

The Tata Power Company Ltd		<i>OPEN TENDER NOTIFICATION</i>
<i>Tender Reference: CC24VJS049</i>		<i>Document Date: 20th Dec 2023</i>

The Tata Power Company Limited Invites Tender through E-Tender Two-Part Bidding Process from interested bidders for the following package: -

A. Summary of the tendered package:

Sr. No.	Description	Tender Reference no.	Bid Guarantee Fee / EMD (Rs.)	Tender Fee (Rs.)	Last Date and Time for payment of Tender Participation fee
For the following package please send mail to Mr. Vinayak Shinde (vinayak.shinde@tatapower.com) with copy to Mr. Rameshkumar P N (pnramesh@tatapower.com)					
1.	Out Line Agreement for 1 year for procurement of Dry Type Transformers for Mumbai Distribution	CC24VJS049	16,00,000/-	2,000 /-	29 th December 2023 1500 Hrs.

B. Procedure to Participate in Tender.

Following steps to be done before “Last date and time for Payment of Tender Participation Fee” as mentioned above

1. Non-Refundable Tender Fee, as indicated in table above, to be submitted in the form of Direct deposit in the following bank account and submit the receipt along with a covering letter clearly indicating the Tender Reference number –

Beneficiary Name – The Tata Power Co. Ltd.

Bank Name – HDFC Bank Ltd.

Branch Name – Fort Branch, Mumbai

Address – Maneckji Wadia Building, Nanik Motwani Marg, Fort, Mumbai 400023.

Branch Code – 60

Bank & Branch Code – 400240015

Account No – 00600110000763

Account type – CC

IFSC Code – HDFC0000060

2. Eligible and Interested Bidders to submit duly signed and stamped letter on Bidder's letterhead indicating

Tender Enquiry number

Name of authorized person

Contact number

e-mail id

Details of submission of Tender Participation Fee

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E-mail with necessary attachment of 1 and 2 above to be send to vinayak.shinde@tatapower.com with copy to pnramesh@tatapower.com before “Last date and time for Payment of Tender Participation Fee”

Interested bidders to submit Tender Participation Fee and Authorization Letter before Last date and time as indicated above after which link from Tata Power E-Tender system (Ariba) will be shared for further communication and bid submission.

Please note all future correspondence regarding the tender, bid submission, bid submission date extension, Pre-bid query etc. will happen only through Tata Power E-Tender system (Ariba).

No e-mail or verbal correspondence will be responded. All communication will be done strictly with the bidder who have done the above step to participate in the Tender.

Also it may be strictly noted that once date of “Last date and time for Payment of Tender Participation Fee” is lapsed no Bidder will be sent link from Tata Power E-Tender System (Ariba). Without this link vendor will not be able to participate in the tender. Any last moment request to participate in tender will not be entertained.

Any payment of Tender Participation Fee by Bidder who have not done the pre-requisite will not be refunded.

Also all future corrigendum's to the said tender will be informed on Tender section on website <https://www.tatapower.com> only.

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OPEN TENDER NOTIFICATION

FOR

Out Line Agreement for 1 year for procurement of Dry Type Transformers for Mumbai Distribution.

**The Tata Power Company Limited (Tata Power)
Smart Center of Procurement Excellence, 2nd Floor,
Sahar Receiving Station, Near Hotel Leela,
Sahar Airport Road, Andheri East, Mumbai-400059**

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Section A : Tender Notice including Instruction to Bidders

1. Tender Details

1.1 Key Tender Specific Details

Reference Number	CC24VJS049
Description	Out Line Agreement for 1 year for procurement of Dry Type Transformers for Mumbai Distribution
Type of Tender	Out Line Agreement
Estimated Period	One Year
Tender Fee	Rs 2000/-
Earnest Money Deposit (EMD)	Rs 16,00,000/- Rs. Sixteen Lakhs Only PLEASE NOT THAT IT IS MANDATORY TO SUBMIT EMD IN BANK GUARANTEE FORMAT ONLY
Price Basis	On Price Variation Basis
Executive Handling this Tender*	Name: Mr. Vinayak Shinde E-Mail ID: vinayak.shinde@tatapower.com
Technical Query *	Name: Mr. Ajay Potdar E-Mail ID: avpotdar@tatapower.com

*You may contact the above personnel from Monday to Friday during office hours only.

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1.2 Calendar of Events

(a)	Payment of Tender Fee and Submission of letter nominating authorized person by Interested Bidder indicating their intent to Buy Tender	Till 29 th December 2023 , up to 1500 Hours
(b)	Access to Tender Documents through E-Tender system to authorized person of Interested Bidder	29 th December 2023
(c)	Last Date of receipt of pre-bid queries, if any.	By 5 th January 2024, 1500 Hrs.
(d)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	12 th January 2024
(e)	Last date and time of receipt of Bids	19 th January 2024 by 15:00 Hrs.*

Note:- * These date and time are as planned and tentative. In case of change the same shall be intimated to Authorized Person of Interested Bidder through E-Tender System.

Please note post submission of Bids relevant communication will be done with Authorized Person of Interested Bidder through E-Tender System

1.3 Mandatory documents required along with the Bid

- 1.3.1 Bid Guarantee Fee (EMD) of requisite value and validity. PLEASE NOTE THAT BID GUARANTEE ONLY IN FORM OF BANK GUARANTEE WILL BE ACCEPTED.
- 1.3.2 Requisite Documents to ascertain fulfilling of Technical and Commercial Pre-Qualification Requirement as detailed in Tender Enquiry.
- 1.3.3 Technical Submission including Drawings, Type Test details etc as detailed in Technical Specification.
- 1.3.4 Required Commercial Submission as detailed in Tender Document
- 1.3.5 Technical and Commercial Clarification and Deviations as per the format attached in the Tender Enquiry
- 1.3.6 Proper authorization letter to sign the tender and participate in Tata Power E-Tender system on the behalf of bidder.
- 1.3.7 **For vendor not registered with Tata Power, Duly filled Vendor Registration form with all supporting documents is mandatory to participate in the Tender.**

Please note that in absence of any of the above documents, the bid submitted by a bidder shall be liable for rejection.

Also please note that whenever editable format are shared it is requested that data be filled in relevant cells. No formatting or addition / deletion of rows / columns to be done. Wherever editable Excel submission are requested the file should be free from references, macros etc.

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Checklist of Document Submission

Stage of Tendering	Document	Type of Format	Mode of submission
Before last date of Pre-Bid Query	Query / Clarification / Deviation (QCD) Format. (F1) Technical and Commercial	Editable Excel Format	Through message in E-tender system
Bid Submission Envelope 1 (First Part)	Earnest Money Deposit	Original Bank Guarantee	In Sealed Envelope
Bid Submission Envelope 2 (Second Part)	Documents to be uploaded in Ariba only. In case of multiple files, a zipped folder can be attached for the same (size limit of 100MB per zipped file)		
To be submitted Under Tab 2.1 in Ariba	Duly filled PQR and supporting documents		
	Duly filled PQR format	Editable Excel Format	E-Tender System
	Backup documents for Technical and Commercial PQR	Signed and Scanned documents	E-Tender System
To be submitted under Tab 2.2 in Ariba	Technical Submission and Supporting Documents		
	Duly filled Unpriced Bid Format. Signed copy of Technical Specifications indicating your acceptance of the same	Signed and scanned copy of document	E-Tender System
To be submitted under Tab 2.3 in Ariba	Commercial Submission and supporting document		

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	Letter of Undertaking (FOR VENDORS NOT REGISTERED WITH TATA POWER)	Scanned Copy of letter of undertaking duly filled, stamped and signed	E-Tender System
	E-auction Undertaking form	Scanned Copy of letter of undertaking duly filled, stamped and signed	E-Tender System
Bid Submission Envelope 3 (Third Part)	Duly filled Priced Bid Format	Hard copy in original duly signed and stamped	Sealed Envelope
	Duly filled Priced Bid Format	To be entered in E-Tender System	E-Tender System

1.4 Deviation from Tender

Normally, the deviations to tender terms are not admissible and the bids with deviation are liable for rejection. Hence, the bidders are advised to refrain from taking any deviations on this Tender. Still in case of any deviations, all such deviations shall be set out by the Bidders, clause by clause in the Query / Clarification / Deviation (QCD) Format. Deviations have to be mandatorily submitted in editable Excel sheet.

Technical or Commercial Deviation should be mentioned in Deviation Format only. Deviation in any other document or Format will not be considered.

1.5 Right of Acceptance/Rejection

1.5.1 Bids are liable for rejection in absence of following:-

1.5.2 Mandatory Documents as listed in 1.3 above

1.5.3 Price Bid as per the Price Schedule mentioned in Tender Document

1.5.4 Receipt of Bid and Response to queries within the due date and time

Tata Power reserves the right to accept/reject any or all the bids without assigning any reason thereof.

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1.6 Qualification Criteria

S.No.	Description	Qualifying Criteria	Evaluation Documents Required
1	Infrastructure	Bidder must be an OEM of Equipment with manufacturing facility in India. The bidder must have in-house routine and acceptance testing facilities as per specifications and relevant IS/IEC..	Bidder must submit undertaking in this regard
2	Supply and Experience	<p>The bidder must have supplied for same (500kVA) or higher size and voltage dry type CRT,</p> <ul style="list-style-type: none"> a) A minimum of 114 nos during last 3 years or b) A single order of 57 nos or c) Two orders of 34 nos last 3 years. <p>Indian Subsidiaries of global companies having plant in India are also eligible to bid if the qualification requirements stated above are met independently or in combination with the parent company. Declaration from parent company needs to be submitted.</p>	<p>Purchase Order Copies and Completion Certificates.</p> <p>Self-undertaking to be submitted in this regard. TATA Power reserves the right to inspect the said manufacturing facility as a proof of compliance to this parameter.</p>

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S.No.	Description	Qualifying Criteria	Evaluation Documents Required
	Type Test	<p>The bidder shall submit Type test reports obtained from CPRI/ERDA/ International Accredited Lab for the equipment / material offered. The type tests should have been conducted on the equipment / material of the same design meeting IS guidelines.</p> <p>The type tests should have been conducted within 5 years prior to the date of bid opening. Time period for type test can be extended by another 5 years as a special case if there is no change in design / material of construction (MOC).</p> <p>In case the type test reports furnished are not for the quoted equipment / material but for the equipment / material with higher voltage class and/or different capacity, then type test shall be carried out for the offered equipment / material from CPRI /ERDA/ International Accredited Lab without any cost implication to the owner and the Type Test reports shall be submitted before dispatch of the equipment / material and within 120 days of outline agreement.</p>	<p>Type Test Report.</p> <p>Undertaking that there is no change in design / material of construction (MOC) if Type Test Report older than 5 years.</p> <p>Undertaking that type test shall be carried out for the offered equipment / material from CPRI / ERDA/ International Accredited Lab without any cost implication to the owner and Type Test reports shall be submitted before dispatch of the equipment / material and within 120 days of outline agreement.</p>
5	Commercial Capability	Average of Annual turnover of the bidder for last three years shall not be less than Rs. 20 Crs.	Copies of audited Balance Sheet and P&L Statements along with UDIN number to be submitted in this regard.

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S.No.	Description	Qualifying Criteria	Evaluation Documents Required
6	Performance	The bidder should have performance certificates for 2 years satisfactory performance from at least 2 reputed Distribution Utilities for equipments of similar or higher rating. The work against these issued certificates should be completed in last seven years from the date of bid submission. In case the bidder has a previous association with any of Tata Power Groups for similar products and services, the performance feedback for that bidder by Tata Power User Group shall only be considered irrespective of performance certificates issued by any third organization.	Supply List & Performance Certificates from the utilities

1.7 Pre-Bid Queries

Technical or Commercial Pre-Bid Queries if any has to be sent through message in E-Tender System. Pre-Bid Query has to be sent only in the Query / Clarification / Deviation (QCD) Format. Pre-Bid Queries sent in any other format or send through any other communication channel will not be accepted and answered. Pre-Bid Query have to be sent in the stipulated timeline as defined in the Tender Document. No Pre-Bid Query will be accepted after the due time and date as specified as "Last Date of receipt of pre-bid queries, if any"

1.8 Marketing Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the General Condition of Contracts and other parts of Tender Documents. Bidders must agree to these rules prior to participating. In addition to other remedies available, Tata Power reserves the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the General Condition of Contracts or other part of the Tender Documents. A bidder who violates the market place rules or engages in behavior that disrupts the fair execution of the marketplace, may result in restriction of a bidder from further participation in the marketplace for a length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace
- Breach of terms as published in TENDER
- Submit irrelevant documents or frequently cases of missing documents as part of compliance to Qualifying, Technical or Commercial Requirements causing unnecessary delay in Tender Evaluation

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1.9 Supplier Confidentiality

All information contained in this tender is confidential and shall not be disclosed, published or advertised in any manner without written authorization from Tata Power. This includes all bidding information submitted to Tata Power. All tender documents remain the property of Tata Power and all suppliers are required to return these documents to Tata Power upon request. Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

1.10 Payment Terms

100% payment shall be made within **60 days** from the receipt and acceptance of the material at the Consignee Stores/Site/Location as per the Contractual Terms and Conditions.

