| The Tata Power Company Ltd | | *OPEN TENDER NOTIFICATION* |
|---|---|---|
| *Tender Reference:* ***CC24VJS065*** | | *Document Date:* ***20th Jan 2024*** |

**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. | Corrigendum to Tender issued vide published advertisement dtd. 19th Jan 2024 - Outline Agreement for supply of LT Panels for Mumbai Distribution | CC24VJS065 | 2,50,000/- | 2,000 /- | **31st Jan 2024** |

**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

E-mail with necessary attachment of 1 and 2 above to be send to vinayak.shinde@tatapower.com with copy to pnramesh@tatapower.combefore "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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***Summary of Changes***

1. Date extension of submission of Expression of Interest till 31st Jan. 2024.

The original tender document is reproduced below.

# OPEN TENDER NOTIFICATION

# FOR

## Outline Agreement for supply of LT Panels 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**

## Section A : Tender Notice including Instruction to Bidders

### 1. Tender Details

### 1.1 Key Tender Specific Details

| | |
|---|---|
| **Reference Number** | **CC24VJS065** |
| **Description** | **Outline Agreement for supply of LT Panels for Mumbai Distribution** |
| **Type of Tender** | **Out Line Agreement** |
| **Estimated Period** | **One Year** |
| **Tender Fee** | **Rs 2000/-** |
| **Earnest Money Deposit (EMD)** | **Rs 2,50,000/-**<br>**Rs. Two Lakhs Fifty Thousand Only**<br>**PLEASE NOT THAT IT IS MANDATORY TO SUBMIT EMD IN BANK GUARANTEE FORMAT ONLY** |
| **Price Basis** | **On Firm Basis** |
| **Executive Handling this Tender*** | Name: Mr. Vinayak Shinde<br>E-Mail ID: vinayak.shinde@tatapower.com |
| **Technical Query *** | Name: Mr. Ajay Potdar<br>E-Mail ID: avpotdar@tatapower.com |

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

**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 29th January 2024 |
| (b) | Access to Tender Documents through E-Tender system to authorized person of Interested Bidder | 29th January 2024 |
| (c) | Last Date of receipt of pre-bid queries, if any. | By 5th February 2024 |
| (d) | Last Date of Posting Consolidated replies to all the pre-bid queries as received | 10th February 2024 |
| (e) | Last date and time of receipt of Bids | 19th February 2024 |

**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.***

**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 | | |

| | | | |
|---|---|---|---|
| | 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.

**1.6 Qualification Criteria**

| Sr no | Parameter | Tata Power Requirement | Documents required |
|---|---|---|---|
| 1 | Infrastructure | Bidder must be an OEM of Equipment with manufacturing facility / assembly in India.<br>The bidder must have in-house routine and acceptance testing facilities for acceptance as per relevant IS/IEC | Self-undertaking to be submitted in this regard.<br>TATA Power reserves the right to inspect the said manufacturing facility as a proof of compliance to this parameter. |
| 2 | Supply and Experience | The bidder must have supplied for same or higher size and voltage<br>a) A minimum of 50 nos during last 3 years or<br>b) A single order of 25 nos or<br>c) Two orders of 15 nos last 3 years.<br><br>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. | Purchase Order Copies and Completion Certificates.<br><br>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. |
| 3 | Performance | The bidder should have performance certificates for 2 year 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 |
| 4 | Commercial Capability | Average Annual turnover of the bidder for last three years shall not be less than Rs 4 Crs | Copy of audited Balance Sheet and P&L Account to be submitted in this regard. |

| | | | |
|---|---|---|---|
| 5 | Type Test | The bidder shall submit Type test reports obtained from NABL/ International Accredited Lab for the equipment / material offered. The type tests should have been conducted on the equipment / material of the same design.<br><br>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).<br><br>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 NABL / International Accredited Lab without any cost implication to the owner and the Type Test reports shall be submitted before dispatch of the equipment / material. | Type Test Report.<br><br>Undertaking that there is no change in design / material of construction (MOC) if Type Test Report older than 5 years.<br><br>Undertaking that type test shall be carried out for the offered equipment / material from NABL / International Accredited Lab without any cost implication to the owner and the Type Test reports shall be submitted before dispatch of the equipment / material, in case type test reports furnished are not for the quoted equipment / material but for the equipment / material with higher voltage class and/or different capacity, (if applicable) |

**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

**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:** Not Applicable ( On Firm basis )

## 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.

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 though 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**
**"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 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.

**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 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 Contact 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:

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.

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**Annexure 1**

**Schedule Of Items**

| Sr. no. | Material / Service Short Text (as per SAP) | Quantity | UoM | Unit Rate (Basic) | Total |
|---|---|---|---|---|---|
| 1 | LTP 3200A, 415V, 8W-800A O/G FUSE | 3 | nos. | | - |
| 2 | LTP 2000A, 415V, 6W-630A O/G FUSE | 89 | nos. | | - |
| 3 | LTP 1250A, 415V, 6W-630A O/G FUSE | 15 | nos. | | - |
| 4 | LTP 2500A, 415V, 2MCCB & 3Fuse | 3 | nos. | | - |
| 5 | LTP 3200A,2-1200A MCCB,2-630A&2-800 FUSE | 4 | nos. | | - |
| 6 | LTP 2500A, 415V, 6W-630A O/G FUSE | 15 | nos. | | - |
| 7 | LTP 2500A, 415V, 8W-630A O/G FUSE | 15 | nos. | | - |
| 8 | Type test Charges (Temp rise on LV panels) - LT | 1 | nos. | | - |
| | **Sub Total** | | | | - |
| | **GST @18%** | | | | - |
| | **Total with taxes** | | | | - |

# TECHNICAL SPECIFICATION

## 2500 A LT Panel with MCCB & Fuse



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

# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2028-R00**

**Document Title: Technical SPECIFICATION OF 2500 A LT Panels with MCCB & Fuse**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R00 | ENSE-DS-2028-R00 (For Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
| R0 | D-NPCE-SPEC-07 | 21/08/2019 | ND | -sd- | NK | -sd- | NCP | -sd- |
| **Rev No.** | **Remarks** | **Date** | **Initials** | **Sign** | **Initials** | **Sign** | **Initials** | **Sign** |
| | | | **Prepared By** | | **Reviewed By** | | **Approved & Issued By** | |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
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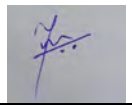
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

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**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 2500 A LT Panel with 2 no's 3P 1000 A MCCB & 3 nos 800 A HRC Fuse Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 2500A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 2500 A |
| | Bus bar Size for Phase & Neutral | 3600 sq.mm for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 2500A ACB with 8 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders – 1000 A MCCB | Quantity - 2 Nos of 1000A each with 4 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G |

| | | |
|---|---|---|
| | No of outgoing feeders – HRC Fuse | Quantity - 3 Nos of 800A each<br>With 3 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| 7 | Panel construction | CRCA sheet steel of thickness 3 mm |
| 8 | Panel enclosure class | IP54 - ingress protection |
| 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| 10 | Door type for front & rear access | Double door with rear door bolted |
| 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| 12 | Padlocking facility | For front door |
| 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating.<br>Bolts below 12 mm size shall be SS material. |
| 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer.<br>Wherever required bimetallic washers to be provided |
| 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | Bus bar size in mm for 2500 A O/G | 3600 sq.mm for Phase & Neutral |
| | 2500A ACB Incoming | 3600 sq.mm for Phase & Neutral |
| | ACB O/G LINKS | 3600 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| 16 | Bus bar colour coding for R, Y, B & neutral | Heat shrinkable sleeves with colour Red, Yellow, Blue & Black respectively |
| 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |
| 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |

| | | |
|---|---|---|
| 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 25 | Fuses (800 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 26 | 1000 A MCCB 3P | MCCB shall be with Micro Processor Based Release having LSIG Protections. The MCCB shall have Spreader Links & Phase Barriers. |
| | | Approved Make - Schneider/L&T/ABB/Siemens/Eaton |
| 27 | CT's for 2500A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 no's dual core CT's of ratio 2500/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 no's single core CTs of ratio 2500/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 2500/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 28 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP make |
| 29 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 30 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 31 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 32 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS<br>b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 32a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |
| 33 | Clearance between live parts | Phase - phase -Minimum 25 mm &<br>Phase - earth - Minimum 20 mm |

| | | |
|---|---|---|
| 34 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |
| 35 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 36 | Distance between 2 MCCBs | 80 mm (Minimum) |
| 37 | Distance between MCCB outlet & panel surface | 125 mm (Minimum) |
| 38 | Control terminals for CTs | Stud type with disconnecting facilities |
| 39 | Control terminals for Voltage & other circuits | Stud type |
| 40 | Illumination and Indicating Bulb | LED |
| 41 | Continuous rated operating voltage | 440 volt +/- 10% |
| 42 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 43 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 44 | Labels & name plates | As per Specifications |
| 45 | Surface preparation for painting | Sand blasting or 7 tank process |
| 46 | Painting | Sand blasting or 7 tank process. Light grey shade No 631 of IS-5 Powder coated epoxy paint min thickness 120 micron |
| 47 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 48 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 49 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 50 | Panel Dimensions (Min depth of 900 mm) | L X D X H |
| 51 | Numerical Relay | Ashida (ADR 241S) with 4 Element For E/F and O/C Protection on ACB. |
| 52 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

| | | |
|---|---|---|
| **5.0** | **GENERAL CONSTRUCTION** | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 2500A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) MCCB shall be with Micro Processor Based Release having LSIG Protections. The MCCB shall have Spreader Links & Phase Barriers,

17) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

18) Distance between centre to centre should be minimum 150mm between each fuse outlet and 125mm between fuse outlet and body of panel to be maintained. Distance between 2 no's MCCB shall be minimum 80 mm, & between MCCB outlet & panel body shall be minimum 125 mm.

19) The panel shall be provided with two separate earthing terminals connected to earth bus.

20) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

21) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth.

22) Eyebolt of suitable sizes shall be provided for lifting arrangements.

23) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

24) The panel shall be powder coated with light shade grade no 631 of IS 5.

25) Required number of foundation bolts shall be supplied with the panel.

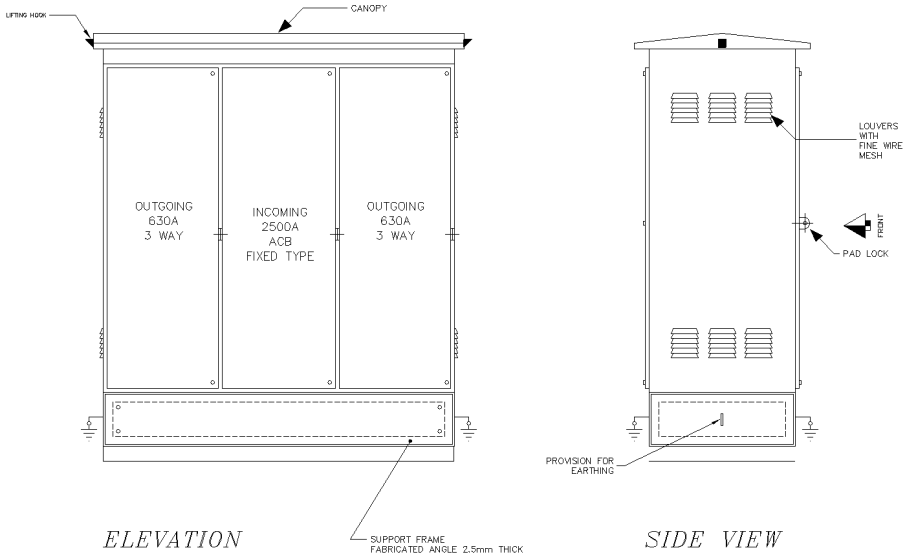
26) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

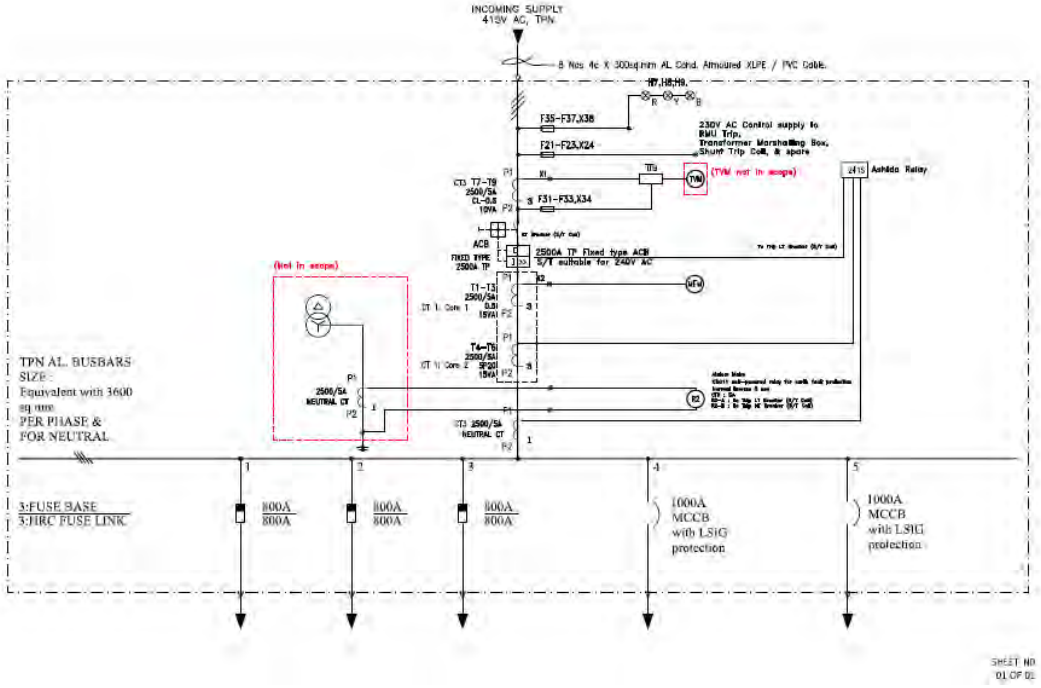
27) The control terminals shall be as follows:
Stud type with disconnecting facilities for CT circuits
Stud type for voltage and other circuits.

28) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

29) Lighting System in Feeder Pillar should be LED based.

LT Panel: Representative GA drawing & SLD-

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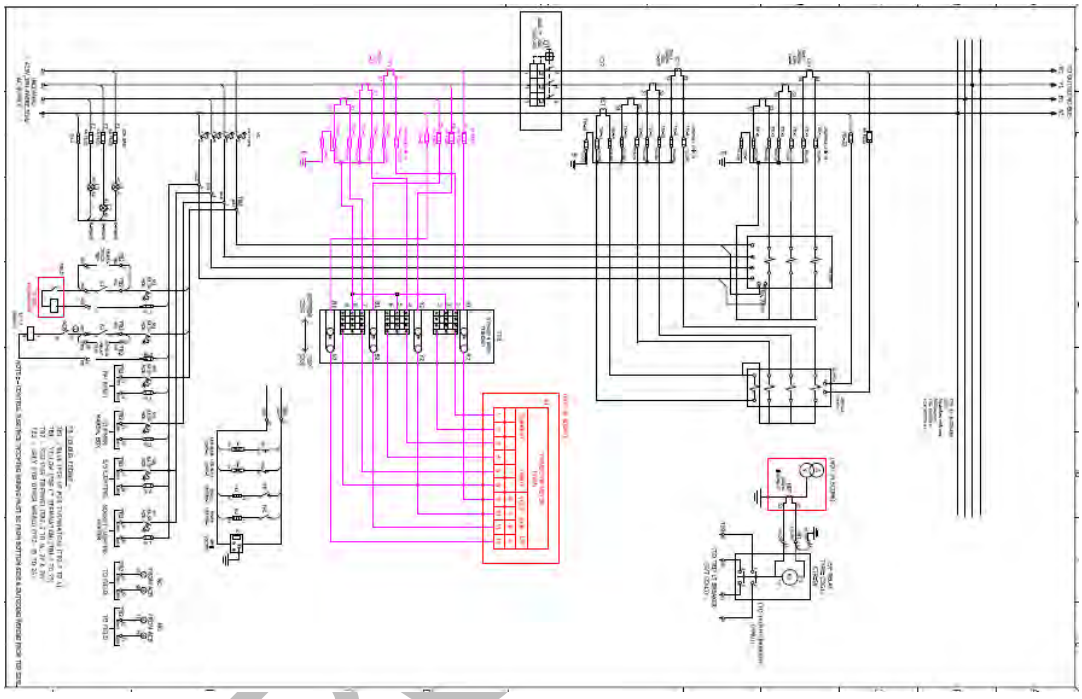
Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 5 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 2500A Incomers | 1No. | 8 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 800 A Fuse Outgoing | 3 No. Per outgoing | 3 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 3 | 1000 A MCCB 3P | 2 no. Per outgoing | 4 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 2500A Incomer shall be provided with resin cast CTs of ratio 2500/5A for metering & protection.

3 no's dual core CT 2500A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 no's single core CT 2500A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 2500A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Colour | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):
Three phase and neutral for metering circuit.
Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | L&T/Siemens/Schneider/ABB/Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

u) The robust isolating arrangement in the OG fuse compartment to be made.

| | | |
|---|---|---|
| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted Al label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick Al plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid. |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

| | | |
|---|---|---|
| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB, MCCB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br><br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |

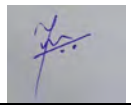
| | | |
|---|---|---|
| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

| | | |
|---|---|---|
| **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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| **15.0** | **MINIMUM TESTING FACILITIES** | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| **16.0** | **MANUFACTURING ACTIVITIES** | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS** | Keys of door |
| **18.0** | **DRAWING AND DOCUMENTS** | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid. All the documents & drawings shall be in English language<br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates<br>g) Any other technical document, if required |
| **19.0** | **SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS** | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

**20.0 SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

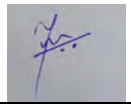
Designation :

# Annexure – 1

Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB, MCCB and fuses. (Bidder to arrange for the same, either in factory or in external lab)

