all the functions	%	
Insulation Resistance Tester Calibration			
	Test Voltage range	V	
	Insulation resistance ranges	Ohm	
	Best one year guaranteed accuracy (Specify temperature)	%	
Micro-ohm meter calibration module			
	Operating range	Ohm	
	Best one year guaranteed accuracy (Specify temperature)	%	

Temperature Calibration			
(a) Reference Thermometer			
	Type		
	Number of sensor wires		
	Drift rate per year	°C	
	Temperature range	°C	
	Best one year guaranteed Accuracy	°C	
	Guaranteed Reproducibility	°C	
	Stability	K	
Temperature baths			
	Type		
	Temperature range (bath 1)	°C	
	Temperature range (bath 2)	°C	
	Best one year guaranteed Accuracy	°C	
	Stability	K	
	Communication interface		
Pressure Calibration			
	Gauge pressure Operating range	Bar	
	Gauge pressure accuracy (specify temp.)	% FS	
	Gauge pressure Resolution	Bar	
	Gauge Maximum line pressure	Bar	
	Differential pressure Operating range	Bar	
	Differential pressure accuracy (specify temp.)	% FS	
	Differential pressure Resolution	Bar	
	Differential Maximum line pressure	Bar	
	Vacuum operating range	Bar	
	Vacuum pressure accuracy (specify temp.)	% FS	
	Vacuum pressure Resolution	Bar	
	Vacuum Maximum line pressure	Bar	
	Absolute Pressure operating range	Bar	
	Absolute pressure accuracy (specify temp.)	% FS	
	Absolute pressure Resolution	Bar	
	Absolute Maximum line pressure	Bar	
	Filter element size for each pressure port	micron	
Pneumatic pressure calibration Pump			
	Pressure range	Bar	
	Pressure resolution	Bar	
	Test gauge connection	Inch	
Electrical Vacuum pump			
	Pressure range	inHg	
	Process connection port size	Inch	
Function Generator Module			
	Frequency Range	Hz	
	Frequency resolution	Hz	
	Communication Interface		

Flow meter Calibrator			
	Best 1 year guaranteed uncertainty	%	
	Number of Temperature sensors		
Vibration Sensor/Transducer Calibrator			
	vibration frequency response measurement range	Hz	
	Test amplitude	m/s ² (rms)	
	Best 1 year guaranteed accuracy	%	
	Communication interface		
Soldering and Rework Module			
	Soldering iron temperature range	°C	
	De-soldering tool temperature range	°C	
	Hand piece for hot air rework temperature range	°C	
	Number of powered ports for soldering		
	Number of rolls of high grade solder wire		
	Length of high grade solder wire of each roll		
Industrial PC			
	Type of Display screen		
	Display screen size	Inch	
	RAM	GB	
	Type of Internal Hard Disk		
	Capacity of Internal Hard Disk	GB	
	Type of Communication ports		
	Number of communication ports		
Laptop			
	Type of Display screen		
	Size of Display screen		
	Resolution of screen display		
	Type and version of Operating System		
	Type of processor		
	Processor speed	Hz	
	RAM	GB	
	Type of Internal Hard Disk		
	Capacity of Internal Hard Disk	GB	
	Capacity of External Hard Disk	GB	
	Graphics card capacity	GB	
	Battery Type and capacity	Ah	
	Resolution of Webcam camera	MP	
	Type of Communication ports		
Printer			
	Type and make of printer		
	Communication interface		

Calibration Centre Furniture			
a) Operator Chairs			
	Adjustable height	mm	
b) Storage Cupboard			
	Dimensions of the storage cupboard	(H X W X D) mm	
	Shelf Uniform Distributed Load Capacity	kg	
c) Trolleys			
	Dimensions of the trolleys	(H X W X D) mm	
Trolley Tool case			
	Dimensions of the trolley tool case	(H X W X D) mm	
	Number of tools		
Test Leads and Connectors			
	Length of general purpose test leads	meter	
UPS			
	Rating	kVA	
	Output Voltage and tolerance	V	
	Output Frequency and tolerance	HZ	
	Output power factor		
	Type of battery		
	Effective battery capacity	Ah	
	Efficiency	%	
	Autonomy time at 100% loading	min	

