NIT No.: TPCODL/P&S/1000000085/ 20-21

Ref: TPCODL/P&S/1000000085/2021-22 (Open tender Regarding RC for supply of LT Distribution Box for 25,63,100,250,500 KVA ,11/0.433KV Distribution transformer.

Sub: **Corrigendum – IV**

Following amendments in Colour, Dimension of Enclosers ,LT CT specification & Technical Specification of LTDB are as follows:

1. LTDB Colour shall be OFF

   (i) White for SMC Enclosures (25KVA to 100KVA)) and

   (ii) Siemens Grey (RAL 7032) for GI Enclosures. (250 KVA & 500 KVA).

2. Dimension:

Existing	Amended / Read as
Dimensions in mm (Height X Width X Depth) 1. For 25KVA Distribution box:1000X500x170 2. For 63KVA Distribution box:1010x1000x325 3. For 100KVA Distribution box:1010x1000x325 4. For 250KVA Distribution box :1800x1600x500 5. For 500KVA Distribution box : 2300x2500x500	Dimensions in mm (Height X Width X Depth) 1. For 25KVA Distribution box :800X1000X300 2. For 63KVA Distribution box :1050x1305x325 3. For 100KVA Distribution box :1050x1305x325 4. For 250KVA Distribution box :1800x1600x500 5. For 500KVA Distribution box :2300x2000x500

Drawing for Tender Purpose in TS. Subject to small changes as per Manufacturer's type tested design while considering required clearances as per relevant Standards.

3. CT Ratio shall be as per detailed Engineering. Specification shall be as per Annexure-2 of TS.

4. Technical Specification for 25KVA,63KVA,100KVA Panel (SMC Enclosure) and 250KVA,500KVA Panel (GI enclosures)also attached below.

All other terms and conditions of the above open tender remain unaltered.

By Order,
Chief (Procurement & Stores)

CONTENTS

1. SCOPE

This Specification covers the design, manufacture, testing at works and supply of L.T Distribution Boxes made out of SMC (S3 grade) conforming IS : 13410-1992 for controlling the L.T. feeders from the L.T. side of Distribution for Feeders upto 100KVA. The system shall be A.C. 3 phase, 4 wires, 433 V, 50 HZ with effectively grounded neutral.

2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International standards and shall confirm to the regulations of the local authorities.

S.NO	Indian Standard	Title
1	IS 5039	Specification for distribution pillars below 1000V AC
2	IS :13947/1993 (Part 3)	Specification for Isolator (Switch Disconnector)
3	IS: 13947/1993 (Part2) (amended upto date)	Specification for L.T. MCCBs.
4	IS: 8623/1993 (amended upto date)	Specification for enclosure Box & for degree of protection provided by enclosures of electrical equipments.
5	IS: 4237/1982 IS: 8623/1993 (amended upto date)	Specification for general requirement of L.T. switchgears.
6	IS 13703/1993 (Part I & II amended upto date)	Specification for HRC Fuse Base and HRC Fuse Link.
7	IS: 13410: 1992	Specification for Sheet Moulding compound (SMC) Enclosure
8	IS: 13411: 1992	Specification for Glass Reinforced Polyester Dough Moulding Compounds.
9	IS 2705	Current Transformer

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

a) Max. Ambient Temperature : 50 deg.C
b) Max. Daily average ambient temp : 40 deg.C
c) Min Ambient Temp : 0 deg.C
d) Maximum Humidity : 90%
e) Minimum Humidity : 10%
f) Average Annual Rainfall : 1458 mm

The atmosphere across coastal divisions of TPCODL is very Saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months.The area is Cyclone prone with wind speed upto 300KM.

4. GENERAL TECHNICAL REQUIREMENTS

Standard General Arrangement MCCB In the incoming & HRC fuse base with HRC fuse links in the Outgoing Circuit. Provision space for fixing 3 Phase energy meter.

5. GENERAL CONSTRUCTIONS

Distribution Boxes shall have triple-pole MCCB on incoming circuit and HRC fuse base with HRC fuse links on outgoing circuits with necessary interconnecting Bus Bars/Links. The distribution box shall have provision for installation of 3 Phase energy meter.
LTDB for 25KVA, 63KVA, 100KVA will be pole mounted .Suitable arrangements in Scope of Bidder.