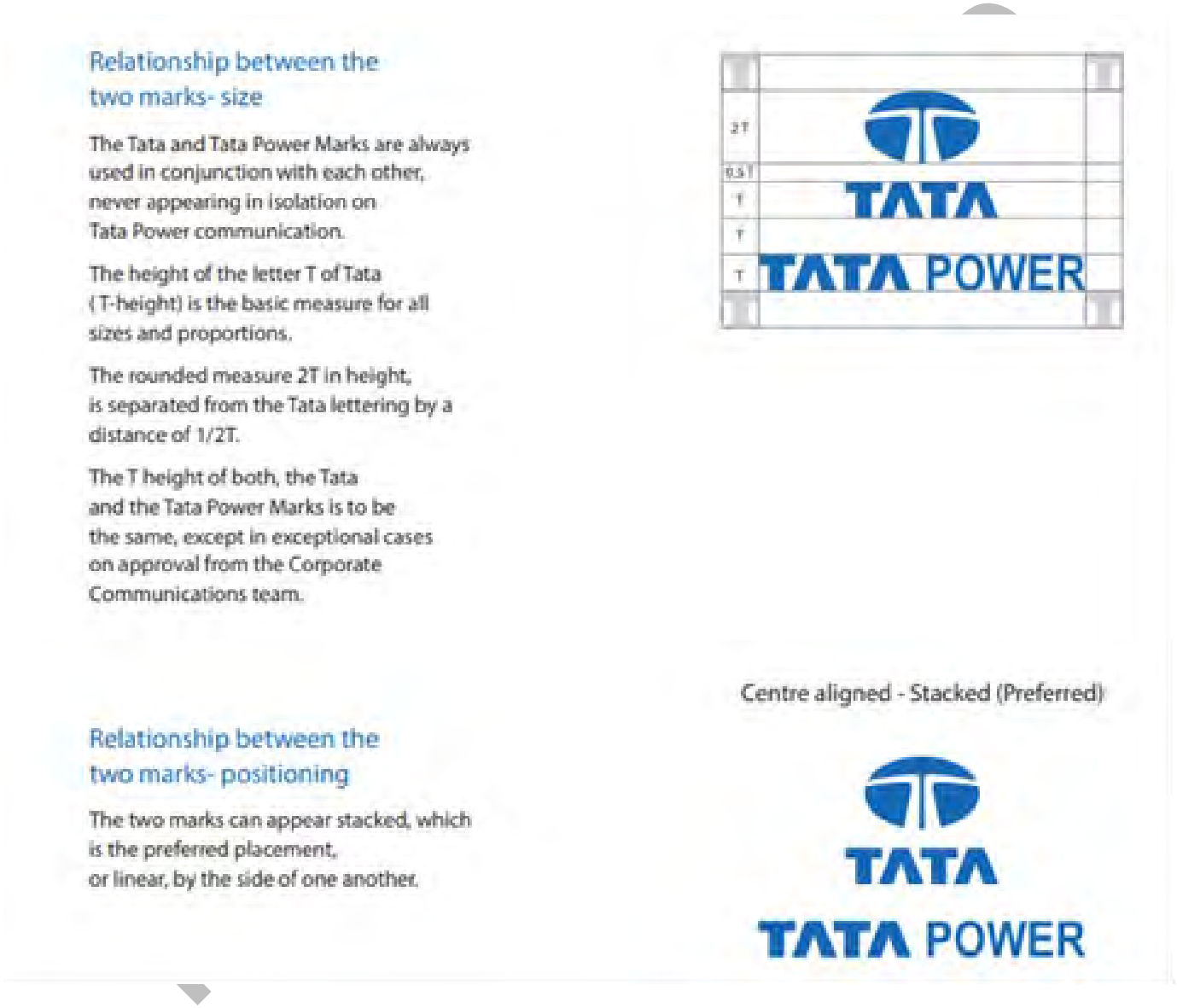


| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

# Annexure – 2

**Tata power Branding Name plate -**

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

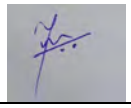


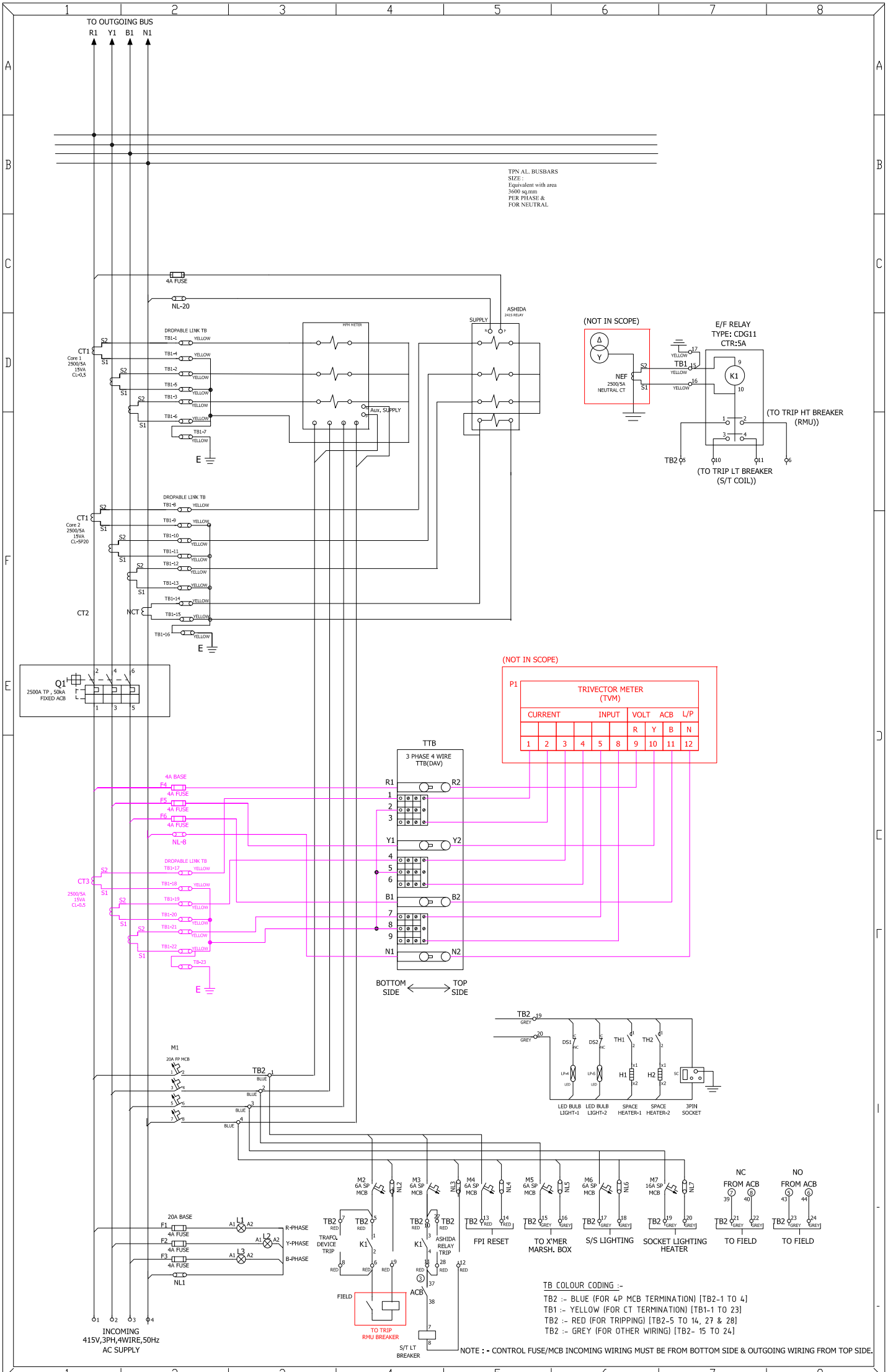

| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

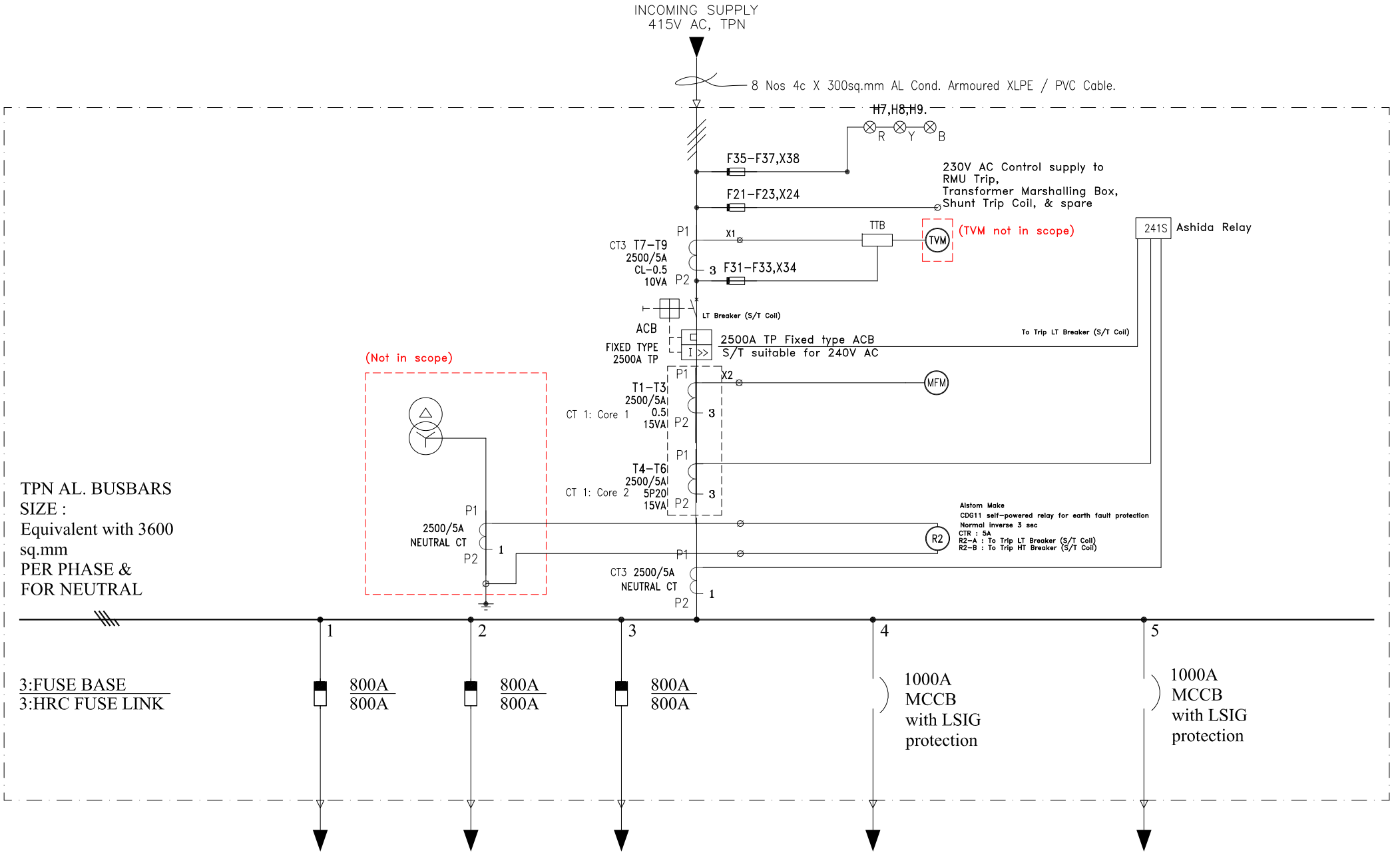
# Annexure – 3

Reference drawings



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |


TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :-
Equivalent with area
3600 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
SUPPLY
ASHIDA
2415 RELAY
MPH METER
DROPABLE LINK TB
CT1
Core 1
2500/5A
15VA
CL-0.5
CT1
Core 2
2500/5A
15VA
CL-5P20
CT2
NCT
Aux. SUPPLY
(NOT IN SCOPE)
NEF
2500/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
(TO TRIP HT BREAKER
(RMU))
(TO TRIP LT BREAKER
(S/T COIL))
Q1
2500A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT INPUT
VOLT ACB L/P
R Y B N
1 2 3 4 5 8 9 10 11 12
TTB
3 PHASE 4 WIRE
TTB(DAV)
R1 R2
Y1 Y2
B1 B2
N1 N2
BOTTOM SIDE
TOP SIDE
4A BASE
NL-8
CT3
2500/5A
15VA
CL-0.5
TB-23
M1
20A FP MCB
TB2
BLUE
LED BULB LIGHT-1
LED BULB LIGHT-2
SPACE HEATER-1
SPACE HEATER-2
3PIN SOCKET
M2 6A SP MCB
M3 6A SP MCB
M4 6A SP MCB
M5 6A SP MCB
M6 6A SP MCB
M7 16A SP MCB
NC FROM ACB
NO FROM ACB
20A BASE
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO. DEVICE TRIP
ASHIDA RELAY TRIP
FPI RESET
TO X'MER MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING HEATER
TO FIELD
TO FIELD
FIELD
ACB
TO TRIP RMU BREAKER
S/T LT BREAKER
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.




SHEET NO.
01 OF 01

# TECHNICAL SPECIFICATION

## 3200 A LT Panel with MCCB & Fuse



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

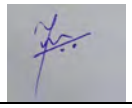
# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2029-R00**

**Document Title: Technical SPECIFICATION OF 3200 A LT Panels with MCCB & Fuse**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R00 | ENSE-DS-2029-R00 (for Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
| **Rev No.** | **Remarks** | **Date** | **Initials** | **Sign** | **Initials** | **Sign** | **Initials** | **Sign** |
| | | | **Prepared By** | | **Reviewed By** | | **Approved & Issued By** | |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

## CONTENTS





| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
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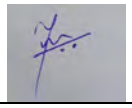
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 3200 A LT Panel with 2 no's 3P 1200 A MCCB, 2 no's 630 A HRC Fuse & 2 no's 800 A HRC Fuse Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 3200A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 3200 A |
| | Bus bar Size for Phase & Neutral | 4000 sq.mm for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 3200A ACB with 10 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders – 1200 A MCCB | Quantity - 2 Nos of 1200A each with 4 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| | No of outgoing feeders – HRC Fuse | Quantity –<br>2 Nos of 800A each<br>With 3 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G<br>2 Nos of 630A each<br>With 2 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G |

| | | | |
|---|---|---|---|
| | 7 | Panel construction | CRCA sheet steel of thickness 3 mm |
| | 8 | Panel enclosure class | IP54 - ingress protection |
| | 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| | 10 | Door type for front & rear access | Double door with rear door bolted |
| | 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| | 12 | Padlocking facility | For front door |
| | 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| | 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating.<br>Bolts below 12 mm size shall be SS material. |
| | 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer.<br>Wherever required bimetallic washers to be provided |
| | 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | | Bus bar size in mm for 3200 A O/G | 4000 sq.mm for Phase & Neutral |
| | | 3200A ACB Incoming | 4000 sq.mm for Phase & Neutral |
| | | ACB O/G LINKS | 4000 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| | 16 | Bus bar colour coding for R, Y, B & neutral | Heat shrinkable sleeves with colour Red, Yellow, Blue & Black respectively |
| | 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| | 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| | 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| | 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |

| | | |
|---|---|---|
| 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 25 | Fuses (800 A & 630 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 26 | 1200 A MCCB 3P | MCCB shall be with Micro Processor Based Release having LSIG Protections. The MCCB shall have Spreader Links & Phase Barriers. |
| | | Approved Make - Schneider/L&T/ABB/Siemens/Eaton |
| 27 | CT's for 3200A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 no's dual core CT's of ratio 3200/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 no's single core CTs of ratio 3200/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 3200/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 28 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP Make |
| 29 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 30 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 31 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 32 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 32a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |

| | | |
|---|---|---|
| 33 | Clearance between live parts | Phase - phase -Minimum 25 mm & Phase - earth - Minimum 20 mm |
| 34 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |
| 35 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 36 | Distance between 2 MCCBs | 80 mm (Minimum) |
| 37 | Distance between MCCB outlet & panel surface | 125 mm (Minimum) |
| 38 | Control terminals for CTs | Stud type with disconnecting facilities |
| 39 | Control terminals for Voltage & other circuits | Stud type |
| 40 | Illumination and Indicating Bulb | LED |
| 41 | Continuous rated operating voltage | 440 volt +/- 10% |
| 42 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 43 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 44 | Labels & name plates | As per Specifications |
| 45 | Surface preparation for painting | Sand blasting or 7 tank process |
| 46 | Painting | Sand blasting or 7 tank process.<br>Light grey shade No 631 of IS-5<br>Powder coated epoxy paint min thickness 120 micron |
| 47 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 48 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 49 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 50 | Panel Dimensions (Min depth of 900 mm) | L X D X H |
| 51 | Numerical Relay | Ashida (ADR 241S) with 4 Element |
| 52 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

| | | |
|---|---|---|
| 5.0 | GENERAL CONSTRUCTION | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 3200 A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) MCCB shall be with Micro Processor Based Release having LSIG Protections. The MCCB shall have Spreader Links & Phase Barriers,

17) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

18) Distance between centre to centre should be minimum 150mm between each fuse outlet and 125mm between fuse outlet and body of panel to be maintained. Distance between 2 no's MCCB shall be minimum 80 mm, & between MCCB outlet & panel body shall be minimum 125 mm.

19) The panel shall be provided with two separate earthing terminals connected to earth bus.

20) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

21) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth.

22) Eyebolt of suitable sizes shall be provided for lifting arrangements.

23) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

24) The panel shall be powder coated with light shade grade no 631 of IS 5.

25) Required number of foundation bolts shall be supplied with the panel.

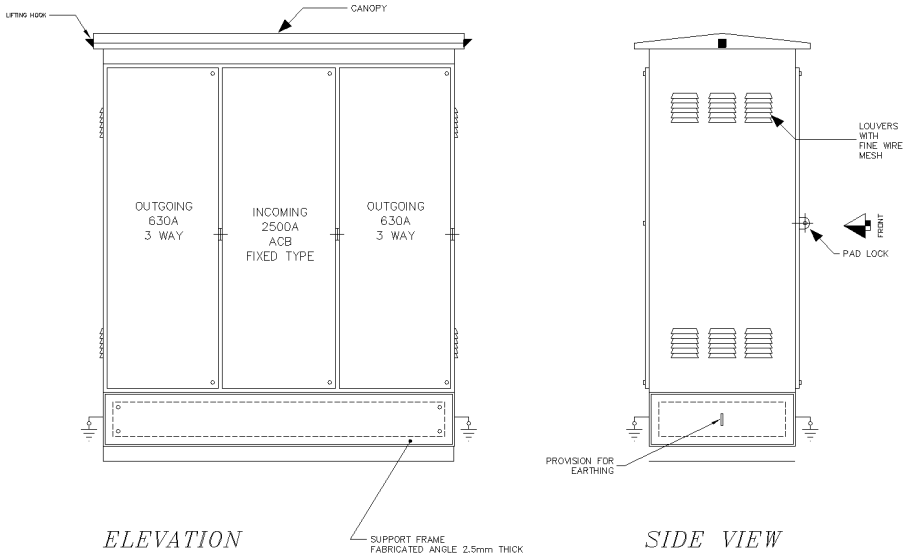
26) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

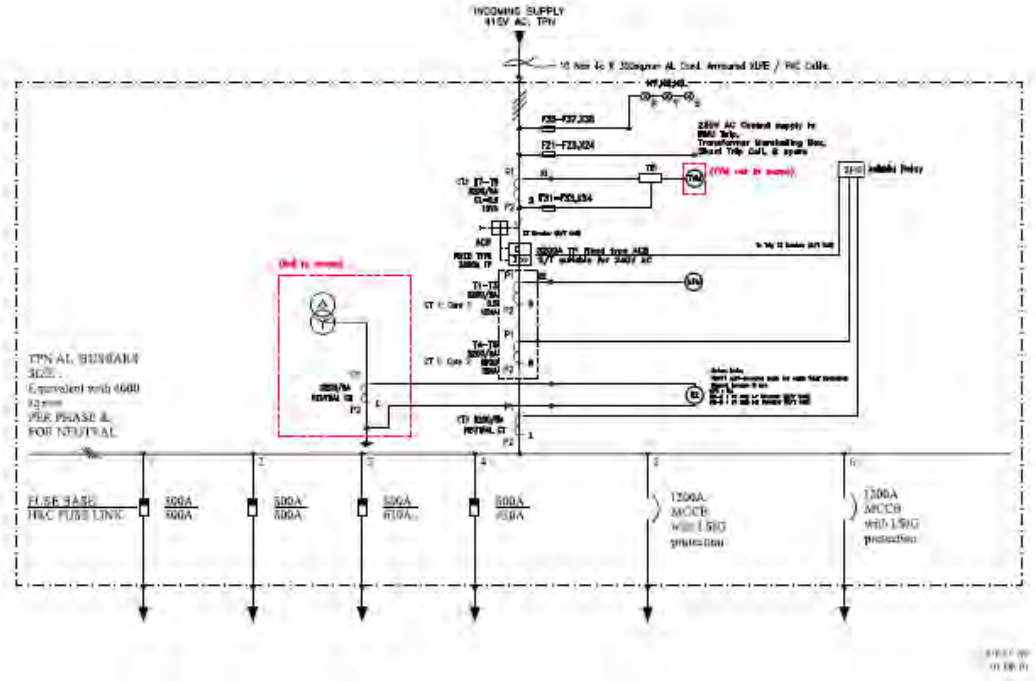
27) The control terminals shall be as follows:
    a. Stud type with disconnecting facilities for CT circuits
    b. Stud type for voltage and other circuits.

28) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

29) Lighting System in Feeder Pillar should be LED based.

LT Panel: Representative GA drawing & SLD-

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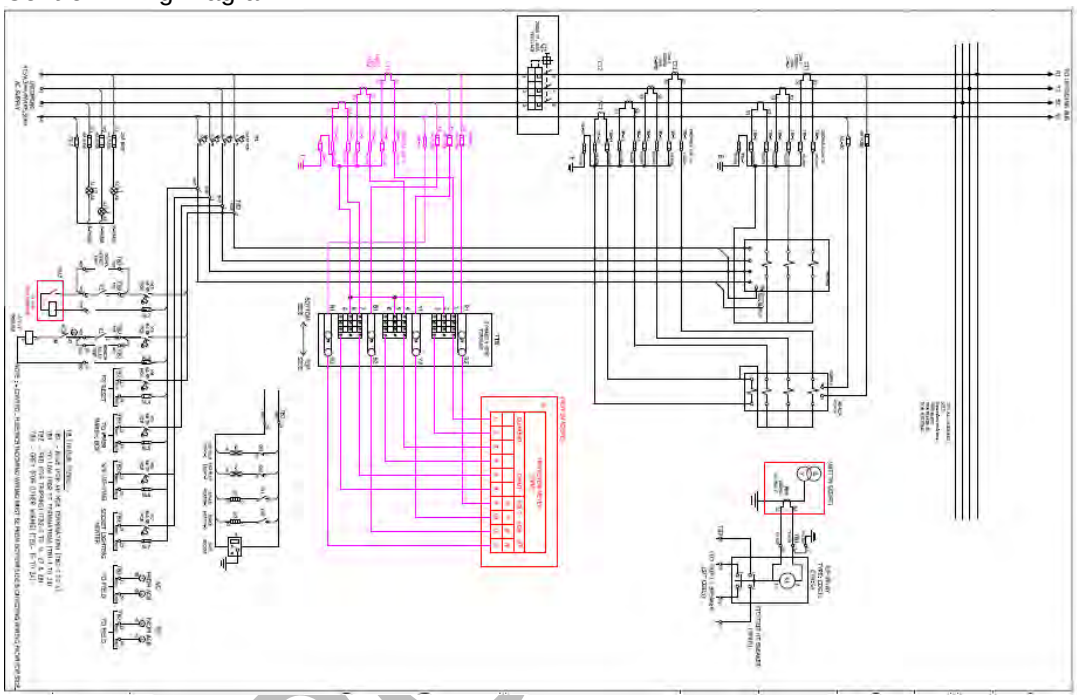
Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 6 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 3200A Incomers | 1No. | 10 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 1000 A MCCB 3P | 2 no. Per outgoing | 4 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 3 | 800 A Fuse Outgoing | 2 No. Per outgoing | 3 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 4 | 630 A Fuse Outgoing | 2 No. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 3200A Incomer shall be provided with resin cast CTs of ratio 3200/5A for metering & protection.