SECTION VIII: PRICE SCHEDULE FOR GOODS AND SERVICES

Name of tenderer _____ Tender Number _____ Page _____ of _____

No	Item Description	UoM	Country Of Origin	Qty	Unit Price	Total Price EXW Per Item (Cols. 4x5)	Unit price of other incidental services payable
PART I : GENERAL REQUIREMENTS							
1.	Engineering services; study and design						
2.	Installation and commissioning services						
3.	Site training						
4.	Drawings and technical documentation						
5.	Factory tests and training						
6.	Annual re-calibration services for 3years						
7.	After sales technical support services(attach services offered with rates)						
8.	Calibration software licenses						
PART II: CALIBRATION EQUIPMENT							
1.	Workbench	UNIT		1			
2.	Multifunctional AC/DC Calibrator	UNIT		2			
3.	Power Supply module	UNIT		2			
4.	Insulation resistance tester calibration module	UNIT		1			
5.	Micro-ohm meter calibrator	UNIT		1			
6.	Standard Platinum Resistance Thermometers (SPRT)	UNIT		2			
7.	Temperature bath	UNIT		2			
8.	Gauge Pressure Calibration Equipment	UNIT		1			
9.	Differential Pressure module	UNIT		1			
10.	Vacuum Pressure Module	UNIT		1			
11.	Absolute Pressure (Barometric Pressure Reference Option)	UNIT		1			
12.	Pneumatic Pressure calibration pump	UNIT		2			
13.	Electrical Vacuum pump	UNIT		1			
14.	Pressure Adapter and fittings kit	SET		1			
15.	Function Generator Module	UNIT		1			
16.	Flow meter Calibrator	UNIT		1			
17.	Vibration Sensor/Transducer Calibrator	UNIT		1			
18.	Soldering Station	SET		1			
19.	Industrial PC	UNIT		1			
20.	UPS	UNIT		1			
21.	Laptops	UNIT		2			
22.	Software	PACKAGE		1			
23.	Printer	UNIT		1			
24.	Label Printer	UNIT		1			
25.	Certificates	LOT		1			
26.	Trolley Tool case	UNIT		1			

27.	Assorted Tools	SET		1			
28.	Test Leads and connectors	SET		1			
CALIBRATION CENTRE FURNITURE							
29.	Operator chairs	UNIT		3			
30.	Storage Cupboard	UNIT		2			
31.	Trolleys	UNIT		2			
32.	Any other necessary equipment (attach List with individual prices)	UNIT		1			
33.	Spare parts and consumables (Itemize)	SET		1			
FOR LOCAL TENDERERS							
<i>Sub-Total</i>							
<i>Discount (%) if any</i>							
Other Charges e.g. transport, handling							
Total Cost DDP Tana Power Station							
Country of Origin							
Currency of Tender							
Delivery Period							
FOR OVERSEAS TENDERERS							
Sub-Total							
Discount (%) if any							
Air / Sea freight charges to Nairobi / Mombasa Port							
Other Charges (if any)							
Total Cost & Freight (DDP) Tana Power Station							
Country of Origin							
Currency of Tender							
Delivery Period							

Signature of tenderer _____

Note:

- a) The expected delivery period for the package should not exceed 8 (eight) months from contract signing.
- b) Attach a comprehensive delivery schedule for all items.
- c) After sales Technical Support price list shall not form part of the evaluation.
- d) KenGen reserves the right at the time of contract award to vary quantities of goods originally specified in the schedule of requirements without change in unit price or other terms and condition.
- e) **NOTE: AWARDS WILL BE IN TWO PHASES:**
 - **Phase one - Furniture and fittings for the Calibration Centre, during the 2017-2018 financial year, which ends in June 2018.**
 - **Phase two – all equipment for the Calibration Centre, during the 2018-2019 financial year, which commences in July 2018.**