2. Evaluation Criteria

- The bids will be evaluated technically on the compliance to tender terms and conditions.
- The bids will be evaluated commercially on the overall all-inclusive lowest cost for the complete tender BOQ / each line item as calculated in Schedule of Items. Tata Power however, reserves right to split the order line item wise and/or quantity wise among more than one Bidder. Hence all bidders are advised to quote their most competitive rates against each line item.
- Bidder has to mandatorily quote against each item of Schedule of Items. Failing to do so, Tata Power may reject the bids.

NOTE: In case of a new bidder not registered with Tata Power, factory inspection and evaluation shall be carried out to ascertain bidder's manufacturing capability and quality procedures. However Tata Power reserves the right to carry out factory inspection and evaluation for any bidder prior to technical qualification. In case a bidder is found as Disqualified in the factory evaluation, their bid shall not be evaluated any further and shall be summarily rejected. The decision of Tata Power shall be final and binding on the bidder in this regard.

2.1 Price Variation Clause and Cap:

The prices shall be subject to IEEMA Price Variation Clause with following conditions:

IEEMA formulae and factors governing the price variation shall be as follows:

$$P = Po \left(7 + 35 C + 30 ES + 7 IS + 8 IM + 7 ER + 6 W \right) / 100$$

CO ESO ISO IMO ERO WO

- P Price payable as adjusted in accordance with the formula
PO Price quoted / confirmed (Each)
- C Price of Copper - Applicable in the Month of ordering.
CO Price of Copper - as per base month of tender.
- ES Price of CRGO - Applicable in the Month of ordering.

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ESO Price of CRGO - as per base month of tender.

IS Price of HR Coil of 3.15mm - Applicable in the Month of ordering.

ISO Price of HR Coil of 3.15mm - as per base month of tender.

IM Price of Insulating Materials - Applicable in the Month of ordering.

IMO Price of Insulating Materials - as per base month of tender.

ER Price of Epoxy resin - Applicable in the Month of ordering.

ERO Price of Epoxy resin - as per base month of tender.

W All India average Consumer price index - Applicable in the Month of ordering.

WO All India average Consumer price index average - as per base month of tender.

- Base circular shall be Dec. 2023 circular issued in Jan. 2024. Base month for Bid Price shall remain same throughout the negotiation process till Outline Agreement / Rate Contract is finalized. Base month circular has to be attached in the Price Bid.
- Whenever Firm Order has to be placed against Outline Agreement / Rate Contract Tata Power shall seek PVC corrected price based on index published and available during the said month from the bidder. Purchase Order against Outline Agreement / Rate Contract will be placed at PVC corrected price. The said price shall then remain firm till completion of delivery and bill payment.
- There will be no cap on both positive and negative side.

Note : If due date of bid submission is extended due to any reason, the base date will remain unchanged for the calculation of PV clause

3. Submission of Bid Documents

3.1 Bid Submission

Bidders are requested to submit their offer in line with this Tender document. Bids shall be submitted in 3 (three) parts:

FIRST PART: "EMD – BANK GUARANTEE" of Value detailed in 1.1 valid for 180 days from the due date of bid submission in the form of Bank Guarantee favoring 'The Tata Power Company Limited'. The EMD has to be strictly in the format as mentioned in Tender Document, failing which it shall not be accepted by Tata Power and the bid as submitted shall be liable for rejection.

Note : BG of 180 days and further claim period of 180 days is needed. In case the same cannot be issued by your bank then BG valid for 365 days can be provided.

Tata Power Bank details for EMD BG / NEFT:

Beneficiary Name – The Tata Power Co. Ltd.

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Bank Name – HDFC Bank Ltd.

Branch Name – Fort Branch, Mumbai

Address – Maneckji Wadia Building, Nanik Motwani Marg, Fort, Mumbai 400023.

Branch Code – 60

Bank & Branch Code – 400240015

Account No – 00600110000763

Account type – CC

IFSC Code – HDFC0000060

The hard copy of EMD in a sealed envelope should be sent on address mentioned in Tender document. Pls mail the UTR details in case of NEFT for verification.

First Part has to be submitted in Sealed Envelope.

SECOND PART: “TECHNICAL / UN-PRICED COMMERCIAL BID” shall contain the following documents:

- a) Documentary evidence in support of Technical, Commercial qualifying criteria
- b) Technical literature/GTP/Type test report/Details of Qualified Manpower Available/ Testing Facility available etc. *(complete in all respect as desired and detailed in Technical Specification and Technical Requirement Section)*
- c) Duly filled Technical and Commercial Deviation Sheets
- d) Duly filled formats like Authorization affidavit form
- e) *Unpriced Commercial Bid*

The technical / un-priced commercial bid shall be properly indexed and is to be submitted in Soft Copy through E-Tender system of Tata Power. Hard Copy of Technical Bids need not be submitted.

Second Part has to be submitted through E-Tender System Only

THIRD PART: “PRICE BID” shall contain only the price details and strictly in Price Bid format along with explicit break up of basic prices and applicable GST. Basic price should include packaging forwarding, freight, transit insurance and any other cost envisaged by the bidder.

Third part has to be submitted through E-Tender System (ARIBA) only.

FOR BIDS INVITED THROUGH E-TENDER SYSTEM (TECHNICAL AND UN-PRICED COMMERCIAL BID) :

In response to advertisement Bidder has to provide details of person authorized to Bid on behalf of the Bidder. An e-mail will be generated by E-Tender System and the authorized person can download the Tender Documents from the system.

SECOND and THIRD PART of the Bid have to be submitted in E-Tender System.

Bidders have to mandatorily submit SECOND PART (Technical and Un-priced commercial Bid) only through E-Tender system of Tata Power. Bids submitted through any other form/ route shall not be admissible.

EMD BG to be sent in a sealed envelope which shall be clearly marked as below to the below address.

EMD

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“Please mention Tender Reference No”

The Tata Power Company Limited, Smart Center of Procurement Excellence, 2nd Floor, Sahar Receiving Station, Near Hotel Leela, Sahar Airport Road, Andheri East, Mumbai-400059

Bids submitted by Email/Telex/Telegram /Fax will be rejected. No request from any Bidder to Tata Power to collect the proposals from Courier/Airlines/Cargo Agents etc. shall be entertained.

SIGNING OF BID DOCUMENTS:

The bid must contain the name, residence and place of business of the person or persons making the bid and must be signed and sealed by the Bidder with his usual signature. The names of all persons signing should also be typed or printed below the signature.

The Bid being submitted must be signed by a person holding a Power of Attorney authorizing him to do so, certified copies of which shall be enclosed.

The Bid submitted on behalf of companies registered with the Indian Companies Act, for the time being in force, shall be signed by persons duly authorized to submit the Bid on behalf of the Company and shall be accompanied by certified true copies of the resolutions, extracts of Articles of Association, special or general Power of Attorney etc. to show clearly the title, authority and designation of persons signing the Bid on behalf of the Company. Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

A bid by a person who affixes to his signature the word ‘President’, ‘Managing Director’, ‘Secretary’, ‘Agent’ or other designation without disclosing his principal will be rejected.

The Bidder’s name stated on the Proposal shall be the exact legal name of the firm.

3.2 Contact Information

Communication Details: Detailed in 1.1

3.3 Bid Prices

Bidders shall quote for the entire Scope of Supply/ work with a break up of prices for individual items and Taxes & duties. The bidder shall complete the appropriate Price Schedules included herein, stating the Unit Price for each item & total price with taxes, duties & freight up to destination at various sites of Tata Power. The all-inclusive prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during the execution of the supply work, breakup of price constituents.

The quantity break up shown else-where other than Price Schedule is tentative. The bidder shall ascertain himself regarding material required for completeness of the entire work. Any items not indicated in the price schedule but which are required to complete the job as per the Technical Specifications/ Scope of Work/ SLA mentioned in the tender, shall be deemed to be included in prices quoted.

3.4 Bid Currencies

Prices shall be quoted in Indian Rupees Only. It also may be noted that the denomination of Purchase Order / Outline Agreement / Rate Contract and associated Payment to Successful Bidder shall also be in Indian Rupees Only. In case Bidder intends to import any equipment, part etc and supply to Tata

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Power then all liability and costs related to import will rest with the Bidder. All statutory compliances, payments, expenditure etc related to importing of equipment will be responsibility of the bidder.

3.5 Period of Validity of Bids

Bids shall remain valid for 180 days from the due date of submission of the bid.

Notwithstanding clause above, Tata Power may solicit the Bidder's consent to an extension of the Period of Bid Validity. The request and responses thereto shall be made in writing.

3.6 Alternative Bids

Bidders shall submit Bids, which comply with the Bidding documents. Alternative bids will not be considered. The attention of Bidders is drawn to the provisions regarding the rejection of Bids in the terms and conditions, which are not substantially responsive to the requirements of the bidding documents.

3.7 Modifications and Withdrawal of Bids

The bidder is not allowed to modify or withdraw its bid after the Bid's submission. The EMD as submitted along with the bid shall be liable for forfeiture in such event.

3.8 Earnest Money Deposit (EMD)

The bidder shall furnish, as part of its bid, an EMD amounting as specified in the tender. The EMD is required to protect the Tata Power against the risk of bidder's conduct which would warrant forfeiture.

The EMD shall be in following form:

- Bank Guarantee valid for 180 days after due date of submission.

The EMD shall be forfeited in case of:

- a) The bidder withdraws its bid during the period of specified bid validity.

Or

- b) In case of a successful bidder, if the Bidder, within 15 days, does not
 - i) accept the purchase order, or
 - ii) furnish the required Contract Performance Bank Guarantee (CPBG)

Original Bank Guarantee submitted as EMD shall be returned only after completion of award process for unsuccessful bidders and issue of Contract Performance Bank Guarantee (CPBG) for successful bidder.

4. Bid Opening & Evaluation process

4.1 Process to be confidential

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence Tata Powers processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

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4.2 Technical Bid Opening

Bids will be opened at Corporate Office of Tata Power as per our standard Process. The bids shall be opened internally by Tata Power. Technical bid must not contain any cost information whatsoever.

First the envelope marked “EMD” will be opened. Bids without EMD of required amount/ validity in prescribed format, shall be rejected.

Next, the technical bid of the bidders who have furnished the requisite EMD will be opened in E-Tender system.

4.3 Preliminary Examination of Bids/Responsiveness

Tata Power will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order. Tata Power may ask for submission of original documents in order to verify the documents submitted in support of qualification criteria.

Prior to the detailed evaluation, Tata Power will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

Bid determined as not substantially responsive will be rejected by the Tata Power and/or the Tata Power and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

4.4 Techno Commercial Clarifications

Bidders need to ensure that the bids submitted by them are complete in all respects. To assist in the examination, evaluation and comparison of Bids, Tata Power may, at its discretion, ask the Bidder for a clarification on its Bid for any deviations with respect to the Tata Power specifications and attempt will be made to bring all bids on a common footing. All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted owing to any clarifications sought by Tata Power.

4.5 Price Bid Opening

The EMD of the bidder withdrawing or substantially altering his offer at any stage after the technical bid opening will be forfeited at the sole discretion of Tata Power without any further correspondence in this regard.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

4.6 Reverse Auction and Price Matching Option

Tata Power reserves the right to go for Reverse Auction (RA) for price negotiation and discover the most competitive price on ARIBA portal, Tata Power’s official e-tendering platform. This will be

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decided after techno-commercial evaluation of the bids. Bidders need to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case Tata Power decides to go for RA.

Only those bidders who are techno-commercially qualified shall be eligible to participate further in RA process. However, the original H1 bidder (whose price bid is the highest post techno-commercial evaluation) shall not be allowed to participate in further RA process provided minimum three techno-commercially qualified bids are available.

For case where more than one bidders have to be awarded (including Rate Contract / Outline Agreement) Price Matching Option will be exercised. Volume of job allocated to original competitive bidder will be more than bidder who is chosen through Price Matching Option. Tata Power decision regarding work sharing shall be final and no explanation OR clarification shall be given regarding the same.

5.0 Award Decision

Tata Power will award the contract to the successful bidder whose bid has been determined to be the lowest-evaluated responsive bid as per the Evaluation Criterion mentioned at Clause 2.0. The Cost for the said calculation shall be taken as the all-inclusive cost quoted by bidder in Priced Bid Format subject to any corrections required in line with Clause 4.3 above. The decision to place purchase order/Outline Agreement/ Rate Contract solely depends on Tata Power on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that Tata Power may deem relevant.

Tata Power reserves all the rights to award the contract to one or more bidders so as to meet the delivery requirement or nullify the award decision without assigning any reason thereof.

In case any supplier is found unsatisfactory during the delivery process, the award will be cancelled and Tata Power reserves the right to award other suppliers who are found fit.

5.1 Rate Contract / Outline Agreement

Rate Contract / Outline Agreement does not guarantee any assured business volume in Rupees or Quantity. Quantities are only indicative and specified for the purpose of readiness as per the request from Purchaser. Supplies shall be only against Firm Purchase Orders placed as per the agreed terms and conditions of Rate Contract / Outline Agreement. Purchaser shall be entitled at its discretion to place firm order for such supplies on "As and When Required Basis" without minimum take-off guarantee.

