



अप्रमत्तेन वेदव्यम्

# COTTON UNIVERSITY

## TENDER DOCUMENT

FOR

**DESIGN, MANUFACTURE, SUPPLY, DELIVERY OF  
1X800KVA, BIS MARKED, 11/0.433KV DISTRIBUTION  
TRANSFORMER OF ENERGY EFFICIENCY LEVEL-2**

PART - I

**TECHNO-COMMERCIAL BID**

**NIT No. 03 of 2021-22**

**Dt. 08.03.2022**

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**COTTON UNIVERSITY  
PANBAZAR,  
GUWAHATI – 781 001**

**NOTICE INVITING TENDER**

NIT No: 03 of 2021-2022 Dtd. 08.03.2022

Sealed tenders in two-bid-system are invited for and on behalf of the Cotton University for "Design, Manufacturer, Supply, Delivery of 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2 for the Cotton University"

Key details of the tender are furnished below-

Name of the work	"Design, Manufacturer, Supply, Delivery of 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2 for the Cotton University"
Cost of tender document	Rs 1000.00
Last date and time of receipt of tenders	23.03.2022 Till 14.00Hrs
Date and time of opening of technical bid	23.03.2022 , 15.00Hrs
Date and time of opening of price bid	Will be intimated to the technically qualified bidders through email.
EMD	Rs 28,000.00
Delivery period	3 months

**Terms and Conditions:**

1. Price bids of only the eligible bidders will be opened in presence of authorized bidder's representatives who choose to attend the opening of tender on the above specified date, time
2. In case the day of submission of the tenders happens to be holiday on account of Govt. notification, the submission & opening of the tenders shall automatically be extended to the next working day, the times specified remaining the same.
3. Any future clarification(s) and / or corrigendum (s) shall be communicated through the website. Therefore, the bidders are requested to regularly visit the website.
4. The University reserves the right to amend or withdraw any of the terms and conditions contained in the Tender Document including quantity of items to be supplied or to reject any or all tenders without giving any notice or assigning any reason. The decision of the University shall be final in this regard.
5. **Validity period:** The rates quoted in the tender shall remain valid for 120 days.
6. Complete Tender Document may be downloaded from the university's website [www.cottonuniversity.ac.in](http://www.cottonuniversity.ac.in). Interested contractors who have credentials to fulfill the Eligibility/ Qualifying criteria as detailed in item-9 below, may participate in the tender.. Tenderers are requested to submit tenders as per the formats and guidelines given in this document.



7. **Submission of EMD and cost of tender document:** The EMD and the cost of tender documents shall be submitted in the form of Demand draft/ Banker's cheque in favour of "Registrar, Cotton University" payable at Guwahati. The EMD and the cost of tender document shall be submitted in the sealed envelope containing the Technical Bid. **Tender submitted without EMD and cost of tender document shall be summarily rejected and such tenders will not be considered for technical evaluation.**
8. Bidders are expected to examine all instructions, forms, terms & conditions, and specifications in the bidding document. Failure to furnish all information prescribed in the bidding documents or submission of bids not substantially responsive to the bidding documents in every respect may result in the rejection of the bid.
9. **Eligibility/ Qualifying criteria:** The bidder must fulfill the following qualifying eligibility criteria :

Serial No	Requirements	Documents to be submitted
1	The bidder must be an approved manufacturer of transformer of APDCL for 800KVA, 11/0.433KV for Efficiency Level-2 as per IS:1180, Part-1, 2014, having complete infrastructure and testing facilities for the type of transformer being tendered. It is mandatory that the bidder should be in such manufacturing business for not less than 10 years	Relevant document to substantiate the clause
2	BIS License	<p>(i) The bidding is open to those manufacturers only, who possess valid ISI License/ Marketing rights for offered rating for energy efficiency level-II as specified in IS:1180 (Part-I):2014.</p> <p>(ii) ISI marking- The transformer, as per Energy Efficiency Level-2 specified in IS- 1180(Part-1):2014, must bear 'ISI' certification mark. In this connection, a certified photocopy of the valid ISI license/marketing rights must be submitted along with the tender.</p> <p>(iii) In absence of ISI marking License, the offer shall be liable for rejection.</p>
3	Must have experience of manufacture and supply of at least 2 transformers of similar/ higher capacity of 11KV or 33KV level (Efficiency Level-2) in Power Utilities, Govt Departments, PSUs, Autonomous bodies in last 7 years.	<p>(i) Copies of work orders and completion reports duly signed by competent authority.</p> <p>(ii) In case, such execution is through contractors, in addition to documents mentioned in item (i), certificate from respective agencies (Power Utilities, Govt Departments, PSUs, Autonomous bodies) shall be submitted as evidence that the transformer(s) against the respective orders were supplied to them.</p>
4	Type test report for tendered rating of transformers	<p>(i) The certified photo copies of valid type test Reports for 'ISI' mark, losses as per Energy Efficiency Level-2 specified in IS- 1180(Part-1):2014, copper wound -800 KVA rating distribution transformer from the Govt. Standard test Laboratory/Govt. Approved Laboratory shall be submitted along with the tender.</p> <p>(ii) The type test certificates including dynamic short</p>

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		<p>circuit report for the offered or higher rating having similar design, shall be submitted.</p> <p>(iii) Type test reports shall not be more than 5 years old from the date of opening of the tender</p>
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#### 10. Submission of Bid:

Tender shall be submitted in the following manner in separate sealed covers duly superscripted as explained in the special conditions of contract:

**Part I – Techno-Commercial Bid**

**Part II – Price Bid**

The EMD and the cost of tender document shall be deposited along with Part – I, i.e. Techno-Commercial Bid.

Tenders shall be submitted as per detailed instructions given in the Special Instructions to Tenderer, to **The Registrar, Cotton University, Panbazar, Guwahati-781001**, so as to reach within the specified time of the last date of submission of the tender.

11. Late tenders will not be considered. No responsibility will be taken for postal delay or non-receipt of Bid documents. Unsealed bids or bids sent by FAX or e-mail, will not be considered.
12. **Evaluation of the techno-commercial bids:** The techno-commercial bids shall be evaluated strictly on the basis of eligibility criteria specified in clause-9 above and also elaborated in the special conditions of contract and technical specifications. Fulfillment of the eligibility criteria shall be based on the information, documents furnished along with the tender. It is the responsibility of the bidder to submit all the relevant information supported with necessary document to establish the fulfillment of each of the eligibility criteria in full, whether specifically asked to be filled up in the attached formats/ annexure or not.
13. The Price Bids of only the eligible bidders shall be opened in presence of their authorized representatives, on a date, to be intimated to them (the eligible bidders). The price bids of only those bidders will be opened whose bids have been found eligible as per the terms mentioned in the Special Conditions of Contract. Interested bidders are requested to carefully study the eligibility criteria stated in the Special Conditions of Contract. All eligibility conditions have to be satisfied on the date of submission of the bid and not on a later date. The date and time of opening of the technical bids/ price bids will not be postponed due to the non-presence of any bidder or his authorized representative.
14. **Rejection of Bids:** Canvassing by the bidder in any form, unsolicited letter and post tender correction, unsigned bids shall be summarily rejected and may lead to forfeiture of EMD. Conditional tenders will also be rejected. Cotton University reserves the right to cancel/reject any/all the tenders without assigning any reason thereof.
15. **Completion period:** The successful bidder will have to complete the delivery within three months from the date of conclusion of the contract or signing of work order unless the period is extended by mutual agreement.
16. The authority of Cotton University may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The University, at its discretion, may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
17. A bid submitted with false information thereby misleading will not only be rejected but also the EMD submitted by the bidder will be forfeited. Further, the bidder may be debarred from participation in future tendering process.

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Registrar,  
Cotton University

**COTTON UNIVERSITY**  
**Submission of Tender**

From :.....

To  
The Registrar  
Cotton University  
Panbazar, Guwahati – 781 001

1. I / We hereby tender for Design, Manufacturer, Supply, Delivery of 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2 for the Cotton University as per tender within the time schedule mentioned therein as separately signed and accepted by me / us, at the schedule of rates quoted by me / us for the whole work in accordance with Notice Inviting Tender, General Conditions of Tender, Special Instructions to Tenderer, Technical Specifications, workmanship, drawings, other documents and papers, all as detailed in the tender documents.
2. It has been explained to me / us that the time stipulated for job and completion of works in all respects and in different stages mentioned in the "Time schedule" of completion of job and signed and accepted by me / us is the essence of the Contract. I / We agree that in the case of failure on my / our part to strictly observe the time of completion mentioned for jobs or any of them and to the final completion of works in all respects according to the schedule set out in the said "Time Schedule of Completion of Job", I / We shall pay compensation to the Owners as per provision and stipulations contained in clause – 1.13 of General conditions of Tender and I / We agree to recovery being made as specified therein. In exceptional circumstances extension of time which shall always be in writing may, however, be granted by the Engineer-in-Charge at his entire discretion for some items of work, and I / We agree that such extension of time will not be counted for the extension of completion dates stipulated for job and for the final completion of works as stipulated in the said "Time Schedule" of Completion of Jobs.
3. I / We agree to pay the earnest money and security deposit and accept the terms and conditions laid down in the memorandum below in this respect.

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**MEMORANDUM**

(a) General description of work .....

(b) Earnest Money Rs.....  
(Rupees).....

The Earnest money is payable in the manner set out in para 5 below. The Earnest money, if the tender is accepted, will be retained against the security deposit when Earnest Money is paid in cash or demand draft only.

(c) Security Deposit 5% of the contract amount which will be paid in the manner set out in clause (1.9) in Section - I of the General Conditions of Tender

(d) Time allowed for starting work : Fifteen days from the date of issue of letter of acceptance of the tender

4. Should this tender be accepted I / We hereby agree to abide by and fulfill all terms and conditions referred to above and in default thereof, to forfeit and pay to the Owner or its successors or its authorized nominees such sums of money as are stipulated in conditions contained in Notice Inviting Tender and other tender documents.

5. If I / We fail to commence the work specified in the memorandum in para (3) above, or I / We fail to deposit the amount of security deposit specified in the Memorandum in para (3) above, I / We agree that the said Owner and its successors without prejudice to any other right or remedy be at liberty to forfeit the said earnest money in full otherwise the said earnest money shall be retained by Owner, towards the security deposit specified in para (3) above. The said Owner shall also be at liberty to cancel the notice of acceptance of tender if I/We fail to deposit the security amount as aforesaid or to execute an agreement or to start work as stipulated in the tender documents.

I / We enclose herewith evidence of my/ our experience of execution of work of similar nature and magnitude carried out by me/ us in the prescribed proforma.