3 no's dual core CT 3200A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 no's single core CT 3200A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 3200A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Colour | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50 A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):
Three phase and neutral for metering circuit.
Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

u) The robust isolating arrangement in the OG fuse compartment to be made.

| | | |
|---|---|---|
| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted Al label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick Al plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

| | | |
|---|---|---|
| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB, MCCB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br><br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |

| | | |
|---|---|---|
| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |



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|---|---|---|---|
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| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

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| 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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| 15.0 | MINIMUM TESTING FACILITIES | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| 16.0 | MANUFACTURING ACTIVITIES | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS | Keys of door |
| 18.0 | DRAWING AND DOCUMENTS | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid. All the documents & drawings shall be in English language<br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates<br>g) Any other technical document, if required |
| 19.0 | SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |

**20.0 SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

# Annexure – 1

Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB, MCCB and fuses. (Bidder to arrange for the same, either in factory or in external lab)



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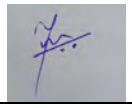
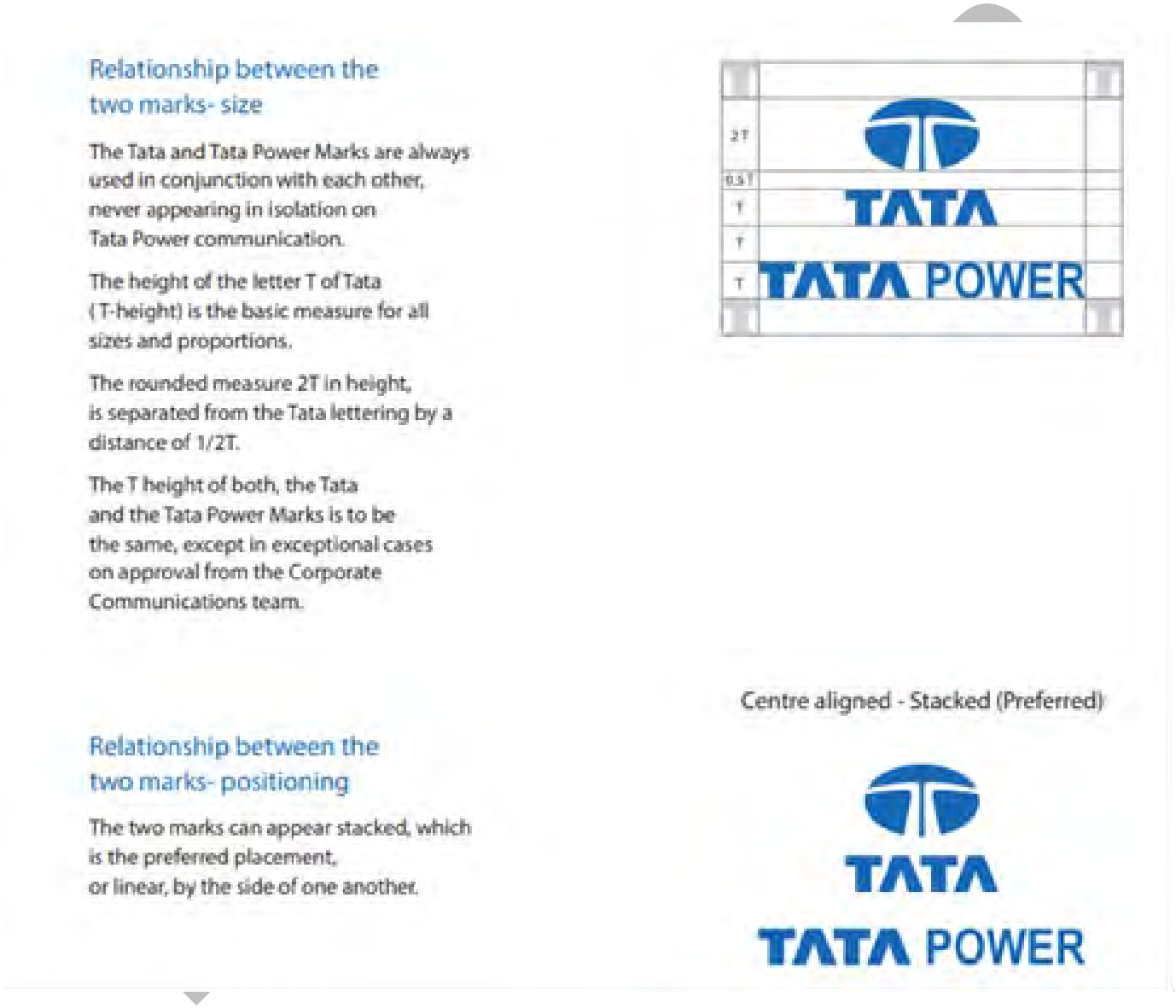
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

# Annexure – 2

**Tata power Branding Name plate -**

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

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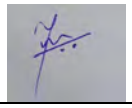
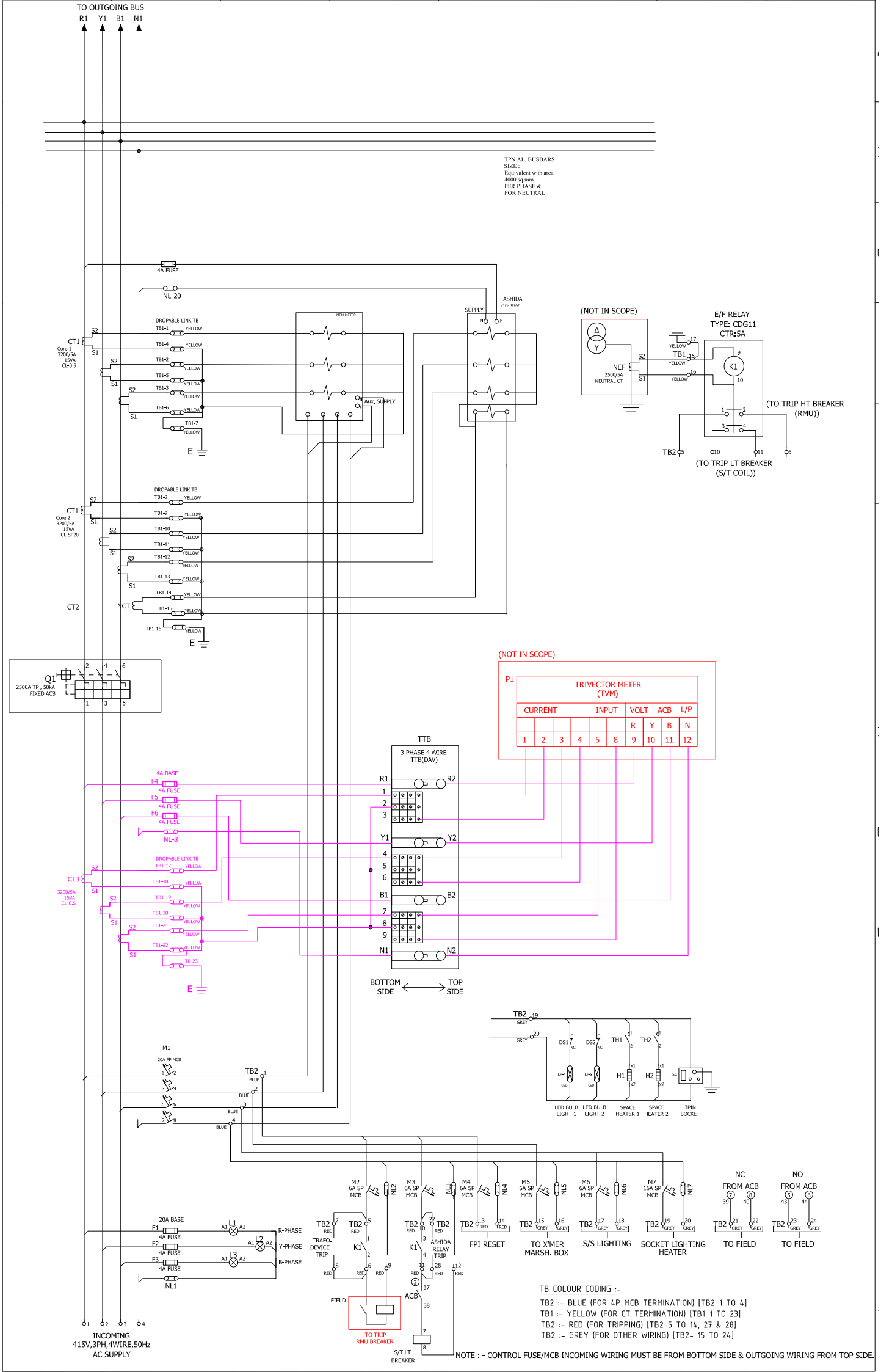
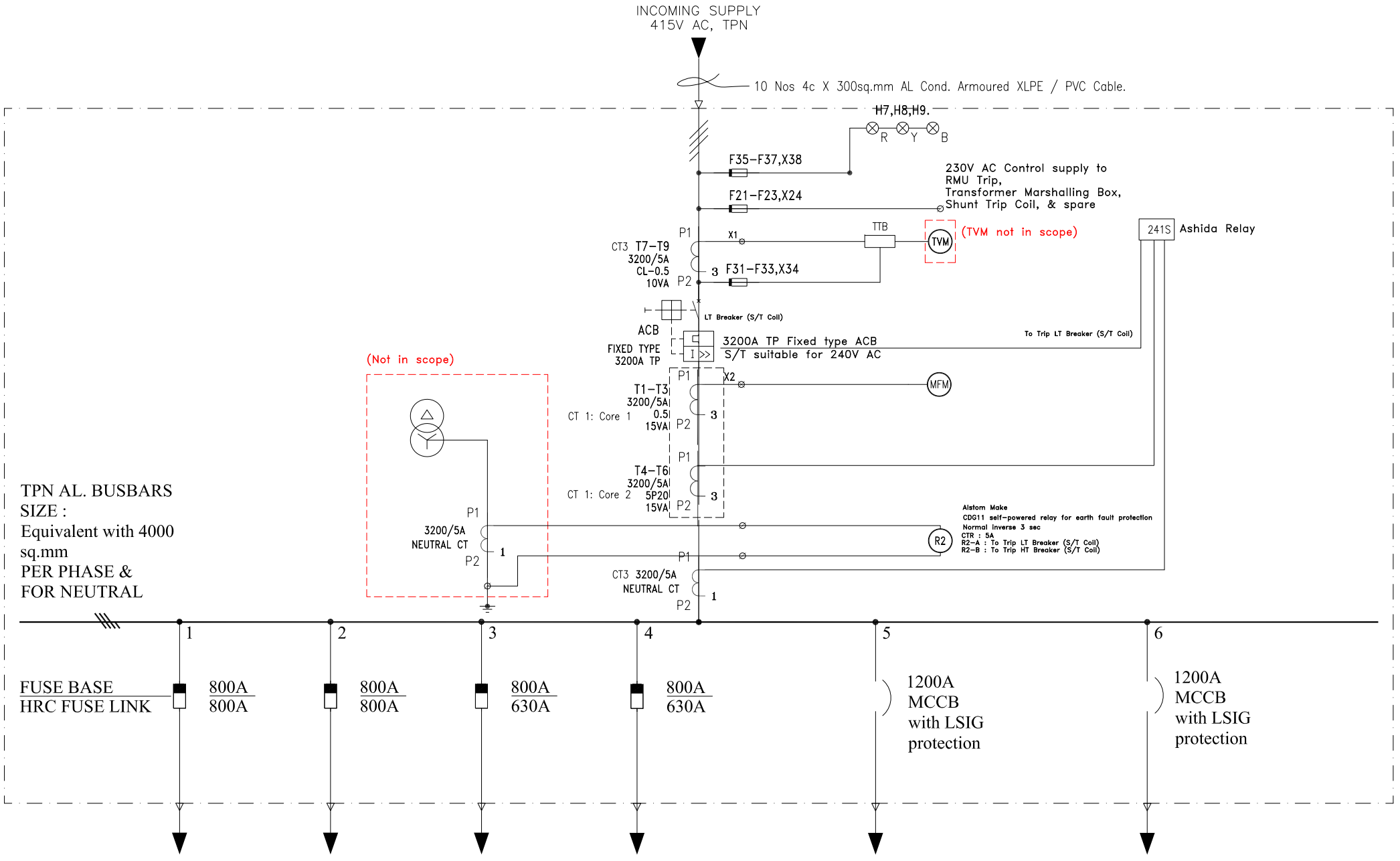
# Annexure – 3

Reference drawings



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |


TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :
Equivalent with area
4000 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
ASHIDA
24IS RELAY
SUPPLY
MFM METER
DROPABLE LINK TB
CT1
Core 1
3200/5A
15VA
CL-0.5
Aux. SUPPLY
(NOT IN SCOPE)
NEF
2500/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
TB1
K1
(TO TRIP HT BREAKER
(RMU))
TB2
(TO TRIP LT BREAKER
(S/T COIL))
Core 2
3200/5A
15VA
CL-5P20
CT2
NCT
Q1
2500A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT
INPUT
VOLT
ACB
L/P
TTB
3 PHASE 4 WIRE
TTB(DAV)
4A BASE
NL-8
CT3
3200/5A
15VA
CL-0.5
BOTTOM
SIDE
TOP
SIDE
M1
20A FP MCB
LED BULB
LIGHT-1
LED BULB
LIGHT-2
SPACE
HEATER-1
SPACE
HEATER-2
3PIN
SOCKET
M2
6A SP
MCB
M3
6A SP
MCB
M4
6A SP
MCB
M5
6A SP
MCB
M6
6A SP
MCB
M7
16A SP
MCB
NC
FROM ACB
NO
FROM ACB
20A BASE
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO.
DEVICE
TRIP
ASHIDA
RELAY
TRIP
FPI RESET
TO X'MER
MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING
HEATER
TO FIELD
TO FIELD
FIELD
TO TRIP
RMU BREAKER
ACB
S/T LT
BREAKER
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.




SHEET NO.
01 OF 01

# TECHNICAL SPECIFICATION

## 6 Way & 8 Way 2500 A LT Panel



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

# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2030-R00**

**Document Title: Technical SPECIFICATION OF 6 Way & 8 Way 2500 A LT Panels**

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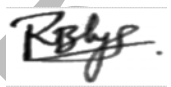
| R00 | ENSE-DS-2030-R00 (For Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
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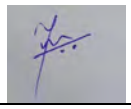
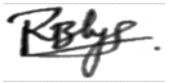
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 2500 A LT Panel with 6 or 8 no Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 2500A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 2500 A |
| | Bus bar Size for Phase & Neutral | 3600 sq.mm (2x150mmx12mm or equivalent) for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 2500A ACB with 8 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders (8 Way) | Quantity -8 Nos of 630A each with 2 nos of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| | No of outgoing feeders (6 Way) | Quantity -6 Nos of 630A each with 2 nos of 4CX300 sq.mm Al Ar XLPE cables per O/G |

| | | |
|---|---|---|
| 7 | Panel construction | CRCA sheet steel of thickness 3 mm |
| 8 | Panel enclosure class | IP54 - ingress protection |
| 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| 10 | Door type for front & rear access | Double door with rear door bolted |
| 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| 12 | Padlocking facility | For front door |
| 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating.<br>Bolts below 12 mm size shall be SS material. |
| 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer.<br>Wherever required bimetallic washers to be provided |
| 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | Bus bar size in mm for 2500 A O/G | 3600 sq.mm for Phase & Neutral |
| | 2500A ACB Incoming | 3600 sq.mm for Phase & Neutral |
| | ACB O/G LINKS | 3600 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| 16 | Bus bar color coding for R, Y, B & neutral | Heat shrinkable sleeves with color Red, Yellow, Blue & Black respectively |
| 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |
| 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |

| | | |
|---|---|---|
| 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 25 | Fuses (630 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 26 | CT's for 2500A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 nos dual core CT's of ratio 2500/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 nos single core CTs of ratio 2500/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 2500/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 27 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP make |
| 28 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 29 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 30 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 31 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS<br>b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 31a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |
| 32 | Clearance between live parts | Phase - phase -Minimum 25 mm & Phase - earth - Minimum 20 mm |
| 33 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |

| | | |
|---|---|---|
| 34 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 35 | Control terminals for CTs | Stud type with disconnecting facilities |
| 36 | Control terminals for Voltage & other circuits | Stud type |
| 37 | Illumination and Indicating Bulb | LED |
| 38 | Continuous rated operating voltage | 440 volt +/- 10% |
| 39 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 40 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 41 | Labels & name plates | As per Specifications |
| 42 | Surface preparation for painting | Sand blasting or 7 tank process |
| 43 | Painting | Sand blasting or 7 tank process. Light grey shade No 631 of IS-5 Powder coated epoxy paint min thickness 120 micron |
| 44 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 45 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 46 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 47 | Panel Dimensions (Min depth of 900 mm) | L X D X H (For 6 W & 8W) |
| 48 | Numerical Relay | Ashida (ADR 241S) with 4 Element |
| 49 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

| | | |
|---|---|---|
| 5.0 | **GENERAL CONSTRUCTION** | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 2500 A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

17) Distance between centre to centre should be minimum 150 mm between each fuse outlet and 125 mm between fuse outlet and body of panel to be maintained.

18) The panel shall be provided with two separate earthing terminals connected to earth bus.

19) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

20) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth

21) Eyebolt of suitable sizes shall be provided for lifting arrangements.

22) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

23) The panel shall be powder coated with light shade grade no 631 of IS 5.

24) Required number of foundation bolts shall be supplied with the panel.

25) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

26) The control terminals shall be as follows:
    a. Stud type with disconnecting facilities for CT circuits
    b. Stud type for voltage and other circuits.

27) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

28) Lighting System in Feeder Pillar should be LED based.



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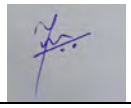
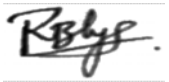
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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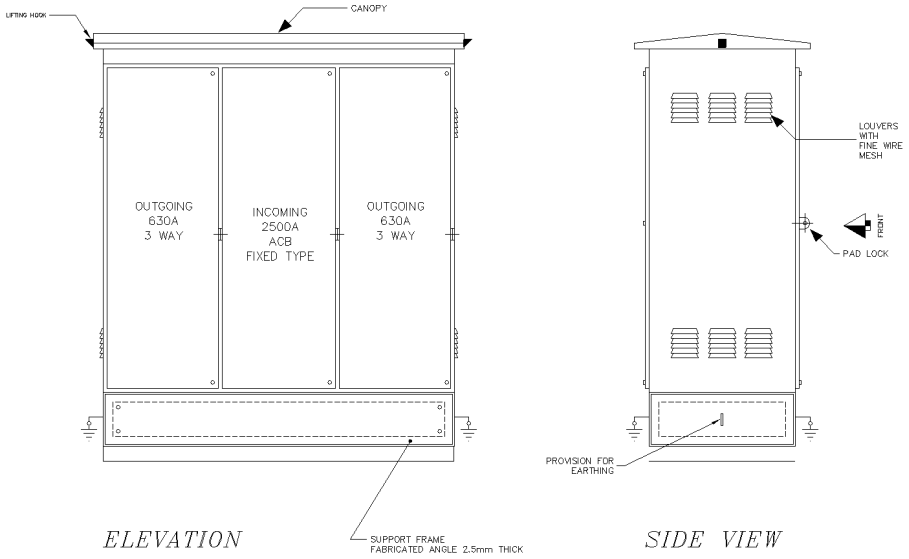
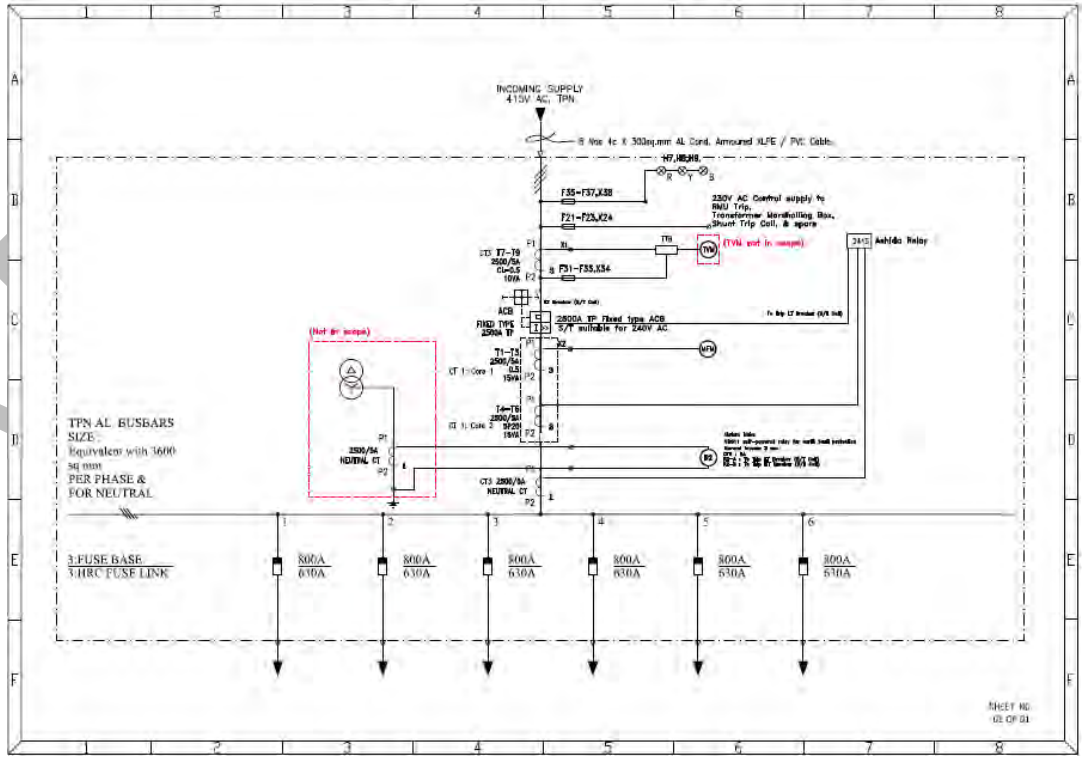
6 Way LT Panel: Representative GA drawing & SLD-

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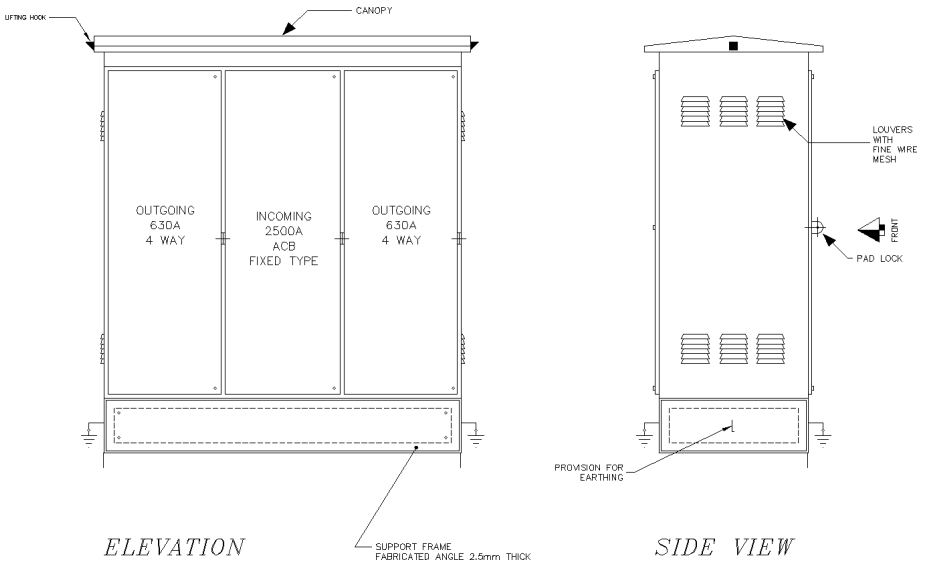
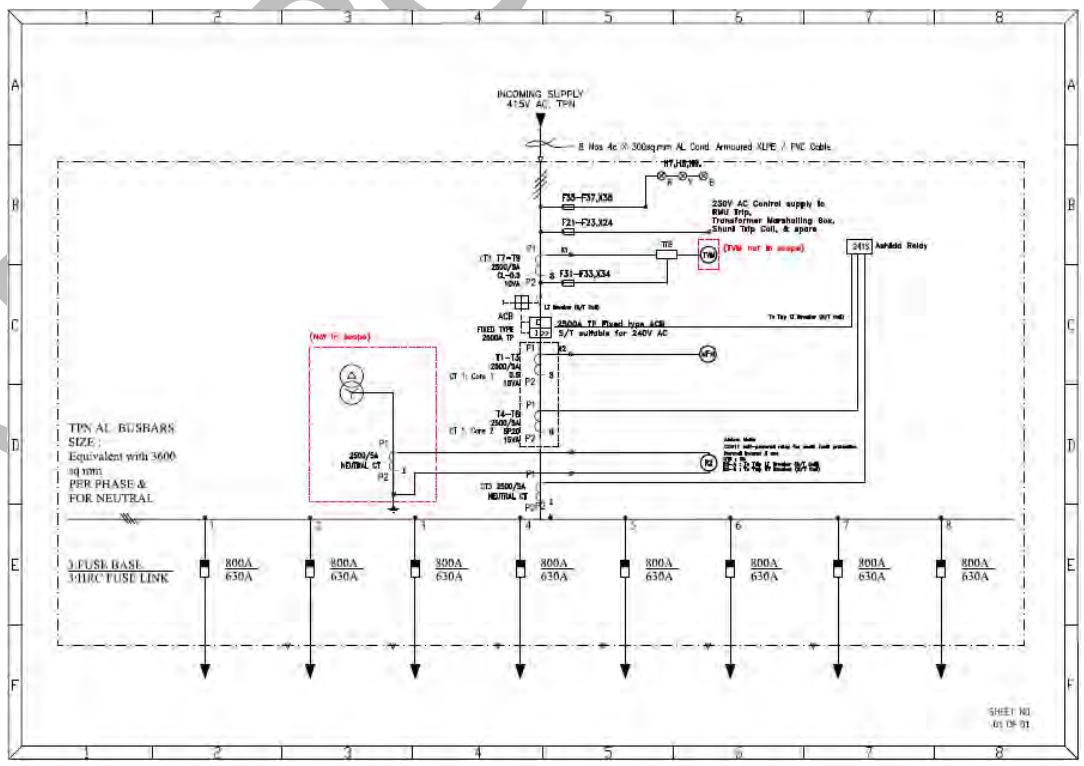
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