SECTION IX: STANDARD FORMS

9.1 FORM OF TENDER

Date _____
Tender No. _____

To: _____

[name and address of procuring entity]

Gentlemen and/or Ladies:

1. Having examined the tender documents including Addenda Nos. *[insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to **Design, Manufacture, Supply, Installation, Training and Commissioning of Calibration Centre Equipment** in conformity with the said tender documents for the sum of *(total tender amount in words and figures)* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Tender.

NOTE: QUOTE THE TOTAL PRICE FOR EACH OF THE 2 PHASES SEPERATELY.

2. We undertake, if our Tender is accepted, to deliver install and commission the equipment in accordance with the delivery schedule specified in the Schedule of Requirements.

3. If our Tender is accepted, we will obtain the guarantee of a bank in a sum of equivalent to _____ percent of the Contract Price for the due performance of the Contract, in the form prescribed by *(Procuring entity)*.

4. We agree to abide by this Tender for a period of **120 days** from the date fixed for tender opening of the Instructions to tenderers, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

5. This Tender, together with your written acceptance thereof and your notification of award, shall constitute a Contract, between us, subject to signing of the Contract by the parties.

6. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____ 20 _____

[Signature]

[in the capacity of]

Duly authorized to sign tender for an on behalf of _____

Note: In accordance with **Clause 82** of the **Public Procurement and Asset Disposal Act 2015** **“The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.**

9.2 MANDATORY CONFIDENTIAL BUSINESS QUESTIONNAIRE

(Must be filled by all applicants or Tenderers' who choose to participate in this tender)

Name of Applicant(s).....

You are requested to give the particulars in Part 1 and either Part 2 (a), 2 (b) or 2 (c), whichever applies to your type of business. Part 2 (d) to part 2 (i / j) must be filled. You are advised that giving wrong or false information on this Form will lead to automatic disqualification of your tender or termination of your contract or debarment of your firm at your cost.

Part 1 – General

Business Name:.....Certificate of Incorporation /
Registration No.Location of business premises:
CountryPhysical address
TownBuilding.....
Floor.....Plot No.
Street / RoadPostal Address
Postal / Country Code.....Telephone No's.....
Fax No's.E-mail address
Website
Contact Person (*Full Names*) Direct / Mobile No's.....
Title Power of Attorney (**Yes / No**)
If **yes**, attach written document.
Nature of Business (*Indicate whether manufacturer, distributor, etc*)

(Applicable to Local suppliers only)

Local Authority Trading License No. Expiry Date
Value Added Tax No.....
Value of the largest single assignment you have undertaken to date (**USD/KShs**)
.....
Was this successfully undertaken? **Yes / No**(If **Yes**, attach reference)
Name (s) of your banker (s)
.....
Branches Tel. No's.....

Part 2 (a) – Sole Proprietor (if applicable)

Full names
Nationality..... Country of Origin.....
.....
Company Profile (*Attach brochures or annual reports in case of public company*)

Part 2 (b) – Partnerships (if applicable)

Give details of partners as follows:

Full Names Nationality Citizenship Details Shares

1.
2.
Company Profile (*Attach brochures*)

Part 2 (c) – Registered Company

Private or public
Company Profile (*Attach brochures or annual reports in case of public companies*)
State the nominal and issued capital of the Company
Nominal KShs
Issued KShs

List of top ten (10) shareholders and distribution of shareholding in the company. Give details of all directors as follows:-

Full Names Nationality Citizenship Details Shares

1.....
2.....

Part 2 (d) – Debarment

I/We declare that I/We have not been debarred from any procurement process and shall not engage in any fraudulent, corrupt, coercive and obstructive acts with regard to this or any other tender by the KENGEN and any other public or private institutions.