Date.....day of.....2021

Witness :

PROPOSAL PARTICULARS & VENDOR INFORMATION

1. Tenderer's complete Company Name & Address :
2. Tenderer's proposal no. :
3. Tenderer's proposal date :
4. Tenderer's proposal validity period :
5. Whether Earnest Money & Cost of Tender Document deposited ? If so, furnish amount, bank name & DD no-
  - a) Cost of tender document :  
:
  - b) EMD :  
:
6. Name and designation of the officer of the tenderer to whom all reference shall be made for expeditious technical co-ordination. :
7. Make & capacity of the transformer offered :
8. Whether the offered transformer is BIS Certified :
9. Complete period for design, manufacture & delivery :
10. Guarantee period for the transformer offered :
11. Particulars of past experience of execution of similar projects, furnished ? :
12. How long the bidder is in the business of manufacture of transformer? :
13. GST No :  
Copy of the GST Registration certificate enclosed? :
14. PAN No :  
Copy of PAN Card enclosed ? : *true*
15. Audited balance sheet for last three financial years enclosed? :
16. Bank details :  
Bank name :

Branch name :  
Bank MICR Code :  
Account No :  
Type of account :  
IFSC Code :

Date :

(Signature of the tenderer)

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SECTION - 1

GENERAL CONDITIONS OF TENDER

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## DEFINITION OF TERMS

In the contract documents as herein defined where the context so admits, the following words and expressions will have the following meanings :

1. "The Owner" means the Cotton University having its office at Panbazar, Guwahati.
2. The "Purchaser" means the Cotton University having its office at Panbazar, Guwahati.
3. "The Contractor / Supplier" means the person or the persons, firm or company whose tender has been accepted by the Owner and includes the Contractor's legal representative, his successor and permitted assignees.
4. The "Engineer-in-Charge" shall mean the person designated as such by the Owner and shall include those who are expressly authorized by the Owner to act for and on his behalf for operation of this contract.
5. The "Work" shall mean the works to be executed in accordance with the contract or part thereof as the case may be and shall include all extra, additional altered or substituted works as required for the purpose of the contract.
6. The "Permanent work" means and includes works as will be incorporated in and form a part of the work to be handed over to the Owner by the Contractor on completion of the contract.
7. "Construction Equipment" means all applications and equipment of whatsoever nature for the use in or for the execution, completion, operation or maintenance of the work unless intended to form part of the Permanent work.
8. "Site" means the areas on which the permanent Works are to be executed or carried out and any other places provided by the Owner for purpose of the contract.
9. "Contract Document" means collectively the Tender Document, Designs, Drawings, Specifications, agreed variations, if any, and such other documents constituting the tender and acceptance thereof.
10. "The Sub-Contractor" means any person or firm or Company (other than the Contractor) to whom any part of the work has been entrusted by the Contractor, with the written consent of the Engineer-in-Charge, and the legal personal representatives, successors and permitted assigns of such person, firm or company.



11. The "Contract" shall mean the Agreement between the Owner and the Contractor for the execution of the works including therein all contract documents.
12. The "Specification" shall mean the various technical specifications attached and referred to in the tender documents. It shall also include the latest edition including all addenda/corrigenda of relevant Indian Standard Specifications published before entering into Contract.
13. "The Drawings" shall include maps, plans and tracings or prints thereof with any modifications approved in writing by the Engineers-in-Charge and such other drawings as may, from time to time, be furnished or approved in writing by the Engineer-in-Charge.
14. The "Tender" means the tender submitted by the Contractor for acceptance by the Owner.
15. The "Alteration Order" means an order given in writing by Engineer-in-Charge to effect additions to or deletion from and alteration in the work.
16. The "Completion Certificate" shall mean the certificate to be issued by the Owner when the works have been completed to his satisfaction.
17. The "Final Certificate" in relation to a work means the certificate issued by the Owner after the period of liability is over.
18. The "Period of Liability" in relation to a work means the specified period from the date of issue of completion certificate up to the date of issue of final certificate during which the Contractor stands responsible for rectifying all defects that may appear in the works.
19. The "Appointing Authority" for the purpose of arbitration shall be the Registrar, Cotton University, Panbazar, Guwahati or any other person so designated by the Owner.

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## SECTION – 1

### GENERAL CONDITIONS OF TENDER

#### 1.1 Scope of work :

The scope of work under this contract shall include Design, Manufacturer, Supply, Delivery of 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2 for the Cotton University. The transformer shall be outdoor type, copper wound and shall include all accessories and equipments as detailed in Section – 3 – Scope & Technical Specification (incorporated in this document) and Bill of Quantities incorporated in the Part – II (Price Bid) of the Tender Document.

#### 1.2 Time Schedule :

The entire work shall be completed within a period of 3 (three) months from the date of issue of Letter of Intent.

#### 1.3. Drawings and manuals to be furnished by the Tenderer :

##### 1.3.1 After award of the supply / work order :

Every offer shall include complete detailed technical literature performance data including test certificates. Operations, maintenance and spare parts manuals have to be furnished by the successful tenderer / contractor.

The successful tenderer shall furnish in duplicate the following drawings within a fortnight of issue of the supply / work order for approval by the Cotton University —

- i) Transformer layout and other drawings showing details of all components & accessories of the transformer
- ii) Foundation drawing
- iii) Electrical layout & control schematic drawings.

#### 1.4. Inspection and testing :

**1.4.1 Stage Inspection:** The Transformer may be stage inspected at the factory of the manufacturer. The manufacturer shall intimate in advance, in writing, to the purchaser about the stages of manufacturer & subsequent readiness of the transformers, to enable the purchaser to carry out stage inspection & final inspection and testing of the finished transformers. The stage inspection will be carried out at the discretion of the purchaser during the process of manufacturing of the Transformers. The manufacturer need not stop the process of production because of programme of stage inspection of the Purchaser.

**1.4.2. Final inspection and witnessing of Routine Tests:** The transformer shall be finally inspected by purchaser's engineer at the manufacturer's works upon completion of manufacturing. All routine and special tests as mentioned in item 3.24.1 of Section-3 shall be conducted in presence of purchase's engineer and clearance for dispatch shall be given upon satisfactory completion of all the tests and verification of test results for compliance to the relevant BIS specifications and relevant data & parameters specified in this tender document.

At least 15 day's clear notice shall be given to the purchaser for witnessing of the tests. The supplier shall arrange all possible facilities for such Inspection and testing free of cost.

**1.5. Supervision in commissioning.**

The successful tenderer shall have to send their engineer for supervision in commissioning of the transformer at his own cost.

**1.6. Payment term :**

Standard payment shall be as follows :

- i) 100% of the cost shall be released after receipt of the materials and equipments at site in full and in good condition.
- ii) No part payment will be entertained.

**No payment shall be released unless the security deposit as per clause no.1.9 is deposited.**

**1.7. Price escalation :**

The prices shall be firm till completion of supply, delivery, installation & commissioning.

**1.8. Taxes :**

- a) For supply parts, ex-works price, GST, packing & transportation charge and transit insurance shall be quoted as per the format given in the Part – II of the tender.
- b) Income Tax, if applicable shall be deducted at source as per prevailing rules & rates.

**1.9. Security Deposit :**

1.9.1 A sum of 5% of the total value of the contract shall be deposited by the successful tenderer within 15 days from the date of issue of the Letter of Intent.

1.9.2 The security deposit amount may be furnished by (a) Demand Draft, or (b) Bank Guarantee of State Bank of India or any schedule 'A' bank in favour of Registrar, Cotton University, payable at Guwahati, valid for the entire guarantee period.

1.9.3 The security deposit shall be retained by the University till successful completion of the performance guarantee period.

1.9.4 If the supplier / contractor fails or neglects to observe, perform any of his obligation under the contract either in respect to supply, installation, testing and commissioning of the equipment or in respect to the guarantee period, it will be lawful for the 'Purchaser' / 'Owner' to forfeit either in full or in part at his absolute discretion, the security deposit furnished by the supplier.

1.9.5 No interests shall be payable on such deposits.

**1.10 Earnest Money :**

1.10.1 Earnest money prescribed in the NIT shall be paid in the shape of Bank Call Deposit / Bank Draft payable in favour of the Registrar, Cotton University, Guwahati.

1.10.2 In case of unsuccessful tenderers, earnest money will be released.

1.10.3 In case of successful tenderer, the earnest money will be retained until submission of the security deposit referred to in the clause 1.9.

1.10.4 No interest shall be payable on such deposits.

1.10.5 The Purchaser / Owner reserves the right to forfeit the EMD or part thereof, in circumstances which according to him indicate that the tenderer is not earnest in accepting / executing the order(s) placed under this specification.

**1.11. Guarantee and Warranty :**



**1.11.1.** The transformer shall be guaranteed for a period of 60 months from the date of installation or 66 months from the date of receipt by the purchaser whichever is earlier. If the goods, stores and equipments found defective due to bad design or workmanship the same should be repaired or replaced by the manufacturer free of charge if reported within 66 months of their receipt at site or 60 months from the date of commissioning of equipments whichever is earlier. The manufacturer will be responsible for the proper performance of the equipments / materials for the guarantee period. In case the transformer fails/ develops any problem during the above guarantee period, the same shall be rectified/ repaired by the manufacturer at his own cost and the repaired transformer shall have to perform as per the guaranteed parameters specified in this tender document.

**1.11.2** It will be the responsibility of the manufacturer to immediately depute their testing engineer for testing and inspection of the transformer upon intimation about defect/ failure or malfunctioning, if falls within the aforementioned guarantee period. The cost of transportation, fooding, lodging etc of the testing engineer shall be borne by the manufacturer.

**1.11.3.** The transformer, if possible, shall be repaired at site. However, if it becomes necessary to shift the transformer to their works for repair, the same shall be arranged in shortest possible time. The cost of transportation of the transformer to their works and returning back to site after repair, including handling charges, shall be borne by the manufacturer. The entire period shall not be more than 30 days. It will be the responsibility of the manufacturer to install one transformer temporarily for the interim period at their own cost to avoid prolonged interruption.

**1.12. Delivery schedule as per contract :**

- i) Normally, the delivery schedule as stipulated in the NIT or tender specification shall be offered in the purchase order and shall be binding on the successful tender. For the purpose of reckoning delivery period the date of dispatch will be counted as the effective date.
- ii) In case of the successful tender offering a different delivery schedule, the "Purchaser" reserves the right to alter the delivery schedule through negotiation.
- iii) The date of commencement of the delivery schedule of the purchase order will be deemed to be effective from the date for issue the purchase order.
- iv) Should progress be delayed by strikes, lockouts, fire accidents, delay in approval of drawings or any cause whatsoever beyond reasonable control of the Contractor and whether such delay or impediment occur before or after the time or extended time for dispatch or completion, reasonable extension of time may be granted on the application made by the contractor in writing to the Purchaser but without prejudice to other terms and conditions of the contract.
- v) Price variation, if any, applicable as per purchase order shall not apply to any quantity not delivered as per delivery schedule of the purchase order. If however the prices in respect of delayed deliveries are found to have gone down, payment will be made at the reduced prices or penalty levied at the discretion of the purchaser.