8 Way LT Panel: Representative GA drawing & SLD-

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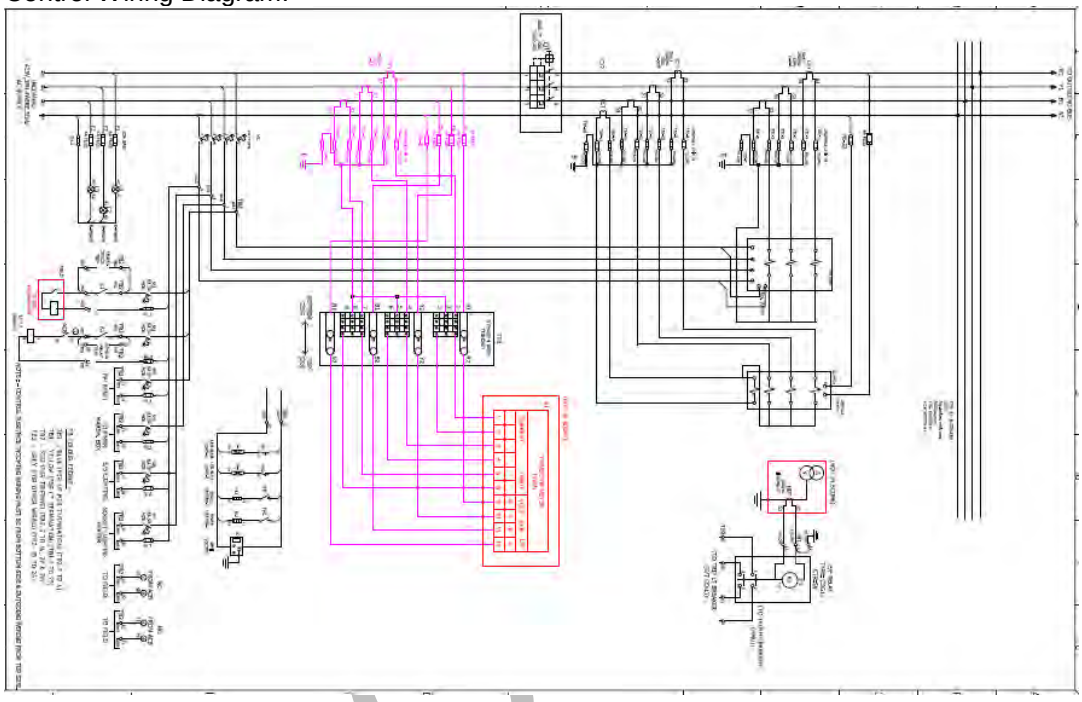
Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 6 or 8-way type having 6 or 8 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 2500A Incomers | 1No. | 8 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 6 Way Panel 630 A Fuse Outgoing | 6 No. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 3 | 8 Way Panel 630 A Fuse Outgoing | 8 no. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 2500A Incomer shall be provided with resin cast CTs of ratio 2500/5A for metering & protection.

3 nos dual core CT 2500A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 nos single core CT 2500A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 2000A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Color | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50 A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):

Three phase and neutral for metering circuit.

Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | L&T/C&S/Siemens/Schneider/ABB/Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

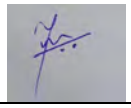
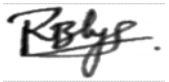
u) The robust isolating arrangement in the OG fuse compartment to be made.

| | | |
|---|---|---|
| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted AI label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick AI plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid. |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

| | | |
|---|---|---|
| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br><br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |

| | | |
|---|---|---|
| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

| | | |
|---|---|---|
| **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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| **15.0** | **MINIMUM TESTING FACILITIES** | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| **16.0** | **MANUFACTURING ACTIVITIES** | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS** | Keys of door |
| **18.0** | **DRAWING AND DOCUMENTS** | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid.<br>All the documents & drawings shall be in English language<br><br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates<br>g) Any other technical document, if required |
| **19.0** | **SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS** | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |

**20.0** **SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

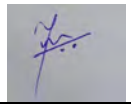
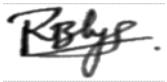
Designation :

# Annexure – 1

Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab)



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

# Annexure – 2

**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.

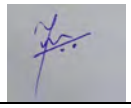
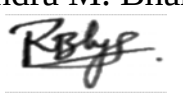
Centre aligned - Stacked (Preferred)

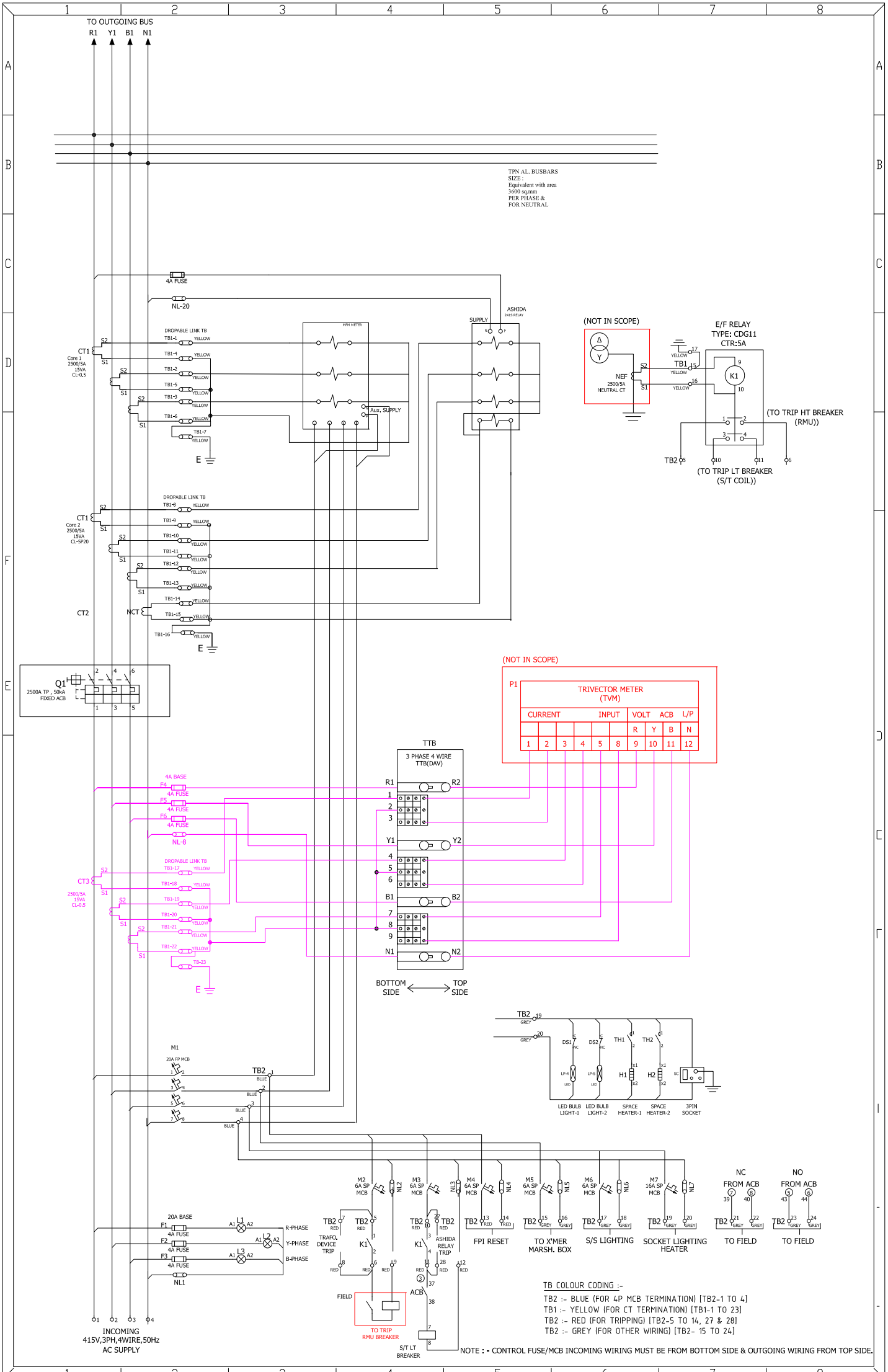

| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

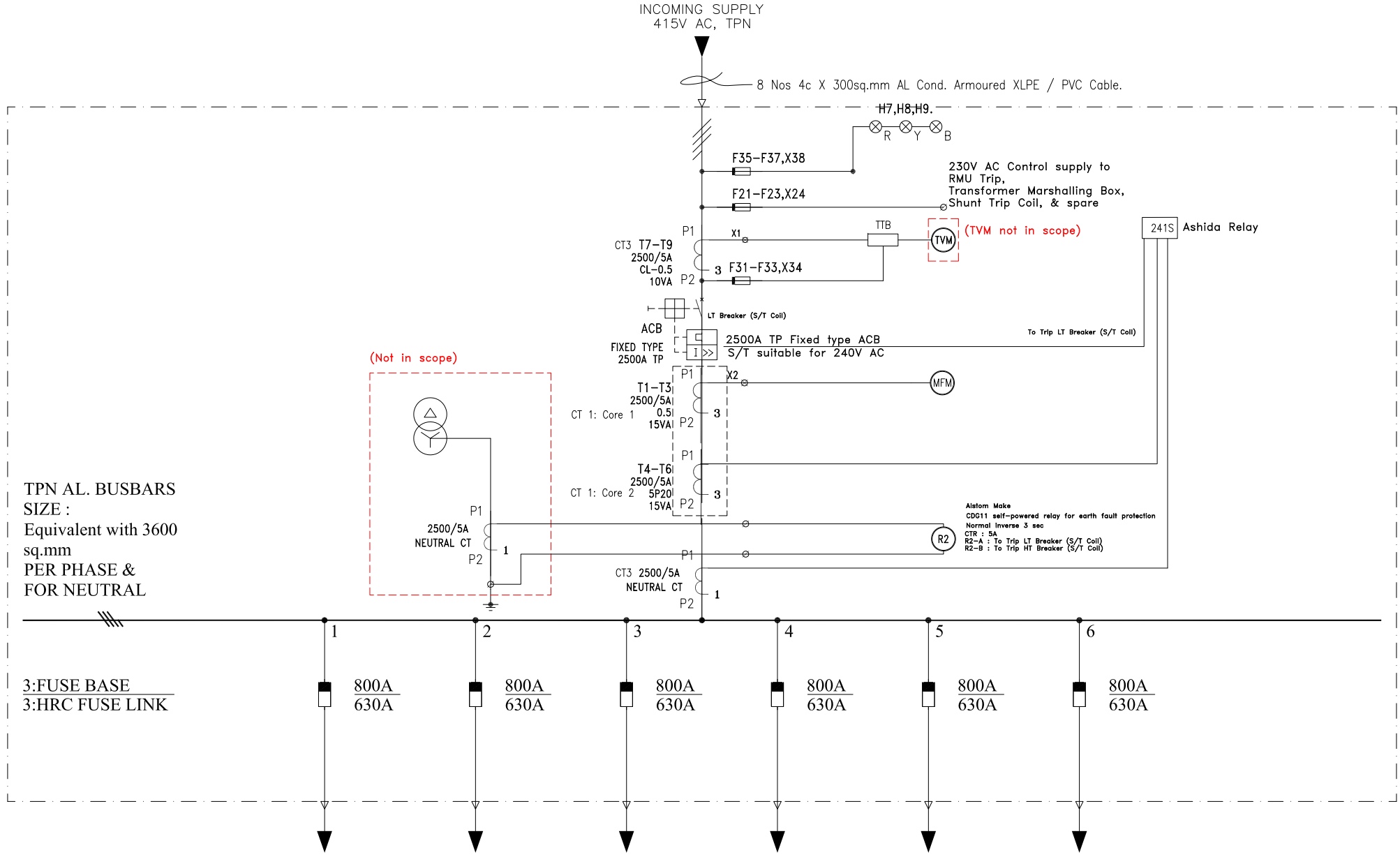
# Annexure – 3

Reference drawings

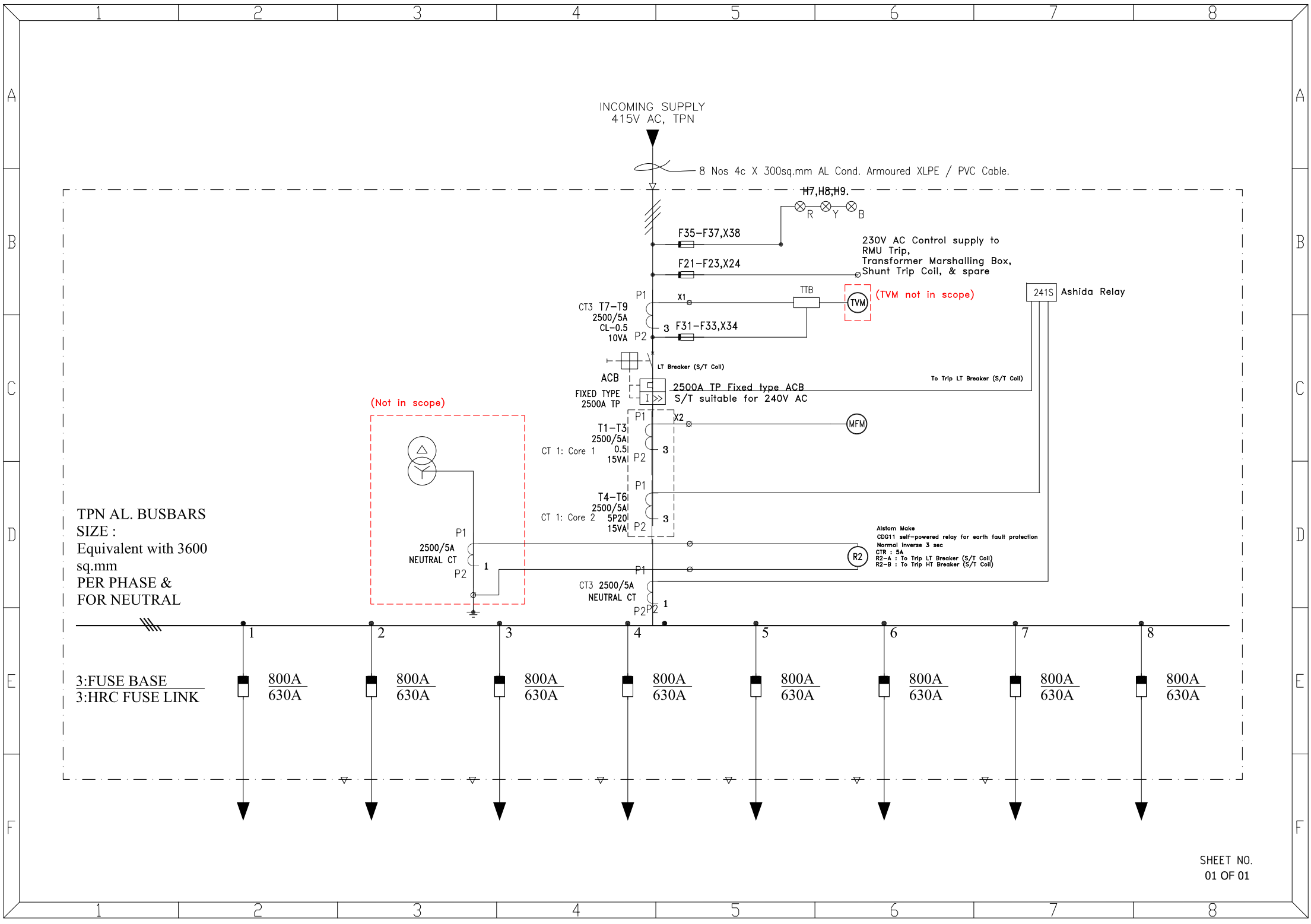


| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |


TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :-
Equivalent with area
3600 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
SUPPLY
ASHIDA
2415 RELAY
MPH METER
DROPABLE LINK TB
CT1
Core 1
2500/5A
15VA
CL-0.5
CT1
Core 2
2500/5A
15VA
CL-5P20
CT2
NCT
Aux. SUPPLY
(NOT IN SCOPE)
NEF
2500/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
(TO TRIP HT BREAKER
(RMU))
(TO TRIP LT BREAKER
(S/T COIL))
Q1
2500A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT INPUT
VOLT ACB L/P
R Y B N
1 2 3 4 5 8 9 10 11 12
TTB
3 PHASE 4 WIRE
TTB(DAV)
R1 R2
Y1 Y2
B1 B2
N1 N2
BOTTOM SIDE
TOP SIDE
4A BASE
NL-8
CT3
2500/5A
15VA
CL-0.5
TB-23
M1
20A FP MCB
TB2
BLUE
LED BULB LIGHT-1
LED BULB LIGHT-2
SPACE HEATER-1
SPACE HEATER-2
3PIN SOCKET
M2 6A SP MCB
M3 6A SP MCB
M4 6A SP MCB
M5 6A SP MCB
M6 6A SP MCB
M7 16A SP MCB
NC FROM ACB
NO FROM ACB
20A BASE
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO. DEVICE TRIP
ASHIDA RELAY TRIP
FPI RESET
TO X'MER MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING HEATER
TO FIELD
TO FIELD
FIELD
ACB
TO TRIP RMU BREAKER
S/T LT BREAKER
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.




SHEET NO.
01 OF 01




SHEET NO.
01 OF 01

# TECHNICAL SPECIFICATION

## 6 Way 1250 A LT Panel



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

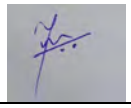
# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2031-R00**

**Document Title: Technical SPECIFICATION OF 6 Way 1250 A LT Panels**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R00 | ENSE-DS-2031-R00 (For Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
| R0 | SPEC-NET-Feeder Pillar-1250A | 17/09/21 | MY | -sd- | AVP | -sd- | RK | -sd- |
| **Rev No.** | **Remarks** | **Date** | **Initials** | **Sign** | **Initials** | **Sign** | **Initials** | **Sign** |
| | | | **Prepared By** | | **Reviewed By** | | **Approved & Issued By** | |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

## CONTENTS

**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 1250 A LT Panel with 6 no Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 1250A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 1250 A |
| | Bus bar Size for Phase & Neutral | 2000 sq.mm for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 1250A ACB with 7 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders (6 Way) | Quantity - 5 Nos of 630A each with 2 no's of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| 7 | Panel construction | CRCA sheet steel of thickness 3 mm |
| 8 | Panel enclosure class | IP54 - ingress protection |

| | | | |
|---|---|---|---|
| | | 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| | | 10 | Door type for front & rear access | Double door with rear door bolted |
| | | 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| | | 12 | Padlocking facility | For front door |
| | | 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| | | 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating.<br>Bolts below 12 mm size shall be SS material. |
| | | 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer.<br>Wherever required bimetallic washers to be provided |
| | | 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | | | Bus bar size in mm for 1250 A O/G | 2000 sq.mm for Phase & Neutral |
| | | | 1250A ACB Incoming | 2000 sq.mm for Phase & Neutral |
| | | | ACB O/G LINKS | 2000 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| | | 16 | Bus bar colour coding for R, Y, B & neutral | Heat shrinkable sleeves with colour Red, Yellow, Blue & Black respectively |
| | | 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| | | 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| | | 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | | | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| | | 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |
| | | 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| | | 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| | | 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |

| | | |
|---|---|---|
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 25 | Fuses (630 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 26 | CT's for 1250A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 no's dual core CT's of ratio 1250/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 no's single core CTs of ratio 1250/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 1250/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 27 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP make |
| 28 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 29 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 30 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 31 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS<br>b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 31a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |
| 32 | Clearance between live parts | Phase - phase -Minimum 25 mm & Phase - earth - Minimum 20 mm |
| 33 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |



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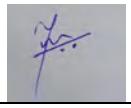
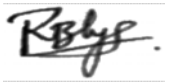
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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| 34 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 35 | Control terminals for CTs | Stud type with disconnecting facilities |
| 36 | Control terminals for Voltage & other circuits | Stud type |
| 37 | Illumination and Indicating Bulb | LED |
| 38 | Continuous rated operating voltage | 440 volt +/- 10% |
| 39 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 40 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 41 | Labels & name plates | As per Specifications |
| 42 | Surface preparation for painting | Sand blasting or 7 tank process |
| 43 | Painting | Sand blasting or 7 tank process. Light grey shade No 631 of IS-5 Powder coated epoxy paint min thickness 120 micron |
| 44 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 45 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 46 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 47 | Panel Dimensions (Min depth of 900 mm) | L X D X H |
| 48 | Numerical Relay | Ashida (ADR 241S) with 4 Element |
| 49 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

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| **5.0** | **GENERAL CONSTRUCTION** | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 1250 A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

17) Distance between centre to centre should be minimum 150 mm between each fuse outlet and 125 mm between fuse outlet and body of panel to be maintained.

18) The panel shall be provided with two separate earthing terminals connected to earth bus.

19) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

20) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth

21) Eyebolt of suitable sizes shall be provided for lifting arrangements.

22) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

23) The panel shall be powder coated with light shade grade no 631 of IS 5.

24) Required number of foundation bolts shall be supplied with the panel.