5.1 INCOMING CIRCUIT

Each distribution box shall have 1 nos. of triple-pole MCCB rating suitable for 25KVA/63 KVA /100 KVA KVA Box to protect out going circuits. MCCB shall be conforming as mentioned below table. The bidder shall indicate the makes and types of MCCBs offered in GTP. The Bidder shall furnish detailed type test reports before or on due date & time of submission of tender. Opening & Closing of MCCB shall only be manual .MCCB should electrically open during fault. The MCCB should be front operated triple pole type.

5.2 OUTGOING CIRCUIT

1. HRC FUSE :
   HRC Fuse of suitable capacity shall be provided on outgoing terminal of MCCB to facilitate electrical breaking of the circuit. Each Distribution Box shall have HRC Fuse Base with HRC Fuse (Blade type Contacts) on Outgoing Circuit. The bidder shall indicate in GTP, the make, type,Fault Rating and capacity of HRC Fuse Base and Fuse offered.

2. HRC FUSE BASE
   The base of the HRC Fuse shall be of non-tracking, heat resistant insulating material of Dough Moulding Compound (DMC) of D3Grade as per IS: 13411/1992. The Fuse Base shall be sturdy in construction. The extension terminal connector strips of the Fuse Base shall be projecting out on both sides, made with two pieces (half portion of the terminal contact and extension strip should be continuous in one piece).

DT RATING	LTDB Incoming MCCB-3P	O/G-1 HRC Fuse Rating	O/G-II HRC Fuse Rating	O/G-III HRC Fuse Rating	O/G-IV HRC Fuse Rating
25KVA	40A	6No's x 25A HRC fuse			
63KVA	100A	100A	63A	NA	NA
100KVA	160A	160A	100A	NA	NA

3. The Bidder shall furnish detailed type test reports before or on due date & time of submission of tender. The HRC fuse base with HRC fuse to be provided in the Distribution Box. Each Distribution box shall have provision for fixing of three phase tri-vector energy meter & suitable rating CTs for DT metering. CT arrangement will be the incoming side of MCCB.
4. Meter size 400mm x 400mm x 150mm.
   Metering Terminal Block shall be provided by bidder.

Suitable arrangements to be given to physically isolate the meter from Busbar area for safety purpose.

5 Current Transformers :The Bidder has to supply Base Mounted Current Transformers .
CT Specification as per Annexure-2.
Suitable CT Ratios to be selected by Bidder.

5.3 BUSBARS AND CONNECTIONS:

The Incomer feeder should be on Left side of the distribution box and all outgoing feeders will be on Right side of the distribution box, with phase sequence RYB to be maintained. The phase bus bars and feeder droppers from bus bars shall be of electrolytic grade Aluminium with purity 99.5%.

1) **The Incomer Feeder dropper & Bus Bar for 25KVA LTDB will be 25 X 3 mm Cross Section**
2) **The Incomer Feeder dropper & Bus Bar for 63KVA LTDB will be 25 x 6 mm cross section.**
3) **The Incomer Feeder dropper & Bus Bar for 100KVA LTDB will be 25 x 8 mm cross section.**

All bus bars and droppers shall be properly drilled and deburred. Each bus bars shall be of one single strip without any joint. At the joint with copper part the aluminium end piece shall be bimetallic with sufficient thickness. Bus bars shall be provided with durable PVC insulating sleeves of standard colour code for different phases. Corrugated/Spring & Plain washers shall be used for Nut-Bolt connections. Bus bars shall be mounted on suitable size support insulators which should be tightened from inside. i.e. once fitted, should not be able to removed. Minimum clearances, wherever shown, shall be as per General Arrangement shall be as per requirement of IS: 4237/1982 amended up to date.

1) Minimum Clearance between **Phase to Earth** to be maintained : **40mm**
2) Minimum Clearance between **Phase to Phase** to be maintained : **40mm**

5.4 ENCLOSURE:

The enclosure shall be made up of Thermosetting Plastic, Sheet Moulding Compound (SMC) As per confirming IS 13410 of 3 mm thickness . The manufacturing process of Box shall be moulding type. SMC distribution boxes, the rounding of corners and slope on Top shall be as shown in the drawing. No joints in the body of the Box are permitted. The enclosure shall be dust proof, rust proof, vermin and water proof, ultra violet stabilized and flame retardant property.