Rate Contract / Outline Agreement will have list of Items with Unit Rate and applicable Taxes and Duties. There will be a cap on value for which order which can be placed against the Rate Contract / Outline Agreement. Actual quantity ordered for each line item may differ significantly from the tentative quantity indicated in the Tender Document. One / few / all items of Rate Contract / Outline Agreement can be ordered till the Cap Value is reached.

6.0 Order of Preference/Contradiction:

In case of contradiction in any part of various documents in tender, following shall prevail in order of preference:

The Tata Power Company Ltd		<i>OPEN TENDER NOTIFICATION</i>
<i>Tender Reference: CC24VJS049</i>		<i>Document Date: 20th Dec 2023</i>

1. Outline Agreement/Purchase Order (with Commercial conditions)
2. Special Terms and conditions (if applicable)
3. General Terms and conditions
4. Technical Specifications

In case there is a discrepancy in the BOQ mentioned in tender (to the extent modified through subsequent Corrigendum, if any) and the bid submitted by any bidder, the description as mentioned in the tender (to the extent modified through subsequent Corrigendum, if any) shall prevail.

7.0 Ethics

Tata Power is an ethical organization and as a policy Tata Power lays emphasis on ethical practices across its entire domain. Bidder should ensure that they should abide by all the ethical norms and in no form either directly or indirectly be involved in unethical practice.

Tata Power work practices are governed by the Tata Code of Conduct. Bidder is request to refer Tata Code of Conduct Clause in General Terms and Conditions.

8.0 General Condition of Contract and Special Condition of Contracts

Any condition not mentioned above shall be applicable as per General Terms and Conditions and Special Condition of Contracts attached along with this tender.

---XXX---

The Tata Power Company Ltd		OPEN TENDER NOTIFICATION
Tender Reference: CC24VJS049		Document Date: 20 th Dec 2023

Annexure 1
Schedule Of Items

Sr. no.	Material / Service Short Text (as per SAP)	Quantity	UoM	Unit Rate (Basic)	Total
1	TRANSFORMER,TRF CAST RESIN 800 KVA 11KV	22	nos.		-
2	TRANSFORMER,TRF CAST RESIN 1600KVA 11KV	16	nos.		-
3	TRANSFORMER,TRF CAST RESIN 800 KVA 22KV	12	nos.		-
4	TRANSFORMER,TRF CAST RESIN 1600KVA 22KV	18	nos.		-
5	TRF DIST DRY TYPE 11KV/433V 1000KVA	18	nos.		-
6	TRANSFORMER,315 KVA,11 KV,315 KVA,415 V,	2	nos.		-
7	TRANSFORMER,500KVA,11KV,415V,CAST RESIN,	2	nos.		-
8	XFMR PWR,DIST/DRY,22Kv,433V,315KVA	2	nos.		-
9	TRANSFORMER,500KVA,22KV,415V,CAST RESIN,	2	nos.		-
10	TRF DIST DRY TYPE 22KV/433V 1000KVA	18	nos.		-
11	TRANSFORMER,1000KVA,6.6KV,415V,CAST RESIN	2	nos.		-
	Sub Total				-
	GST @18%				-
	Total with taxes				-

The Tata Power Company Ltd



TECHNICAL SPECIFICATION OF
22KV/415V & 11KV/415 Dry Type
Transformer


ENSE-DS-2004-R0

Date of Issue: 20/11/2023

TECHNICAL SPECIFICATION



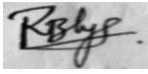
22 KV/415 V & 11KV/415 V Dry Type Transformers

The Tata Power Company Ltd.
Engineering Services (ENSE),
Distribution Division, Senapati Bapat Marg,
Lower Parel, Mumbai – 400013 Maharashtra



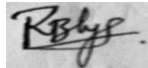
The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
ENSE-DS-2004-R0		Date of Issue: 20/11/2023

Document No: ENSE-DS-2004-R00

Document Title: Technical specifications for 22KV/415V & 11KV/415V Dry Type Transformer



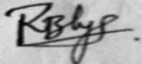
00	For tender purpose (ENSE-DS-2004-R00)	20/11/23	KSJ		AVP		RMB	
Rev No.	Remarks	Date	Initials	Sign	Initial	Sign	Initials	Sign
			Prepared By		Checked By		Approved and Issued By	


The Tata Power Company Ltd.
Engineering Services (ENSE),
Distribution Division, Senapati Bapat Marg,
Lower Parel, Mumbai – 400013 Maharashtra

Rev No.	Prepared By & Date	Checked By & Date	Approved for Issue By & Date
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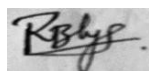
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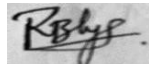
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The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
ENSE-DS-2004-R0		Date of Issue: 20/11/2023

1	SCOPE	<p>1. This Specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing forwarding, supply at store and performance of Cast resin type, naturally cooled, three Phase 11/0.415 kV & 22/0.415 kV, 50Hz, copper wound indoor type Distribution Transformer.</p> <p>2. The transformer shall be complete with all components and accessories, which are necessary or usual for their efficient performance and trouble-free operation under the various operating and atmospheric conditions specified in clause no. 3.</p> <p>3. Such of the parts that may have not been specifically included, but otherwise form part of the transformer as per standard trade and/or professional practice and/or are necessary for proper operation of transformer, will be deemed to be also included in this specification. The successful bidder shall not be eligible for any extra charges for such accessories etc. notwithstanding the fact that at the time of an initial offer bidder had segregated such items and quoted for them separately.</p>																																								
2	APPLICABLE STANDARDS	<p>The equipment (and the materials used) covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, IEC / International standards , with latest amendment from time to time, thereof, some of which are listed below:</p> <table border="1" data-bbox="448 890 1500 1764"> <thead> <tr> <th data-bbox="448 890 695 953">Indian Standards (IS)</th> <th data-bbox="695 890 1500 953">Title</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 953 695 984">IS 2026 Part-11</td> <td data-bbox="695 953 1500 984">Dry type Transformer</td> </tr> <tr> <td data-bbox="448 984 695 1016">IS 2026 : 2011</td> <td data-bbox="695 984 1500 1016">Specification for Power Transformers</td> </tr> <tr> <td data-bbox="448 1016 695 1047">IS 104 : 2017</td> <td data-bbox="695 1016 1500 1047">Specification for ready mixed paint, brushing, zinc chrome, priming</td> </tr> <tr> <td data-bbox="448 1047 695 1079">IS 191 : 2007</td> <td data-bbox="695 1047 1500 1079">Copper</td> </tr> <tr> <td data-bbox="448 1079 695 1110">IS 649: 1997</td> <td data-bbox="695 1079 1500 1110">Testing for steel sheets and strips and magnetic circuits.</td> </tr> <tr> <td data-bbox="448 1110 695 1142">IS 5 : 2007</td> <td data-bbox="695 1110 1500 1142">Specification for Colors for ready mixed paints and enamels</td> </tr> <tr> <td data-bbox="448 1142 695 1173">IS 1576: 1992</td> <td data-bbox="695 1142 1500 1173">Solid Pressboard for Electrical Purposes -Specification</td> </tr> <tr> <td data-bbox="448 1173 695 1205">IS 1897: 2008</td> <td data-bbox="695 1173 1500 1205">Copper strip for electrical purposes</td> </tr> <tr> <td data-bbox="448 1205 695 1236">IS 60137 : 2017</td> <td data-bbox="695 1205 1500 1236">Insulated Bushings for Alternating Voltages above 1 000 V</td> </tr> <tr> <td data-bbox="448 1236 695 1268">IS 3024 : 2015</td> <td data-bbox="695 1236 1500 1268">Grain oriented electrical steel sheets and strips</td> </tr> <tr> <td data-bbox="448 1268 695 1331">IS 4253: Part II: 2008</td> <td data-bbox="695 1268 1500 1331">Specification for cork composition sheets- Part II : Cork and Rubber</td> </tr> <tr> <td data-bbox="448 1331 695 1394">IS 4257(Part I): 1981</td> <td data-bbox="695 1331 1500 1394">Dimensions for Clamping Arrangements for Porcelain transformer Bushings - Part I: For 12 kV to 36 kV Bushings</td> </tr> <tr> <td data-bbox="448 1394 695 1457">IS 5082:1998</td> <td data-bbox="695 1394 1500 1457">Wrought Aluminum and Aluminum Alloy bars, Rods , Tubes, Sections, Plates and Sheets for Electrical Applications</td> </tr> <tr> <td data-bbox="448 1457 695 1488">IS 5561 : 2018</td> <td data-bbox="695 1457 1500 1488">Specification for Electric Power Connectors</td> </tr> <tr> <td data-bbox="448 1488 695 1551">IS 7404 (Part-1): 1991</td> <td data-bbox="695 1488 1500 1551">Paper Covered conductors: Round Conductors</td> </tr> <tr> <td data-bbox="448 1551 695 1614">IS 7421:1988</td> <td data-bbox="695 1551 1500 1614">Specification for porcelain bushings for alternating voltages up to and including 1000kv</td> </tr> <tr> <td data-bbox="448 1614 695 1646">IS 9335:1979</td> <td data-bbox="695 1614 1500 1646">Specification for Cellulosic Papers for Electrical Purposes</td> </tr> <tr> <td data-bbox="448 1646 695 1709">IS 10028: 1981</td> <td data-bbox="695 1646 1500 1709">Code of Practice for Selection, Installation and Maintenance of Transformers</td> </tr> <tr> <td data-bbox="448 1709 695 1764">IS 11149:1984</td> <td data-bbox="695 1709 1500 1764">Specification for rubber gaskets</td> </tr> </tbody> </table>	Indian Standards (IS)	Title	IS 2026 Part-11	Dry type Transformer	IS 2026 : 2011	Specification for Power Transformers	IS 104 : 2017	Specification for ready mixed paint, brushing, zinc chrome, priming	IS 191 : 2007	Copper	IS 649: 1997	Testing for steel sheets and strips and magnetic circuits.	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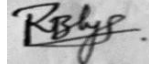
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	IS 12444: 2020	Specification for continuously cast and rolled electrolytic copper wire rods for electrical conductors																														
	IS 13964: 1994	Methods of measurement of transformer and reactor sound levels																														
	IEC Standard	Title																														
	IEC 60529: 2001	Degrees of protection provided by enclosures (IP Code)																														
	IEC 60076 Part 11	Specification for power transformer.																														
	IEC 60626-2	Combined flexible materials for electrical insulation - Part 2: Methods of test																														
	IEC 60076 Part 12	Loading guide for Dry type Transformers																														
	IS 60137 : 2017	Insulated Bushings for Alternating Voltages above 1000 V																														
	<p>Material conforming to other internationally accepted standards, which ensures equal or better quality than the standards mentioned above would be acceptable, subject to prior approval from Tata Power. In case the Bidders who wish to offer material conforming to the other standards, salient points of difference between the Standards adopted and the specific standards shall be clearly brought out in relevant schedule copy of such standards with authentic English Translation shall be furnished along with the offer.</p> <p>In the case of conflict the order of precedence shall be</p> <ol style="list-style-type: none"> 1) Indian Standards, 2) IEC Standards 3) Other alternative standards. 																															
3	CLIMATIC CONDITIONS OF THE INSTALLATION	<table border="1"> <tr> <td>1</td> <td>Maximum ambient temperature</td> <td>50 deg.C</td> </tr> <tr> <td>2</td> <td>Max. Daily average ambient temp</td> <td>40 deg.C</td> </tr> <tr> <td>3</td> <td>Min Ambient Temperature</td> <td>10 deg.C</td> </tr> <tr> <td>4</td> <td>Maximum Humidity</td> <td>100%</td> </tr> <tr> <td>5</td> <td>Minimum Humidity</td> <td>10%</td> </tr> <tr> <td>6</td> <td>Average Annual Rainfall</td> <td>2386mm</td> </tr> <tr> <td>7</td> <td>Average No. of rainy days per annum</td> <td>115</td> </tr> <tr> <td>8</td> <td>Rainy months</td> <td>June to Oct.</td> </tr> <tr> <td>9</td> <td>Altitude above MSL not exceeding</td> <td>300m</td> </tr> <tr> <td>10</td> <td>Average Air Pressure</td> <td>29.6 inch Hg</td> </tr> </table>	1	Maximum ambient temperature	50 deg.C	2	Max. Daily average ambient temp	40 deg.C	3	Min Ambient Temperature	10 deg.C	4	Maximum Humidity	100%	5	Minimum Humidity	10%	6	Average Annual Rainfall	2386mm	7	Average No. of rainy days per annum	115	8	Rainy months	June to Oct.	9	Altitude above MSL not exceeding	300m	10	Average Air Pressure	29.6 inch Hg
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<p>Atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1g.</p>																																

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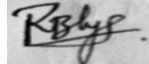
The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
ENSE-DS-2004-R0		Date of Issue: 20/11/2023