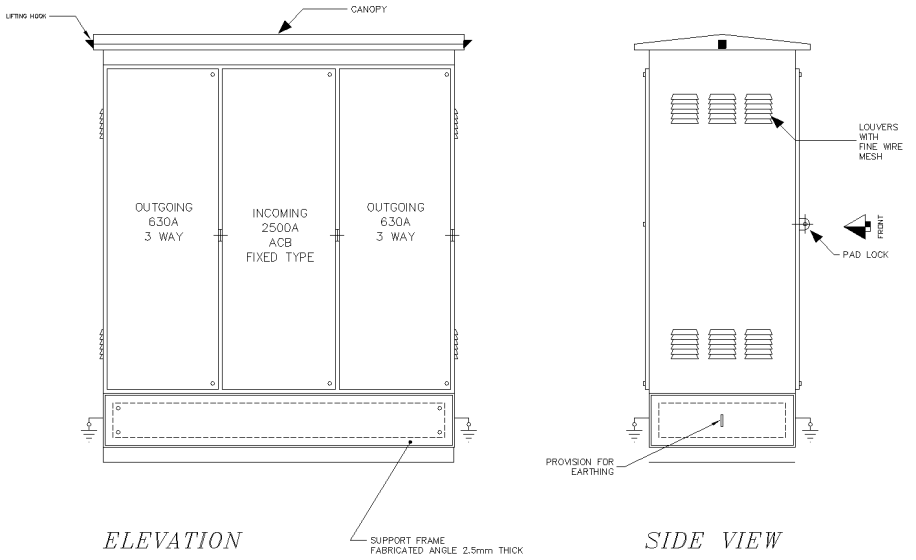
25) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

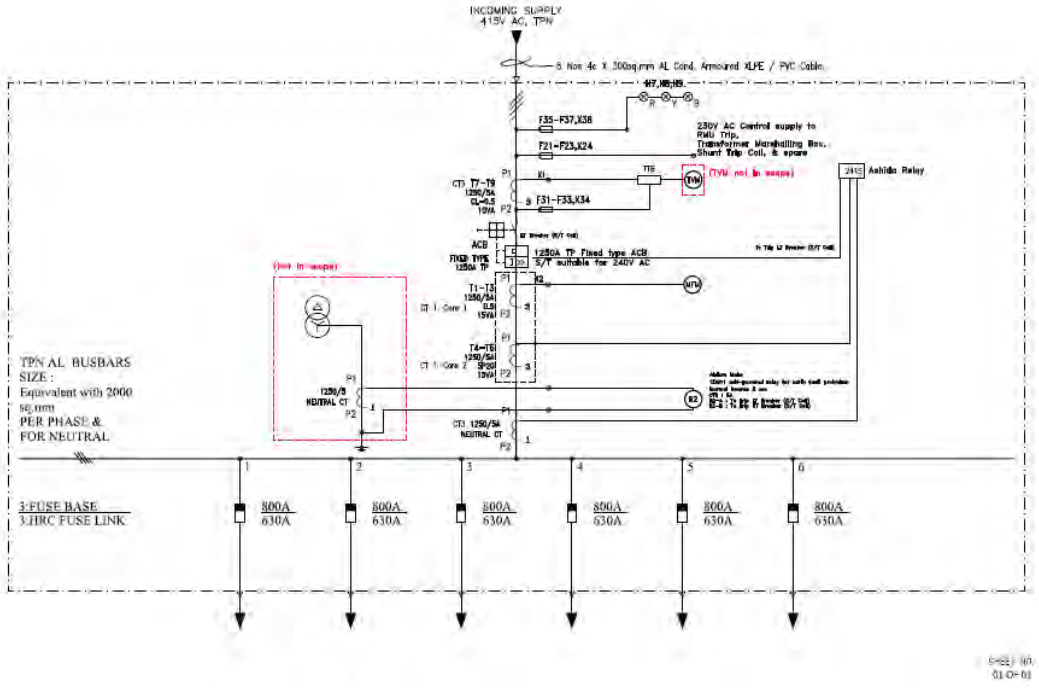
26) The control terminals shall be as follows:
    a. Stud type with disconnecting facilities for CT circuits
    b. Stud type for voltage and other circuits.

27) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

28) Lighting System in Feeder Pillar should be LED based.

6 Way LT Panel: Representative GA drawing & SLD-

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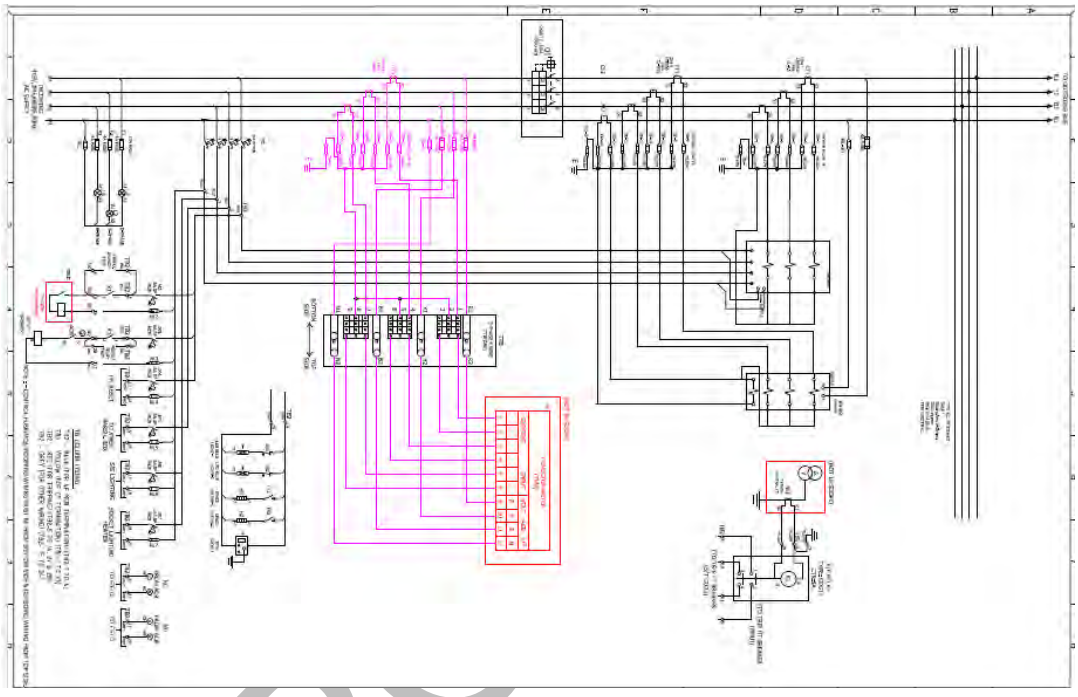
Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 6 way type having 6 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 1250A Incomers | 1No. | 6 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 6 Way Panel 630 A Fuse Outgoing | 6 No. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 1250A Incomer shall be provided with resin cast CTs of ratio 1250/5A for metering & protection.

3 no's dual core CT 1250A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 no's single core CT 1250A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 1250A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Colour | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50 A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):
Three phase and neutral for metering circuit.
Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

u) The robust isolating arrangement in the OG fuse compartment to be made as per the

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| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted AI label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick AI plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid. |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

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| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |

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| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |

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| **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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| **15.0** | **MINIMUM TESTING FACILITIES** | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| **16.0** | **MANUFACTURING ACTIVITIES** | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS** | Keys of door |
| **18.0** | **DRAWING AND DOCUMENTS** | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid.<br><br>All the documents & drawings shall be in English language<br><br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates |
| **19.0** | **SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS** | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |

**20.0 SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

# Annexure – 1

Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab)



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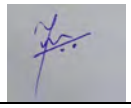
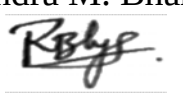
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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# Annexure – 2

**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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# Annexure – 3

Reference drawings



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
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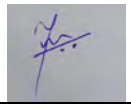
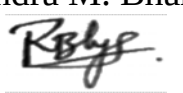
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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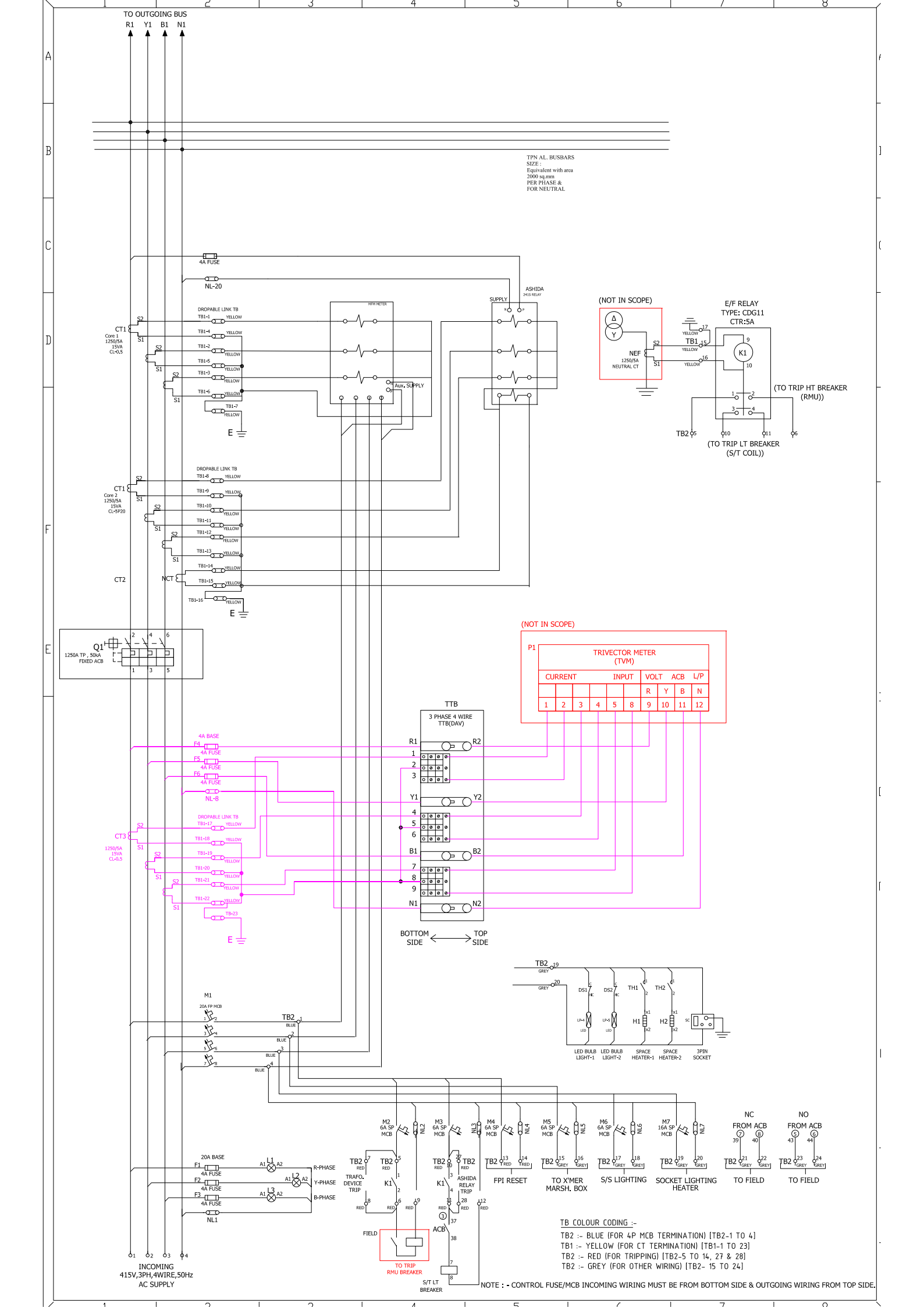
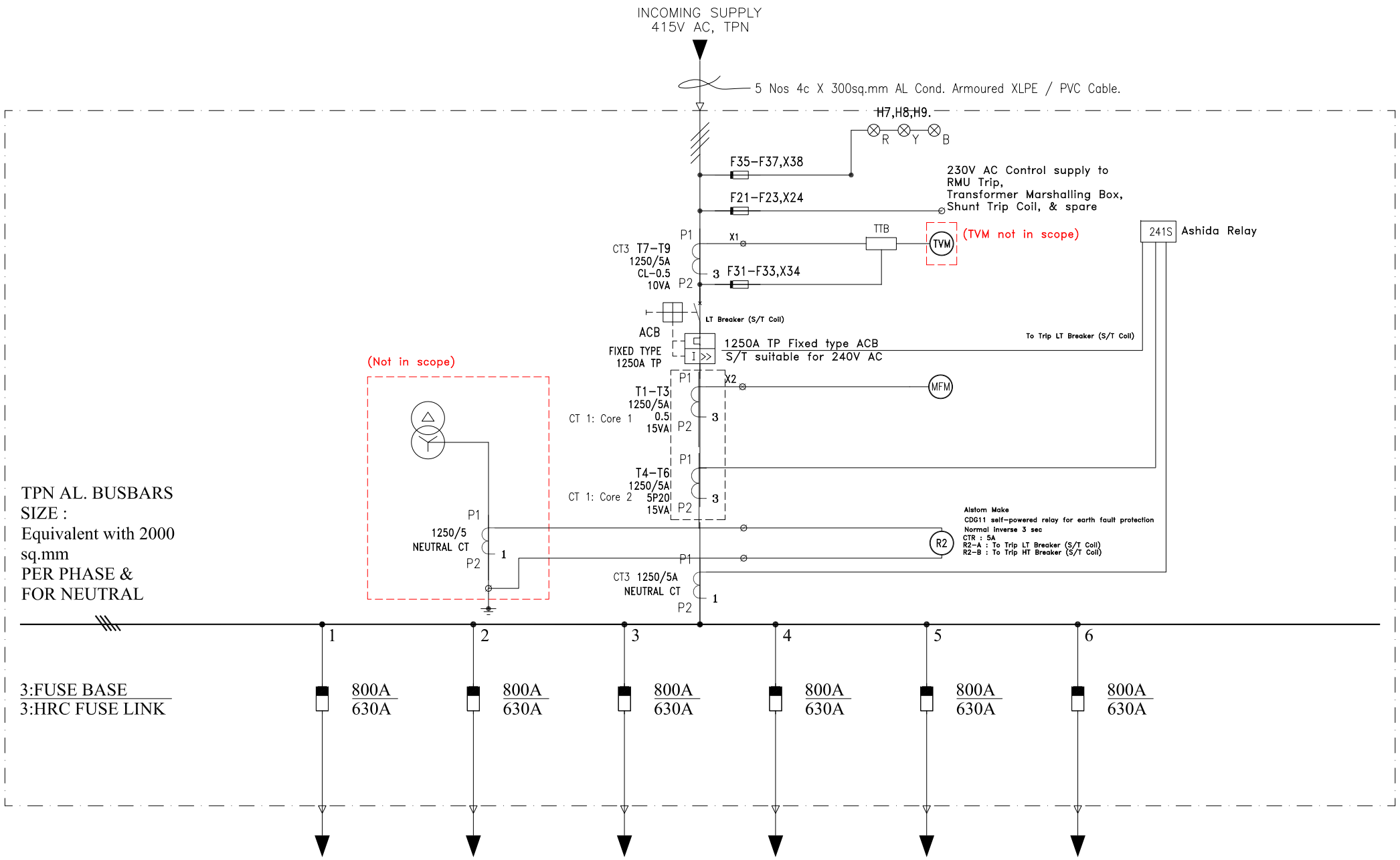

TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :
Equivalent with area
2000 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
DROPABLE LINK TB
CT1
Core 1
1250/5A
15VA
CL-0.5
NPM METER
Aux. SUPPLY
SUPPLY
ASHIDA
24IS RELAY
(NOT IN SCOPE)
NEF
1250/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
(TO TRIP HT BREAKER
(RMU))
(TO TRIP LT BREAKER
(S/T COIL))
Core 2
1250/5A
15VA
CL-5P20
CT2
NCT
Q1
1250A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT
INPUT
VOLT
ACB
L/P
TTB
3 PHASE 4 WIRE
TTB(DAV)
4A BASE
NL-8
CT3
1250/5A
15VA
CL-0.5
BOTTOM
SIDE
TOP
SIDE
M1
20A FP MCB
LED BULB
LIGHT-1
LED BULB
LIGHT-2
SPACE
HEATER-1
SPACE
HEATER-2
3PIN
SOCKET
M2
6A SP
MCB
M3
6A SP
MCB
M4
6A SP
MCB
M5
6A SP
MCB
M6
6A SP
MCB
M7
16A SP
MCB
NC
FROM ACB
NO
FROM ACB
20A BASE
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO.
DEVICE
TRIP
ASHIDA
RELAY
TRIP
FIELD
TO TRIP
RMU BREAKER
ACB
S/T LT
BREAKER
FPI RESET
TO X'MER
MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING
HEATER
TO FIELD
TO FIELD
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.




SHEET NO.
01 OF 01

# TECHNICAL SPECIFICATION

## 6 Way 2000 A LT Panel



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

# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2032-R00**

**Document Title: Technical SPECIFICATION OF 6 Way 2000 A LT Panels**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R00 | ENSE-DS-2032-R00 (For Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
| R2 | SPEC-NET-Feeder Pillar-2000A | 14/7/17 | ND | -sd- | SBK | -sd- | CKC | -sd- |
| R1 | SPEC-NET-Feeder Pillar-2000A | 13/10/16 | ND | -sd- | SBK | -sd- | CKC | -sd- |
| R0 | SPEC-NET-Feeder Pillar-2000A | 10/06/16 | AP | -sd- | SBK | -sd- | CKC | -sd- |
| **Rev No.** | **Remarks** | **Date** | **Initials** | **Sign** | **Initials** | **Sign** | **Initials** | **Sign** |
| | | | **Prepared By** | | **Reviewed By** | | **Approved & Issued By** | |



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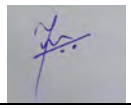
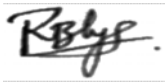
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

## CONTENTS

**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 2000 A LT Panel with 6 no Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 2000A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 2000 A |
| | Bus bar Size for Phase & Neutral | 3000 sq.mm for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 2000A ACB with 7 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders (6 Way) | Quantity - 6 Nos of 630A each with 2 nos of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| 7 | Panel construction | CRCA sheet steel of thickness 3 mm |

| | | | |
|---|---|---|---|
| | 8 | Panel enclosure class | IP54 - ingress protection |
| | 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| | 10 | Door type for front & rear access | Double door with rear door bolted |
| | 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| | 12 | Padlocking facility | For front door |
| | 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| | 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating.<br>Bolts below 12 mm size shall be SS material. |
| | 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer.<br>Wherever required bimetallic washers to be provided |
| | 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | | Bus bar size in mm for 2000 A O/G | 3000 sq.mm for Phase & Neutral |
| | | 2000A ACB Incoming | 3000 sq.mm for Phase & Neutral |
| | | ACB O/G LINKS | 3000 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| | 16 | Bus bar color coding for R, Y, B & neutral | Heat shrinkable sleeves with color Red, Yellow, Blue & Black respectively |
| | 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| | 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| | 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| | 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |
| | 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| | 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |

| | | |
|---|---|---|
| 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 25 | Fuses (630 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller /Bussmann / ABB |
| 26 | CT's for 2000A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 nos dual core CT's of ratio 2000/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 nos single core CTs of ratio 2000/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 2000/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 27 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP make |
| 28 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 29 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 30 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 31 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 31a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |
| 32 | Clearance between live parts | Phase - phase -Minimum 25 mm & Phase - earth - Minimum 20 mm |
| 33 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |

| | | |
|---|---|---|
| 34 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 35 | Control terminals for CTs | Stud type with disconnecting facilities |
| 36 | Control terminals for Voltage & other circuits | Stud type |
| 37 | Illumination and Indicating Bulb | LED |
| 38 | Continuous rated operating voltage | 440 volt +/- 10% |
| 39 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 40 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 41 | Labels & name plates | As per Specifications |
| 42 | Surface preparation for painting | Sand blasting or 7 tank process |
| 43 | Painting | Sand blasting or 7 tank process. Light grey shade No 631 of IS-5 Powder coated epoxy paint min thickness 120 micron |
| 44 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 45 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 46 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 47 | Panel Dimensions (Min depth of 900 mm) | L X D X H |
| 48 | Numerical Relay | Ashida (ADR 241S) with 4 Element |
| 49 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

| | | |
|---|---|---|
| **5.0** | **GENERAL CONSTRUCTION** | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 2000 A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

17) Distance between centre to centre should be minimum 150 mm between each fuse outlet and 125 mm between fuse outlet and body of panel to be maintained.

18) The panel shall be provided with two separate earthing terminals connected to earth bus.

19) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

20) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth

21) Eyebolt of suitable sizes shall be provided for lifting arrangements.

22) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

23) The panel shall be powder coated with light shade grade no 631 of IS 5.

24) Required number of foundation bolts shall be supplied with the panel.

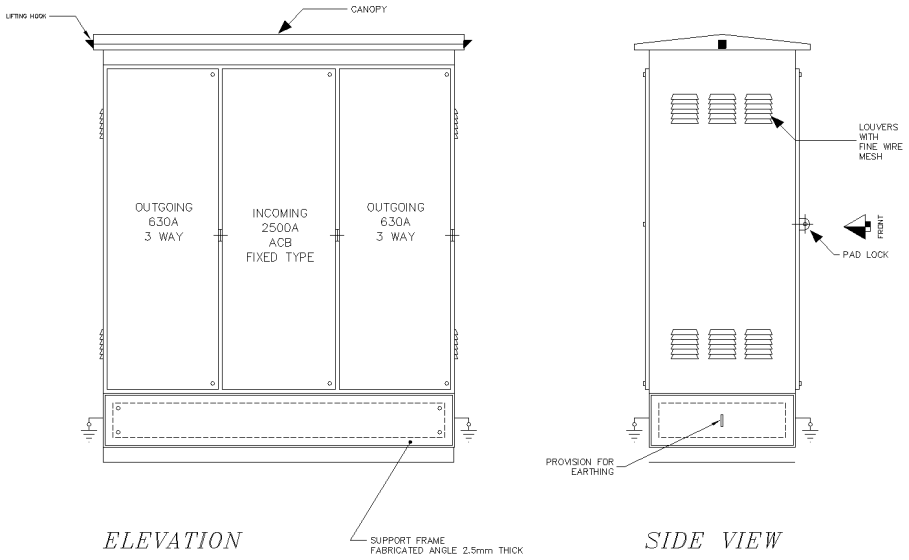
25) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

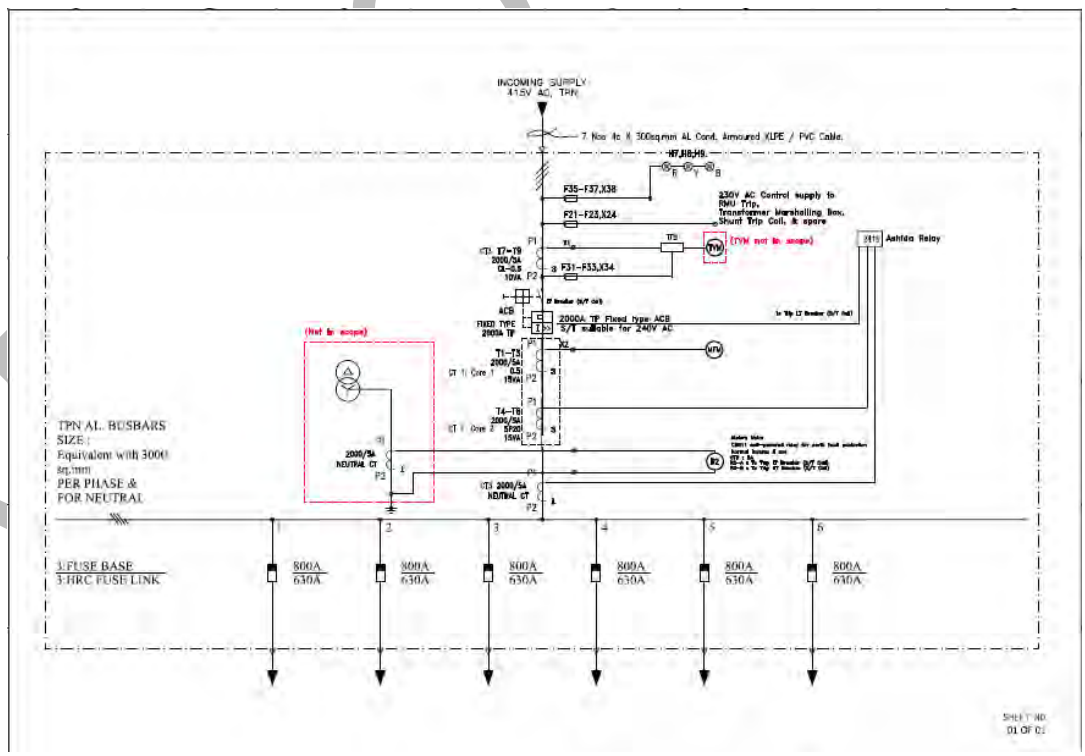
26) The control terminals shall be as follows:
    a. Stud type with disconnecting facilities for CT circuits
    b. Stud type for voltage and other circuits.

27) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

28) Lighting System in Feeder Pillar should be LED based.

6 Way LT Panel: Representative GA drawing & SLD-

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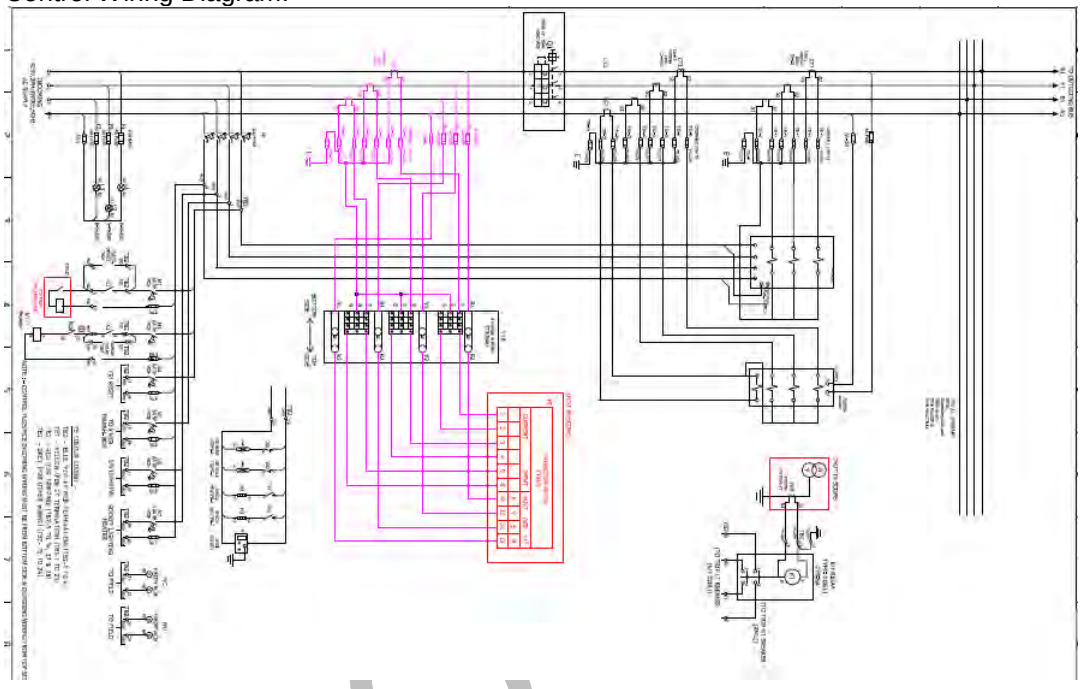
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 6 way type having 6 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 2000A Incomers | 1No. | 7 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 6 Way Panel 630 A Fuse Outgoing | 6 No. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 2000A Incomer shall be provided with resin cast CTs of ratio 2000/5A for metering & protection.

3 nos dual core CT 2000A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 nos single core CT 2000A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 2000A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Color | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50 A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):

Three phase and neutral for metering circuit.

Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

u) The robust isolating arrangement in the OG fuse compartment to be made.

| | | |
|---|---|---|
| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted AI label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick AI plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid. |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

| | | |
|---|---|---|
| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br><br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

| | | |
|---|---|---|
| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

| | | |
|---|---|---|
| **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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| **15.0** | **MINIMUM TESTING FACILITIES** | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| **16.0** | **MANUFACTURING ACTIVITIES** | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS** | Keys of door |
| **18.0** | **DRAWING AND DOCUMENTS** | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid.<br>All the documents & drawings shall be in English language<br><br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates<br>g) Any other technical document, if required |
| **19.0** | **SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS** | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |

**20.0 SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

# Annexure – 1

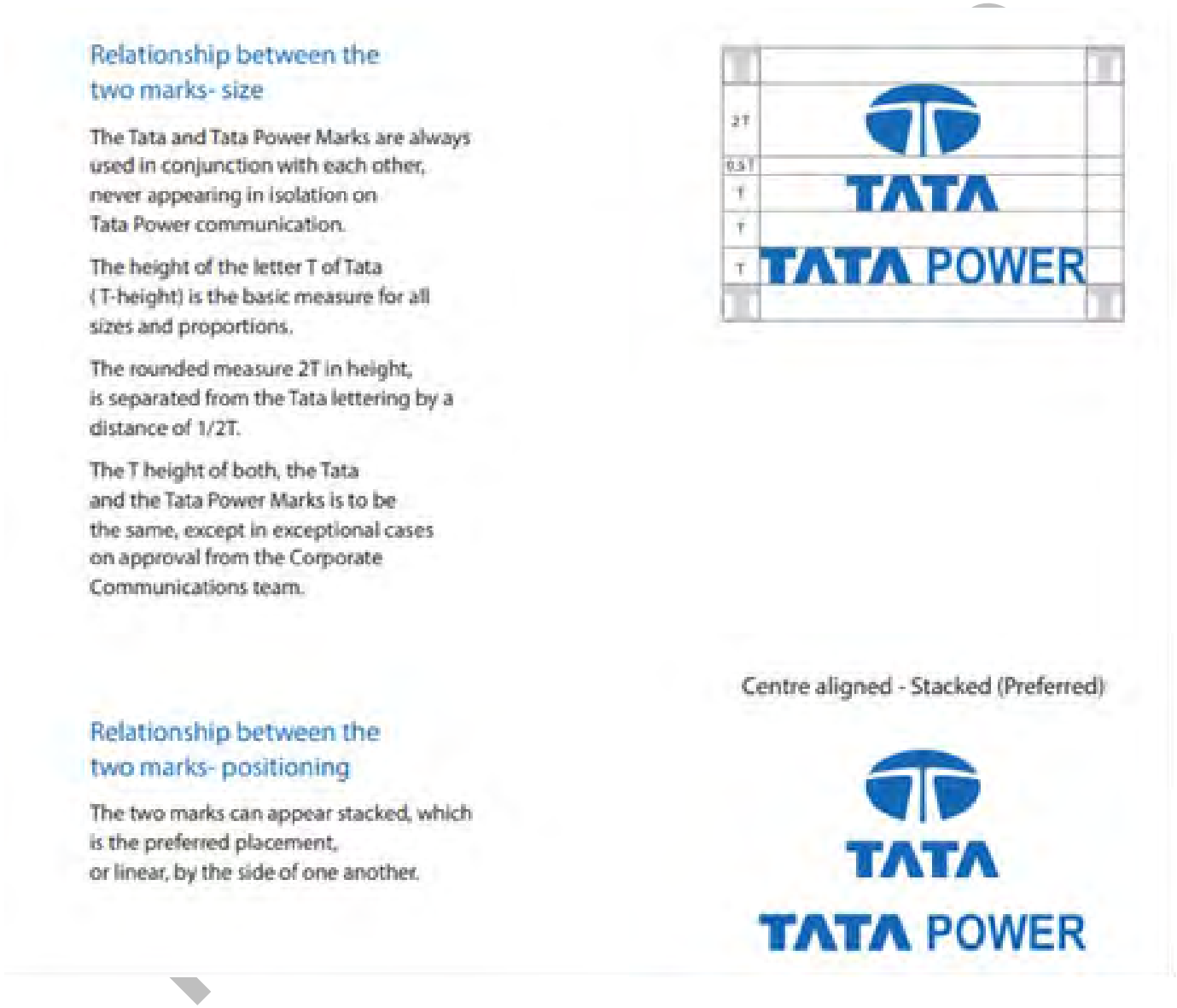
Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab)

# Annexure – 2

**Tata power Branding Name plate -**

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

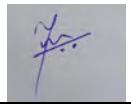
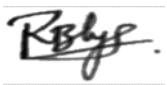


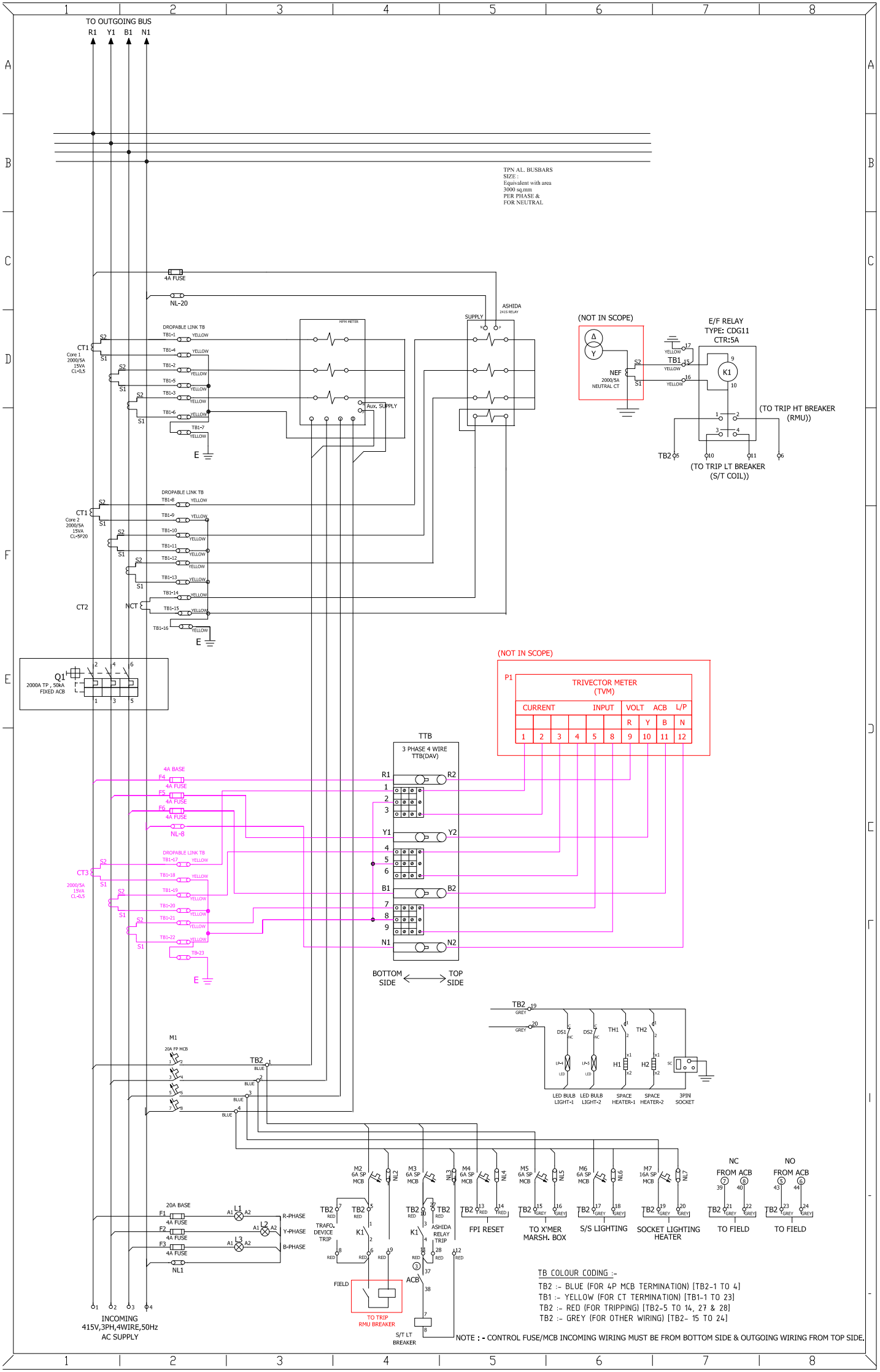

| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane | Ajay V. Potdar | Ravindra M. Bhanage |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

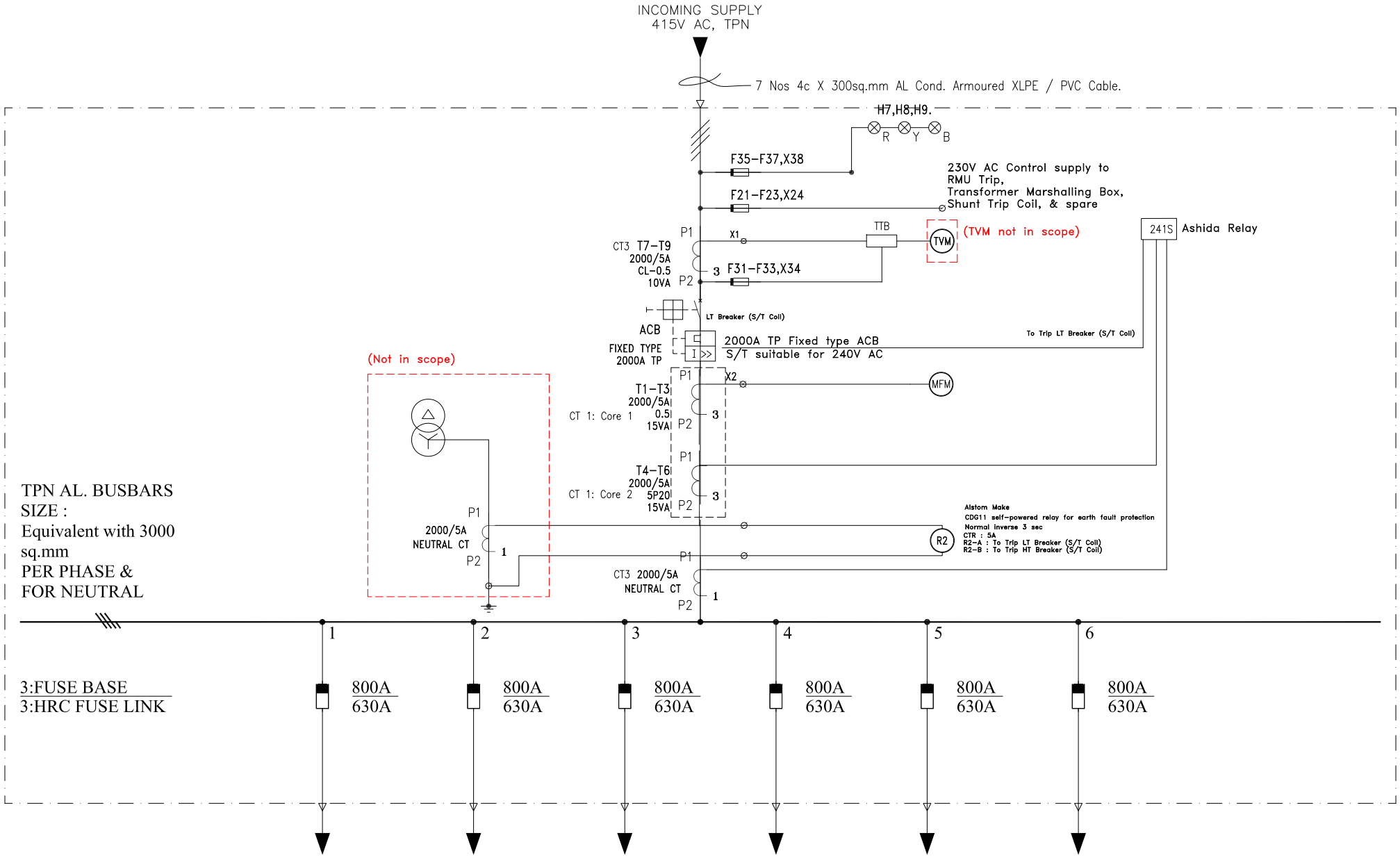
# Annexure – 3

Reference drawings



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |


TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :
Equivalent with area
3000 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
ASHIDA
2415 RELAY
SUPPLY
NPH METER
Aux. SUPPLY
DROPABLE LINK TB
CT1
Core 1
2000/5A
15VA
CL-0.5
CT1
Core 2
2000/5A
15VA
CL-5P20
CT2
NCT
(NOT IN SCOPE)
NEF
2000/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
(TO TRIP HT BREAKER
(RMU))
(TO TRIP LT BREAKER
(S/T COIL))
Q1
2000A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT
INPUT
VOLT
ACB
L/P
TTB
3 PHASE 4 WIRE
TTB(DAV)
BOTTOM
SIDE
TOP
SIDE
4A BASE
NL-8
CT3
2000/5A
15VA
CL-0.5
M1
20A FP MCB
M2
6A SP
MCB
M3
6A SP
MCB
M4
6A SP
MCB
M5
6A SP
MCB
M6
6A SP
MCB
M7
16A SP
MCB
LED BULB
LIGHT-1
LED BULB
LIGHT-2
SPACE
HEATER-1
SPACE
HEATER-2
3PIN
SOCKET
FPI RESET
TO X'MER
MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING
HEATER
NC
FROM ACB
NO
FROM ACB
TO FIELD
TO FIELD
20A BASE
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO.
DEVICE
TRIP
ASHIDA
RELAY
TRIP
FIELD
TO TRIP
RMU BREAKER
ACB
S/T LT
BREAKER
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.




SHEET NO.
01 OF 01

# TECHNICAL SPECIFICATION

## 8 Way 3200 A LT Panel



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

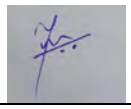
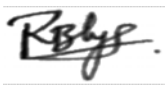
# TECHNICAL SPECIFICATION COVER SHEET

**Document No: ENSE-DS-2033-R00**

**Document Title: Technical SPECIFICATION OF 8 Way 3200 A LT Panels**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R00 | ENSE-DS-2033-R00 (For Tendering Purpose) | 11/01/2024 | YMM |  | AVP |  | RMB |  |
| R2 | SPEC-NET-Feeder Pillar-3200A | 02/03/23 | MY | -sd- | VK | -sd- | SBM | -sd- |
| **Rev No.** | **Remarks** | **Date** | **Initials** | **Sign** | **Initials** | **Sign** | **Initials** | **Sign** |
| | | | **Prepared By** | | **Reviewed By** | | **Approved & Issued By** | |



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
|---|---|---|---|
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
| | 11/01/2024 | 11/01/2024 | 11/01/2024 |

## CONTENTS

**1.0 SCOPE**

This specification covers design, engineering, manufacture; shop testing, inspection, painting, packing, and supply of 415V, 3200 A LT Panel with 8 no Outgoing Feeders complete with all accessories for efficient and trouble-free operation of the distribution network for Tata Power Company Limited at Mumbai.

It is not our intent to specify completely herein all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standards of Engineering design and workmanship and shall be capable of performing in a manner acceptable to the purchaser (TPC) who will interpret the meaning of drawings and specification and shall be entitled to reject any work or material which in his judgement is not in full accordance therewith.

All the bought-out items shall be of reputed make and shall be subject to approval by the PURCHASER (TPC) after award of contract.

**2.0 APPLICABLE STANDARDS**

The equipment shall conform to this specification and latest revision of following codes with all amendments.

| | Title | Indian standard |
|---|---|---|
| 1 | IS 8623 | Specification for low voltage switchgear |
| 2 | IS 12063/ IEC 60529 | Classification of degrees of protection provided by Enclosures of Electrical equipment |
| 3 | IS 5 | Color of ready mixed paints |
| 4 | IS 5082 | Wrought Aluminium & Al alloy plates & sheets for electrical application |
| 5 | IS 2705 | Current Transformers |
| 6 | IS 2551 | Danger Notice plates |
| 7 | IS 13703-2 | Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC. Part 2 Fuses for use by authorized persons |
| 8 | IEC 255 | Protection Relays |
| 9 | IEC 801 | Control and monitoring |
| 10 | IEC 60947-2 /IS 13947-2 | Low Voltage Switchgear & control gear |
| 11 | IEC 60269 | Low Voltage Fuses |

In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.

**3.0 CLIMATIC CONDITIONS OF THE INSTALLATION**

| | | |
|---|---|---|
| 1 | Maximum ambient temperature | 43 deg.C |
| 2 | Max. Daily average ambient temp | 35 deg.C |
| 3 | Min Ambient Temperature | 07 deg.C |
| 4 | Maximum Relative Humidity | 100% |
| 5 | Minimum Relative Humidity | 40% |
| 6 | Average No. of thunderstorm per annum | 50 |
| 7 | Average Annual Rainfall | 2380mm |
| 8 | Average No. of rainy days per annum | 115 |
| 9 | Rainy months | June to Oct. |
| 10 | Altitude above MSL not exceeding | 300 meters |
| 11 | Average Air Pressure | 29.6-inch Hg |

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.