**1.13. Delay in Delivery / Completion of work :**

The date of delivery / completion of work shall be deemed to be the essence of the contract. The delivery and the installation shall be completed not later than the date specified in the purchase order / contract. In case of failure to delivery the materials / equipments in full and complete the work within the stipulated period or delay in the erection work, the "Purchaser" shall be entitled –

- i) To recover liquidated damage at the rate of ½% (half percent) of the total value of the undelivered materials or materials delivered late or of the value of incomplete work per week of delay or part thereof subject to a maximum of 10% (ten percent) of the total value of the contract price.

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- ii) To purchase the undelivered materials / equipment from elsewhere giving notice to the supplier and to recover any extra expenditure incurred thereby for having to purchase these materials at higher price at the risk and cost of the contractor.
- iii) To cancel the contract wholly or in part and to purchase materials / equipment at the full risk and cost of the contractor and forfeit the earnest money and / or security deposit.

**1.14. Contractual Failure :**

In the event of the contractual failure of any respect on the part of supplier, the "Purchaser" shall be entitled to operate security deposit or any deposit or any payment due to supplier irrespective of whether his default relates to the particular orders or not, towards the Purchaser's claim for damages arising out of the failure. In addition, Gauhati University may black-list or ban the "Contractor" or pending enquiry, suspend him or take any other steps considered suitable.

**1.15. Rejection :**

In the event, any of the equipment supplied by the contractor is found defective in materials or workmanships or otherwise not in conformity with the requirements of the contract specification, the purchaser shall either reject the equipments, or request the contractor in writing to rectify the same. The contractor, on receipt of such notification shall either rectify or replace the defective equipment free of cost to the purchaser. If the contractor fails to do so, the purchaser may :

- a) At his option, replace or rectify such defective equipment and recover the extra cost so involved from the contractor plus 15% (fifteen percent), or
- b) Terminate the contract for default,
- c) Acquire the defective equipment at a reduced price as considered equitable under the circumstances.

**1.16. Force majeure :**

Normally force majeure shall cover only act of God, fire, war, strikes, riots and civil commotion, act of Government etc. Any constraints other than those specified above will not constitute force majeure condition. In view of other constraint beyond the control of the supplier primarily due to statutory compulsion, extension of delivery may also be considered on individual merit of the case. In case of force majeure condition the contractor shall notify the purchaser such conditions within 10 (ten) days from the beginning of such delay in writing for consideration and acceptance.

**1.17. Change of name of the tenderer :**

- a) At any stage after tendering the "Purchaser" shall deal with supplier only in the name and the address under which he has submitted the tender. All the liabilities / responsibilities for due execution of the contract shall be that of the supplier / and in circumstances he shall be relieved of any litigations under the contract. The "Purchaser" may however, in his discretion deal with agents / representatives / distributors / manufacturers / associates / principals / sister concerns and such dealings shall not absolve the supplier(s) from the responsibilities / obligations / liabilities to the "Purchaser" under the contract.
- b) Any change / alteration of name / constitution / organization of supplier shall be duly notified to the "Owner" and the owner reserves the right to determine the contract, in case of any such notification. In the event of such determination, the "Owner" may effect the purchasers of the materials not supplied, from elsewhere at the risk and cost of the tenderer / supplier.

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## SECTION – 2

### **SPECIAL INSTRUCTIONS TO TENDERER**

- 2.1. Tenders are invited for Design, manufacture, supply, delivery to Cotton University, Panbazar, Guwahati properly packed for transportation including loading / unloading etc. of Design, Manufacturer, Supply, Delivery of 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2 for the Cotton University. The transformer shall be outdoor type, copper wound and shall include all accessories and equipments as detailed in Section – 3 – Scope & Technical Specification (incorporated in this document) and Bill of Quantities incorporated in the Part – II (Price Bid) of the Tender Document.

Tenderer is advised to read these instructions carefully to ensure that his response complies fully therewith. Failure to provide the information and documents required by this invitation to tender may render the tender to be unacceptable. For tenderer's convenience, this section is divided into three main sections as follows —

- a) General Conditions of Tendering
- b) Qualifying requirement
- c) Proposal of the tenderer

#### **2.2. General Conditions of Tendering :**

- 2.2.1. Tender documents may be downloaded from the website of the university [www.cottonuniversity.ac.in](http://www.cottonuniversity.ac.in). While submitting the tender, tenderer shall sign each page of the tender documents with office seal as token of his acceptance.

#### **2.2.2 Tender Validity :**

Tender shall remain valid for acceptance for a period of 120 (one hundred twenty) days from the date of opening of the tender. The tenderer shall not be entitled during the said period, to revoke or cancel his tender or to vary the tender given or any term thereof. In case of tenderer revoking or canceling his tender or varying any term in regard thereof, the owner shall forfeit the earnest money paid by him along with the tender. The tender shall be revalidated for extended period as required by owner in writing.

#### **2.2.3 Submission of Tender :**

- a) Tenders must be submitted by the time and date mentioned in the Notice Inviting Tender in the office of Cotton University at the address stated in para (c) hereunder. The University takes no responsibility for any delay, loss or non receipt of tender documents sent by post. Tenders received after the time and date fixed for receipt of tenders are liable for rejection.
- b) Priced and Unpriced parts of the tender must be submitted in separate sealed covers in tow parts as follows :

##### **PART – I : TECHNO-COMMERCIAL (UNPRICED) BID**

This part shall contain techno-commercial (unpriced) proposal, required as per para 2.4.1 hereinafter. The tenderer shall also submit subsequent correspondences in two copies.

Part – I of the tender i.e. the Techno-Commercial (Unpriced) Bid shall be opened on the time and date as given in the tender notice. The owner shall evaluate Techno-Commercial bid and Part – II (Priced) bid of only those tenderers who are found qualified shall be opened at a later date to be notified to the qualified tenderers. Price bid of other tenderers shall be rejected.

##### **PART – II : PRICE BID**



This part of the tender shall contain bill of quantity duly filled in, signed & sealed in two copies.

c) Tenderers must submit tender including queries if any, at the following office :

**The Registrar,  
Cotton University  
Panbazar, Guwahati – 781 001**

d) The tender and all details submitted subsequent to the tender shall be signed by any one, legally authorized to enter into commitment on behalf of the tenderer. Tenderer shall submit power of attorney in favour of the person who is authorized to enter into commitments on behalf of the tenderer.

Owner will not be bound by any power of attorney granted by the tenderer or changes in the constitution of the firm made subsequent to submission of the tender or the award of the contract. The owner may, however, recognize any such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the tenderer.

The cancellation of any document such as power of attorney, partnership deed etc. should be communicated by the tenderer to the owner in writing well in time, failing which it shall have no responsibility or liability for any action taken by it on the strength of the said documents.

### **2.3. Qualifying requirement/ Eligibility criteria :**

Bidders are informed that the owner intends to fully evaluate the technical ability of the firms. It is therefore, very important that bidders clearly demonstrate their ability, giving the owner a high level of confidence that the bidders have the technical, financial and infrastructural capability to execute the job up to the satisfaction of the owner within scheduled time, meeting all the tender requirements. Therefore, the bidders are requested to carefully study the qualifying/ eligibility criteria specified in the NIT and Part-3 (Scope and Technical Specifications) and submit all relevant documents specified therein to qualify as responsive bid. Bid(s), not fulfilling any one or more of the minimum qualifying criteria shall be considered as non responsive.

Bidders are therefore requested to carefully study the tender document and furnish all relevant documents, narratives required for fulfillment of the qualifying criteria mentioned below.

### **2.4. Organisation :**

- a) In case the tenderer is a partnership firm, certified copy of the partnership deed together with a certified extract from the register of firms containing names and addresses of all the partners of the firm should be furnished along with the tender.
- b) In case of the company (whether private or public), certified copy of the certificate of incorporation together with certified Memorandum of Articles of Association and a list containing names and address of all the directors should accompany the tender.
- a) In case of a proprietorship firm, the name and address of proprietor, should be furnished.

The contractor shall also submit an organization chart of the proposed manpower engagement for the installation, testing & commissioning work.

### **2.5. Project scheduling & Monitoring :**

The tenderer shall follow project schedules and monitor progress in accordance with the **bar chart** covering all major activities to be submitted along with the tender.

### **2.6. Financial Documents :**

The tenderer shall submit last three financial year's audited balance sheet as supporting document for the minimum annual turnover specified as one of the eligibility criteria. Further copies of the PAN card, GST registration certificate and bank details as asked in the Proposal Particulars shall be furnished.

**2.7. Pricing Requirements :**

- a) All rates set forth in tenderer's quotation, shall be in Indian Rupee as payment shall be made only in the Indian currency.
- b) The rate should be written both in figures and words. In case of difference between the two, the one, which is justified from the amount (entered in the amount column) shall be considered as correct. In case the rate in figure and words are same but the amount does not match with the rate multiplied by quantity, then the amount shall be considered as wrong and the same shall be corrected.
- c) The tenderers are requested to furnish the rebate, if any, only in the last page of 'Schedule of Rates' only. Rebate, if offered at any other place, shall be considered INVALID.

**2.8. Proposal of the tenderer.** The tenderers shall arrange their tenders in the following order :

**2.5.1. Part – I (Techno-commercial Bid) –**

- a) Submission of tender letter along with original set of tender document and drawings duly signed and sealed.
- b) Earnest Money Deposit and its details
- c) Cost of tender paper.
- d) List of similar project executed during last 7 (seven) years as per Annexure – I
- e) Performance record of the offered brand of D.G. Set as per Annexure – II
- f) Details about authorized spare parts dealer as per Annexure – III
- g) Details about authorized service dealer as per Annexure – IV
- h) Project Schedule
- i) GST registration certificate
- j) Copy of Pan no.
- k) Proposal Particulars and Vendor information duly filled up as provided before section-1 of the tender document
- l) Compliance to requirement of tender document as per Annexure – V
- m) Warranty/ Guarantee as per Annexure-VI
- n) Validity of tender as per Annexure – VII
- o) Deviation sheet of Technical Specification in Annexure – VIII
- p) Deviation sheet of Tendering & General Conditions in Annexure – IX
- q) Electrical contractor's licence
- r) Compliance certificate for noise and emission as per Clause 1.9 of the General Conditions of Tender
- s) Catalogue of the DG set with key technical particulars
- t) Audited balance sheet of last three financial years
- u) Section-5- Bidding Schedule- Technical Bid, duly filled up
- v) Any other relevant document tenderers wish to furnish.