Full Names
.....
Signature
Dated this day of 2017.
In the capacity of
.....
Duly authorized to sign Tender for and on behalf of

Part 2 (e) – Bankruptcy / Insolvency / receivership.

I/We declare that I/We have not been declared bankrupt or insolvent by the competent Authorities in Kenya and neither are we under receivership:

Full Names
.....
Signature
Dated this day of 2017.
In the capacity of
.....
Duly authorized to sign Tender for and on behalf of

Part 2 (f) – Criminal Offence

I/We, (Name (s) of Director (s)):-

a)
b)

Have not been convicted of any criminal offence relating to professional conduct or the making of false statements or misrepresentations as to its qualifications to enter into a procurement contract within a period of three (3) years preceding the commencement of procurement proceedings.

Signed
For and on behalf of M/s
.....
In the capacity of
.....
Dated this day of 2017.
Suppliers' / Company's Official Rubber Stamp
.....

Part 2 (g) – Conflict of Interest

I/We, the undersigned state that I / We have no conflict of interest in relation to this procurement:

a)
b)
For and on behalf of M/s
In the capacity of
Dated this day of 2017
Suppliers' / Company's Official Rubber Stamp
.....

Part 2 (h) – Interest in the Firm:

Is there any person/persons in KENGEN or any other public institution who has interest in the Firm? Yes/No
 (Delete as necessary) Institution

(Title) (Signature) (Date)

Part 2(i) – Experience:

Please list here below similar projects accomplished or companies / clients you have supplied with similar items or materials for the prescribed years.

	Company Name	Country	Contract/Order No.	Value	Contact person (Full Names)	E-mail address	Cell phone No.
1							
2							

Part 2 (i or j) - Declaration

I / We, the undersigned state and declare that the above information is correct and that I / We give KENGEN authority to seek any other references concerning my / our company from whatever sources deemed relevant, e.g. Office of the Registrar of Companies, Bankers, etc.

Full names

.....
 Signature.....

For and on behalf of M/s

In the capacity of

.....
 Dated thisday of2017.

Suppliers' / Company's Official Rubber Stamp

.....

9.3 **TENDER SECURITY FORM**

(To be on the Banks Letterhead)

WHEREAS [*Name of the tenderer*]
(Hereinafter called “the tenderer”) has submitted its tender dated [*Date of submission of tender*] for **Design, Manufacture, Supply, Delivery, Installation, Training and Commissioning of Calibration Centre Equipment** (hereinafter called “the Tender”)

KNOW ALL PEOPLE by these presents that **WE** of
..... having our registered office at
(Hereinafter called “the Bank”), are bound unto the **Kenya Electricity Generating Company Limited** (hereinafter called “the Procuring entity”) in the sum of for which payment well and truly to be made to you, the Bank binds itself, its successors, and assigns by these presents.

Sealed with the Common Seal of the said Bank this _day of _____20_____

THE CONDITIONS of this obligation are:-

1. If the tenderer withdraws its Tender during the period of tender validity specified by the tenderer on the Tender Form; or
2. If the tenderer, having been notified of the acceptance of its Tender by the Procuring entity during the period of tender validity:
 - (a) fails or refuses to execute the Contract Form, if required; or
 - (b) fails or refuses to furnish the performance security in accordance with the Instructions to tenderers;

We undertake to pay the Procuring entity up to the above amount upon receipt of its first written demand, without the Procuring entity having to substantiate its demand, provided that in its demand the Procuring entity will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This tender guarantee will remain in force up to and including thirty (30) days after the period of tender validity, and any demand in respect thereof should reach the Bank not later than the above date.