**4.0 GENERAL TECHNICAL REQUIREMENTS**

| Sr. No | Item Description | Tata Power Requirement |
|---|---|---|
| 1 | Manufacturer | Name |
| | | Manufacturer Address |
| | | Contact telephone no |
| 2 | Breaker Rating (ACB) | 3200A Manual Fixed Type without any microprocessor relay. 230V AC Shunt tripping coil to be provided. |
| | Model of ACB | The Model shall be such that current density in current carrying part shall be less than 3 A/sq.mm. (Bidder to mention the model) |
| | Approved Make | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 3 | Main bus bar rating | 3200 A |
| | Bus bar Size for Phase & Neutral | 4000 sq.mm for Phase & Neutral |
| | Earth Bus | 1 x 50 x 10 mm GI |
| 4 | Type of Installation | Indoor / Outdoor Type |
| 5 | No of Incoming feeders | Qnty -1no. of 3200A ACB with 10 Nos of 4CX300 sq.mm Al Ar XLPE cables |
| 6 | No of outgoing feeders (8 Way) | Quantity -8 Nos of 630A each with 3 nos of 4CX300 sq.mm Al Ar XLPE cables per O/G |
| 7 | Panel construction | CRCA sheet steel of thickness 3 mm |
| 8 | Panel enclosure class | IP54 - ingress protection |

| | | |
|---|---|---|
| 9 | Sheet steel thickness | Doors & Covers - 2.5mm, FRAME - 3mm |
| 10 | Door type for front & rear access | Double door with rear door bolted |
| 11 | Door hinges | Minimum three anti-theft type hinges self-locking type |
| 12 | Padlocking facility | For front door |
| 13 | Master key for all doors | Identical for all panels, 1 no./ panel to be provided |
| 14 | Hardware & Fasteners | All Nuts, Bolts, Washers shall be Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. Bolts below 12 mm size shall be SS material. |
| 14a | Current Carrying part hardware | Each bolt on Bus Bar and Fuse terminal shall be provided with Belleville washer and plain washer. Wherever required bimetallic washers to be provided |
| 15 | Phase & neutral Bus bar | Aluminium grade 19501 (H2) as per IS 5082 |
| | Bus bar size in mm for 3200 A O/G | 4000 sq.mm for Phase & Neutral |
| | 3200A ACB Incoming | 4000 sq.mm for Phase & Neutral |
| | ACB O/G LINKS | 4000 sq.mm for Phase & Neutral (Dimensions as per feasibility with Breaker palm connection) |
| 16 | Bus bar color coding for R, Y, B & neutral | Heat shrinkable sleeves with color Red, Yellow, Blue & Black respectively |
| 16 a | Bus Bar Heat shrinkable sleeves | Cross-linked Polyolefin (Bidder to specify thickness) |
| 17 | Main bus bar short circuit withstand capacity | Above 50kA for 1 sec |
| 18 | Permissible maximum temperature rise above ambient of 50°C | Busbar: 45 deg C |
| | Permissible maximum temperature rise above ambient of 50°C | Terminals: 65 deg C |
| 19 | Bus bar support insulators | As per IS13410<br>SMC / DMC, 1100V grade |
| 20 | Incoming Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 21 | Outgoing Cable Size | 4C 300 Sq.mm Al Ar XLPE |
| 22 | Gland plate at panel bottom | HRCA MS 3mm thickness |

| | | |
|---|---|---|
| 23 | Cable termination clearance | 600 mm minimum from gland plate & ACB |
| 24 | Fuse Base | 800 A |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller / Bussmann / ABB |
| 25 | Fuses (630 A) | HRC plug-in type gG (General Purpose, Fast acting fuse) |
| | Approved Make | L&T / Siemens / Schneider / GE Power Control / Jean Muller / Bussmann / ABB |
| 26 | CT's for 3200A Incoming Feeder | 7 Nos. Single resin cast.<br>a) 3 nos dual core CT's of ratio 3200/5A<br>• Core 1: Class 0.5 & 15VA burden – For MFM<br>• Core 2: 5P20 & 15VA – For Ashida make O/C+E/F relay<br>b) 3 nos single core CTs of ratio 3200/5 A, Class 0.5 & 15 VA for Energy meter (Energy meter is not in bidder scope)<br>c) 1 no single core CT of ratio 3200/5A, 5P20 & 15 VA for Neutral unbalance protection<br>Approved Make of CTs: Reco/Newtek/Pragati/Kappa/ECS/Adcon |
| 27 | TTB for Metering | Front connection, Screw Type 3 Phase 4 Wire, 4SF, 50 A, DAV/IMP Make |
| 28 | Wiring convention for TTB | Incoming from Bottom Side & Outgoing to Meter from Top side |
| 29 | Multifunction Digital meter | Should be communicable on Modbus RS 485 |
| 30 | Earth Fault protection relay (NEF) | Alstom make CDG11 self-powered. Relay type is normal inverse with 3 Sec with E/F setting of 0.5 to 2 A |
| 31 | Earthing Hardware | a) Earthing Nut and Bolt shall be M12 SS b) Washers shall be with Hot Dip Galvanized with 80 micron Galvanisation or Alu-Zinc coating. |
| 31a | Panel Earthing | Earthing provision to be provided on both sides with 50 mm extension of main Earth Bus Bar. |
| 32 | Clearance between live parts | Phase - phase -Minimum 25 mm & Phase - earth - Minimum 20 mm |
| 33 | Distance between each fuse outlet | Centre to Centre - 150mm (Minimum) |

| | | |
|---|---|---|
| 34 | Distance between fuse outlet & panel surface | 125 mm (Minimum) |
| 35 | Control terminals for CTs | Stud type with disconnecting facilities |
| 36 | Control terminals for Voltage & other circuits | Stud type |
| 37 | Illumination and Indicating Bulb | LED |
| 38 | Continuous rated operating voltage | 440 volt +/- 10% |
| 39 | High voltage withstand capacity | 2000 volt at 50 Hz for 1minute |
| 40 | Insulation resistance ph-ph & ph-earth | Minimum 10MOhm with 500V Megger |
| 41 | Labels & name plates | As per Specifications |
| 42 | Surface preparation for painting | Sand blasting or 7 tank process |
| 43 | Painting | Sand blasting or 7 tank process. Light grey shade No 631 of IS-5 Powder coated epoxy paint min thickness 120 micron |
| 44 | Power Supply Socket | 5A/15A Plug point socket to be provided |
| 45 | Breaker Barrier | Breaker must have a metallic removable sheet from the front side which will act as a barrier between operator and the breaker. Provision must be given for breaker operation to be done through this barrier. |
| 46 | Branding Plate | All supplied Units shall be fitted with engraved metallic logo of Tata Power on the front side. The Tata Power Co Ltd to be mentioned below the logo with clear font and Dimension 12*12 Inches. * Refer Annexure 2 |
| 47 | Panel Dimensions (Min depth of 900 mm) | L X D X H |
| 48 | Numerical Relay | Ashida (ADR 241S) with 4 Element |
| 49 | Bus-bar phase barriers/ Phase separators (R-Y & Y-B) | FRP insulating sheet - (to be placed near to the phase bus-bar) (min 3 mm thickness) shall be provided between bus-bars, so as to ensure that there is no accidental contact with any live parts. (65 mm width) |

| | | |
|---|---|---|
| **5.0** | **GENERAL CONSTRUCTION** | 1) The feeder pillar frame shall be fabricated using suitable mild steel structural section or pressed and shaped Cold Rolled Closed Annealed (CRCA) sheet of thickness 3 mm.<br><br>2) Frames shall be enclosed by CRCA sheet of thickness 3mm, smoothly finished, levelled and free from flaws. Doors and cover shall be made of CRCA sheet of thickness not less than 2.5mm. Stiffeners shall be provided, wherever necessary. Gland plates shall be of Hot Rolled Closed Annealed (HRCA) thickness not less than 3 mm. alternatively gland can also be provided between two angles so that removal of gland is easy. The dimension of base frame should be 75mm X 40mm X 5 mm.<br><br>3) The panel shall be of metal enclosed and outdoor type, support frame mounted type with canopy of adequate slope to avoid water accumulation. Degree of protection shall be IP 54.<br><br>4) Breaker compartment and fuse compartment should be separated by metallic sheet; the same should be split suitably in order to avoid local heating due to eddy currents generated by three phase bus bars crossing through the same sheet. The breaker compartment should be in center of panel & Outgoings shall be on both the sides of breaker compartment.<br><br>5) The panel shall be of dust and vermin proof construction and of self-cooled design with adequate louvers on sides and top portion. The louvers shall have fine wire mesh made of brass. The minimum depth of panel shall be 900 mm.<br><br>6) Labels on the front and rear indicating the panel designation, phase marking and danger signs shall be provided. Single Line Diagram & feeder details shall be engraved and pasted on inside of panel.<br><br>7) Danger boards shall be provided in local languages on the Hylam sheet below breaker and on front & rear cover with red background and with white letters.<br><br>8) Hinged doors of lift off type, with concealed type with brass type hinges and captive screws shall be provided on the front side & Back side. Adequate numbers of door hinges shall be provided and should be durable and easy in operation. All doors shall be provided with padlocking facility. The design of doors should permit inter-changeability. The back-side doors shall have nut and bolt arrangement. All Hinged doors shall be connected to the earth terminal with 2.5 Sq.mm braided copper wires.<br><br>9) Cable entry facilities at bottom of panel and removable gland plates of size suitable to accommodate incoming & outgoing cables of sizes, 4 Core 300 Sq mm 1.1 KV XLPE Cable, shall be provided at required locations.<br><br>10) Distance between Gland plate and cable termination of Air Circuit Breaker should be minimum 600mm.<br><br>11) The panel shall be provided with gasket all around the perimeter of covers, gland plates, removable covers and doors.<br><br>12) ACB termination shall be with tinned copper or tinned aluminium Bus Bar. Wherever required bimetallic washer to be provide, if bare copper terminal is provided. |

13) Busbars shall be of aluminium with Bakelite shrouding, rated for 3200 A, 50 kA for 1 sec and shall have adequate cross section to carry the rated continuous and short time current. Main Bus bar should be continuous/ without any joint. All bus bars, bus taps and joints shall be PVC taped. Neutral bus bar shall be provided on read side & rated for full bus bar rating.

**14) The ACBs shall be mechanical operated fixed type 3 Pole with shunt trip coil without any microprocessor protection release. Ashida make (ADR41S) relay to be provided for tripping the breaker with Overcurrent & earth faut protection. Spare ACB contacts for shunt trip should be provided.**

15) All fuses shall be of the HRC cartridge type mounted on plug-in type fuse bases having a prospective current of not less than 80 kA.

16) Phase to phase clearance of 25mm and Phase to Neutral / Earth clearance of 20mm shall be provided in the panel.

17) Distance between centre to centre should be minimum 150mm between each fuse outlet and 125mm between fuse outlet and body of panel to be maintained.

18) The panel shall be provided with two separate earthing terminals connected to earth bus.

19) All instruments shall be connected to the earth terminal using 650V grade PVC insulated 2.5 sq mm stranded tinned copper earthing conductor. All Earthing should be routed properly along with body of panel.

20) All hinged doors, Covers, Gland Plates shall be connected to the earth terminal, with the help of braided copper conductors of adequate size. Flat earth bus should be protruded out for connection of external earth

21) Eyebolt of suitable sizes shall be provided for lifting arrangements.

22) All wiring shall be carried out with 650V grade PVC insulated stranded copper conductors of adequate sizes to suit the rated circuit current.

23) The panel shall be powder coated with light shade grade no 631 of IS 5.

24) Required number of foundation bolts shall be supplied with the panel.

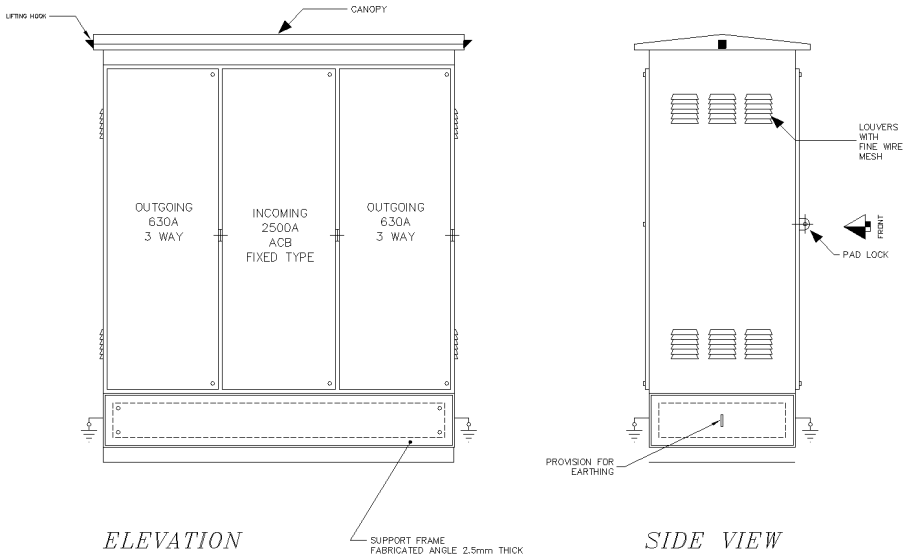
25) Control fuses with control terminals for external cable connections shall be in the breaker chamber only.

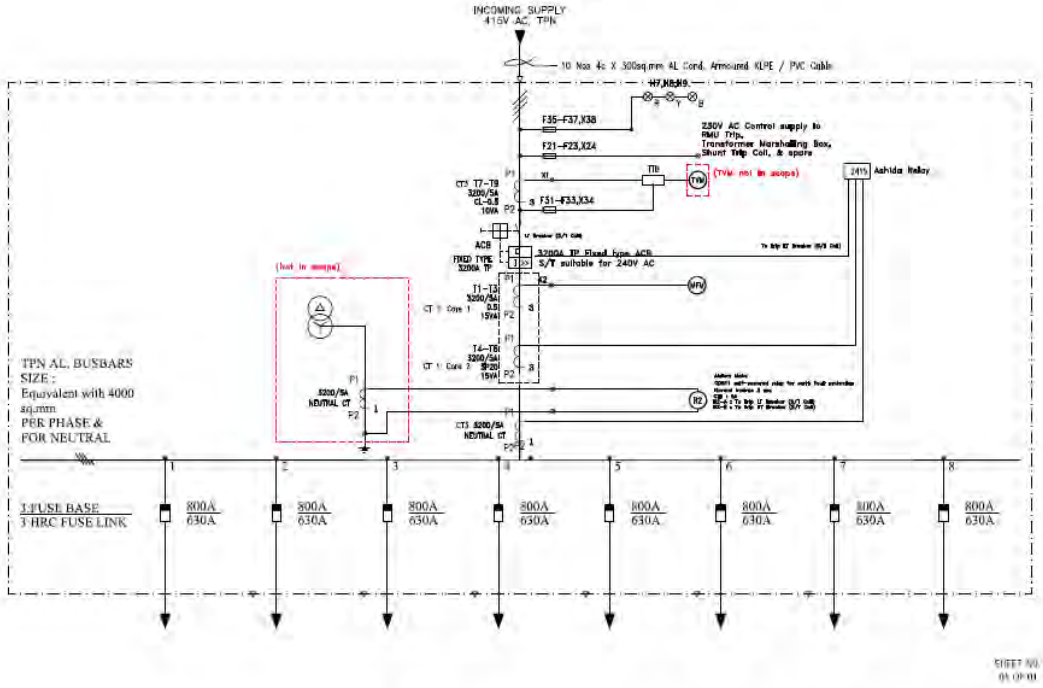
26) The control terminals shall be as follows:
Stud type with disconnecting facilities for CT circuits
Stud type for voltage and other circuits.

27) Fuse bases shall have adequate contact surface with the bus bars provided to ensure that no local heating takes place.

28) Lighting System in Feeder Pillar should be LED based.

8 Way LT Panel: Representative GA drawing & SLD-

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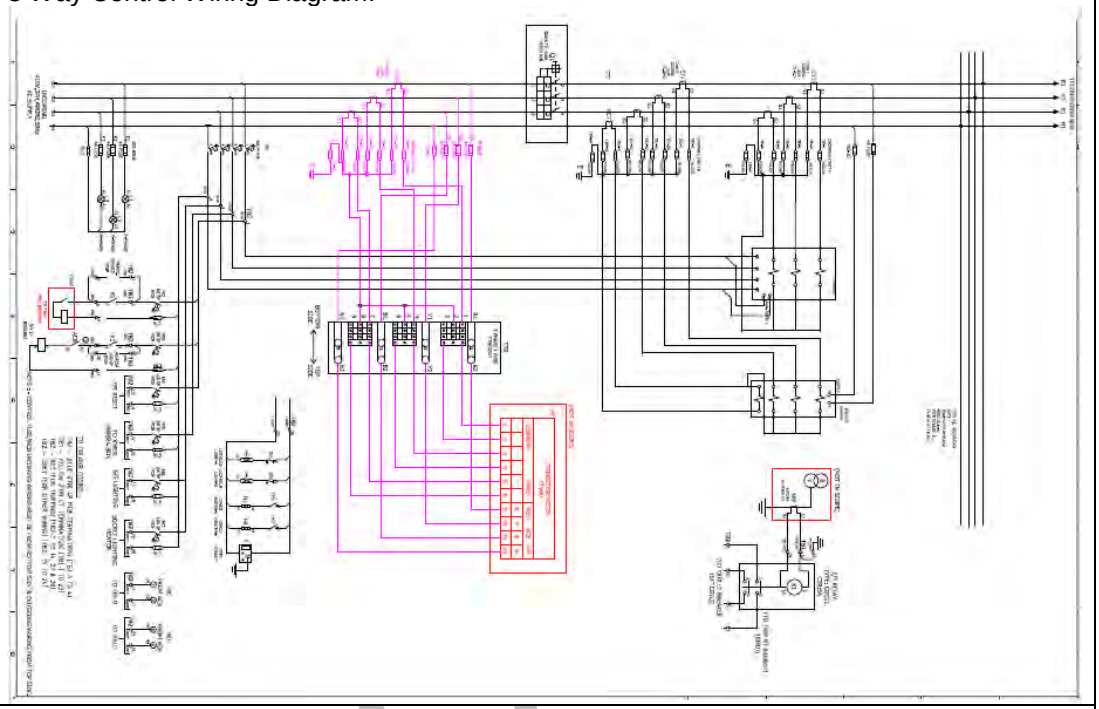
8 Way Control Wiring Diagram:



**5.1 Specific Requirements**

a) The LT Panel should be 8 way type having 8 Nos. outlets per phase respectively as per tender requirement.

b) Material Quality Plan, general arrangement drawing and single line diagram of the feeder pillar to be approved before manufacturing.

c) Adequate cable termination shall be provided as follows

| Sr. No. | TYPE | UoM | No. of Cable | Description |
|---|---|---|---|---|
| 1 | 3200A Incomers | 1No. | 10 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |
| 2 | 8 Way Panel 630 A Fuse Outgoing | 8 no. Per outgoing | 2 | 1.1KV, 4C, 300 sqmm AL cond. Armoured XLPE/PVC Cable |

d) 3200A Incomer shall be provided with resin cast CTs of ratio 3200/5A for metering & protection.

3 nos dual core CT 3200A/5A, Core 1: 0.5 Cl, Core 2: 5P20, 15 VA, to be used for MFM.

3 nos single core CT 3200A/5A, 0.5, 15 VA, to be used for Energy metering.

1 no single core CT 3200A/5A, 5P20, 15 VA, to be used for neutral unbalance protection.

e) All CT termination should be round plug type. No CT shorting arrangement to be provided. (As per SLD)

f) Secondary wiring shall be carried out with 1.1KV grade PVC insulated stranded copper conductor of 2.5 Sq. mm for CT circuits and 2.5 Sq. mm for PT and other circuits. All wires will be colour coded.

| Sr. No. | Equipment | Color | Nomenclature of TBs | Types of TBs |
|---|---|---|---|---|
| 1. | TBs of 4 Pole MCB Termination | Blue | TB2 | Droppable |
| 2. | TBs for CT Termination | Yellow | TB1 | Droppable |
| 3. | TBs for Tripping | Red | TB2 | Droppable |
| 4. | All others | Default | TB2 | Normal |

g) The feeder pillar panel shall be provided with Alstom Make CDG11 self-powered relay for earth fault protection. The relay type is normal inverse with 3 sec with E/F setting of 0.5 to 2 A.

h) Test terminal box for Energy Metering should be Front Connection, Screw Type (4SF), 50 A to be provided and the convention of the wiring in the TTB should be Incoming from the bottom side and outgoing to Meter from top side. There must not be any partition between Relay & metering box in LV compartment. It should be single door compartment. No lugs shall be provided for wires to meter, TTB, and Fuses (PT secondary). Sealing arrangement to be provided for Energy Meters. Inspection glass (Transparent Toughened Glass) to be provided for viewing of meter.

i) All Protection/ control wiring must terminate in LV compartment.

j) Provision to be provided for mounting the energy meter with max dimensions as L x B x D: 360 x 200 x 200 mm (Energy meter will be supplied by TPC). The relay and energy meter shall be installed in the breaker compartment with suitable partitions. The relays shall be supplied by the vendor.

k) The LT panel shall be equipped with shrouded type anti condensation space heaters with thermostat, internal light with switch & 5A/15A metal clad general-purpose plug socket.

l) The following separate control circuit 20A, 4 pole MCB duly wired up to terminal block for purchaser's use shall be provided before the circuit breaker in feeder pillars leading to following single pole MCB with neutral links (refer SLD):

Phase and neutral for 230V supply to RMU. (6A)
Phase and neutral for 230V supply to Transformer marshalling box. (6A)
Phase and neutral for external shunt trip coil (6A)
Phase and neutral for FPI reset (6A)
Separate 16A, DP MCB duly wired for Auxiliary supply for LT panel for following purpose,
Phase and neutral for substation lighting (6A)
Phase and neutral for Socket (15A)/ Heater circuit
Phase and neutral for Ashida overcurrent relay (4A)

m) The following separate control fuses with neutral links duly wired out to a set of stud type link terminals for purchaser's use shall be provided before the circuit breaker in feeder pillars Control fuse Incoming wiring must be from bottom side & Outgoing wiring from top side. (refer SLD):

Three phase and neutral for metering circuit.