**2.5.2 Part – II (Price Bid) –**

- a) Bill of quantity duly filled in along with proposal particulars

### 3.5 APPLICABLE STANDARDS:

Unless otherwise modified in the specifications, the Distribution Transformers, including various accessories, shall generally comply with the following Indian Standards / REC Specifications. The standard(s) shall be with latest amendment, if any, from time to time. Note: Wherever ISS are mentioned, equivalent or better International standards are also acceptable at the discretion of the Owner.

IS: 1180 Part-1 2014:	Specification for outdoor type oil immersed distribution transformers up to and including 2500 KVA, 33 KV
IS:2026 (PART-I,II,III,IV & V)/1981	Specifications of Power Transformers
IS:8603:2008	Dimensions for porcelain transformers bushings for use in heavily polluted atmospheres 12/17.5 kV, 24 kV and 36kV (Amalgamating IS 8603 (Parts 1,2&3) : 1977
IS:3347 (Part-I/Sec. 1 & 2)	Dimension of Porcelain parts & Metal parts for Transformer bushing (1.1KV)
IS:3347 (PART-III/Sec-1 & 2)	Dimensions of Porcelain parts & Metal parts for Transformer bushing (17.5 KV).
IS:12444	Specification for copper wire rod
IS:7421	Porcelain Transformer Bushings for low voltage upto 1 KV
IS:2099/1986	Porcelain Transformer bushing for AC volts above 1000 volts
IS:3639/1966	Fittings & accessories for Transformers
IS:1866/1978	Code of practice for maintenance & supervision of insulating oil in service
IS:9335	Specifications for insulating kraft paper
IE:1578	Specifications for solid insulating press boards for electrical purposes.
IS:649	Testing of steel sheets and strips for magnetic circuits
IS:2362	Determination of water content in oil for porcelain bushing transformers
IS: 4257	Dimensions for clamping arrangements for bushings
IS:6262	Method of test for power factor and di-electric constant of electrical insulating liquids.
IS:6792	: Determination of electrical strength of insulating oil
IS:10028	Selection, Installation and maintenance of transformers
3401	Silicagel
CBIP	Manual on Transformers
CEA/ Ministry of Power	Relevant specifications and guidelines on Distribution Transformers

**Note:** In case there is any conflict between any specification/ parameters in the above list and specific parameters/ design details specified in this document and IS 1180 (Part-1)- 2014, parameters and specifications shall prevail in following order-

1. Specification/ parameters specified in this document.
2. IS 1180 (Part-1)- 2014
3. Other specifications referred in the above list.

### 3.6 SERVICE CONDITIONS:

The transformer to be supplied against this specification shall be suitable for satisfactory continuous operation under the following climatic conditions

3.11 IMPEDANCE: The percentage impedance at rated current at 75°C shall be as under:

RATING	Percentage Impedance at 75°C	Tolerance
800KVA	5%	(+/-) 10%

### 3.12 TAPPINGS:

Off circuit tap changing arrangement shall be provided by means of an externally operated switch with mechanical locking device and a position indicator Relevant details of the tap shall be as follows-

Winding tapped	HV
Number of tap position	7
Voltage variation	(+) 5% to (-) 10% in steps of 2.5% for variation of HV
Minimum current rating of the tap changing device	100A

### 3.13 FREQUENCY:

Transformers shall be designed for normal frequency of 50 Hz, but shall be capable of giving the rated output with the variation of plus/minus (+/-) 5% from the rated frequency.

### 3.14 ELECTRICAL CLEARANCES:

#### 3.14.1 EXTERNAL CLEARANCES:

Minimum external clearances without any negative tolerance, shall be as under-

Nominal Voltage	Min Phase to Phase Clearance (mm)		Min Phase to Earth Clearance (mm)	
	In Air	In Cable Box	In Air	In Cable Box
11KV	255	130	140	80
Up to 1.1KV	75	25	40	20

#### 3.14.2 INTERNAL (IN OIL):

The following minimum internal clearances shall be maintained as per details given hereunder:

On width side (non bushing side)	25 mm
On length side (bushing side HV & LV both)	40 mm
Between HV windings & yokes (end insulation)	20 mm
Between LV windings to core (Bare conductor)	5 mm
From top of yoke to inside of top cover of tank (with gasket)	100 mm
Between LV/HV winding (Radial bare conductor Clearance)	11 mm
Phase to Phase Clearance between HV limbs	10 mm

The aforesaid external and internal clearances are minimum clearances and no negative tolerance on these clearances shall be allowed.

### 3.15 TEST VOLTAGE:

Transformers shall be capable of withstanding the power frequency and impulse test voltage prescribed below:

Nominal Voltage	System	Highest Voltage	System	Impulse Voltage	withstand	Power Withstand Voltage	Frequency

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11KV	12KV	75KV(Peak)	28KV
0.433KV	-----	-----	3KV

The Transformer shall have fully insulated windings designed for the above impulse level.

### 3.16. HEAT DISSIPATION (COOLING) / RADIATOR CALCULATIONS & E T R /PSR (ELLIPTICAL TUBE RADIATORS) /(PRESSED STEEL RADIATOR) PLACEMENT:

The transformers shall be capable of giving a continuous output without exceeding the specified temperature rise. Only Elliptical tube radiators of section 57 of gauge 18 or Pressed steel radiator (with tolerance as per relevant ISS) shall be acceptable on the transformers.

header pipe connecting radiator bank to the tank shall be rectangular in shape with approximate size of 100x20 mm. Alternatively round pipe of dia 80 mm can also be used for connecting the radiator bank to the tank .The placement of top header pipe to the tank body shall be above the top of yoke, to facilitate cooling for hot oil sump over top yoke.

The removable radiators shall be fitted with shut off valves. . All removable covers shall be provided with weatherproof, hot oil resistant, resilient gaskets. The design shall be such as to prevent any leakage of water into or oil from the tank.

Cooling area of the tank should be sufficient to dissipate the guaranteed losses satisfactorily . Necessary calculations in this regard shall be furnished by the Bidder with their tender. For the purpose of heat dissipation calculations, the following criteria shall be adopted:

- i) Plain surface of tank – 500 W / m<sup>2</sup>  
(Note: The area of top/bottom tank surface, headers, HV/LV bushing pocket and conservator shall not be considered for purpose of above calculations).
- ii) Elliptical tube of section 57 – 55 watts/meter length.

### 3.17 WINDING AND INSULATION:

#### i) MATERIALS:

Super Enamelled/ Double paper covered copper conductors shall be used for 11 KV class transformers. The covering shall conform to applicable ISS.

#### ii) CONSTRUCTION:

The High-tension windings shall be concentric with the Low-tension windings. The Arrangement of the windings shall be robust in electrical and mechanical construction and shall permit free circulation of oil and avoid hot spots. The LT conductor shall be rectangular in shape. Two layer of electrical grade insulation craft paper of 2 mil thickness or one layer of min. 4 mil thickness shall be used for interlayer insulation both for HV and LV Coils. Insulation cylinder made from electric grade pre-compressed board(s) having minimum total thickness of 1.5 mm shall be used between HV and LV windings. Alternatively 20 mil pressphan paper making thickness of the cylinder 1.5 mm having similar electrical properties may also be used.

For phase barrier, 2 Nos. of 1 mm thick press board shall be used for covering the tie rods. Besides, tie rods shall be covered by SRBP tubes of suitable size.

2 mm press board shall be used for base support insulation and core clamping channel insulation.

For bottom and top yoke insulation, only PC Board of min. 2 mm thickness will be used.

Also, vertical spacers between HV and LV coils and radial spacers (tickleys)/ blocks etc. shall be of PC Board only.

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Top layer of all HV coil shall be given one coat of air drying insulation varnish.

A tolerance of upto plus minus 1% shall be permissible on ID and OD and axial length of HV and LV coils. However, the above tolerances are subject to maintaining the min. required clearances. The material and thickness of various insulation provided for phase barrier, foot plate insulation, yoke insulation and core clamp insulation shall be clearly indicated in the drawing and in any case shall not be inferior to those used in type tested transformers.

Min. number of coils on HV side shall be 6 (six) per phase for each rating transformers. Dovetailed shaped radial spacers shall be placed between HV coil sections, suitably – locked with vertical spacers around the circumference of the coils. The number of such spacers shall be minimum 8(eight).

### iii) Current Density:

The current density for HV and LV conductor at rated capacity shall not exceed the value given hereunder

HV winding	2.5 Amp/ sq mm At the tap position corresponding to lowest primary voltage, i.e.(-10%) (not in the principal tap)
LV winding	2.5 Amp/ sq mm

Note : Bidder shall have to furnish the HV and LV winding conductor sizes/ cross sectional area along with the bid to establish compliance to the above requirement.

### iv) CONNECTIONS AND TERMINATIONS:

Electrical grade insulating Kraft paper of only Triveni / Ballarpur / Padamjee shall be used. Press Board used shall be of senapathy whitely / Raman make. Perma wood or haldu wood blocks shall be used for Top and Bottom yoke insulation.

### v) CONNECTIONS AND TERMINATIONS:

#### A) HV Winding:

The following method shall be adopted for taking out HV connections

a) The coil series connections shall be made by soldering / brazing only, after completely removing the insulation from the ends.

b) Starting and finishing leads of HT coils shall be covered with empire sleeve(s) of proper size. These leads should be clamped with the body of the winding with the help of cotton twine during manufacture of the coils.

c) All delta leads from the HT coils as well as HT line leads shall be taken out through multiple paper covered (MPC) copper wires of sufficient cross section area to impart the desired mechanical strength. The current density in HV lead wire shall not exceed 0.8 A/mm<sup>2</sup>. These lead wires shall be provided with multi layer paper insulation of minimum 1.0 mm thickness i.e. minimum increase in diameter due to paper insulation shall not be less than 2 mm. The layer of glass sleeves/ glass tape shall also be provided on the delta MPC wire and it should be further covered with minimum 12 mm dia SRBP tube. The MPC should also be varnish dipped. The SRBP tube shall be extended in such a way that it is entered up to 50% of bushing height.

d) All the above leads shall then be clamped tightly with cotton twine directly on to the special frame/bracket making "Pie" shape connection. This structure could be made up of Bakelite/ Permalli wood/ laminated PC board flats, having minimum size of 25x6.0 mm. Line leads leading to the HV bushing terminals shall be directly clamped to the horizontal support bar of the

"Pie" structure so that any tension which may develop in the HT leads due to jerks or at the time of making the connection, is not passed to the HT coils.

e) Delta joint and lead from delta joint to bushing rod shall be made by brazing only.