[Signature of the bank] _____

(Amend accordingly if provided by Insurance Company)

9.4 **CONTRACT FORM**

THIS AGREEMENT made the _____ day of _____ 20__ between
[*name of the Employer*] of [*country of the Employer*] (hereinafter called "**the Employer**") of the one part and [*name of the Tenderer*]/of [*city and country of the Tenderer*] (hereinafter called "**the Tenderer**") of the other part;

WHEREAS the Employer invited tenders for and has accepted a tender by the tenderer for the supply of in the sum of [*contract price in words and figures*] (hereinafter called "the Contract Price).

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to:
2. The following documents shall be deemed to form and be read and construed as part of this Agreement viz.:
 - (a) The Tender Form and the Price Schedule submitted by the tenderer
 - (b) The Schedule of Requirements
 - (c) The Technical Specifications
 - (d) The General Conditions of Contract
 - (e) The Special Conditions of contract; and
 - (f) The Procuring entity's Notification of Award and Tenderer's Acceptance
 - (g) Applicable addenda and clarifications
3. In consideration of the payments to be made by the Procuring entity to the tenderer as hereinafter mentioned, the tenderer hereby covenants with the Procuring entity to provide the goods and to remedy defects therein in conformity in all respects with the provisions of the Contract
4. The Procuring entity hereby covenants to pay the tenderer in consideration of the provisions of the goods and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed by _____ the _____ (for the Procuring entity)

Signed by _____ the _____ (for the tenderer in the presence of _____)

(Amend accordingly if provided by Insurance Company)

9.5 PERFORMANCE SECURITY FORM

(To be on the Banks Letterhead)

To
[name of Procuring entity]

WHEREAS [name of tenderer] (hereinafter called “the tenderer”) has undertaken , in pursuance of Contract No. _____ [reference number of the contract] for dated _____ 20 _____ to **Design, Manufacture, Supply, Delivery, Installation, Training and Commissioning of Calibration Centre Equipment** (hereinafter called “the Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the tenderer shall furnish you with a bank guarantee by a reputable bank for the sum specified therein as security for compliance with the Tenderer’s performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the tenderer a guarantee:

NOW THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the tenderer, up to a total of [amount of the guarantee in words and figure] and we undertake to pay you, upon your first written demand declaring the tenderer to be in default under the Contract and without cavil or argument, any sum or sums within the limits of [amount of guarantee] as aforesaid, without you needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the _____ day of _____ 20 ____

Signed and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]

NOTE: PERFORMANCE SECURITY SHALL BE REQUIRED FOR EACH PHASE, NOT COMBINED.

9.6 MANUFACTURER'S AUTHORIZATION FORM

To *[name of the Procuring entity]*

WHEREAS *[Name of the manufacturer]* who are established and reputable manufacturers of **Calibration Equipment** having factories at *[Address of factory]* do hereby authorize *[Name and address of Agent]* to submit a tender, and subsequently negotiate and sign the Contract with you against tender No. *[Reference of the Tender]* for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per the General Conditions of Contract for the goods offered for supply by the above firm against this Invitation for Tenders.

[Signature for and on behalf of manufacturer]

Note: This letter of authority should be on the letterhead of the Manufacturer and should be signed by a person authorized.