SMC SHEET PROPERTIES (APPLICABLE FOR PANEL UPTO 100KVA)

Sr. no	Test Details	Requirement for S3 electrical Grade	Type of test	Reference standard
1.	Glass Content , % by mass , minimum	20	type	Annexure –A of IS : 13411: 1992
2.	Flow, mm, Min	170	Acceptance	Annexure – C of IS : 13411: 1992
3.	Mould shrinkage , linear percent, Max	0.25	Acceptance	Annexure – B of IS : 13411: 1992
4.	Density of Moulding , g/ml	1.8 to 2.1	Routine	IS:8543 (part 1/Sec2:1970)
5.	Water Absorption, % Max.	0.01	Acceptance	Annex. D of ofIS : 13411: 1992
6.	Izod Impact Strength (Notched), KJ/m2, Min	55	Type, Acceptance for S2	Annex.E IS : 13411: 1992
7.	Tensile Strength ,MPa, Min	70	Type, Acceptance for S2	IS:8543 Part 4/1984)
8.	Flexural Strength, Mpa	170	Type	Annex. F of IS13411:1992.
9	Modulus of Elasticity,103 MPa	12 to 15	Type	IS 8543 (Part 4/Sec1) : 1984
10	Surface Resistivity (24H in Water), Ohm, Min	$1x10^{13}$	Routine	IS3396:1979
11	Volume Resistivity , Ohm-cm,Min	$1x10^{14}$	Routine	IS3396:1979
12	Tracking Resistance CTI, Min	1000	Type	IS2824:1975
13	Power Arc Resistance, sec, Min	180	Type(Acceptance for S2)	Annex. G of IS13411:1992

14	Dielectric Strength at 90°C In Oil KV/Min	11	Type	IS 6262:1971
15	Dissipation factor (4 days at 80% RH & 1 KHz)	0.01	Type	IS4486:1967
16	Heat Distortion Temperature, C, Min	150	Type	Annex. H of 13411:1992
17	Oxygen Index, % Min		24	Type (Part6/Sec6):1992
18	Flammability (Vo)	-	Type	UL 94 or IS : 11731(Pt.II)
19	Glow wire test	-	Type	IEC – 695 –2-1 or IS :11000(Pt 2/sec.1)
20	Ball pressure test	-	Type	IEC : 335
21	Mechanical Strength	-	Type	IS : 14772
22	Marking, Dimensions and construction	-	Routine	IS : 14772
23	Spirit burner test (Self Extinguishing)	-	Type	IS : 4249
24	Melting point (to test up to 400ºC) should not melt		Type	IS :13360

The general clear dimensions of Distribution boxes without considering colour of box.

Dimensions in mm (Height X Width X Depth) :

For 25KVA Distribution box :800X1000X300

For 63KVA Distribution box :1050x1305x325

For 100KVA Distribution box :1050x1305x325

The above dimension are indicative, the box should able to accommodate all equipments with sufficient rating & required clearances . The design should also be maintenance friendly so that the replacement of any equipment can be done without any difficulty.

The Base and doors of SMC enclosure shall be individually in one piece, except for fixing of the accessories like hinges, clamps, mounting clamps, bolts etc.

Boxes shall have centre opening swing double door type with four hinges as shown in drawing. On closing of doors, right door shall rest on the left door. Base and doors shall have flange / collars. Collar of Base and doors shall overlap by 10mm. Rubber gasket of suitable size shall be provided in between base and doors, such that it provides proper sealing between the door and base of box to avoid penetration of dust & ingress of water. Degree of protection shall be IP-55 . Rubber Gasket shall be fixed with suitable adhesive. Hinges shall be stainless type ,minimum 50 mm in length & made from 2mm thickness. The hinges shall not be visible from outside.Padlocking arrangement should be provided outside the Door.

The MCCBs, HRC Fuse, Meter, CT and HRC fuse base shall be housed inside the enclosure.

Four set of Louvers (two sets on each side) of suitable size shall be provided as shown in drawing. The louvers shall be provided such that heat dissipation is proper. The perforated sheet of 20 SWG with 2.5 mm holes shall be welded from inside of the louvers.

Mounting of components inside the enclosure shall allow free air circulation keeping the clearances as per drawings

5.5 LOCKING ARRANGEMENT TO THE BOX

A. The door should be front operated with a common handle provided outside the door. In addition to this, Pad lock to be provided in Centre & C&R panel door locks shall be provided to the door at top & bottom. Key way shall be provided on the door for operating the lock from outside. Key way shall be provided with cover. A nylon washer shall be provided between the handle and door to avoid penetration of water.