#### B) LV Winding :

a) The LV connection shall be taken out by cut on the top yoke channel duly reinforced to compensate for the mechanical strength.

b) The layers in LV Coil may be either even or odd in numbers but minimum layers shall be two.

c) LV star point shall be formed of copper flat of sufficient strength. Leads from winding shall be connected to the flat by brazing.

d) Firm connection of LV winding to bushing shall be made of adequate size of "L shape flat". Connection of LV coils to L shape flat shall be by brazing only.

e) "L" shape Flat shall be clamped to LV Bushing metal part(s) by using nut, lock nut and washer.

f) Neutral of the Secondary winding (LV) shall be brought out to a separate insulated bushing.

g) For Copper windings, silver brazing rods with suitable flux will be used.

#### 3.18 CORE CONSTRUCTION & CORE COIL ASSEMBLY DETAILS:

The bidder may quote the transformer either with CRGO or Amorphous core.

##### A . CRGO

i) The core shall be stack/ wound type of high grade cold rolled grain oriented annealed steel laminations, having low loss and good grain properties, coated with hot oil proof insulation, bolted together to the frames firmly to prevent vibration or noise. All core clamping bolts shall be effectively insulated. The value of the flux density allowed in the designs and grade of laminations used shall be clearly stated in the offer, along with the curves. The transformer core shall be constructed out of the prime class of materials. CRGO Lamination used shall be of prime grade and not second grade steel laminations.

ii) It will be mandatory for all the transformer manufacturers to use only PRIME grade CRGO Laminations of M-4 grade/ 0.27 mm or 0.23 mm (with tolerance as per relevant ISS) thickness with maximum specific loss of 0.89 watt per kg at 1.6 Tesla or any other combination of better grades with any thickness subject to maximum specific loss of 0.89 watt per kg. at 1.6 Tesla will also be acceptable. The bidder shall furnish the core loss (watt/Kg.) and power (VA/Kg) curves of the laminations used. **The designed no load loss calculation shall have to be submitted with the bid.** The core shall be properly stress relieved by annealing in inert atmosphere. The transformer shall be suitable for over fluxing (due to combined effect of voltage and frequency) upto 12.5% without injurious heating. The operating flux density shall be such that there is a clear safe margin over the fluxing limit of 12.5%.

iii) Full mitred core construction technique shall be adopted. Top yoke & bottom yoke pieces shall all be in one single piece and no cut pieces shall be acceptable. The cross sectional area of yoke & limb shall be approximately same.

iv) The transformer core shall not get saturated for any value of V/f ratio to the extent of 115% of the rated value of V/f ratio (i.e. 11000/ 50) due to combined effect of voltage and frequency

without injurious heating at full load conditions. The bidder shall furnish necessary design data in support of this situation.

v) Flux density at rated voltage and frequency of core and yoke shall not be more than 1.6 Tesla. The Over fluxing shall be limited to 12.5% of rated value and flux density at 112.5% of rated voltage does not exceeds by 1.9 Tesla. The No Load Current (magnetizing current) of the transformers at rated voltage and at 112.5% of rated voltage shall not exceed the values given below:

	At 100% rated voltage	At 112.5% rated voltage
Maximum permissible magnetising current in percentage of rated full load current	2%	5%

vi) For free circulation of oil axial and radial ducts of the following minimum thickness shall be provided:

Width of axial duct in mm in between insulating cylinder and		Radial duct between HV coils in mm
HV winding	LV winding	
5	4	8

Tolerance of  $\pm 1$  mm on above axial ducts width shall be allowed provided that total clearance between HV to LV coil (bare conductor) is maintained as minimum 11 mm.

## B. AMORPHOUS METAL CORE

a) The core shall be high quality amorphous ribbons having very low loss formed into wound cores of rectangular shape, bolted together to the frames firmly to prevent vibration or noise. The complete design of core must ensure permanency of the core loss with continuous working of the transformers. The value of the flux density allowed in the design shall be clearly stated in the offer. Curve showing the properties of the metal shall be attached with the offer.

b) Core Clamping – Amorphous Metal and CRGO wound core Transformers 1. Core clamping shall be with top and bottom U-shaped core clamps made of sheet steel clamped with MS tie rods for efficient clamping. 2. MS core clamps shall be painted with varnish or hot oil resistant paint 3. Suitable provision shall be made in the bottom core clamp / bottom plate of the transformer to Arrest movement of the active part.

c) The transformer core shall be suitable for over fluxing due to combined effect of voltage and frequency upto 12.5% without injurious heating at full load conditions and shall not get saturated. The Bidder shall furnish necessary design data in support of this situation.

d) Flux density should not be more than 1.6 Tesla for Amorphous core. The Over fluxing shall be limited to 12.5% of rated value and flux density at 112.5% of rated voltage does not exceed by 1.9 Tesla. No load current shall not exceed 2% of full load current and will be measured by energizing the transformer at 433 volts 50 c/s on the secondary. Increase of voltage of 433 volts by 12.5% shall not increase the no load current disproportionately high and shall not exceed i.e., 5%. Test for magnetic balance by connecting the LV phase by phase to rated phase voltage and measurement of an, bn, cn voltage will be carried out.

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**NOTE : Equal Weightage shall be given to the transformers with Amorphous metal core and CRGO.**

**C. CORE-COIL ASSEMBLY:**

The core joints shall be interleaved and with full mitre design, as mentioned above. Ample provision for free circulation of oil in the radial gap between the core & LV coils shall be made. Eyes or lugs of sufficient size shall be provided for lifting core and winding assembly out of the tank. The core shall be effectively earthed through copper earthing foil of 25 mm width & 1 mm thickness bolted on core frame channels, after removing the channel paint.

For top yoke channels, if cut or holes are made for taking LV connections, suitable reinforcement to channels shall be made by providing adequate size of MS Flat of the thickness not less than 6 mm.

On the core-coil assembly, core clamping channels, tie rods, core studs, spacers, assembly base supports, etc. of each rating shall be provided as per details given hereunder:

Sr. No.	Item	Particulars
a)	Tie rods	Minimum 8 Nos. of 16 mm each properly insulated and covered with SRBP tubes. Tie rods shall also be provided with lock nuts.
h)	Core studs	Minimum 8 Nos. of 16 mm each properly insulated and covered with SRBP tubes. The core studs shall also be provided with lock nuts
c)	Spacers	Minimum 8 Nos. dovetail type with min. peripheral coverage of 30%.
d)	Support of core assembly base	2 Nos. MS channels OF 100x50x6t mm. with minimum peripheral coverage of 40%.
e)	Channels for clamping core coil assembly	4 MS Channels of 100x75x6t mm. size (applicable for CRGO transformers)

Guides on all the four sides shall be provided to prevent shifting of the active parts and thereby accidental touching the tank. Alternatively boss nut arrangement at the top of core coil assembly to lock the same with the transformer tank be provided.

The assembly fixing boss nut(s) are to be welded, 20-30 mm off the centre line (and diagonally) of the tanks, so that assembly shifting during transport etc. is prevented. M S Channel, Tie Rods etc should be painted with hot oil and corrosion resistant paint before use.

All core-coil assembly shall be indelibly marked / punched on core channel / an identity plate welded on core channel with following details:

1. Name of Supplier:
2. Order:
3. Rating:
4. Sr. No. of Transformer:

In case if above marking is not found on the core assembly of physically opened transformer selected for physical verification during final inspection then no further inspection shall be carried out and re-inspection charges shall be payable by the supplier.

### 3.19 TANK:

3.19.1 The transformer tank shall be of robust construction rectangular in shape and shall be built up of tested MS sheets. The tank shall be made of prime quality MS sheet of thickness stated below with necessary stiffener to withstand the pressure built in during the expansion of oil due to temperature rise.

Minimum thickness in mm	For sides	For top & bottom
	4	6

3.19.2 The exterior of the transformer tank and other ferrous fitting shall be thoroughly cleaned, scraped /sand blasted and given a priming coat and two finishing coats of durable oil and weather resistant paint of dark admiral grey conforming to colour code No. 632 of IS-5/1961

3.19.3 The internal clearance of tank shall be such that, it shall facilitate easy lifting of core with coils from the tank without dismantling LV bushings. All joints of tank and fittings shall be oil tight and no bulging should occur during service. The tank design shall be such that the core and windings can be lifted freely.

3.19.4 The tank plate shall be of such strength that the complete transformers when filled with oil may be lifted bodily by means of lifting lugs. Inside of tank shall be painted with Hot oil resistive paint.

3.19.5 The four walls of the tank shall be made of Two "L" shaped sheets (without joints) fully welded at the corners from inside and outside of the tank for withstanding a pressure of 0.8 kg/cm<sup>2</sup> for 10 minutes. OR One "U" shaped bend sheet with straight plate and welded outside the tank at 2 corners for withstanding pressure of 0.8 Kg/cm<sup>2</sup> for 10 minutes.

3.19.6 The tank shall be reinforced by welded angle on all the outside walls on the edge of the tank to form two equal compartments. Permanent deflection when the tank without oil is subject to a vacuum of 525 mm of mercury for rectangular tank and 760 mm of mercury for round tank, shall not be more than 5 mm upto 750 mm length and 6 mm upto 1250 mm length. The tank shall further be capable of withstanding a pressure of 0.8 kg/sq.cm (g) and a vacuum of 0.3 kg/sq.cm (g) without any deformation.

3.19.7 Lifting lugs: 4 Nos. of lifting lugs are to be provided in the transformers. Lifting lugs of MS plate 8 mm thick (min) suitably reinforced by vertical supporting flat welded edgewise below the lug on the side wall.

3.19.8 Pulling lugs: 4 Nos. of welded heavy duty pulling lugs of MS plate 8 mm thick (min) shall be provided to pull the transformer horizontally.

3.19.9 Top cover fixing bolts of G.I adequately spaced and 6 mm Neoprene bonded cork gaskets conforming to IS 4253 part-II shall be placed between tank and cover. The bolts outside tank shall have 2 flat washers & one spring washer.

### 3.20. CONSERVATOR:

The conservator shall be of cylindrical shape. The capacity of a conservator tank shall be designed to contain 10% of the total quantity of oil and its contraction and expansion due to temperature variations. Normally 3% quality of total oil will be contained in the conservator. In addition the cover of main tank shall be provided with an air release plug to enable air trapped within to be released, unless the conservator is so located as to eliminate the possibility of air being trapped within the main tank. The inside diameter of the pipe connecting the conservator to the main tank should be within 30 to 50 mm and it should be projected into the conservator so

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that its end is approximately 20 mm above the bottom of the conservator so as to create a sump for collection of impurities. The minimum oil level (corresponding to -5 deg C) should be above the sump level. There shall be minimum -5deg, normal 30deg and maximum 98deg marking on the oil gauge indicator of the conservator.