APPENDIX I: PRESSURE ADAPTOR AND FITTINGS KIT

1/4 BSP Male to Metric	<ul style="list-style-type: none"> 1 off M10 x 1.0 Female 1 off M10 x 1.0 Male 1 off M12 x 1.0 Female 1 off M12 x 1.0 Male 1 off M12 x 1.25 Female 1 off M12 x 1.25 Male 1 off M14 x 1.5 Female 1 off M14 x 1.5 Male 1 off M16 x 1.5 Female 1 off M16 x 1.5 Male 1 off M20 x 1.5 Female 1 off M20 x 1.5 Male
1/4 BSP Male to BSP	<ul style="list-style-type: none"> 1 off 1/8 BSP G Female 1 off 1/8 BSP G Male 4 off 1/4 BSP G Female 1 off 1/4 BSP G Male 1 off 3/8 BSP G Female 1 off 3/8 BSP G Male 2 off 1/2 BSP G Female 1 off 1/2 BSP G Male 1 off 1/8 BSP Rc Female 1 off 1/8 BSP R2 Male 1 off 1/4 BSP Rc Female 1 off 1/4 BSP R2 Male 1 off 3/8 BSP Rc Female 1 off 3/8 BSP R2 Male 1 off 1/2 BSP Rc Female 1 off 1/2 BSP R2 Male
1/4 BSP Male to NPT	<ul style="list-style-type: none"> 2 off 1/8 NPT Female 1 off 1/8 NPT Male 4 off 1/4 NPT Female 1 off 1/4 NPT Male 1 off 3/8 NPT Female 1 off 3/8 NPT Male 1 off 1/2 NPT Female 1 off 1/2 NPT Male
Additional	<ul style="list-style-type: none"> 2 off Minimes 1/4 BSP G Male 1 off 4mm OD Hose pushfit M 1 off 4mm OD Hose pushfit F
Hoses	<ul style="list-style-type: none"> 1 off Minimes to Minimes 1m 1 off Minimes to Minimes 0.5m 1 off Minimes to 1/4G 1m 2 off QR Plug to Socket 550mm 2 off QRC Plug to Plug 550mm 2 off QRC Socket to Socket 550mm 1 off 2m of 6mm
Extras	<ul style="list-style-type: none"> 2 off 6mm hose push fit to 1/4 BSP G M 2 off 4mm hose push fit to 1/4 BSP G M 4 off Quick release plug to 1/4 BSP G M 4 off Quick release socket to 1/4 BSP G M 2 off Y-piece 1/4 BSP G F 2 off Quick release socket to 6mm hose 2 off Quick release plug to 6mm hose 4 off 1/8 dowty bonded washer 8 off 1/4 dowty bonded washer
Tools and Cases	<ul style="list-style-type: none"> 1 off 10" Adjustable Spanner 1 off roll of PTFE tape 1 off Case with foam inserts for adaptors, central partition & extra compartments.

APPENDIX II: TOOLS

1. ELECTRICAL MULTIMETER PREMIUM KIT

Specifications

PARAMETER	VALUE/ RANGE
DC Voltage Accuracy	±0.09%
DC Voltage Digits	+2 D
DC Voltage Lowest Range	600mV
DC Voltage Highest Range	1000V
DC Voltage Lowest Resolution	0.1mV
AC Voltage Accuracy	±1%
AC Voltage Digits	+3 D
AC Voltage Lowest Range	600mV
AC Voltage Highest Range	1000V
AC Voltage Lowest Resolution	0.1mV
AC Voltage Max Frequency	500Hz
DC Current Accuracy	±1%
DC Current Digits	+3 D
DC Current Lowest Range	60mA
DC Current Highest Range	10A
DC Current Lowest Resolution	0.01mA
AC Current Accuracy	±1.5%
AC Current Digits	+3 D
AC Current Lowest Range	60mA
AC Current Highest Range	10A
AC Current Lowest Resolution	0.01mA
AC Current Max Frequency	1kHz
Absolute Maximum Capacitance Measurement	9999µF
Best Capacitance Measurement	±10%
Capacitance Measurement Resolution	1nF
Absolute Maximum Resistance Measurement	50MΩ
Resistance Measurement Resolution	0.1Ω
Resistance Accuracy	±0.7%
Absolute Maximum Temperature Measurement	+400°C
Best Temperature Measurement accuracy	±1% +1°C
Resistance Digits	+2 D

Multimeter Features

- Multimeter type: **Handheld**
- Display Type: **LCD**
- 6000 count LCD with 33 segment bargraph
- Display backlight
- Display & Auto. Hold
- **True RMS** AC voltage and current for accurate measurement of complex signals or non-linear loads

- EN61010-1 safety standard compliance to **CAT IV 600V 7 CAT III 1000V**
- Min/Max Average recording
- Separate battery & Fuse access without breaking the calibration seal.
- Weight: **<430g**
- Battery Life: **200hrs**