B. Electrolytic grade aluminium neutral busbar will be same rating as phase bus bar with current density 1 Amp/sqmm.

C. Neutral Busbar shall be isolated with respect to body. The bimetallic lugs of adequate size, as per enclosed specification & drawing, shall be provided. Neutral Busbar shall be as shown in the drawing attached with the specifications.

D. Two galvanized earthing Bolts of suitable size shall be fixed from inside and projecting outside of the box . There should be no powder coating on the earthing bolts. Two Nuts with washers shall be provided on each bolt.

E. Necessary fixing arrangement shall be provided at the back of the enclosure to ensure proper fixing on double pole structure by means of suitable clamps at 4 places.

F. Danger Board drawing attached with specifications shall be riveted on the box as per IS: 2551. Danger board marking by painting shall not be accepted.

G. All the components inside the Box shall be mounted on SMC BOX. The mounting strips shall be provided with required bends or ribs to give the extra strength and shall be powder coated or zinc plated.

H. All joints of current carrying parts shall be bolted with 8.8 grade High Tensile SS Nuts & Bolts, Corrugated/spring & Plain Washers. The nuts & bolts should be of hexagonal type. All the nuts, bolts & washers should be properly zinc plated.

I. Each distribution box shall be supplied with proper packing in five ply - corrugated box.

J. Name plate having details such as Month & year of manufacturing, Name of manufacturer/Trade mark, Sr.No, and rating of Distribution box, shall be riveted on the Distribution box door. The name plate should be of stainless steel of thickness 1 mm. TPCODL logo shall be embossed on the door of the distribution box.

K. Incoming and outgoing circuit should be duly highlighted with paint by stencil printing.

L. Adequate slope on the top of box shall be provided to drain out rainwater from the top.

Good-quality plastic sticker leaflet should be pasted inside of distribution box door. The matter of instruction leaflet is given along with this specification. All the instructions in leaflet should be in Odia/Hindi/English language.

6. MARKING

The LTDB box shall carry the following information contained in a label attached to it :

a) Reference to the Standards.
b) Manufacturer's name
c) Year of manufacture.
d) The following shall be embossed on the LTDB," PROPERTY OF TPCODL."

e) Danger Name plates, Supply voltage-440v
f) Purchase Order number
g) Warranty has to be marked on the nameplate of the enclosure with another warranty sticker (Metal Riveted) to be placed inside the enclosure with date and other details related to warranty.

7. TESTS

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All Acceptance Tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted on the LTDB components in additions to others specified in the IS/IEC Standards.All these Type Test should be conducted at CPRI/ERDA.Type Test report validity should not exceeded more than 5 Years from the date of testing.

TYPE TESTS

i. **ON COMPLETE BOX:**

- Temperature rise test:-The temperature rise test should be carried out as per IS: 8623 -1993 .
- High voltage test shall be carried out as per IS:8623/ 1993 amended upto date.
- Short Time Withstand Current Test on Distribution Box shall be carried out as per IS 8623 or latest version.
- Degree of protection for IP- 55 on complete box shall be carried out as per IS: 13947/1993 or the latest version thereof.
- Time /current characteristic test on MCCBs shall be carried out as per clause 7.2 of this specification as stated above.
- For Panels of SMC material,Tests in line with Cl. 11.1 and IS: 13410-1992 for Sheet Moulding Compound (SMC) Enclosure for conformance to the values specified therein

ii. **ON HRC fuses base and HRC fuse** :

All type tests on HRC fuses and HRC fuse links IS 13703/1993 (Part I & II date) for HRC Fuse Base and HRC fuse link shall be carried out.

ii. **ON MCCB**:

All type tests on MCCB as per IS-13947 amended upto date shall be carried out.

ACCEPTANCE TESTS

Following tests shall be carried out as per acceptance tests in addition to routine tests on one random sample of each rating out of the lot offered for inspection:

1. Temperature rise test on one sample of each rating. Temperature rise test will be carried out as per the procedure given below: For temperature rise test, a distribution box with all assembly of MCCBs / HRC fuse base with HRC fuse link shall be kept in an enclosure such that the temperature outside the box shall be maintained at 50 ° C.
   20% more current than transformer secondary capacity i.e. for 63 KVA Distribution Transformers full load current 84A, 20 % more is 100 A shall be kept in incoming circuit keeping outgoing circuits short, till the temperature stabilizes and maximum temperature rise should be recorded.
2. Time-Current Characteristics The MCCB should be tested for time current characteristics at 1.05 & 1.2 times of overload release setting current and should pass the requirement given in clause- 7.2.