### 3.21. BREATHER:

The material used for breather shall be only of Poly propylene. The dehydrating agent shall be silica gel. The volume of breather shall be suitable for 1kg silica gel confirming to IS 3401. Makes of the breather shall be subject to purchaser's approval.

### 3.22. HV & LV CABLE TERMINAL BOX:

**3.22.1 :** The transformer shall be fitted with suitable end termination boxes on 11 kV side to terminate one 11 kV/ 3 core Aluminum conductor XLPE cable up to 240 sq mm size. The HT cable box shall be prevented from ingress of moisture into the box due to rainwater directly falling on the box. The H.T. cable box shall be of split type with plain faces and machined and fitted with suitable gasket and complete with brass wiping gland to be mounted on separate split type gland plate with nut bolt arrangement and M.S earthing clamp. The bushings of the cable box shall be fitted with nuts and stem to take the cable cores without bending them. The stem shall be of copper with copper nuts. The cross section of the connecting rods shall be stated and shall be adequate for carrying the rated currents with safety margin of at least 50%. The rods shall not be less than 12mm in diameter. H.T Cable support clamp should be provided to avoid tension due to cable

**3.22.2** The transformer shall be fitted with LV cable end box suitable for termination of 4 runs of 300 sq mm 1.1 kV/ 3.5 core XLPE armored aluminum cables. Required diameter of holes for cable entry shall be done at site as per requirement.

#### 3.22.3 Bushings

Primary: 12 kV Epoxy bushings as per IS: 2099 or Porcelain Bushings as per IS: 3347 as required by the purchaser having suitable diameter with nuts and check nuts for pad and platform mounted transformer as per drawing.

Secondary: Terminals shall be provided with 1.1 kV Epoxy bushings as per IS:3347 having fixed palm type connectors with suitable locking arrangement to restrict the rotation of palm assembly. Palm shall be of copper and stud of copper duly brazed at the joint. Suitable clamps with nuts and bolts for of 4 runs of 300 sq mm 1.1 kV/ 3.5 core XLPE armored aluminum cables shall be provided. Detachable clamps with nuts and bolts for ease of removing LV cables shall be provided.

#### 3.22.4 HV AND LV TERMINALS :

Current density in HV and LV Terminals shall not exceed 1 A/sq.mm in case of Brass terminals and 2 A/sq.mm in case of copper terminals. Terminals shall be rated for at least 150% of the rated currents in respective sides ( HV & LV).

### 3.23. FITTINGS & ACCESSORIES:

The following standard fittings shall be provided on the transformer:

- a) Earthing terminals of M12x40L/ 4/8x1.5" with tinned lugs and symbol – (2 Nos.)
- b) Lifting lugs – (4 Nos. for main tank).
- c) Rating and terminal marking plate shall be non-detachable and affixed with Min. 10 rivets (One in centre of top and bottom and 4 Nos. each on both vertical sides at equal

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distance), details to be included in one plate only. The plate shall be of stainless steel/Aluminium only, with details clearly marked. The base plate of the Rating and terminal marking plate shall be continuously welded with the tank. (1 No.)

- d) Cable terminal box for both HV and LV sides
- e) Oil level gauge of minimum 150 mm length of prismatic glass, indicating three positions of oil, marked as follows, shall be provided at centre of the conservator tank:

1	-5 °C - Min.
2	30 °C - Nor.
3	90 °C - Max

- f) Dehydrating breather suitable for silica gel of 1Kg- 1 no.
- g) Thermometer pocket, 12.5 mm dia with cap. shall be provided — (1 No.
- h) Oil filling hole (1/4"dia) with cover and gun metal drain valve of 20 mm size on the oil conservator.
- i) a) One filter valve of gun metal of 20 mm size at the top side of the tank. b) One drain cum sampling cum filter valve of Steel at the bottom side of the tank but opposite of the top filter valve. The valve shall be either of Leder or L&T or AUDCO make and wheel type.
- j) Neutral terminal with bushing in the LV side for earthing
- k) 100 mm dial type thermometer for oil temperature indication
- l) Explosion vent: Explosion Vent shall be opening towards LV bushing side with M. S. mesh having Pipe Diameter of minimum 50 mm & it should be inserted in the top cover of tank, welded outside & inside of top cover and its Pipe shall be connected with Conservator. Length of the explosion vent should be minimum 700 mm. Nut bolts of flange of Explosion vent should be tag welded. The position of vent pipe should be on right side of tank (when looked from LV bushing side). There shall be minimum 140 mm clearance between live part of HV bushing to Explosion vent.
- m) Air release device on left side (when looked from LV bushing side)

### 3.24. TESTS AND INSPECTIONS:

#### 3.24.1 Routine and special tests to be conducted on the transformer:

The transformer shall be subjected to following routine and special tests at the manufacturer's works in presence of purchaser's engineer:

- (a) Measurement of winding resistance.
- (b) Ratio, polarity and Vector Group test.
- (c) % Impedance voltage at Principal Tap position at 50 Hz & 75°C.
- (d) No load loss at 50 Hz.
- (e) Load Loss at 75°C at 50% loading.
- (f) Load Loss at 75°C at 100% loading
- (g) Insulation resistance.
- h) Induced over voltage withstand.
- (i) Separate source voltage withstand
- (j) Unbalance current: The maximum value of unbalance current in Transformer shall not exceed 2% of full load current as per CBIP manual for Transformer.

*6/2/23*

(k) Magnetizing current at rated voltage & frequency and 110% of rated voltage & frequency.

(l) Pressure Test

(m) Oil Leakage Test

(n) The temperature rise test will be performed on lowest tap at appropriate current related to the said tapping with total losses fed corresponding to min. Voltage tapping as per IS 2026 (Part-2) 1977, amendment no.2, 1984.

### **3.24.2 TYPE TEST REPORT (TO BE SUBMITTED ALONG WITH THE BID):**

The bidder shall submit following Type Test Report from CPRI/NABL Accredited laboratory (third party)/Govt. approved Laboratories along with their offer having identical rating and voltage ratio and type as that of the tendered item, carried out within five years, as per pre-requisites of this tender, failing which their offer may not be technically accepted.

(a) Lightning Impulse withstand test

(b) Dynamic Short Circuit withstand test: The transformer during Dynamic Short Circuit Test shall not exhibit more than 2 percent variation in percentage reactance.

(c) Temperature Rise Test

(d) Measurement of acoustic sound level test

### **3.24.3 INSPECTION:**

(a) **Stage Inspection:** The Transformer may be stage inspected at the factory of the manufacturer. The manufacturer shall intimate in advance, in writing, to the purchaser about the stages of manufacturer & subsequent readiness of the transformers, to enable the purchaser to carry out stage inspection & final inspection and testing of the finished transformers. The stage inspection will be carried out at the discretion of the purchaser during the process of manufacturing of the Transformers. The manufacturer need not stop the process of production because of programme of stage inspection of the Purchaser.

(b) **Final inspection and witnessing of Routine Tests:** The transformer shall be finally inspected by purchaser's engineer at the manufacturer's works upon completion of manufacturing. All routine tests as mentioned in item 3.24.1 shall be conducted in presence of purchase's engineer and clearance for dispatch shall be given upon satisfactory completion of all the tests and verification of test results for compliance to the relevant BIS specifications and relevant data & parameters specified in this tender document.

At least 15 day's clear notice shall be given to the purchaser for witnessing of the tests. The supplier shall arrange all possible facilities for such Inspection and testing free of cost.

### **3.25 TRANSFORMER OIL:**

The transformer shall be supplied complete with first filling of EHV Grade transformer oil, up to the normal oil level. The oil shall conform to the limits of type-II Transformer oil of table-2 of IS: 335-2018 (latest amended) and should be ISI Marked and having the specified aging characteristics.

The Break Down Voltage Value of the fresh oil after filtration and before filling in the transformer should be above 70 KV and after filling in the transformer it should be above 40 KV.

The make of Transformer Oil shall be either APAR/SAVITA. The transformer oil sample taken from the transformer shall be subject to testing as per provisions of IS:1866. The oil manufacturer's test certificate shall be made available at the time of inspection to the inspecting officer.

### 3.26. GUARANTEE FOR THE TRANSFORMER:

**3.26.1** The transformer shall be guaranteed for a period of 60 months from the date of installation or 66 months from the date of receipt by the purchaser whichever is earlier. If the goods, stores and equipments found defective due to bad design or workmanship the same should be repaired or replaced by the manufacturer free of charge if reported within 66 months of their receipt at site or 60 months from the date of commissioning of equipments whichever is earlier. The manufacturer will be responsible for the proper performance of the equipments / materials for the guarantee period. In case the transformer fails/ develops any problem during the above guarantee period, the same shall be rectified/ repaired by the manufacturer at his own cost and the repaired transformer shall have to perform as per the guaranteed parameters specified in this tender document.

**3.26.2** It will be the responsibility of the manufacturer to immediately depute their testing engineer for testing and inspection of the transformer upon intimation about defect/ failure or malfunctioning, if falls within the aforementioned guarantee period. The cost of transportation, fooding, lodging etc of the testing engineer shall be borne by the manufacturer.

**3.26.3** The transformer, if possible, shall be repaired at site. However, if it becomes necessary to shift the transformer to their works for repair, the same shall be arranged in shortest possible time. The cost of transportation of the transformer to their works and returning back to site after repair, including handling charges, shall be borne by the manufacturer. The entire period shall not be more than 30 days. It will be the responsibility of the manufacturer to install one transformer temporarily for the interim period at their own cost to avoid prolonged interruption.