Three Phase and neutral for indication lamp

n) Locking should be of welded type. Earthing jumpers to be provided for all the doors. Louvers with stainless steel wire mesh to be provided on body side and cover plate.

o) Makes of various bought out items shall be limited to the following:

| Sr. No. | Items | Approved Make |
|---|---|---|
| 1 | ACB | Schneider/ L&T/ Siemens/ C&S/ ABB/ Eaton |
| 2. | CT | Reco/Newtek/Pragati/Kappa/ECS/Adcon |

p) Flexible copper braiding should be provided on the doors. Neutral bus shall be connected with earth bus. All control cable should be multi stranded and FRLS. CT ISF should be less than or equal to 5. Close and Open status of the breaker should be available on SCADA through spare auxiliary contact and on LT panel through LED Lamp.

q) The fuses provide should be of knife type and same should be removable with the help of fuse puller. There shall be no obstruction during removal of outgoing fuses by fuse puller.

r) The safety locking facility to be provided for putting three nos. of safety locks.

s) Panel minimum width in mm: 900 mm

t) The breaker manufacturer to provide the complete support in terms of training; hand holding to our Testing and O&M staff. The breaker manufacturer to give the support service for next 10 years.

u) The robust isolating arrangement in the OG fuse compartment to be made as per the

| | | |
|---|---|---|
| **6.0** | **NAME PLATE AND MARKING** | 6.1 Name plate- On front door top left side-showing<br>1) Purchaser name & PO number.<br>2) Manufacturer name<br>3) Month / year of manufacturing<br>4) 'Property of Tata Power'<br><br>6.2 Marking for panel earth stud- Black letter 'E', on riveted AI label<br><br>6.3 Danger board in English &local language, riveted on doors- White colour background with red lettering on 1.6mm thick AI plate.<br><br>6.4 SLD shall be engraved & pasted on inside of door.<br><br>6.5 CT Serial Nos., Ratio & ACB Serial Nos. to be written on doors with marker pen.<br><br>6.6 Separate metallic name plate with Tata Power Logo of Dimension 12*12 Inches in clear font as shown in Annexure-2. |
| **7.0** | **TESTS** | All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. Following tests shall be necessarily conducted on the 'Feeder Pillar' in addition to others specified in IS/IEC standards.<br><br>*In case of any conflict on any technical particular, the stricter requirement mentioned in the relevant standard shall be valid. |
| **7.1** | **Type test** | Type test - Only type tested components – ACBs, Fuses, Insulators & aluminium bus bar shall be accepted. Following type test shall be carried out on the assembly.<br><br>a) Verification of temperature-rise limits – Clause 8.2.1 of IS 8623<br>b) Verification of dielectric properties – Clause 8.2.2 of IS 8623<br>c) Verification of short-circuits strength – Clause 8.2.3 of IS 8623<br>d) Verification of continuity of the protective circuit – Clause 8.2.4 of IS 8623<br>e) Verification of clearance and creepage distances – Clause 8.2.5 of IS 8623<br>f) Verification of mechanical operation – Clause 8.2.6 of IS 8623<br>f) Verification of degree of protection – Clause 8.2.7 of IS 8623 |
| **7.2** | **Routine test** | Acceptance & routine test- (Inspection test witness by purchaser as per approved Quality Assurance Plan)<br><br>1) Visual inspection, dimension checks & paint thickness checks.<br>2) Bill of material check<br>3) Insulation resistance test<br>4) High voltage test<br>5) Operational check<br>6) Verification of dielectric properties<br>7) Tolerances on panel dimensions- Maximum +/- 5mm<br>8) No negative tolerance on bus bar dimensions & bus bar clearances<br>9) Stability test shall be conducted on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function. |

| | | |
|---|---|---|
| **7.3** | **Acceptance test** | 1) Visual inspection & dimensional check<br>2) Verification of clearance and creepage distance<br>3) Paint thickness check<br>4) Wiring checks<br>5) Insulation resistance test<br>6) HV test<br>7) Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function.<br>8) 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab) |
| **8.0** | **TYPE TEST CERTIFICATE** | The Bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. Type Test to be conducted on similar Design/ rating panel. All the tests shall be conducted at CPRI / ERDA/ NABL as per the relevant standards. Type test should have been conducted in certified Test Laboratories during the period not exceeding 10 years from the date of opening the bid.<br><br>Type tests shall have been conducted in certified Test laboratories during the period not exceeding 10 years from the date of opening the bid. In case if type test conducted beyond 10 years then bidder to certify on letter head of parent OEM that no design change & no manufacturing plant change occurred from type tested product.<br><br>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. |
| **9.0** | **PRE-DISPATCH INSPECTION** | The Material shall be subject to inspection by a duly authorized representative of the TATA POWER COMPANY. Inspection may be made at any stage of manufacture at the discretion of the Purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TATA POWER COMPANY `s representatives when the work is in progress. Inspection by the TATA POWER COMPANY or its authorized representatives shall not relieve the Bidder of his obligation of furnishing equipment in accordance with the specifications. TATA POWER COMPANY authorized representatives shall have the right to inspect the design, materials and workmanship and to report thereon, at any stage of manufacture, if found necessary. All facilities shall be extended to our representatives for witnessing the tests. Due notice shall be given to us to enable us to depute our representatives for stage inspection.<br>Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TATA POWER COMPANY.<br>Five certified copies of all test certificates including type tests, sample test certificates shall be sent to us for our approval prior to dispatch of materials.<br><br>Following documents shall be sent along with material<br><br>a) Test reports<br>b) MDCC issued by TATA POWER COMPANY<br>c) Invoice in duplicate<br>d) Packing list<br>e) Drawings & catalogue<br>f) Delivery Challan<br>g) Other Documents (as applicable). |

| | | |
|---|---|---|
| **10.0** | **INSPECTION AFTER RECEIPT AT STORE** | The material received at TPC, Mumbai store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery.<br><br>The material should be delivered at TPC, Mumbai stores within 45 days from the date of manufacturing, same shall be checked during delivery and overdue material shall not be accepted. Bidders to plan the delivery accordingly.<br><br>Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. The delay in rectification shall lead to any contractual penalty.<br><br>Billing shall be processed only after acceptance of the material. |
| **11.0** | **GUARANTEE** | Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract.<br><br>In the event any defect is found by the TATA POWER COMPANY up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements) Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the TATA POWER COMPANY will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.<br><br>In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.<br><br>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 AND TRANSPORT** | Bidder shall ensure that the item covered under this specification shall be packaged for rail/road transport in a manner so as to protect the equipment from damage in transit.<br><br>1) Packing protection- Against shocks, vibration & corrosion, damages during transportation<br>2) Packing identification labels, to show purchaser name, PO number, quantity of panels, Panel type, Manufacturer serial number<br>3) Handling instruction- To be marked on packing boxes.<br>4) Bidders should prefer to use recyclable & environmentally friendly materials for packing.<br>5) No single use plastic to be used.<br>6) Packing should be done with environment friendly recyclable materials. |
| **13.0** | **TENDER SAMPLE** | Not Applicable |



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| **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 within the parameters of the delivery schedule shall be furnished.<br><br>TATA POWER COMPANY shall reserve the sole rights for the type test of a random sample from the lot and in case of any discrepancy or deviation from the Type test certificates submitted along with the Bid; the complete Lot shall be rejected.<br><br>TATA POWER COMPANY representative or its nominated representative shall have free access to the Bidder's works to carry out inspections.<br><br>If anything missing in QAP and required as per other clauses of this document, bidder is liable to perform the same without cost implication. |
| **15.0** | **MINIMUM TESTING FACILITIES** | Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards and as specified above. |
| **16.0** | **MANUFACTURING ACTIVITIES** | The successful bidder will have to submit first GTP & Drawing with 7 days from placement of outline agreement for approval and complete the approval process within 14 days of outline agreement. 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, AND TOOLS** | Keys of door |
| **18.0** | **DRAWING AND DOCUMENTS** | Following drawings and documents shall be prepared based on TATA POWER COMPANY specifications and statutory requirements and shall be submitted with the bid.<br>All the documents & drawings shall be in English language<br><br>a) Completely filled in Technical Particulars<br>b) General description of the equipment and all components including brochures.<br>c) General arrangement drawing.<br>d) Bill of material<br>e) Experience List<br>f) Type test certificates<br>g) Any other technical document, if required |
| **19.0** | **SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS** | Bidders to comply for all above requirement of specifications clauses & submit signed and stamp copy as technical compliance document. |

**20.0 SCHEDULE "B"DEVIATIONS**

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(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:

| Sr.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 :

# Annexure – 1

Inspection Testing Plan

1. Visual inspection & dimensional check
2. Verification of clearance and creepage distance
3. Paint thickness check
4. Wiring checks
5. Insulation resistance test
6. HV test
7. Stability test on all Panels, to ensure there shall be no tripping in case of unbalance current on earth fault function
8. 1 unit from 1st lot shall be tested for Temperature rise test with ACB and fuses. (Bidder to arrange for the same, either in factory or in external lab)



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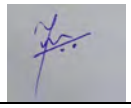
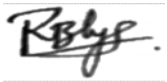
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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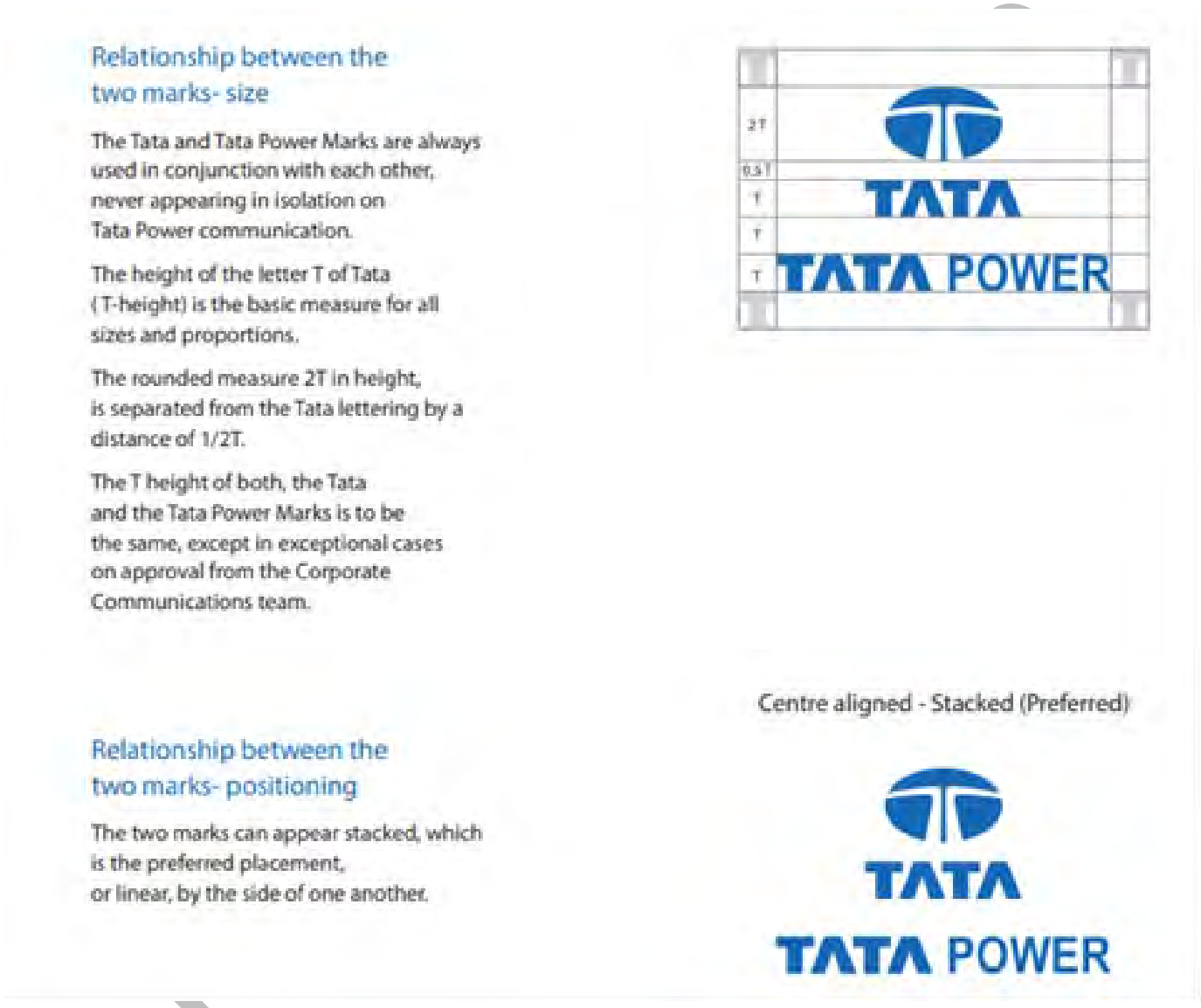
# Annexure – 2

**Tata power Branding Name plate -**

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

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# Annexure – 3

Reference drawings



| Rev No. | Prepared By & Date | Checked By & Date | Approved for Issue By & Date |
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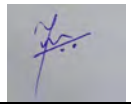
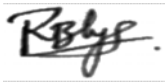
| R00 | Yash M. Mane  | Ajay V. Potdar  | Ravindra M. Bhanage  |
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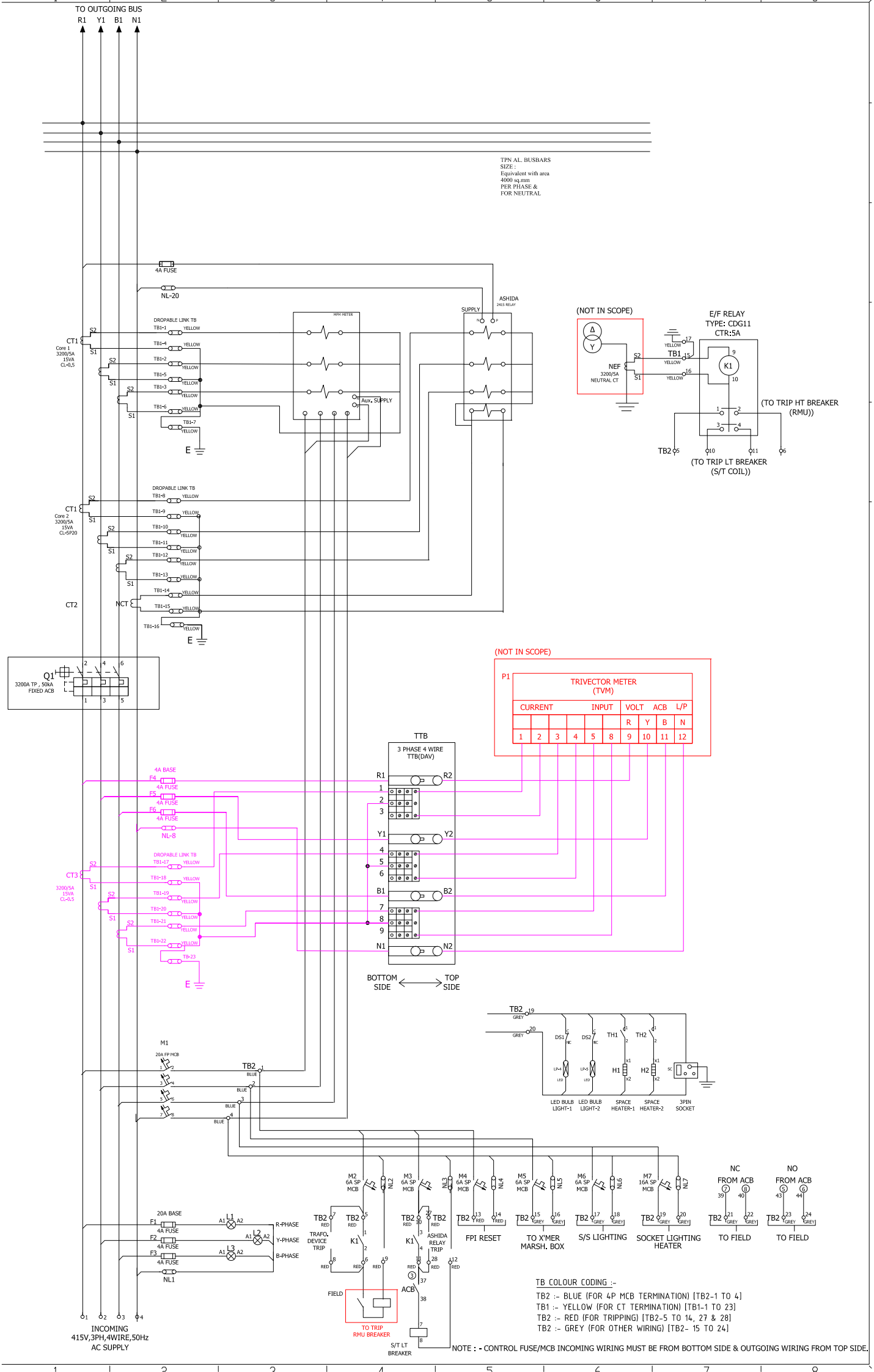
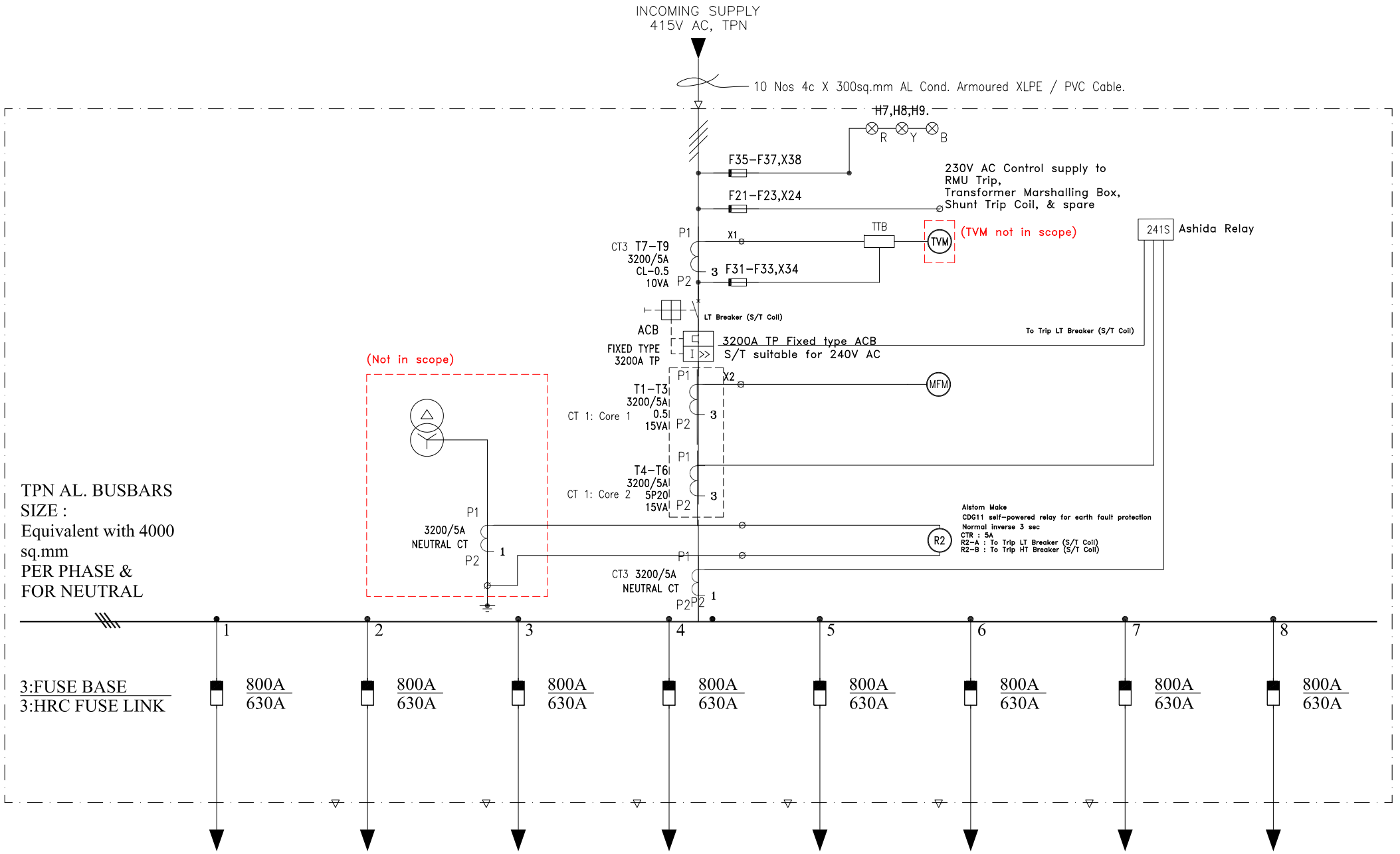

TO OUTGOING BUS
R1 Y1 B1 N1
TPN AL. BUSBARS
SIZE :
Equivalent with area
4000 sq.mm
PER PHASE &
FOR NEUTRAL
4A FUSE
NL-20
ASHIDA
24IS RELAY
SUPPLY
MPM METER
DROPABLE LINK TB
CT1
Core 1
3200/5A
15VA
CL-0.5
Aux. SUPPLY
E
(NOT IN SCOPE)
NEF
3200/5A
NEUTRAL CT
E/F RELAY
TYPE: CDG11
CTR:5A
TB1
K1
(TO TRIP HT BREAKER
(RMU))
TB2
(TO TRIP LT BREAKER
(S/T COIL))
Core 2
3200/5A
15VA
CL-5P20
CT2
NCT
Q1
3200A TP , 50kA
FIXED ACB
(NOT IN SCOPE)
P1
TRIVECTOR METER
(TVM)
CURRENT
INPUT
VOLT
ACB
L/P
R
Y
B
N
1 2 3 4 5 8 9 10 11 12
TTB
3 PHASE 4 WIRE
TTB(DAV)
R1
R2
Y1
Y2
B1
B2
N1
N2
BOTTOM
SIDE
TOP
SIDE
4A BASE
F4
F5
F6
NL-8
CT3
3200/5A
15VA
CL-0.5
TB-23
M1
20A FP MCB
TB2
BLUE
LED BULB
LIGHT-1
LED BULB
LIGHT-2
SPACE
HEATER-1
SPACE
HEATER-2
3PIN
SOCKET
M2
6A SP
MCB
NL2
M3
6A SP
MCB
NL3
M4
6A SP
MCB
NL4
M5
6A SP
MCB
NL5
M6
6A SP
MCB
NL6
M7
16A SP
MCB
NL7
NC
FROM ACB
NO
FROM ACB
20A BASE
F1
F2
F3
NL1
R-PHASE
Y-PHASE
B-PHASE
TRAFO.
DEVICE
TRIP
ASHIDA
RELAY
TRIP
FPI RESET
TO X'MER
MARSH. BOX
S/S LIGHTING
SOCKET LIGHTING
HEATER
TO FIELD
TO FIELD
FIELD
ACB
TO TRIP
RMU BREAKER
S/T LT
BREAKER
INCOMING
415V,3PH,4WIRE,50Hz
AC SUPPLY
TB COLOUR CODING :-
TB2 :- BLUE (FOR 4P MCB TERMINATION) [TB2-1 TO 4]
TB1 :- YELLOW (FOR CT TERMINATION) [TB1-1 TO 23]
TB2 :- RED (FOR TRIPPING) [TB2-5 TO 14, 27 & 28]
TB2 :- GREY (FOR OTHER WIRING) [TB2- 15 TO 24]
NOTE : - CONTROL FUSE/MCB INCOMING WIRING MUST BE FROM BOTTOM SIDE & OUTGOING WIRING FROM TOP SIDE.

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