ROUTINE TESTS

1. Overall Dimensions Checking.
2. Insulation Resistance Tests.
3. High Voltage Test at 2500 V, 50 Hz AC for one minute.
4. Operation Test on MCCB/Link Disconnector / HRC fuse base and HRC fuse links.
5. Thermal overloading Test for MCCB
6. Contact Resistance Test

8. TYPE TEST CERTIFICATES

The Bidder shall furnish the type test certificates of the LTDB for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL

9. PRE DISPATCH INSPECTION

The Material shall be subject to inspection by a duly authorized representative of the TPDCOL. 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 grant free access to the places of manufacture to TPCODL's representatives at all times when the work is in progress. Inspection by the TPCODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL.

Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPDDL
c) Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORES

The material received at TPCODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of 108 months from the date of commissioning or 120 months from the date of last supplies made under the contract, whichever is later. Bidder shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Purchaser, failing which the Purchaser 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. In case of any issue in LTDB and its components within the guarantee period the purchaser will immediately inform the Bidder who shall take back the LTDB components within 15 days

from the date of intimation at his own cost and replace / repair the faulty component within forty-five days of date of intimation with a roll over replaced shall not be counted for arriving at the guarantee period.

Waste Handling:

As per the guidelines issued by NGT/MOEF/CPCB and as per "Plastic Waste Management Rules 2016", we need to make sure that, the collection of waste generated by SMC/FRP Enclosures at the end of the useful life for recycling/re-use/proper disposal to be done.
Following this rule,Vendor has to specify the useful life of the enclosure supplied by them. It will be the sole responsibility of the vendor to collect the waste of the enclosures supplied by them at the end of the product life cycle.

12. PACKING

Supplier shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly.

13. TENDER SAMPLE

Bidder shall submit the sample of material with the offer (in case of first supply to TPCODL).

14. 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. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

15. 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.

16. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

17. SPARES, ACCESSORIES AND TOOLS

Bidder shall provide a list of recommended spares with quantity and unit prices for 5 years of operation after commissioning. The Purchaser may order all or any of the spare parts listed at the time of contract award and the spare parts so ordered shall be supplied as part of the definite works. The Purchaser may order additional spares at any time during the contract period at the rates stated in the Contract Document.

Bidder shall give an assurance that spare parts and consumable items will continue to be available through the life of the equipment which shall be 25 years minimum. However, the Purchaser shall be given a minimum of 12 months' notice in the event that the Bidder or any sub-vendor plans to discontinue manufacture of any component used in this equipment. Any spare apparatus, parts or tools shall be subject to the same specification, tests and conditions as similar material supplied under the Contract. They shall be strictly interchangeable and suitable for use in place of the corresponding parts supplied with the plant and must be suitably marked and numbered for identification.

18. DRAWINGS AND DOCUMENTS

Following documents shall be prepared based on TPCODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

a) Completely filled in Technical Particulars.
b) General description of the equipment and all components including brochures.
c) Type test Certificates
d) Experience List/Performance Certificate from reputed Customers

After the approval of the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser

Following Drawings/Documents shall be submitted after the award of the contract

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates.		√	√
4	Installation Instructions		√	√
5	Transport/shipping dimension drawing		√	√
6	QA & QC Plan	√	√	√
7	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