### 3.26. KEY TECHNICAL PARAMETERS TO BE GUARANTEED:

Sl.no	Description	Parameters
1	Input voltage	11KV
2	Highest system voltage	12 KV
3	No of phases	3
4	Frequency	50Hz
5	No of windings	2
6	Voltage ratio	11000V/ 433V
7	Type of cooling	ONAN
8	Vector group	Dyn11
9	Rating	800KVA
10	Maximum limit of temperature rise (over ambient of 50°C)	
	Top oil measured by thermometer	40°C
	Winding measured by resistance method	45°C
11	Percentage Impedance	5.00%
12	Winding material (for both HV & LV)	Electrolytic grade copper
13	Maximum current density :	
	HV- At the tap position corresponding to the lowest primary voltage, i.e. (-) 10%	2.5 A/ sq mm
	LV	2.5 A/ sq mm
14	Maximum Losses (Design calculations for losses along with details of core material and thickness and winding conductor sizes, shall be submitted)	
	Total losses at 50% load at 75°C	2287 W

*Subs*

	Load loss at 100% load and at principal tapping at 75°C	6402 W
15	Tap changer	
	Type	OFF CIRCUIT TAP CHANGER
	Range	+5 to -10%, 7 tap positions in equal steps each of 2.5%
	Rating	Not less than 100A
16	Insulation levels (12KV)	
	Impulse withstand voltage	75 KVp
	One min power frequency withstand voltage	28 KV
17	Maximum flux density at any part of the core and yoke at rated voltage and rated frequency	1.6 Tesla
18	Type of core material	CRGO, high grade having low loss and good grain properties. (thickness and grade of material shall be furnished along with the bid)
19	Type of winding insulation	
	HV	Uniform
	LV	Uniform
20	Terminals	
	HV	Air insulated cable box suitable for cable connection
	LV	Air insulated cable box suitable for cable connection

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**SECTION - 4**  
**ANNEXURES**

*6/1/20*



ANNEXURE – I

List of similar or higher capacity transformers supplied by the bidder:

Sl. No.	Full Postal Address of client & Name of Officer-in-Charge	Description of the transformer	Value of contract	Date of completion	Remarks

**Note:** Original or attested copies of the supply order and completion certificates from the client should be attached by the applicant without which information furnished shall be considered null and void. Order involving supply, of transformer of capacity 800 KVA & above only shall be furnished. Extra sheet may be added if required.

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(Signature of Tenderer)

*[Handwritten Signature]*

ANNEXURE – II

**Compliance to requirement of tender documents:**

We confirm that our tender complies to the total Techno-Commercial requirements of Bidding document without any deviation.

Seal

(Signature of the Tenderer)



ANNEXURE – III

**WARRANTY/ GURANTEE:**

Is there any deviation in the guarantee/ warranty envisaged under the NIT and Scope and Technical Specification	
-----------------------------------------------------------------------------------------------------------------	--

Seal

(Signature of the Tenderer)



ANNEXURE – IV

**TENDER VALIDITY**

Tender shall remain valid for acceptance for a period of 120 (one hundred twenty) days from the date of opening of the tender. The tenderer shall not be entitled during the said period to revoke or cancel his tender or to vary the tender given or any term thereof. In case of tenderer revoking or canceling his tender or varying any term in regard thereof, the OWNER shall forfeit the earnest money paid by him along with the tender. Tender shall be revalidated for extended period as required by Owner in writing.

Seal

(Signature of the Tenderer)



ANNEXURE – V

Deviation sheet – Technical Specification

If the proposal has got any deviation from the Technical Specification, the Tenderer shall tabulate these deviations clause by clause in this schedule. Add more sheets, if required.

Sl. No.	Clause No.	Deviations

Seal

(Signature of the Tenderer)

*Handwritten signature*

ANNEXURE – VI

**Deviation sheet – Tendering & General Conditions**

If the proposal has got any deviation from the tendering conditions and the General Conditions of Contract, the Tenderer shall tabulate those deviations clause by clause in this Schedule. Add more sheet, if required.

Sl. No.	Clause No.	Deviations

Seal

(Signature of the Tenderer

*[Handwritten Signature]*

**SECTION - 5**

**BIDDING SCHEDULE - TECHNICAL BID**

*6/2/23*

**SECTION - 5**  
**BIDDING SCHEDULE – TECHNICAL BID**  
**Schedule of Guaranteed Technical Particulars**

(To be furnished and signed by the tenderer)

Sl. No.	PARTICULARS	GTP TO BE FILLED BY THE BIDDER
1	Name of the manufacturer	
2	Factory address	
3	Whether the manufacturer has the BIS certification for manufacturing the item offered ?	
3(a)	If yes, Energy efficiency level for which BIS certification is provided	
3(b)	Whether the copy of the certificate from the BIS submitted?	
4	Whether the manufacturer has submitted Type, Special & other test reports required for BIS certification for manufacturing the item offered?	
5	Maximum continuous rating in KVA	
6	No load voltage ratio (In KV/KV)	
7	Rated frequency (in Hz)	
8	Number of phases	
9	Type of Cooling	
10	Connections	
	(i) H.V. Winding	
	ii) L.V. Winding	
11	Vector Symbol	
12	(i) Temperature rise under normal operating condition above ambient temperature:	
	(a) Top oil (in C.)	
	(b) Winding (in C)	
	(ii) Maximum hot spot temperature of winding (in C)	
13	Magnetizing current referred to H.V. at rated frequency	
	(a) At 90% rated voltage (in Amps)	
	(b) At 100% rated voltage (in Amps)	
	(c) At 112.5% rated voltage (in Amps)	
14	Power factor of magnetizing current at 100% rated voltage & frequency	
15	No load current at rated voltage and rated frequency (in Amps)	
16	Maxm No load loss in watt at rated frequency & voltage	
17	Maxm Load loss in Watt at 75 OC. at rated output and frequency	
18	Maxm Total Loss ( including NLL & FLL) at 100 % loading at 75 °C	
19	Maxm Total Loss ( including NLL & FLL) at 50 % loading at 75 °C	
20	Percentage Regulation at full load at 75 °C	
	(a) At unity power factor	
	(b) At 0.8 power factor lagging	
21	Efficiencies at 75 °C (in percentage)	
(a)	At full load	
	(i) At unity power factor	

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(b)	At $\frac{3}{4}$ full load	
	(i) At unity power factor	
	(ii) At 0.8 power factor lagging	
(c)	At $\frac{1}{2}$ full load	
	(i) At Unity power factor	
	(ii) At 0.8 Power factor lagging	
22	Impedance voltage on rated kVA base at rated current and frequency at 75 ° C (in percentage)	
23	(a) Resistance voltage at rated current and frequency at 75 °C (in percentage)	
	(b) Reactance voltage at rated current and frequency at 75 °C (in percentage)	
24	Resistance at H.V. base at 75 °C	
	a) HV (between lines) (ohms)	
	b) LV (between lines) (ohms)	
25	Reactance at H.V. base at 50 c/s	
26	Withstand time without injury for three phase dead short circuit at terminal (in seconds)	
27	Short time current rating for short circuit with duration	
	(a) H.V. Winding (in K Amps)	
	(b) L.V. Winding (in K Amps)	
	(c) Duration in seconds)	
28	Permissible over loading with time at max amb temp	
	a) 125% load after running with 50% load with steady temp rise. (hrs.)	
	b) 120% load after running with 100% load with steady temp rise. (hrs.)	
29	Core :	
i)	Material type	
ii)	Whether stack core/ wound core type	
iii)	Flux density of Core and yoke	
	(a) At rated voltage at 50 HZ (in line/sq cm)	
	(b) At 112.5% rated voltage at 50 HZ (in line/sq cm)	
iv)	Thickness of Stampings (in mm)	
v)	Type of Insulation between core lamination	
vi)	Approximate area of Cross Section of Core and yoke (in sq.mm)	
vii)	Material of Core clamping plate	
viii)	Thickness of Core clamping plate (in mm)	
ix)	Insulation of Core clamping plate	
x)	Describe location/Method of Core grounding	
xi)	Please specify the use of primary core material in the offered transformer	
xii)	Whether the proof of use of prime core material to be submitted?.	
30	Terminal arrangement:	
	(i) high voltage	
	(ii) low Voltage	
31	Positive Sequence Impedance between HV & LV winding on rated KVA base at rated current and frequency at 75 ° C. Winding temperature (in percent).	
32	Sequence Impedance at reference temperature of 75 ° C (in percent)	
33	Details of windings:	
	(i) Type of Winding	
	(ii) Joints in the windings soldering / brazing but in	

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	any case crimping is not allowed		
	(iii) No. of Tap positions and it's range mentioning the normal Tap position		
	(iv) Material of the winding conductor		
	(a) High Voltage		
	(b) Low Voltage		
	(v) Conductor size/ Area		
	(a) High voltage		
	(b) Low Voltage		
	(vi) Current density of winding at rated KVA		
	(a) High Voltage at tap position '7' (Amp per sq.mm)		
	(b) Low voltage (Amps per Sq.mm)		
	(vii) Insulating material used for		
	(a) High Voltage winding		
	(b) Low Voltage winding		
	(viii) Insulating material used between:		
	(a) High voltage and low voltage winding		
	(b) Low Voltage winding and Core		
34	Insulation withstand Test Voltages		
	(i) Lightning Impulse withstand test voltage (KV Peak		
	(ii) Power frequency withstand test voltage (in KV rms for 1 min)		
	(iii) Induced over voltage withstand test voltage (In KV rms)		
35	Current in the winding at rated KVA		
	(a) High Voltage (in Amps)		
	(b) Low Voltage (in Amps)		
36	Voltage per turn (KV per turn)		
37	Ampere turn		
38	Number of turns		
	(i) Low Voltage		
	(ii) High Voltage		
39	Bushing	High Voltage	Low Voltage
	(i) Make		
	(ii) Type		
	(iii) Applicable standard		
	(iv) Insulation withstand test voltage		
	(a) Lightning Impulse withstand test voltage (1.2 x 50 micro seconds (in KV Peak		
	(b) Power frequency withstand test voltage (in KV for 1 min ) :		
	Dry		
	Wet		
	(v) Creepage distance in air:		
	Total (in mm		
	Protected (in mm)		
	(vi) Material of the bushing rod/ section		
	(a) High voltage		
	(b) Low voltage		
	(vii) Size of the bushing rod/ section		
	(a) High voltage		
	(b) Low voltage		
	(viii) Current rating of the bushing rod/ section		
	(c) High voltage		
	(d) Low voltage		
40	Minimum clearance of live conducting parts(in mm)	In OIL	In Air
	(i) H.V		

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	(a) Between Phases	
	(b) Between Phase to Ground	
	(i) L.V	
	(c) Between Phases	
	(d) Between Phase to Ground	
41	Approximate weight of Transformer (in Kgs)	
	(i) Core with clamping	
	(ii) Coil with Insulation	
	(iii) Core and winding	
	(iv) Tank and fitting with accessories	
	(v) Untanking weight	
	(vi) Oil required for the transformer	
	(vii) Total weight with Core, Winding, oil and fittings	
42	Details of Tank	
	(i) Type of tank	
	(ii) Approximate thickness of Sheet (in mm)	
	(a) Sides	
	(b) Bottom	
	(c) Cover	
	(iii) Vacuum withstand capacity	
	(iv) Dimension of base channel (in mm x mm)	
43	Oil	
	(i) Applicable standard	
	(ii) Total quantity of oil (in litres)	
44	Approximate overall Dimensions (in mm)	
	(a) Length ::	
	(b) Breadth	
	(c) Height	
45	Whether Type Test Report, Credential, Performance Certificate submitted as Pre-requisites as mentioned in respective clauses	
46	List of testing equipments available in the testing lab. of manufacturer (to be submitted separately)	

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### SECTION-3

#### TECHNICAL SPECIFICATION FOR SUPPLY OF BIS MARKED 11/0.433KV, 800 KVA RATING OUTDOOR TYPE (COPPER WOUND) DISTRIBUTION TRANSFORMER, ENERGY EFFICIENCY LEVEL-2 AGAINST IS-1180 (PART-1) -2014

##### 3.1. SCOPE:

This specification covers the design, engineering, manufacture, assembly, inspection and testing at manufacturer's works before supply and delivery to site including cost of transportation, loading, unloading etc. of one (1) no Oil immersed, Oil Natural Air Natural (ONAN), outdoor type, 11KV/433 V, 800KVA, three phase, 50 Hz, double wound core type, Copper Wound Distribution Transformer of Energy Efficiency Level-2 under IS-1180 (Part-1)-2014, complete with fittings and accessories for use in Cotton University, Guwahati

As per Government of India notification effective from 01-08-2015, it is mandatory for distribution transformers up to 2500KVA and up to 33KV level, to have BIS mark under IS 1180 (Part-1)-2014. So, it is mandatory that the transformer covered under the scope, shall have BIS mark. Copy of valid certification from BIS for the relevant efficiency level shall be submitted.