Multimeter Accessories

- 80BK K bead thermocouple for temperature measurements with integral adaptor
- **Test Leads:** the Multimeter shall be equipped with **test lead** set with the following features:
 - One pair (red, black) 1.5 meter long silicone test leads with right angle shrouded banana plug
 - Lantern tip (removable) for use with European wall sockets (4 mm Ø); removable for easy access to terminal blocks (2 mm Ø)
 - Removable insulated IC caps to allow probing on closely spaced leads compliant with GS38
 - CAT II 1000 V, 10 A rating
 - CAT III 1000 V, CAT IV 600V only with protective cap
- **Magnetic hook and strap hanger kit** to allow hands-free use of the multimeter. Should allow hanging of the multimeter on nails, hooks as well as magnetic surfaces.
- **Instruction manual**

Make: West European, USA or Japan. **Provide catalogue**

VDE APPROVED SCREWDRIVER SET – 14PC

General Description:

Two sets each consisting of fourteen (14) screwdrivers. Each set shall incorporate One (1) voltage tester, Four (4) slotted Screwdrivers, Two (2) Phillips Screwdrivers, Two (2) Pozi Screwdrivers, Two (2) Plus-Minus screwdrivers, and Three (3) TORX Socket Screwdrivers.

Specifications:

	TOOL	Quantity	Type	Application	Design Description		Compliant
1.	Voltage tester	1	Slotted 0.5 x 3.0	Sockets 240Vac	Single Pole		
2.	Screwdrivers	4	Slotted: (mm) 0.4 x 2.5 0.6 x 3.5 0.8 x 4.0 1.0 x 5.5	Slotted screw	Slotted screwdriver	Handle Design <ul style="list-style-type: none"> • Agronomic design • non-rolling feature Conical blade VDE Blade: <ul style="list-style-type: none"> • Insulated, individually tested as per IEC 60900 • Zinc-phosphated, Black Point, • laser tip to prevent slipping 	
		2	Phillips: PH1 PH2	Phillips screw	Phillips screwdriver		
		2	Pozi: PZ1 PZ2	Pozidriv*) screw	Pozidriv*) screwdriver		
		2	Pozi Plus Minus #1 #2	PlusMinus, slotted/Pozidriv screw	PlusMinus screwdriver, slotted/Pozidriv*)		
		3	TORX Socket TX10 TX15 TX20	TORX Socket Screws	TORX Socket Screwdriver		

*) Pozidriv = reg. trademark of European Industrial Service Ltd

2. VDE APPROVED CUTTERS AND PLIERS SET – 3Piece

Specifications:

Each tool shall be VDE approved, tested to 10KV, and rated 1000V.

The set shall incorporate:

TOOLS	Quantity	Specifications	
Side cutter	2	>165mm For cutting medium to hard wire Tapered head shaped to access confined spaces Design of the cutter face allows wire to be cut close to the surface Rounded jaw ends provide strength in the area where the majority of cutting takes place	Handles Shall be of ergonomic design to offer optimum balance between grip and comfort Shall have integrated “hand stop” for improved safety by reducing risk of contact with metal head
Combination Pliers	2	>180mm Pipe grip for pipes, rods and round components Serrated jaws for gripping nuts, bolts, studs and similar objects Joint cutter for cleanly cropping wire	Cutting head Shall be manufactured from hardened and tempered drop forged steel for maximum strength and durability Induction hardened and ground edges for maximum durability and performance
Long nose Pliers	2	>200mm long Long tapered jaws for gripping in confined spaces Side cutter for cutting medium hard wire Fine jaw ends for gripping and maneuvering small objects Serrated jaws for extra grip	Shall be manufactured from hardened and tempered drop forged steel for maximum strength and durability Induction hardened and ground edges for maximum durability and performance

3. DR. SOCKET BIT SET: 39 PIECES

Specification:

Material: Chrome vanadium (50bv30) steel for socket and accessories, chrome molybdenum (scm#440) steel for driver portion, chrome molybdenum (s-2) steel for bits and P.P / TPR double injection grip

Finish: Satin chrome plated for socket and accessories, detent grooves on all sockets, sandblast finish for bits and red / black double injection grip.