4 GENERAL TECHNICAL REQUIREMENTS										
S. No.	Description	Requirements								
1.	Continuous Rated Capacity (kVA)	315 kVA	400 kVA	500 kVA	630 kVA	800 kVA	1 MVA	1.25 MVA	1.6 MVA	2 MVA
2.	Application	Indoor								
3.a	System voltage (max.) for 11KV Rating	12 kV	12 kV	12 kV	12 kV	12 kV	12	12	12	12
3.b	System voltage (max.) for 22KV Rating	24 kV	24 kV	24 kV	24 kV	24 kV	24 kV	24 kV	24 kV	24 kV
4.a	Rated voltage HV (kV)	11	11	11	11	11	11	11	11	11
4.b	Rated voltage HV (kV)	22	22	22	22	22	22	22	22	22
5.	Rated voltage LV (V)	415-239	415-239	415-239	415-239	415-239	415-239	415-239	415-239	415-239
6.a	Line current HV (A)11 KV	16.53 A	20.96 A	26.25 A	33.06 A	42.0 A	52.48 A	65.6 A	83.98 A	104.97A
6.b	Line current HV (A)22 KV	8.3 A	10.5 A	13.1 A	16.5 A	21.0 A	26.2 A	32.8 A	42.0 A	52.5 A
7.	Line current LV (A)	438.22 A	556.46 A	685.58 A	876.43 A	1113 A	1391.16 A	1738.95 A	2225.86 A	2782.33 A
8.	Frequency (Hz)	50 Hz +/- 5 %								
9.	No. of Phases	Three	Three	Three	Three	Three	Three	Three	Three	Three
10.	Connection HV	Delta	Delta	Delta	Delta	Delta	Delta	Delta	Delta	Delta
11.	Connection LV	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)	Star (Neutral Brought out)
12.	Vector group	Dyn-11	Dyn-11	Dyn-11	Dyn-11	Dyn-11	Dyn-11	Dyn-11	Dyn-11	Dyn-11
13.	Type of cooling	AN								
14.	Tap changing arrangement (off load)	+10.0% to -10% in steps of 2.5%								
15.	No. of tap positions	9								
16.	Permissible temperature rise over ambient of winding measured by resistance	115 °C								

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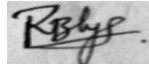
17.	Max. Total Losses at 50% loading at 75°C (watts)	1100	1300	1600	2000	2000	3000	3600	4500	5400
18.	Max. Total Losses at 100% loading) at 75°C (Watts)	3275	3875	4750	5855	5855	9000	10750	13500	17000
19.	Short circuit impedance voltage at 75°C (±10% tolerance)	4.5%	4.5%	4.5%	4.5%	5%	5%	5%	6.25%	6.25%
20.	Insulation Class (overall)	Class H or better								
20.	Insulation Class 1 (winding)	Class H								
21.	Partial Discharge Level at 1.1 times rated voltage	10 pc (max.)								
22.	Max. Flux Density(at rated voltage and frequency)	1.6 T	1.6 T	1.6 T	1.6 T	1.6 T	1.6 T	1.6 T	1.6 T	1.6 T
23.	Maximum current density (A/mm ²)	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
24a	Impulse withstand voltage (for 11 KV)	75 kVp	75 kVp	75 kVp	75 kVp	75 kVp	75 kVp	75 kVp	75 kVp	75 kVp
24b	Impulse withstand voltage (for 22 KV)	125kVp	125kVp	125kVp	125kVp	125kVp	125kVp	125kVp	125kVp	125kVp
25.	Power frequency withstand voltage a. HV for 1 min. for 11 KV b. KV for 1 min. for 22 KV c. LV for 1 min.	<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"></div> <div style="width: 40%; text-align: center;">28 kV</div> <div style="width: 20%;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 40%;"></div> <div style="width: 40%; text-align: center;">50 KV</div> <div style="width: 20%;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 40%;"></div> <div style="width: 40%; text-align: center;">3 kV</div> <div style="width: 20%;"></div> </div>								


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The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
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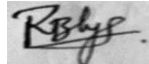
39	Environmental classes	Class E4: Frequent condensation or heavy pollution or combination of both
40	Fire behaviour classes	Class F1: Transformers subject to a fire hazard. Restricted flammability is required. The emission of toxic substances and opaque smokes shall be minimised.

5	GENERAL CONSTRUCTION	<ol style="list-style-type: none"> The transformer shall be cast resin dry type, double wound, copper coil, naturally cooled (AN) and rectangular constructions per above rating. The transformer shall be suitable for service with fluctuations in supply voltage up to plus 12.5% to minus 12.5%. The transformer and accessories shall be designed to facilitate operation, inspection, maintenance and repairs. The design shall incorporate every precaution and provision for the safety of equipment as well as staff engaged in operation and maintenance of equipment.
5.1	CORE	<ol style="list-style-type: none"> Transformer core shall be stack type, constructed from high grade cold rolled, non-ageing, grain oriented, silicon steel lamination which shall be properly annealed (under inert atmosphere, if required) to relieve stresses. The core shall have low loss and good grain properties. It should be coated with hot oil proof insulation, bolted together with frames to prevent vibration and noise. The core thickness should be 0.23mm or less and grade should be M3 or 23HP85 as per IS 3024 or better. All core clamping bolts (if any) shall be effectively insulated. Only one grade and one thickness of core shall be accepted and mixing of different grades shall not be allowed. Core lamination shall be coated with insulation inorganic coating equivalent to C5 type as per ESTM A976 or IS 3024 like carlite-3. The complete design of the core must ensure maximum permanency of the core losses without continuous working of the transformers. The value of the maximum flux density allowed in the design and grade of lamination used shall be clearly stated. The vendor shall submit the calculations in support of the same. The transformer shall be suitable for continuous service without damage under 'over fluxing' where the ratio of voltage over frequency exceeds the corresponding ratio at rated voltage and rated frequency up to 12.5% and the core shall not get saturated. The No Load current shall not exceed 2% of the Full Load current and will be measured by energizing the transformer at rated voltage and frequency. Increase of 12.5% of rated voltage shall not increase the no-load current by 5% maximum of full load current. The bidder shall be required to submit the following documents in regard to procurement of core material: <ol style="list-style-type: none"> Invoice of supplier Mill's test certificate Packing list Bill of landing Bill of entry certificate by custom Description of material, electrical analysis, physical inspection certificate for surface defects, thickness and width of material.

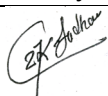

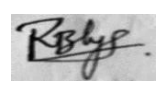
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		<p>12. The bidder shall offer the core for inspection and approval of Tata power during the manufacturing stage. Heavy penalty or black listing shall be imposed on the bidders using defective CRGO sheets.</p> <p>13. RTD to be placed for core temperature detection.</p>																	
5.2	WINDING CONNECTIONS	<ol style="list-style-type: none"> 1. The conductor used in the windings shall be high grade electrolytic solid drawn copper encapsulated winding. The high voltage and low voltage windings shall be vacuum cast in epoxy in a metal mould utilizing a proven casting process that ensures the absence of voids & minimise the partial discharge. The winding shall be designed for better voltage regulation and mechanical strength. 2. All Inter turn and inter layer insulation both for HV & LV winding coils shall be suitable for Class H or better as per IS 1271-1985. Bidder to submit relevant test report. There shall be uniform insulation on the HV and LV side. 3. Copper Strips to be considered for HV winding with suitable grade insulation for handling high voltages. 4. However, enamelled conductors shall not be acceptable for any winding. 5. All turns of windings shall be adequately supported to prevent movement. In cases where turns are spaced out, a suitable inter- turn packing shall be provided. All leads from the windings to the terminal board and bushings shall be rigidly supported to prevent injury from vibration or short circuit stresses. 6. Neutral connection shall be brazed on neutral copper busbar. 7. The current density for HV and LV winding shall not be more than 2.6 Ampere per sq.mm. The insulation between core and bolts and core and clamps shall withstand 2.5 kV for one minute. The bidder shall submit characteristics of insulation paper with the offer. The transformer shall have vibration pads installed between core coil assembly and enclosure base structures to prevent the transmission of structure borne vibration. 8. Guide tube shall be used wherever practicable. The core and coil assembly shall be securely fixed in position so that no shifting or deformation occurs during movement of transformer. The core and coil assembly shall be capable of withstanding without injury, thermal and mechanical effects of short circuit at the terminals of any winding as per IS 2026 with latest amendments thereto. 9. Tolerance for the winding resistance measured from different phases but at the same Taps shall be limited to 2 %. 10. Both HV & LV windings shall be resin casted. 11. The winding shall have minimum 2 RTD pocket embedded inside resin cast on LV winding & 2 RTD/coil to be fixed in LV winding & properly wired up on junction TB placed on core-coil assembly. Then it should be further wired up to marshalling box from junction TB. The core RTD shall also wired through junction TB. 12. Hydrophobic anti tracking coating shall be applied on resin casted winding inside & outside. Bidder to provide details of the same during technical evaluation. 13. Insulated sleeves to be provided on connecting links of HV delta formation. End link of delta formation should be rounded off. 																	
5.3	LOSSES	<ol style="list-style-type: none"> 1. The bidder shall guarantee the total loss at 50% and 100% load condition (at rated voltage and frequency and at 75°C) and these should be within the limits of maximum total losses declared by Tata Power for both 50% and 100% loading values (as per table below). <table border="1" data-bbox="496 1682 1507 1761" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="496 1682 867 1717" rowspan="2" style="text-align: center;">Description</th> <th colspan="5" data-bbox="867 1682 1507 1717" style="text-align: center;">Rating (kVA)</th> </tr> <tr> <th data-bbox="867 1717 1000 1761" style="text-align: center;">315 kVA</th> <th data-bbox="1000 1717 1128 1761" style="text-align: center;">400 kVA</th> <th data-bbox="1128 1717 1271 1761" style="text-align: center;">500 kVA</th> <th data-bbox="1271 1717 1383 1761" style="text-align: center;">630 kVA</th> <th data-bbox="1383 1717 1507 1761" style="text-align: center;">800 kVA</th> </tr> </thead> <tbody> <tr> <td data-bbox="496 1761 867 1761" style="height: 20px;"></td> <td data-bbox="867 1761 1000 1761"></td> <td data-bbox="1000 1761 1128 1761"></td> <td data-bbox="1128 1761 1271 1761"></td> <td data-bbox="1271 1761 1383 1761"></td> <td data-bbox="1383 1761 1507 1761"></td> </tr> </tbody> </table>	Description	Rating (kVA)					315 kVA	400 kVA	500 kVA	630 kVA	800 kVA						
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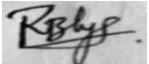
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		<p>No positive tolerance shall be allowed on the losses as mentioned above. However, bidder can offer losses less than specified but no consideration in cost will be given for the same.</p> <ol style="list-style-type: none"> The successful bidder shall guarantee the quoted losses for at least five years. If at any point of time during operation if it is found that the total losses at 50% and 100% load are more than the values given in specifications, then bidder shall be liable to pay a fine of Rs 250 per watt to the amount by which losses at 50% loading and 100% loading increase the values given in specifications. During testing at Bidder's works if it is found that the actual measured losses are more than the values quoted by the Bidder, TATA POWER shall reject the transformer and shall have the right to reject the complete lot. During testing at Bidder's works, if the temperature rise exceeds the specified values, the entire lot shall be rejected by TATA POWER. During testing at Bidder's works, if the impedance values differ from the guaranteed values including tolerance, the transformer shall be rejected by TATA POWER. 																			
5.4	ENCLOSURE	<p>5.4.1 -The epoxy cast resin transformer shall be housed in an enclosure constructed of heavy gauge sheet steel of minimum thickness 2mm with the load bearing member should be of 3mm thick. The enclosure shall provide a minimum degree of protection of IP33. The housing shall have ventilation louvers / opening provided with wire mesh screens and shall be provided with a door, which shall be inter locked such that it should be possible to open the door only when power supply to the transformer is switched off. A suitable danger plate should also be provided.</p> <p>5.4.2 -The enclosure shall be provided with a minimum of two welded heavy duty closed lifting lugs and necessary hardware for mounting on the floor. The lifting lugs shall be capable of withstanding the total weight of the transformer.</p> <p>5.4.3 -The base of the enclosure shall be furnished with ground pads located on opposite diagonal corners. The base shall have jacking pads and shall be constructed of heavy steel members to permit skidding or rolling in any direction. The core shall be visibly grounded to the enclosure frame by means of a removable flexible copper grounding strap. The enclosure shall be powder coated.</p> <p>5.4.4- All doors shall have Limit switch with wiring upto marshalling box of door opening of transformer to be provided.</p> <p>5.4.5- The enclosure shall be such that tap position shall be visible through a transparent polycarbonate window arrangement covered by without opening the door.</p>																			