19. GUARANTEED TECHNICAL PARTICULARS

GUARANTEED TECHNICAL PARTICULARS FOR LTDB 25 KVA DISTRIBUTION TRANSFORMER

Sr No.	PARTICULARS	OFFERED
1	Material of the Meter Box	Thermosetting Plastic, Sheet Moulding Compound (SMC) As per confirming IS 13410
2	Manufacturing Process.	Hot Press Moulding
3	Color of Box	Off White
4	Dimension of Box (HeightXWidthXDepth)	800X1000X300
5	*THICKNESS OF BOX,door,support SMC*	3 mm
i	*Load Bearing Size*	3 mm (Min.)
ii.	*Non Load Bearing size*	3 mm (Min.)
iii	*Door*	Centre Opening Double Door Swing
6	*Strip Hinges*	Minimum 4 Hinges on each door.Stringes-Stainless Steel
7	*Pad Lock arrangement*	Provided
9	*Whether sufficient sealing provided to make dust, water and vermin proof?*	Rubber Gasket
10	*Provided Louvers For ventilation*	Yes 4 Nos
11 a	*Whether inlet and outlet arrangement for service cable provided. Please mention dimension of holes?*	Bottom Entry
b	*Whether for incoming and outgoing cables provisions of glands of suitable size have been made. Please mention its dimension?*	1) suitable for I/c cable -4C x35Sqmm -1No's 2) 6 Nos. O/g PVC glands suitable for 27mm Cable dia entry hole at bottom side
12	*In coming aluminum Bus Bar R, Y, B, N*	25X3mm
13	*Outgoing Aluminum Riser /Dropper*	25x3 mm
16	*No. of connections on each bus bar*	Each phase bus bar 01 no. Incomer and 02 nos outgoings circuit
17	*Bus bar arrangement*	Step mounting arrangement
18	*Busbar mounting insulator*	SMC mounting Insulator

19	*Clearance between busbars.*	40 mm Min
20	*Clearance between busbar & Box walls.*	40 mm Min
21	*Sealing arrangement*	Hole for Wire Sealing
22	*Markings*	Danger name Plate, Supply voltage-440V ,SL no & Property of 'TPCODL' ,Screen Printed
23	*Degree of protection*	IP-55 (Min)
24	*Packing*	Standard Corrugated box packing
25	*Earthing Provision*	M8 x 40 mm-2nos,
26	*Incoming arrangement*	40 Amp MCCB, 40KA TP MCCB -01 Nos
27	*Make of MCCB*	ABB, Siemens, L&T, EATON,Schneider, Legrand.MCCB Should have intregated OL , SC & E/F Protection
28	*Outgoing arrangement*	25 Amp HRC Fuse (06 Nos)- L&T, Siemens,EATON
29	*Terminal Spreader rating*	Minimum cross sectional are must be equivalent to the Incomer bus bar size. Spreader needs to be L-shaped for R and B-phase and straight type for Y-phase
30	*Glands*	Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box.
31	*Provision of LT switch & socket*	1 set of light, socket & switch is provided for availing power auxiliary single phase supply of 16Amp.
32	*Provision of Space for Energy Meter*	To be provided by Bidder
33	*Provision of Space for CT*	To be provided by Bidder
34	*Provision of LED Indication on Incoming supply R,Y, B with Fuse protection*	To be provided by Bidder
35	*Provision of NO & NC Contact for status monitoring of MCCB*	To be provided by Bidder

GUARANTEED TECHNICAL PARTICULARS FOR LTDB 63 KVA DISTRIBUTION TRANSFORMER

Sr No.	PARTICULARS	OFFERED
1	Material of the Meter Box	Thermosetting Plastic, Sheet Moulding Compound (SMC) As per confirming IS 13410
2	Manufacturing Process.	Hot Press Moulding
3	Color of Box	Off White
4	Dimension of Box (HeightXWidthXDepth)	1050x1305X325 mm
5	*THICKNESS OF BOX*	3 mm
i	*Load Bearing Size*	3mm (Min.)
ii.	*Non Load Bearing size*	3mm (Min.)
iii	*Door Type*	Centre Opening Double Door Swing
6	*Strip Hinges*	Minimum 4Hinges on each door.Hinges should be stainless steel
7	*Pad Lock arrangement*	Provided
9	*Whether sufficient sealing provided to make dust, water and vermin proof?*	Rubber Gasket
10	*Provided Louvers For ventilation*	Yes 4 Nos
11 a	*Whether inlet and outlet arrangement for service cable provided. Please mention dimension of holes?*	Bottom Entry
b	*Whether for incoming and outgoing cables provisions of glands of suitable size have been made. Please mention its dimension?*	1) Incoming cable suitable for 4CX95Sqmm 2) 2 Nos. holes for outgoing suitable Cable of dia 4CX95Sqmm
12	*In coming aluminum Bus Bar R, Y, B, N*	25 x 6 mm ,
13	*Outgoing Aluminum Riser /Dropper*	25 x 6 mm
16	*No. of connections on each bus bar*	Each phase bus bar 01 no. Incomer and 02 nos. outgoings circuit
17	*Bus bar arrangement*	Step mounting arrangement
18	*Busbar mounting insulator*	*SMC mounting Insulator*