Hardness: Heat treated to HRC: 38 ~ 54 (sockets & accessory), HRC: 56~ 62 (screwdriver bits)

	Contents:	QTY	Compliant
1.	1/4" dr. quick release ratchet with red (pantone color-187c, p.p) /black (tpr) double injection grip (gear to gear type and 45 teeth)	1 pc	
2.	1/4" dr. shallow socket: (6pt) sizes: 4, 4.5, 5, 5.5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 mm	13 pc	
3.	1/4" dr. 2" (55 mm) extension bar 1 pc-1/4" dr. universal joint: (screw type)	1 pc	
4.	1/4" dr. to 1/4" hexagon bit coupler: (sheet type)	1 pc	
5.	1/4" dr. spinner handle with red (p.p) / black (tpr) double injection grip	1 pc	
6.	1/4" dr. socket bits: (length -37 mm): Slotted: 4, 5.5, 7 mm; Phillips: no.0, 1, 2 & 3; pozidriver: no.1, 2 & 3; Hex bits: 3, 4, 5 & 6mm; Torx: t-10, t-15, t-20, t-25, t-27 t-30 and t-40	21 pc	

5. HEXAGON SOCKET SCREWS KEY SET: 18-piece

Specifications:

- L-Key Set, shall comprise of 9No. Metric and 9No. Imperial type.
- Surface shall be Black Laser treated to give high corrosion protection.
- The surface of each L-key shall have clearly marked inscriptions (engraved by a laser) so that it is easy to recognize the correct size.
- L-keys shall have a large contact surface inside the screw recess to reduce the notching effect and thereby also the deformation of the screw-head and have a higher torque transfer.
- The Hexagon keys shall have a ball-end on the long arm to enable angled access to drive screws in awkward places.
- The L-keys shall be housed in a wear-resistant clip material to ensure that the L-keys are securely held yet easy to remove.

6. VDE CABLE KNIFE, 2No.

Specifications:

- Hardened steel blade for increased durability =< 50mm
- Anti-slip guard and protective detachable cap to maximize safety
- Ergonomically shaped handle for increased comfort in use
- Certified and approved by the VDE (Verband der Elektrotechnik) institute of Germany
- Tested to 10,000V for complete assurance of safety when working on live equipment up to 1,000V AC

Application: For scoring and stripping cables

7. WRENCH SET: 3-PIECE SET

Specifications:

- High quality, phosphate finish
 - Precision-hardened anti-corrosion finish
 - Each adjustable incorporates graduated 15 degree angled head with thin parallel jaws and concealed jaw shank
- Greater accessibility plus ergonomic design for user comfort

8. TAPE MEASURE

Specifications:

- **Material:** Impact abs plastic case, high carbon steel (SK-4, SAE1095) sheet for tape blade, reverse spring and medium carbon steel (S1050C) for slide hook and stainless (#420-J2) steel for belt clip
- **Finish:** Neon yellow (pantone color-115c) injection case with black color locking mechanism, nickel plated for slide hook and chrome plated belt clip
- **Hardness:** Heat treated to HV: 460-500degree
- **Contents:** 1 pc- 5.0m x 19mm (16'x3/4") SAE/metric neon yellow measuring tape with belt clip, fraction marking and non-lead three color printing with nylon coating metric scale approval to EEC pattern 2350 class 2, blade thickness-0.110mm,bumper and 3 rivet slide hook (dimension- 67mm(w) x 31mm(d) x 64mm(h),and weight- 190 grams)

Note:

Suppliers shall provide catalogues for each item quoted for.

All tools shall be made in Europe, USA or Japan.