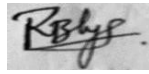
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5.5	TERMINAL ARRANGEMENT	For HT side termination, tinned Copper bus bar (40 mm x 6 mm) shall be provided suitable for connecting to 1C x 185 sq.mm (for 11 KV & 22 KV) cable. Similar termination shall be followed at LT side but the arrangement shall be suitable for the cable sizes and nos. as specified in clause no. 5.6
5.6	CABLE BOXES	<ol style="list-style-type: none"> 1. The HV/LV cable boxes shall be made of Mild Steel (M.S.) Sheet. The LV cable box front cover & bottom plate shall be removable for cable termination purpose. Suitable handle shall be provided on front cover of cable box. 2. All rating shall have HT & LT cable boxes. 3. The LV busbar shall be supported using epoxy insulators from the top side inside the LV dividing box. The neutral terminals of LV windings shall be brought out on LV phase terminals to form four wire systems. 4. Suitable cable clamping/cleating arrangements shall be provided to keep Cable straight and to support cables to avoid tension on bushings due to cable weight for both HV & LV side. 5. Aluminum lugs to be provided by vendor suitable for 1.1 KV 4C 300 sq mm Al armored cable sector shape. 6. Non-magnetic undrilled Gland plates shall be provided for both HV and LV cable box. 7. Gland plates shall be mounted separately with nut & bolt arrangement. 8. Support for GI earth strip, 65x10mm, shall be provided so as to avoid tension on secondary neutral bushing. 9. The size of the cable box cover should be moderate so that only 2 people is enough to lift it. <p><u>HV CABLE BOX:</u></p> <ol style="list-style-type: none"> 10. 1 C X 185 sq.mm 11KV or 22KV XLPE Cable shall be used at HV side. HV box should be suitable for heat shrink of this cable. 11. The minimum clear distance of 600 mm for HT bus bar bolt terminal to gland plate shall be maintained. <p><u>LV CABLE BOX:</u></p> <ol style="list-style-type: none"> 12. Neutral terminal of LV winding shall be brought out on LV phase terminals to form four wire system. 13. The neutral of the star connected winding shall be brought out to a separate bushing terminal of 1.1KV class. Neutral CT should be installed before bifurcation. The neutral bushing shall be provided outside body of transformer to facilitate the earth conductor down to ground level. 14. The Neutral Should be mounted with FRP/Bakelite sheets, firmly, so that LV neutral bus should not touch the CT. 15. Epoxy Insulators shall be provided from top side in LV box to support each LV busbar. 16. LV busbar shall be of AL material & shall have minimum clearances of 200 mm after nut bolts with Lugs between each phase, neutral and 150 mm with enclosure body. 17. Distance between bolt to bolt for phase & neutral busbar shall be minimum 70 mm. 18. The variation between terminal bolt diameter & busbar hole diameter/lug hole diameter shall not be more than 2 mm. 19. Current density of Al busbar for phase & neutral shall be 1A/sq mm.



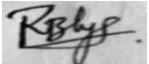
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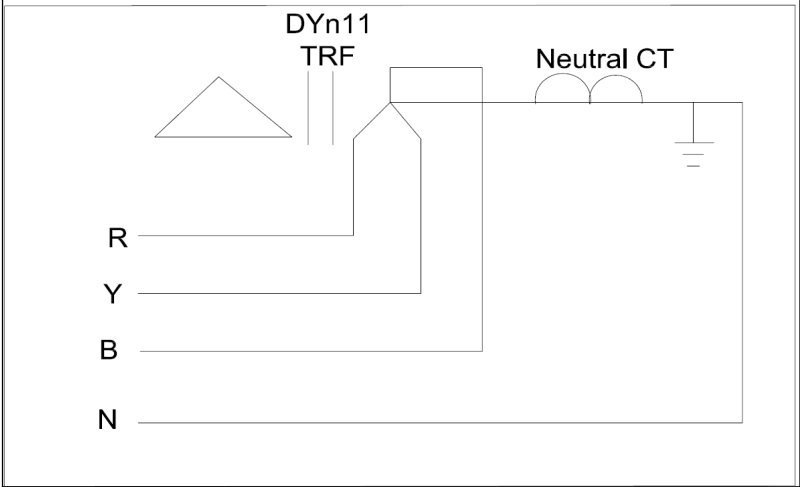
		20. The no. and size of cables for installation on LV side shall be as follows.																						
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5.7	GASKET	Neoprene/Nitrile gasket as per IS 11149 or rubberized cork sheet as per IS:4253 (Part2).																						
5.8	TERMINAL CONNECTOR	<p>HT TERMINAL CONNECTOR:</p> <p>1. All ratings shall be suitable for 1CX185 sq.mm XLPE cable at HT side. For HT side termination, tinned Copper bus bar (40 mm x 6 mm) shall be provided.</p> <p>LT TERMINAL CONNECTOR:</p> <p>1. Aluminum busbar (current density: not more than 1 A/mm²) shall be provided.</p>																						
5.9	TAPS	<p>1. Tap changing shall be carried out by means tinned brass links when the transformer is in de-energised condition. The link should be rounded off at end terminals.</p> <p>2. The taps shall be provided in HV winding and each tap change shall result in voltage variation of 2.5%.</p> <p>3. Switch position no.1 shall correspond to the maximum tapping (+10%) and position 9 shall correspond to minimum tapping (i.e,-10%).</p> <p>4. Suitable plate shall be fixed for tap changing switch to know the position number of tap.</p> <p>5. The tap position shall be visible through a transparent polycarbonate window arrangement covered by without opening the door.</p>																						
5.10	EARTHING CONNECTIONS	<p>NEUTRAL EARTHING:</p> <p>1. Separate LV neutral bushing to be provided on top/side of LV box for neutral earthing.</p> <p>BODY EARTHING:</p> <p>2. Two body earthing terminals, located on the lower side of the transformer, diagonally opposite to each other of M12 size (taken 100mm out of tank) shall be provided on Transformer Enclosure with Bolt.</p> <p>Other parts earthing: Transformer all other parts shall be connected at two diagonal places with each other by tinned copper strips.</p>																						
5.11	RADIO INTERFERENCE	When operated at voltages up to 12.5% in excess of the normal system rating, transformers shall be substantially free from partial discharges (i.e. corona discharges in either internal or external insulation) which are likely to cause interference with radio or telephone communication																						



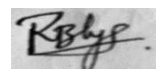
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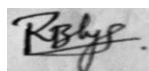
5.1 2	TEMPERATURE INDICATORS	<p>Winding Temperature Indicator (WTI) for measuring the hot spot temperature of the winding shall be provided. It shall be suitable for control room as well as marshalling box installation and is built for long and trouble-free operation under extreme conditions of service associated with the Cast resin Dry type transformers. It shall comprise of the following devices/features:</p> <ol style="list-style-type: none"> a) Resistance Temperature Detector (RTD) sensors shall be suitable to allow the user to monitor max. Six Critical Temperature parameters on the Transformer & 1 no on Core. Routing of cable shall be done through cable turf with necessary tying through nylon tie belts. b) It shall be programmable to display, store and note maximum temperature such that the same can be recalled even after the power for the device is interrupted. c) It shall be compatible for communication with Computer. d) It shall be provided with settable set-points – <ol style="list-style-type: none"> i. To warn the user of high temperature ii. To trip the transformer in case of excessive heating. e) The temperature indication range shall be -25 to 300 deg C. f) The display shall be seven segment LED type for displaying temperature and channel number. g) The enclosure shall be of M.S. sheet box, powder coated, with acrylic viewing window and minimum degree of protection shall be IP52. h) It shall be operated by the supply voltage of 240 V AC. i) It shall not consume power more than 5 VA during operation. j) It shall be suitable for operation under maximum ambient temperature conditions. <p>Following makes of WTI to be considered with back to back warranty with OEM:</p> <ol style="list-style-type: none"> 1) Precimeasure 2) Scientific control 3) Perfect control
5.13	TERMINAL MARKING	<p>All transformers shall have the primary and secondary terminal markings plainly and indelibly marked on the transformer adjacent to the relevant terminal. High voltage phase windings shall be marked both in the terminal boards inside the tank and on the outside with capital letter 1U, 1V, 1W and low voltage winding for the same phase marked by corresponding small letter 2u, 2v, 2w. The neutral point terminal shall be indicated by the letter 2n. Neutral terminal shall be brought out and connected to local grounding terminal by the earthing strip. Sequence of marking should be 1U, 1V, 1W and 2n, 2u, 2v, 2w). Colour codes to be marked in addition to 1U, 1V, 1W & 2u, 2v, 2w and 2n.</p>
5.14	CURRENT TRANSFORMERS	<p>Only protection class Neutral CT to be provided as mentioned below:</p> <p>Neutral Current transformer: All transformer shall be supplied with LT side neutral CT before bifurcation of neutral for earthing. The Neutral CTs shall be window type, resin cast, protection class having ratio & knee voltage as per following table. Current transformer shall be mounted outside the tank with suitable clamping arrangement and should be C-shaped of sliding, soft material, non-screw type. The current transformer shall comply with IS 2705. The terminals shall not have shorting facility. The CTs shall have following parameters. CT terminal box for secondary of CT shall be provided of suitable size on the side of transformer. Box shall have droppable terminal blocks with shorting link.</p>

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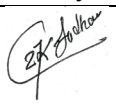

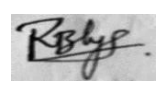
		<p style="text-align: center;">Three Phase LT Schematic</p> 
<p>5.15</p>	<p>FASTENERS</p>	<p>All bolts, studs, screw threads, pipe threads, bolt heads and nut bolts shall comply within the appropriate Indian standards for metric threads. Bolts or studs shall not be less than 6mm in diameter except when used for small wiring terminals. All nuts and pins shall be adequately locked. Wherever possible bolts shall be fitted in such a manner that in the event of failure of locking resulting in the nuts working loose and falling off, the bolt shall remain in position. All ferrous bolts, nuts and washers shall be hot dip galvanized, except high tensile steel bolts and spring washers which shall have electrolytic action between dissimilar metals.</p> <p>Each bolt shall project at least one thread but more than three threads through the nut. The length of the screwed portion of the bolts shall be such that no screw thread may form part of a shear plane between members. All bolts of current carrying part shall have taper washers.</p> <p>Protective washers of suitable material shall be provided on front and back of the securing screws.</p>


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5.16	FITTINGS	<p>The following standard fittings shall be provided.</p> <ol style="list-style-type: none"> Rating and terminal marking plates non-detachable Separate Plate mentioning Guarantee period and date of dispatch. Lifting lugs on enclosure Digital temperature meter with sensors. The winding temperature indicator shall be fitted with Alarm & trip contacts. LV & HV cable box. Danger plate as per IS 2551 on HV & LV cable box & side doors. Base Channel. Four bi-directional rollers (dia-150mm X 50mm wide) with distance between wheels center to center – 820 MM. Marshalling box with WTI as RTD. HV cable box and LV terminal box should be at 180° and shall be properly supported. Separate neutral bushing. Neutral Bushing CT with CT ratio mentioned. 													
5.17	SURFACE PREPARATION AND PAINTING	<ol style="list-style-type: none"> The paint shall be applied by airless spray or seven tank powder coating process as applicable to the various parts of transformer and enclosure. Steel surfaces shall be prepared by shot blast cleaning (IS-9954) to grade Sq.2.5 of ISO 8501-1 or chemical cleaning including phosphating of the appropriate quality (IS 3618). Heat resistant paint shall be used for the inside surface and whereas for external surface one coat of thermosetting powder paint or one coat of epoxy primer as per table given below: <table border="1" data-bbox="521 1108 1386 1272"> <thead> <tr> <th>S.No.</th> <th>Paint type (should be UV restraint, non-fading)</th> <th>Area to be painted</th> <th>No of coats</th> <th>Total dry film thickness (min); micron</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1.</td> <td rowspan="2">Thermosetting powder paint</td> <td>Inside</td> <td>01</td> <td>60</td> </tr> <tr> <td>Outside</td> <td>01</td> <td>60</td> </tr> </tbody> </table> <p>The transformer shall be painted with non-fading paint of shade 631 as per IS 5 or RAL 7032 as applicable.</p> Any damaged part shall be cleaned to bare metal with an area extending 25 mm around its boundary. A priming coat shall be immediately applied followed by full paint finish equal to that originally applied and extending 50 mm around the perimeter of the original damage. The repainted surface shall present a smooth surface which shall be obtained by carefully chamfering the paint edges before and after priming. Painting shall not affect by weather changes & performance against pilling out or fading etc. to be guaranteed for 5 Years. All paints, when applied in a normal full coat, shall be free from runs, sags, wrinkles, patchiness, brush marks or other defects. All primers shall be well marked into the surface, particularly in areas where painting is evident, and the first priming coat shall be applied as soon as possible after cleaning. The paint shall not scale off or crinkle or be removed by abrasion during normal handling. The Sufficient quantity of touch-up paint shall be furnished for application at site. Marking of Serial No., Rating, Year of Manufacturing and Make to painted on front side of Transformer, this marking should be of Black color on a yellow background. 	S.No.	Paint type (should be UV restraint, non-fading)	Area to be painted	No of coats	Total dry film thickness (min); micron	1.	Thermosetting powder paint	Inside	01	60	Outside	01	60
S.No.	Paint type (should be UV restraint, non-fading)	Area to be painted	No of coats	Total dry film thickness (min); micron											
1.	Thermosetting powder paint	Inside	01	60											
		Outside	01	60											