##### 3.2. Qualifying/ Eligibility requirement;

The bidder must be a BIS certified transformer manufacturer and must submit following documents along with the bid:

Serial No	Requirements	Documents to be submitted
1	The bidder must be an approved manufacturer of transformer of APDCL for 800KVA, 11/0.433KV for Efficiency Level-2 as per IS:1180, Part-1, 2014, having complete infrastructure and testing facilities for the type of transformer being tendered. It is mandatory that the bidder should be in such manufacturing business for not less than 10 years	Relevant document to substantiate the clause
2	BIS License	(i) The bidding is open to those manufacturers only, who possess valid ISI License/ Marketing rights for offered rating for energy efficiency level-2 as specified in IS:1180 (Part-1):2014. (ii) ISI marking- The transformer, as per Energy Efficiency Level-2 specified in IS-1180(Part-1):2014, must bear 'ISI' certification mark. In this connection, a certified photocopy of the valid ISI license/marketing rights must be submitted along with the tender. (iii) In absence of ISI marking License, the offer shall be liable for rejection.

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3	Must have experience of manufacture and supply of at least 2 transformers of similar/ higher capacity of 11KV or 33KV level (Efficiency Level-2) in Power Utilities, Govt Departments, PSUs, Autonomous bodies.	(iii)Copies of work orders and completion reports. (iv)In case, such execution is through contractors, in addition to documents mentioned in item (i), certificate from respective agencies (Power Utilities, Govt Departments, PSUs, Autonomous bodies) shall be submitted as evidence that the transformer(s) against the respective orders were supplied to them
4	Type test report for tendered rating of transformers	(i) The certified photo copies of valid type test Reports for 'ISI' mark, losses as per Energy Efficiency Level-2 specified in IS- 1180(Part-1):2014, copper wound -800 KVA rating distribution transformer from the Govt. Standard test Laboratory/Govt. Approved Laboratory shall be submitted along with the tender. (ii)The type test certificates including dynamic short circuit report for the offered or higher rating having similar design, shall be submitted. (iii)Type test reports shall not be more than 5 years old from the date of opening of the tender

### 3.3. COMPLETENESS OF THE OFFER:

3.3.1 The Equipment Offered shall be complete with all parts necessary for their effective and trouble free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in this document or not.

3.3.2 It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuously and satisfactorily in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The specifications furnished hereunder are general in nature and some parameters are the basic minimum requirements. In actual practice, notwithstanding any anomalies, discrepancies, omissions, incompleteness, etc. in these specifications and attached drawings, the design and constructional aspects, including materials and dimensions, will be subject to good engineering practice in conformity with the required quality of the product, and to such tolerances, allowances and requirements for clearances etc. as are necessary by virtue of various stipulation in that respect in the relevant Indian Standards, IEC standards, I.E. Rules, I.E Act and other statutory provisions.

3.3.3 The Tenderer / supplier shall bind him to abide by these considerations to the entire satisfaction of the Purchaser and will be required to adjust such details at no extra cost to the purchaser over and above the tendered rates and prices.

### 3.4. TOLERANCES:

Tolerances on all the dimensions shall be in accordance with provisions made in the relevant Indian/ IEC standards and in these specifications. Otherwise the same will be governed by good engineering practice in conformity with required quality of the product

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### 3.8 NO LOAD VOLATGE RATIO:

The No load voltage ratio(s) shall be 11000/ 433 Volts.

### 3.8 THE LOSSES:

The total Losses at 50% and 100% loading (at rated voltage and frequency and at 75 deg. C.) shall not exceed the value given below:

RATING (KVA)	MAX. LOSSES AT 50% LOADING (WATTS)	MAX. LOSSES AT 100% LOADING (WATTS)
800	2287	6402

The above specified loss values are maximum guaranteed as per Energy Efficient level-2 without any positive tolerance. In case the actual loss values exceed the above guaranteed values, the transformers shall be rejected at the risk, cost and responsibility of the supplier. In such case, the EMD/ Security deposited by the manufacturer shall stand forfeited. Design calculation for losses shall be submitted with relevant core material specification, grade and thickness, winding material grade & cross sectional area of both HV & LV winding.

### 3.9 TEMPERATURE RISE:

Each transformer shall be capable of operating continuously at its normal rating without exceeding following temperature rise with the above service conditions given in clause-3.6

- i) 40 Deg. C in oil by thermometer
- i) 45 Deg. C in winding by resistance

Temperature rise test shall be conducted on Maximum measured total loss (No load at rated excitation + Load loss at max. current tap at 75 oC) at 100% loading shall be supplied during temperature rise test at a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory/ ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory).

The transformer shall be capable of giving continuous rated output without exceeding the specified temperature rise. Bids not meeting the above limits of temperature rise will be treated as non responsive.

It must be noted carefully that readings for hot resistance after shut down shall be taken separately for HV & LV windings, which means, after completing the readings for one winding (HV or LV), the transformer shall be connected again and rated current passed for another 60 minutes (min.) and shut down taken again to take hot resistance readings for the remaining winding. This is in line with the requirement of CBIP manual, to ensure proper resistance v/s time curves.

Hot Spot temperature not to exceed 98 Deg. C when calculated over an annual weighted average ambient temperature of 35 Deg. C as per IS:2026 (Part-II Clause 4.9.4).

However, the transformer shall be designed for class 'A' insulation.

### 3.10 UNBALANCE CURRENT:

The maximum value of unbalance current in transformers shall not exceed 2% of full load current.

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- i) Peak ambient temperature : 45°C
- ii) Minimum Ambient Temperature in shade : 5°C
- iii) Maximum average ambient temp. in a 24 hours period in shade : 35°C
- iv) Maximum temperature attainable by an object exposed to sun : 60°C
- v) Maximum relative humidity : 100 %
- vi) Altitudes : Not exceeding 1000 mtrs.
- vii) Seismic intensity: Zone-V of IS 1893

### 3.7 PRINCIPAL PARAMETERS:

The Transformers shall be suitable for outdoor installation with three phase 50 Hz 11 KV system in which the neutral is effectively earthed and should be suitable for outdoor service as step down transformers under fluctuations in supply voltage upto plus 10% to minus (-) 15% permissible under Indian Electricity Act and rules there under. The transformer shall conform to the following specific parameters:

- i) Continuous rated capacity : 800 KVA
- ii) System Voltage ( Max. ) : 12
- III) Rated HT voltage : 11 KV
- iv) Rated LT voltage : 433 V (P-P)/250 V (P-N)
- v) Line current HV : 41.99 A
- vi) Line Current LV : 1066.73 A
- vii) Frequency : 50 Hz
- viii) No. of phases : THREE
- ix) Primary connection (HT) : DELTA
- x) Secondary connection (LT) : STAR
- xi) Vector Group : Dyn-11
- xii) Percentage impedance at 75°C : 5.0%
- xiii) Taps (off circuits) : +5% to -10%, 7 taps with 2.5% in each tap.
- xiv) Type of cooling : ON AN
- xv) Fault level of the system : 750 MVA

Primary winding shall be DELTA connected and the secondary winding shall be STAR connected (vector symbol Dyn-11), so as to produce a positive displacement of 30° from the primary to the secondary vectors of the same phase. The neutral of the secondary winding shall be brought out to a separate insulated terminal. The transformers shall be Copper Wound. The transformers shall be designed and constructed to withstand without damage the thermal and dynamic stresses of an external short circuit. The manufacturer / supplier shall furnish all relevant design data and calculations in support of having fulfilled this requirement as stipulated in IS:2026 (Part-I) .

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**अप्रमत्तेन वेद्व्यम्**

# **COTTON UNIVERSITY**

## **TENDER DOCUMENT**

**FOR**

**DESIGN, MANUFACTURE, SUPPLY, DELIVERY  
OF 1X800KVA, BIS MARKED, 11/0.433KV  
DISTRIBUTION TRANSFORMER OF ENERGY  
EFFICIENCY LEVEL-2**

**PART – II  
PRICE BID**

**NIT No.03 of 2021-22**

**Dt. 08.03.2022**

*11/3/22*



## PROPOSAL PARTICULARS

1. Name & Address of the Tenderers :
  
2. Tenderer's proposal no. :
  
3. Tenderer's proposal date :
  
4. Total Amount of the tender :

Date :

(Signature of the Tenderer)

*Bill*

PRICE BID

FOR DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 1X800KVA, BIS MARKED, 11/0.433KV  
DISTRIBUTION TRANSFORMER OF ENERGY EFFICIENCY LEVEL-2

Item Description	Unit	Qty	Rate in Figure (Rs.)	Rate in Words	Amount (Rs.)
Design, manufacture, supply, delivery to Cotton University, Guwahati properly packed for transportation including cost of transportation to site, loading / unloading etc. of the following item - 1 x 800 KVA, BIS marked 11/0.433KV Distribution Transformer of Energy Efficiency Level-2, outdoor type, copper wound including all accessories and equipments as detailed in Section - 3 - Scope & Technical Specification of the Techno-commercial bid. The transformer shall be strictly as per specification laid down in the Techno-Commercial Bid...	Set	1			
<b>TOTAL</b>					
<b>GST (----- %)</b>					
<b>TOTAL WITH GST</b>					

Seal

Signature of the Tenderer

*tdlm*  
11/3/22