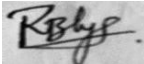
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5.18	MARSHALLING BOX AND PROTECTION	All transformers shall have standard marshaling box. All the Links in these should be of disconnecting type and should have facility to hold ring type of lugs. All links shall be droppable type links. Marshaling Box shall be suitably located not to obstruct the doors & power cables. Sufficient extra links to be provided for control wiring. Knock outs to be provided in marshaling box for control cabling. Heaters shall be provided in the marshaling Box and shall be fitted in proper location without creating any obstruction to other equipment in MB. Standardized TB (terminal link) table to be followed as shown below:				
		TBs standardization for DRY type transformer MB BOX				
		S.No.	From	Device	To (TBs)	Purpose
		1	RTD sensor-1	RTD sensor	T-1,2,3 (Droppable)	Winding Temp detection
		2	RTD sensor-2	RTD sensor	T-4,5,6 (Droppable)	Winding Temp detection
		3	RTD sensor-3	RTD sensor	T-7,8,9 (Droppable)	Winding Temp detection
		4	RTD sensor-4	RTD sensor	T-10,11,12 (Droppable)	Winding Temp detection
		5	RTD sensor-5	RTD sensor	T-13,14,15 (Droppable)	Winding Temp detection
		6	RTD sensor-6	RTD sensor	T-16,17,18 (Droppable)	Winding Temp detection
		7	RTD sensor-7	RTD sensor	T-19,20,21 (Droppable)	Core Temp detection
		8	Fault contact of RTD	RTD sensor	T-22,23 (Droppable)	Customer Use
		9	Alarm contact of RTD	RTD sensor	T-24,25 (Droppable)	Customer Use
		10	Trip contact of RTD	RTD sensor	T-26,27 (Droppable)	Customer Use
		11	Contact for FAN	RTD sensor	T-28,29 (Droppable)	Customer Use
		12	Door –Trip (No contact)	DOORS	T-30,31 (Droppable)	Customer Use
		13	NCT (S1,S2)	Neutral CT	T-32,33 (Droppable)	Customer Use
		14			T-34 (Droppable)	Ground
		15	T- 35,36	Loop	T-35,36 (Droppable)	Heater & Light & Socket
16			T-37 (Droppable)	Ground for Socket		
17	AC Aux Supply	AC source	T-38,39 (Droppable)	For RTD power up		



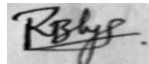
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		18		TB	T-40, 41 (Droppable)	Spare
		19	RTD SCADA point	RTD sensor	T-42, 43, 44 (Droppable)	SCADA
		20	Transformer door interlock limit switch		T-45, 46 (Droppable)	Customer use
		<ol style="list-style-type: none"> 1. The spare TBs (T-40 to T-41) must be of black color. 2. Any new scheme or spare contacts of any device to be wired by O&M after T-46. 3. All Terminal in marshalling box should be of Connectwell / Elmex make, CDTS type, Droppable, 1.1 kV rated, with ring type termination. 4. All the control circuit wiring shall be properly dressed using wire trough made up of flame-retardant material. 				
5.20	Additional details	The HT side of the transformer shall have polymeric surge arresters inside the main body. For 22 KV Surge Arrestor (18 kV, 5 kA) & 11 KV Surge Arrestor (9 kV, 5 KA)				
6.0	NAME PLATE AND MARKING					
6.1	MARKING PLATES	<ol style="list-style-type: none"> 1. Name Plate (Rating) Plate : A rating plate shall be fitted to each transformer in a visible position and shall carry all the information as specified in clause no. 6.2 2. Terminal Marking Plate : <ul style="list-style-type: none"> • The terminal marking plate shall be provided which shall be strictly in accordance with IS 1180-Part 1. This plate may be combined with the rating plate or can be provided separately. • Value of short circuit impedance on extreme tapping and on principal tapping and indication of winding to which impedance is related has to be displayed additionally. 3. Details Plate : A separate plate of size 125 mm x 125 mm shall be provided having following details: <ul style="list-style-type: none"> • Name of the firm. • Serial No. • Rating of transformer. • Order no. and date. • Date of dispatch. 4. Guarantee Plate : A separate warranty plate made of Stainless Steel with following clause written on it. <p style="text-align: center;">“THE EQUIPMENT GUARANTEED UPTO A PERIOD OF 48 MONTHS FROM THE DATE OF COMMISSIONING OR 60 MONTHS FROM THE DATE OF LAST SUPPLY”</p> 				



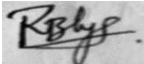
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		<p>All the plates described above (clause 1 to 4) should be as followings:</p> <table border="1"> <tr> <td>Material</td> <td>Stainless Steel</td> </tr> <tr> <td>Thickness</td> <td>1 mm</td> </tr> <tr> <td>Engraving</td> <td>The letters on the rating plate shall be engraved black on the white/silver back ground.</td> </tr> <tr> <td>Fixing</td> <td>Fixing screws shall be of stainless steel.</td> </tr> </table> <p>5. Control Circuit drawing Plates:</p> <ul style="list-style-type: none"> Engraved drawing for control circuit unit shall be available on Marshalling box. <p>The design, colour, size and content of label shall be as specified in the schedule annexure IV.</p>	Material	Stainless Steel	Thickness	1 mm	Engraving	The letters on the rating plate shall be engraved black on the white/silver back ground.	Fixing	Fixing screws shall be of stainless steel.
Material	Stainless Steel									
Thickness	1 mm									
Engraving	The letters on the rating plate shall be engraved black on the white/silver back ground.									
Fixing	Fixing screws shall be of stainless steel.									
6.2	NAME PLATE DETAILS	<p>The name plate shall be strictly as per IS. Additionally, following points shall be displayed :</p> <ol style="list-style-type: none"> Actual no load losses of transformer. Actual total losses of transformer at 50% load and 100% load. “PROPERTY OF Tata Power Company” shall be written in bold letters. PO number with date has to be mentioned. Overall dimensions of the transformer. Type of transformer Relevant standard. Manufacturer’s Name Manufacturer’s Serial No. Year of Manufacture No. of phases Temperature class of insulation Rated kVA Rated frequency Rated Voltage Rated current Connection symbol Percentage impedance voltage at rated current Type of cooling Total mass BIL (Basic Impulse Insulation Level) <p>In addition to the above information the rating plate shall also contain the following: Guaranteed values of no load and full load losses.</p> <ol style="list-style-type: none"> Temperature rise. Table giving the tapping voltage, tapping current and tapping power of each tap. Indication of winding which is fitted with tapings. Value of short circuit impedance on extreme tapping and on principal tapping and indication of winding to which impedance is related. 								
7.0	TESTS	<p>All routine, acceptance & type tests shall be carried out in accordance with the IS 2026. All routine & type tests shall be witnessed by the TATA POWER/his authorized representative. All the components shall also be type tested as per the relevant standards.</p>								

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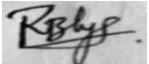
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		Following tests shall be necessarily conducted on the Distribution Transformers in addition to others specified in IS/IEC standards.
7.1	TYPE TEST	<p>a. Temperature rise test for determining the maximum temperature rise after continuous full load Run. The ambient temperature and time of test should be stated in the test certificate.</p> <p>b. Impulse voltage test: with chopped wave of IS 2026 (part-III). BIL for 11kV shall be 75 kV peak on all three phases.</p> <p>c. Short-circuit test – Thermal and dynamic ability.</p> <p>d. Noise level measurement.</p> <p>e. Measurement of Zero-phase sequence impedance.</p> <p>f. Measurement of Harmonics of no-load current.</p> <p>g. IP test for enclosure</p> <p>Note: - Out of the above-mentioned type tests, the tests under sl. no. a, b, c shall be conducted at CPRI/ERDA labs and the balance shall be acceptable as in- house tests</p>
7.2	ROUTINE TEST	<ol style="list-style-type: none"> 1. Measurement of Winding Resistance at each tap [As per IS 2026 (Part 1)]. 2. Measurement of voltage ratio, check of voltage displacement, polarity, phase sequence and vector group [As per IS 2026 (Part 1)]. 3. Measurement of short circuit impedance (principal tapping, when applicable) and load loss at 50% and 100% load [As per IS 2026 (Part 1)]. 4. Measurement of insulation resistance [As per IS 2026 (Part 1)]. 5. Induced over voltage withstand test [As per IS 2026 (Part 3)]. 6. Separate Source voltage withstand test [As per IS 2026 (Part 3)]. 7. Measurement of no load losses and magnetizing current at rated frequency and 90%, 100% and 112.5% of rated voltage. [As per IS 2026 (Part 1)]. 8. Neutral current measurement: The value of the zero sequence current in the neutral of the star winding shall not be more than 2% of the full load current 9. CORE IR at 500 V. 10. Calibration of WTI as RTD 11. 2 kV withstand test for all secondary windings. 12. Partial discharge measurement
7.3	ACCEPTANCE TEST	<ol style="list-style-type: none"> a. Temperature Rise Test (on one unit of every lot offered for inspection for each rating). b. Checking of weight, dimensions, fitting and accessories, tank sheet thickness, material finish and workmanship, physical verification of core coil assembly and measurement of flux density on one unit of each rating of the offered lot with reference to the GTP and contract drawings. c. At least 10% transformer of the offered lot (minimum of one) shall be subjected to all the tests mentioned under the section 'ROUTINE' in presence of TATA POWER's representative at the place of manufacture before dispatch without any extra charges. The testing shall be carried out in accordance with IS: 2026. d. All LT wiring shall be tested for 2kV withstand test during acceptance. e. During acceptance test - Magnetic Balance Test on HV & LV side, with magnetizing current HV and LV side.
8.0	TYPE TEST CERTIFICATES	The Bidder shall furnish the type test certificates of the Transformer for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA as per the relevant standards as mentioned in clause no.7.1. Type tests

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		<p>should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TATA POWER.</p>
9.0	PRE-DESPATCH INSPECTION	<p>9.1 Equipment shall be subject to inspection by a duly authorized representative of the TATA POWER. Inspection may be made at any stage of manufacture at the option of the TATA POWER and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to Tata Power representatives at all times when the work is in progress. Inspection by the TATA POWER or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER. Following documents shall be sent along with material:</p> <ol style="list-style-type: none"> Test reports MDCC issued by TATA POWER Invoice in duplicate Packing list Drawings & catalogue Guarantee / Warrantee card Delivery Challan Other Documents (as applicable) <p>9.2 In respect of raw material such as core stampings, winding conductors, insulating paper, bidder shall use materials manufactured/supplied by standard manufacturers and furnish the manufacturers' test certificate as well as the proof of purchase from these manufacturers (excise gate pass) for information of the Purchaser. The bidder shall furnish following documents along with their offer in respect of the raw materials:</p> <ol style="list-style-type: none"> Invoice of supplier. Mill's certificate Packing List. Bill of Landing Bill of entry certificate by custom. <p>9.3 To ensure about the quality of transformers, the inspection shall be carried out by the Purchaser's representative at following two stages;-</p> <ol style="list-style-type: none"> Online anytime during receipt of raw material and manufacture/assembly whenever the Purchaser desires. At finished stage i.e. transformers are fully assembled and are ready for dispatch. <p>9.4 The stage inspection shall be carried out for routine/acceptance tests in presence of TATA POWER's representative at the place of manufacturer during manufacturing of the transformers without any extra charges. After the main raw-material i.e. core and coil material are arranged and transformers are taken for production on the shop floor and a few assembly have been completed, the bidder shall intimate the Purchaser in this regard, so that an officer for carrying out inspection could be deputed, as far as possible within seven days from the date of intimation. During the stage inspection a few assembled core shall be dismantled to ensure that the CRGO laminations used are of good quality. During inspection</p>

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the bidder shall also furnish the information regarding various components as mentioned below:

Sl. No.	Item	Source of Material	Place of Manufacture	Place of testing and Inspection
1.	Laminations			
2.	Copper Conductor			
3.	Insulating winding wires			
4.	Insulating material			
5.	MS Plates/ Angles/Channels			
6.	Gaskets			
7.	Paints			
8.	Resin Material			

9.5 Further an offer intimating about the readiness of the transformers, for final inspection for carrying out tests as per relevant IS/IECs shall be sent by the bidder along with routine test certificates. The inspection shall normally be arranged by the Purchaser at the earliest after receipt of offer for pre-delivery inspection.

9.6 In case of any defect/ defective workmanship observed at any stage by the Purchaser's Inspecting officer, the same shall be pointed out to the bidder in writing for taking remedial measures. Further processing shall only be done after clearance from the inspecting officer / Purchaser.

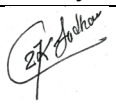

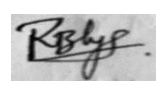
9.7 All tests and inspection shall be carried out at the place of manufacture unless otherwise specifically agreed upon by the manufacturer and Purchaser at the time of purchase. The manufacturer shall offer the inspector representing the Purchaser all reasonable facilities, without charges, to satisfy him that the material is being supplied in accordance with this specification. This will include Stage Inspection during manufacturing stage as well as Active Inspection during Acceptance Tests.


9.8 The bidder shall provide all services to establish and maintain quality of workmanship in his works and that of his sub-contractors to ensure the mechanical / electrical performance of components, compliance with drawings, identification and acceptability of all materials, parts and equipment as per latest quality standards of ISO 9000.

9.9 The TATA POWER has the right to have the test carried out at his own by an independent agency wherever there is a dispute regarding the quality supplied. TATA POWER has right to test 1% of the supply selected either from the stores or field to check the quality of the product. In case of any deviation TATA POWER have every right to reject the entire lot or penalize the bidder, which may lead to blacklisting, among other things.



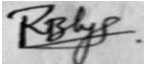
10.0 INSPECTION AFTER RECEIPT AT STORE

- The material received at the TATA POWER store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.
- In case the transformers proposed for supply against the order are not exactly as per the tested design, the Bidder shall be required to carry out the short circuit test and

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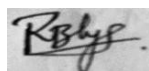
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		<p>impulse voltage withstand test at its own cost in the presence of the representative of TATA POWER.</p> <ol style="list-style-type: none"> The supply shall be accepted only after such test is done successfully, as it confirms on successful withstand of short circuit and healthiness of the active parts thereafter on un-tanking after a short circuit test. Apart from dynamic ability test, the transformers shall also be required to withstand thermal ability test or thermal withstand ability will have to be established by way of calculations. TATA POWER reserves the right to conduct all tests on Transformer after arrival at site / stores and the manufacturer shall guarantee test certificate figures under actual service conditions. TATA POWER reserves the right to conduct short circuit test and impulse voltage withstand test in accordance to IS, afresh on each ordered rating at purchaser cost, even if the transformer of the same rating and similar design are already tested. This test shall be carried out on a transformer to be selected TATA POWER either at the manufacturer's works when they are offered in a lot for supply or randomly from the supplies already made to TATA POWER stores. The findings and conclusions of these tests shall be binding on the bidder.
11.0	GUARANTEE:	<ol style="list-style-type: none"> Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier. Bidder shall be liable to undertake to replace/rectify such defects at his own costs within mutually agreed timeframe and to the entire satisfaction of the TATA POWER, failing which the TATA POWER will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the TATA POWER's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. In case of Distribution transformer fails within the guarantee period TATA POWER will immediately inform the Bidder who shall take back the failed Distribution Transformer within 15 days from the date of intimation at his own cost and replace / repair the transformer within forty five days of date of intimation with a roll over guarantee. The outage period i.e. period from the date of failure till unit is repaired / replaced shall not be counted for arriving at the guarantee period. Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.
12.0	PACKING	<ol style="list-style-type: none"> Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit. No single use plastic to be used in packaging. The packaging material shall be environmentally friendly & recyclable.
13.0	TENDER SAMPLE	NA
14.0	QUALITY CONTROL	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection

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		<p>within the parameters of the delivery schedule shall be furnished. TATA POWER's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.</p> <p>The following information shall necessarily be submitted with the bid:</p> <ol style="list-style-type: none"> 1. List of important raw materials, names of sub-suppliers for raw materials, standards to which raw material is tested and the copies of test reports of the tests carried out on raw materials in presence of Bidder's representatives. 2. List of manufacturing facilities available, level of automation achieved and the areas where manual process exists. 3. List of areas in manufacturing process where stage inspections are normally carried out for quality control and details of these tests and inspections 4. List of testing equipment for final testing with valid calibration reports. Manufacturer shall possess 0.1 class instruments for measurement of losses. 5. QAP withhold points for Tata Power inspection.
15.0	MINIMUM TESTING FACILITIES	Bidder shall have adequate in house testing facilities for carrying out all routine tests, acceptance tests and pre-dispatch inspection as per relevant International / Indian standards.
16.0	MANUFACTURING ACTIVITIES	The successful bidder will have to submit GTP & Drawing with 15 days from placement of order/OLA for approval. The date of Code -2/ Code-1 approval given by TATA Power will be treated as first day for assessment of LD (if applicable).
17.0	SPARES, ACCESSORIES ND TOOLS	<ol style="list-style-type: none"> 1. Bidder shall provide a list of recommended spares with quantity and unit prices for 5 years of operation after commissioning. The Purchaser may order all or any of the spare part listed at the time of award of contract and these parts shall be supplied as a part of definite works. The Purchaser may order additional spares at any time during the contract period at the rates stated in the Contract document. 2. Bidder shall give an assurance that the reparability of transformer, spare parts and consumable items will continue to be available through the life of the equipment which shall be 25 years minimum. However, the Purchaser shall be given a minimum of 12 months' notice in the event that the Bidder or any sub-vendor plans to discontinue manufacture of any component used in this equipment. 3. Any spare apparatus, parts or tools shall be subject to the same specification, tests and conditions as similar material supplied under the Contract. They shall be strictly interchangeable and suitable for use in place of the corresponding parts supplied with the plant and must be suitably marked and numbered for identification.
18.0	DRAWINGS AND DOCUMENTS	<p>Following drawings and documents shall be prepared based on TATA POWER specifications and statutory requirements and shall be submitted with the bid:</p> <ol style="list-style-type: none"> 1. Completely filled in Technical Particulars (General Technical Particulars, General Technical Requirements, Additional Details, and Fittings). 2. Description of the transformer and all components including brochures. 3. General arrangement for Transformer. 4. Foundation plan. 5. Bill of material. 6. Experience List 7. Type test certificates. <p>Drawings / documents to be submitted after the award of the contract are as under:</p> <p>List of Drawings/Parameters to be submitted:</p>

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- 1) Technical Parameters as asked in Specification (General Technical Particulars, General Technical Requirements, Additional Details, Fittings, Type test Reports and Routine test certificates of bought out accessories).
- 2) General Arrangement Drawing of the Transformer (Front view, Top view and both sides view. Complete list of fittings to be displayed and quantities to be mentioned with the drawing).
- 3) Internal Core arrangement drawing.
- 4) Internal Core-coil assembly drawing.
- 5) Marking plates and Markings (as mentioned in clause 6)
- 6) Foundation Plan drawing.
- 7) HV and LV bushings drawing (with internal view and metal parts)
- 8) HT cable termination diagram
- 9) LV Cable termination diagram
- 10) HV and LV Box drawing.
- 11) Gland Plate for HV/LV box.
- 12) CT Terminal Box drawing with internal wiring arrangement.
- 13) Test Certificates.
- 14) Installation Instructions.
- 15) QA/QC plan.
- 16) Temperature class H suitability certification for conductor/winding insulation as well as for resin-hardener combination.
- 17) Climatic, Environmental, Fire Class compliance certificates to be provided.

List of Calculations to be submitted:

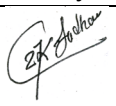

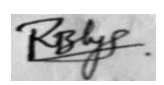
All the calculations shall be step by step showing the use of formulas and other practical considerations. **Concise calculations in table or excel sheet shall not be accepted.** Also, the reference (only standard sources as IS, IEC or any such standard is acceptable) of the formulas shall be mentioned.

1. Resistance Calculation (75 deg. C)
2. Load Losses Calculation (at 75 deg. C)
3. No load Losses.
4. Stray Losses.
5. Weight of Copper (Bare and with Insulation also).
6. Weight of Core.
7. Flux Density calculations.
8. Current Density Calculations.
9. Short Circuit withstand.
10. Temperature Rise Calculations.
11. Cooling Calculations

Additional Documents to be submitted :

- a. List of raw materials as well as bought out accessories and the names of sub-suppliers selected from those furnished along with offer.
- b. Type test certificates of the raw materials and bought out accessories.
- c. The successful Bidder shall submit the **routine test certificates of bought out accessories** and central excise passes for raw material at the time of routine testing.

All the documents & drawings shall be in English language.

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After the receipt of the order, the successful bidder will be required to furnish all relevant drawings/parameters/calculation to TATA POWER for approval.

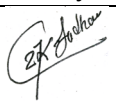

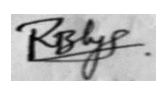
Instruction Manuals:

Bidder shall furnish softcopies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

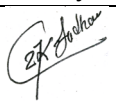

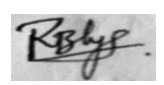
19.0 GUARANTEED TECHNICAL PARTICULARS

In addition to above individual clause wise compliance following details to be provided.

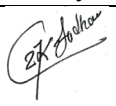

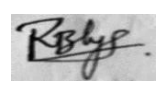
Sl. No.	Description	Unit	As Specified by TATA POWER	As furnished by Bidder
1	Application		Indoor	
2	Continuous Rating	kVA	315/400/500/630/800/1000/ 1250/1600/2000	
3	Type of Transformer		Cast Resin	
4	Name of Manufacturer		To be furnished by Bidder	
5	Place of Manufacture		To be furnished by Bidder	
6	Voltage ratio	kV	11/0.415 (As per tender) 22/0.415 (As per tender)	
7	Vector group		Dyn-11	
8	Type of cooling		AN	
9	Class of Insulation(Over all)		Class H	
10	Winding Material		Copper	
11	Core material used and Grade			
	a) Thickness		0.23 or less	
	b) Grade		M3 or better	
	c) Flux Density at normal voltage	Wb/mm ²	1.6	
	d) Over fluxing without saturation (Curve to be furnished by the Manufacture in support of his claim)	Wb/mm ²	1.9	
12	Maximum temperature rise of:			
	a) Windings by resistance method	Deg.C	115	
13	Magnetizing (no-load) current at:			
	a) 90% Voltage	%	To be furnished by Bidder	
	b) 100% Voltage	%	2	

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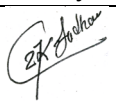

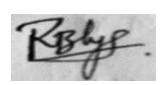
	c) 112.5% Voltage	%	5	
14	Resistance of windings at 20 deg.C			
	a) HV windings	Ohms/Ph	To be furnished by Bidder	
	b) LV windings	Ohms/Ph	To be furnished by Bidder	
15	No load losses		To be furnished by Bidder	
16	Load Losses @50% loading at 75 deg C		To be furnished by Bidder	
17	Load Losses @ 100% loading at 75 degC		To be furnished by Bidder	
18	Total losses@50% load	W	As per specification	
19	Total Losses@100%load	W	As per specification	
20	Winding insulation class		Class H	
21	Winding insulation material		To be furnished by Bidder	
22	Current density used for :			
	a) HV winding	Amp./sq. mm	2.5	
	b) LV winding	Amp./sq. mm	2.5	
23	Clearances :			
	a) Core and LV	mm	To be furnished by Bidder	
	b) LV and HV	mm	To be furnished by Bidder	
	c) HV Phase to phase	mm	To be furnished by Bidder	
24	Efficiency at 75 deg.C			
	a) Unity P.F	%	To be furnished by Bidder	
	1) 125% load	%	To be furnished by Bidder	
	2) 100% load	%	To be furnished by Bidder	
	3) 75% load	%	To be furnished by Bidder	
	4) 50% load	%	To be furnished by Bidder	
	5) 25% load	%	To be furnished by Bidder	
	b) 0.8 P.F.	%	To be furnished by Bidder	
	1) 125% load	%	To be furnished by Bidder	
	2) 100% load	%	To be furnished by Bidder	
	3) 75% load	%	To be furnished by Bidder	

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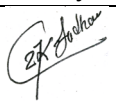

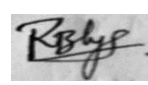
	4) 50% load	%	To be furnished by Bidder	
	5) 25% load	%	To be furnished by Bidder	
25	Regulation at :			
	a) Unity P.F.	%	To be furnished by Bidder	
	b) 0.8 P.F. at 75 deg. C	%	To be furnished by Bidder	
26	% Impedance at 75 deg.C	%	To be furnished by Bidder	
27	Power frequency voltage withstand test:			
	a) HV for 1 minute	kV	28 50	
	b) LV for 1 minute	kV	3	
28	a) Over potential Test (Double voltage and double frequency for 1 minute)	V	830	
	b) Impulse voltage withstand test (HV)	kVP	75 125	
29	Mass of :			
	a) Core lamination (minimum)	Kg	To be furnished by Bidder	
	b) Windings (minimum)	Kg	To be furnished by Bidder	
	c) Total weight	Kg	To be furnished by Bidder	
30	Transformer :			
	a) Overall length × Breadth × Height	mm × mm × mm	To be furnished by Bidder	
31	Inter layer insulation provided in design for :			
	a) In between all layer	mm	To be furnished by Bidder	
32	Insulation materials provided			
	a) For conductors			
	1. HV		To be furnished by Bidder	
	2. LV		To be furnished by Bidder	
	3. Core		To be furnished by Bidder	
33	Material and size of the wire used			
	1) HV Strip	mm /SWG	To be furnished by Bidder	
	a) Total area of cross section	sq.mm	To be furnished by Bidder	

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	2) LV	mm /SWG	To be furnished by Bidder	
	a) Strip size/Foil	mm	To be furnished by Bidder	
	b) No. of conductors in parallel	Nos.	To be furnished by Bidder	
	c) Total area of cross section	sq.mm	To be furnished by Bidder	
34	Painting as per Specifications	YES/NO	To be furnished by Bidder	
35	Whether the ventilation louvers / opening provided with the wire mesh screen as per specifications	YES/ NO	To be furnished by Bidder	
36	Whether enclosure is provided with a minimum of two welded heavy duty closed lifting lugs and necessary hardware for mounting on the floor as required in Specifications	YES/NO	To be furnished by Bidder	
37	Whether the enclosure furnished with ground pads located on opposite diagonal corners as per Specifications	YES/NO	To be furnished by Bidder	
38	Whether the danger plate provided as required in Specifications	YES/NO	To be furnished by Bidder	
39	Whether the name plate gives all particulars as required in Specifications	YES/NO	To be furnished by Bidder	
40	Whether the offer conforms to the limits of impedance mentioned in the specification	YES/ NO	To be furnished by Bidder	
41	Whether the offer conforms the limits of temperature rise mentioned in the specification	YES/NO	To be furnished by Bidder	
42	Whether the losses of the transformers offered are within the limits specified.	YES/NO	To be furnished by Bidder	
43	Whether the transformer offered is already type tested for the design and test reports enclosed.	YES/NO	To be furnished by Bidder	
44	Hydrophobic anti tracking coating shall be applied on resin casted winding inside & outside	YES/NO	To be furnished by Bidder	
45	Climatic, Environmental, Fire Class compliance certificates	YES/NO	To be furnished by Bidder	
Additional Points :				

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Sl. No.	Description	Unit	As Specified by TATA POWER	As furnished by Bidder
1	Core grade		M3 or better	
2	Core diameter	mm	To be furnished by Bidder	
3	Gross core area	Sq.cm	To be furnished by Bidder	
4	Net core area	Sq.cm	To be furnished by Bidder	
5	Flux density (Calculated)	Tesla	To be furnished by Bidder	
6	Mass of core	Kg	To be furnished by Bidder	
7	Loss per Kg of core at the above specified flux density	Watt	To be furnished by Bidder	
8	Core window height	mm	To be furnished by Bidder	
9	Center to center distance of the core	mm	To be furnished by Bidder	
10	No. of LV Turns		To be furnished by Bidder	
11	No. of HV Turns		To be furnished by Bidder	
12	Size of LV conductor bare/covered	mm	To be furnished by Bidder	
13	No. of parallels		To be furnished by Bidder	
14	Size of HV conductor bare/covered	mm	To be furnished by Bidder	
15	Current density of LV winding (Calculated)	A/sq.mm	To be furnished by Bidder	
16	Current density of HV winding (Calculated)	A/sq.mm	To be furnished by Bidder	
17	Wt. of the LV winding (including cast resin)	Kg	To be furnished by Bidder	
(a)	Weight of LV Winding (Bare copper)		To be furnished by Bidder	
18	Wt. of the HV winding(including cast resin)	Kg	To be furnished by Bidder	
(a)	Weight of HV Winding (Bare copper)		To be furnished by Bidder	
19	No. of LV coils/phase		To be furnished by Bidder	
20	No. of HV coils/phase		To be furnished by Bidder	
21	Height of LV winding	mm	To be furnished by Bidder	
22	Height of HV winding	mm	To be furnished by Bidder	
23	ID/OD of HV winding	mm	To be furnished by Bidder	
24	ID/OD of LV winding	mm	To be furnished by Bidder	
25	Size of the duct in LV winding	mm	To be furnished by Bidder	
26	Size of the duct in HV winding	mm	To be furnished by Bidder	
27	Size of the duct between HV and LV	mm	To be furnished by Bidder	
28	Calculated Impedance	%	To be furnished by Bidder	

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The Tata Power Company Ltd



TECHNICAL SPECIFICATION OF
22KV/415V & 11KV/415 Dry Type
Transformer

ENSE-DS-2004-R0

Date of Issue: 20/11/2023

20.0 SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH THE BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:



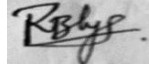
S.No.	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation

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Tata power Branding Name plate -

Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown below.

Relationship between the two marks- size

The Tata and Tata Power Marks are always used in conjunction with each other, never appearing in isolation on Tata Power communication.

The height of the letter T of Tata (T-height) is the basic measure for all sizes and proportions.

The rounded measure 2T in height, is separated from the Tata lettering by a distance of 1/2T.

The T height of both, the Tata and the Tata Power Marks is to be the same, except in exceptional cases on approval from the Corporate Communications team.

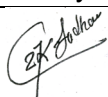

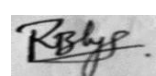



Relationship between the two marks- positioning

The two marks can appear stacked, which is the preferred placement, or linear, by the side of one another.

Centre aligned - Stacked (Preferred)



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The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
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ANNEXURE – I
PROFORMA FOR STAGE INSPECTION OF DISTRIBUTION TRANSFORMER



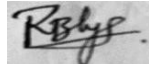
S No.	Particulars	Details
(A)	GENERAL INFORMATION:	
1	Name of firm	
2	Order No. and Date	
3	Details of offer	
a)	Rating	
b)	Quantity	
c)	Serial Numbers	
4	Details of last stage inspected lot:	
a)	Total quantity inspected	
b)	Serial Numbers	
c)	Date of stage inspection	
d)	Quantity offered for final inspection of (a) above with date	
(B)	Position of manufacturing for the offered quantity:	
a)	Complete tanked assembly	
b)	Core and coil assembly ready	
c)	Core assembled	
d)	Coils ready for assembly	
	i) HV coils	
	ii) LV coils	

Note: i) The stage inspection shall be carried out for following quantity in a lot:-

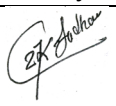

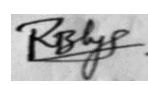
- a) **Core coil assembly of further at least 30% of the quantity offered has been completed.**
- b) **Rest of quantity shall be in form of core assembly & coils.**

ii) Quantity offered for stage inspection should be offered for final Inspection within 15 days from the date of issuance of clearance for stage inspection, otherwise stage inspection already cleared shall be liable for cancellation.

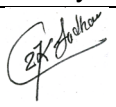

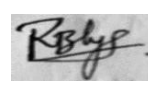
S No.	Particulars	As offered	As observed	Deviation and Remarks
(C)	<u>Inspection of Core :</u>			
	(I) Core Material			
	1) Manufacturer's characteristic certificate in respect of grade of lamination used. (Please furnish test certificate)			
	2) Thickness of core lamination			
	3) Remarks regarding Rusting and smoothness of core.			
	4) Whether laminations used for top and bottom yoke are in one piece.			
	(II) Core Construction :			
	(1) No. of steps			
	(2) Dimension of steps			
	<u>As offered :</u>			

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Step No.	1	2	3	4	5	6	7	8	9	10	11	12
W mm												
T mm												
As found :												
Step No.	1	2	3	4	5	6	7	8	9	10	11	12
W mm												
T mm												
(1) Core Diameter (mm)												
(2) Core length (leg center to leg center)												
(3) Window height.												
(4) Core height												
(D) INSPECTION OF WINDING												
(I) Winding material (Verify From TC)												
(1) Material used for												
a) HV winding												
b) LV winding												
(2) Grade of material for												
a) HV winding												
b) LV winding												
(3) Test certificate of manufacturer (enclosed copy) for winding material of:												
a) HV												
b) LV												
(II) Construction Details												
1) Size of Cross sectional area of conductor for:												
a) HV winding												
b) LV winding												
1) Type of insulation for conductor of:												
a) HV winding – Class H material												
b) LV winding – Class H material												
2) Dimension of strip used for delta formation (mm)												
3) Diameter of coils in:												
a) LV winding												
a) Internal Diameter (mm)												
b) Outer diameter (mm)												
b) HV winding												
i) Internal diameter (mm)												
ii) Outer diameter (mm)												
4) Whether neutral formation on top/side												
5) HV coils / Phase :												
a) Number												

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	b) Turns/coil			
	c) Total turns			
	6) LV coils /Phase:			
	a) Number			
	b) Turns / coil			
	c) Total turns			
	7) Total weight of coils of :			
	a) LV winding (Kg)			
	b) HV winding (Kg)			
	8) HV & LV Windings resin casted			
(E)	INSULATION MATERIALS			
	(I) Material (<u>Verify From TC</u>)			
	1) Class H paper			
	a) Make			
	b) Thickness (mm)			
	c) Test certificate of manufacturer (enclose copy)			
	2) FRP duct/Pressboard			
	a) Make			
	a) Thickness (mm)			
	b) Test certificate of manufacturer (enclose copy)			
	3) Material used for top and bottom yoke and insulation			
	(II) Type and Thickness of material used : (mm) (<u>Verify From TC</u>)			
	a) Between core and LV			
	b) Spacers			
	c) Interlayer			
	d) Between HV and LV winding			
	e) Between phases			
	Resin Material			
	1) Make of resin			
	2) Class H material combination			
	3) Anti tracking paint on finished coils (Inside/Outside)			
(F)	CLEARANCES: (mm)			
	(I) Related to core and winding			
	1) LV to core (radial)			
	2) Between HV and LV (Radial)			
	3) Phase to phase between HV conductor			
	4) Thickness of duct between HV and LV coil mm			
(G)	COLOUR & THICKNESS OF ENCLOSURE, Cable boxes			
	1) Inside			
	2) Outside			
(M)	CHECKING OF TESTING FACILITIES:			
	(Calibration certificate also to be checked for its validity)			
	TESTS:			

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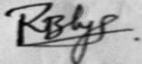
Date of Issue: 20/11/2023

	1) No Load Current			
	2) No Load Loss			
	3) % Impedance			
	4) Load losses			
	5) Insulation Resistance test			
	6) Vector group Test (phase relationship)			
	7) Ratio and Polarity test relationship			
	8) Magnetic Balance			
	9) Measurement of winding resistance (HV and LV both)			
	10) Induced over voltage withstand test (Double voltage and Double frequency)			
	11) Separate source power frequency withstand test at 28kV for HV and 3kV (One minute).			
	12) Unbalanced current test			
	13) Temperature rise (Heat run) test.			
	14) Partial Discharge test			
(I)	Additional check points			
	1. Casting and curing cycle process check report.			
	2. All the control circuit wiring shall be properly dressed using wire trough made up of flame-retardant material inside Enclosure.			

PURCHASER'S OFFICER

BIDDER'S REPRESENTATIVE

DATE OF INSPECTION

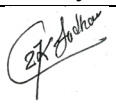

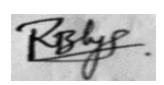
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R00	 Ketan S. Jadhav 20/11/23	 Ajay V. Potdar 20/11/23	 Ravindra M. Bhanage 20/11/23

ANNEXURE-II**PERFORMA FOR PRE-DELIVERY INSPECTION OF DISTRIBUTION TRANSFORMERS**

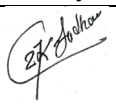

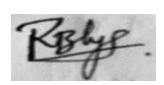
1.	Name of the firm	
2.	Details of offer made	
	(i) Order No. and date	
	(ii) Rating	
	(iii) Quantity	
	(iv) Sl. No. of transformers	
3.	Date of stage inspection of the lot	
4.	Reference of stage inspection clearance	
5.	Quantity offered and inspected against the order prior to this lot	


ACCEPTANCE TESTS TO BE CARRIED OUT

S No.	PARTICULARS	OBSERVATIONS
1.	(a) Ratio Test	AB/an
		BC/bn
		CA/cn
	(b) Polarity Test	
2.	No load loss measurement	
		W1
		W2
		W3
	TOTAL	
	Multiplying factor	
	CT	
	Watt meter	
	Total × MF	
	NET LOSS	
3.	Load loss measurement	
		W1
		W2
		W3
	Total	
	Multiplying factors:-	
	CT	
	Watt meter	
	PT	
	Total × MF	
	Loss at ambient temperature (Watt)	
	Loss at 75 deg C (with calculation sheet) (Watt)	
4.	Winding Resistance :	
	H.V. (in Ohms)	
	At ambient temperature of _____ deg.C	A-B
		B-C

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		C-A
	Resistance at 75 deg.C	A-B
		B-C
		C-A
	L.V. (in Ohms)	
	At ambient temperature of _____ deg.C	a-b
		b-c
		c-a
	Per Phase resistance at 75 deg.C	a-b
		b-c
		c-a
5.	Insulation resistance (M ohm)	HV-LV
		HV-E
		LV-E
6.	Separate source Voltage withstand test voltage:	
	HV	28 kV for 60 secs/ 50 KV for 60 secs
	LV	3 kV for 60 secs.
7.	Induced over-voltage withstand test at double voltage and double frequency	100 Hz, 866 volts for 60 seconds.
8.	No load current at	
	90% volts	
	100%	
	112.5% volts	
9.	Unbalance current	
10.	Vector group test	Diagram and readings be shown in separate sheets
11.	Percentage Impedance at 75 deg.C (Please furnish calculation sheet)	
12.	Heat run test	To be carried out against every offered lot
13.	Partial Discharge test	
14.	Bushing clearance (mm)	HV
	a) Phase to Phase	
	b) Phase to earth	LV
15.	Comments on compliance by the firm on the modifications done as per stage inspection clearance letter issued.	
16.	Whether fittings of the order have been verified.	
17.	Name Plate verification.	
17.	Copy of calibration certificates of metering equipment be enclosed.	
19.	All the control circuit wiring shall be properly dressed using wire trough made up of flame-retardant material.	
20.	Anti tracking paint on resin casted winding (Inside & Outside)	



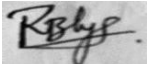
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The Tata Power Company Ltd		TECHNICAL SPECIFICATION OF 22KV/415V & 11KV/415 Dry Type Transformer
ENSE-DS-2004-R0		Date of Issue: 20/11/2023

ANNEXURE – III

SOURCE OF MATERIAL/PLACES OF MANUFACTURE, TESTING AND INSPECTION

Sl. No.	Item	Source of Material	Place of Manufacture	Place of testing and Inspection
1.	Laminations			
2.	Copper Conductor			
3.	Insulating winding wires			
4.	Insulating material			
5.	MS Plates/ Angles/Channels			
6.	Gaskets			
7.	Paints			
8.	Resin Material			

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