19	*Clearance between busbars.*	40 mm Min
20	*Clearance between busbar & Box walls.*	40 mm Min
21	*Sealing arrangement*	Hole for Wire Sealing
22	*Markings*	Danger name Plate, Supply voltage-440V ,SL no & Property of 'TPCODL',Screen Printed
23	*Degree of protection*	IP-55 (Min)
24	*Packing*	Standard Corrugated box packing
25	*Earthing Provision*	M8 x 40 mm-2nos,
26	*Incoming arrangement*	100 Amp 40KA TP MCCB- 01 Nos
27	*Make of MCCB*	ABB, Siemens, L&T, EATON,Schneider, Legrand.MCCB Should have intregated OL , SC & E/F Protection.
28	*Outgoing arrangement*	100 Amp HRC Fuse (03 Nos), 63 Amp HRC Fuse (03 Nos). L&T, Siemens, eaton.
29	*Terminal Spreader rating*	Minimum cross sectional are must be equivalent to the Incomer bus bar size. Spreader needs to be L-shaped for R and B-phase and straight type for Y-phase
30	*Glands*	Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box.
31	*Provision of LT switch & socket*	1 set of light, socket & switch is provided for availing power auxiliary single phase supply of 16Amp.
32	*Provision of Space for Energy Meter*	To be provided by Bidder
33	*Provision of Space for CT*	To be provided by Bidder
34	*Provision of LED Indication on Incoming supply R,Y, B with Fuse protection*	To be provided by Bidder
35	*Provision of NO & NC Contact for status monitoring of MCCB*	To be provided by Bidder

GUARANTEED TECHNICAL PARTICULARS FOR LTDB 100 KVA DISTRIBUTION TRANSFORMER

Sr#	PARTICULARS	OFFERED
1	Material of the Meter Box	Thermosetting Plastic, Sheet Moulding Compound (SMC) As per confirming IS 13410
2	Manufacturing Process.	Hot Press Moulding
3	Color of Box	Off White
4	Dimension of Box (HeightXWidthXDepth)	1050x1305x325 mm
5	*THICKNESS OF BOX*	
i	*Load Bearing Size*	3.0 mm (Min.)
ii.	*Non Load Bearing size*	3.0 mm (Min.)
iii	*Type of Door*	Centre opening double door swing Type
6	*Strip Hinges*	Minimum 3 Hinges on each door.
7	*Panel Type Lock arrangement*	Provided
9	*Whether sufficient sealing provided to make dust, water and vermin proof?*	Rubber Gasket
10	*Provided Louvers For ventilation*	Yes 4 Nos
11 a	*Whether inlet and outlet arrangement for service cable provided. Please mention dimension of holes?*	Bottom Entry As per drawing
b	*Whether for incoming and outgoing cables provisions of glands of suitable size have been made. Please mention its dimension?*	For 100 KVA: 2) Incoming cable Hole suitable to 4CX150Sqmm 3) For Outgoing cable 2 Nos. holes suitable to 4CX150Sqmm cable
12	*In coming aluminum Bus Bar R,Y,B,N*	25 x 8mm ,
13	*outgoing Aluminum Riser/Dropper*	25 x 8mm
16	*No.of connections on each bus bar*	Each phase bus bar 01 no Incomer and 02 nos outgoings circuit

17	*Bus bar arrangement*	Step mounting arrangement
18	*Busbar mounting insulator*	*SMC mounting Insulator*
19	*Clearance between busbars.*	40 mm Min
20	*Clearance between busbar & Box walls.*	40 mm Min
21	*Sealing arrangement*	Hole for Wire Sealing
22	*Markings*	Danger name Plate, Supply voltage-440V , SL no & Property of 'TPCODL',Screen Printed
23	*Degree of protection*	IP-55 (Min)
24	*Packing*	Standard Corrugated box packing
25	*Earthing Provision*	M6 x 35 mm, 02 Nos
26	*Incoming arrangement*	For 100 KVA : 160 Amp 40KA TP MCCB -01 No.
27	*Make of MCCB*	ABB, Siemens, L&T, EATON,Schneider, Legrand.MCCB Should have intregated OL , SC & E/F Protection
28	*Outgoing arrangement*	For 100 KVA : 160Amp HRC Fuse base (03 Nos) and 100Amp HRC Fuse base (03 Nos). HRC Fuse make- L&T, Siemens, EATON
29	*Terminal Spreader rating*	Minimum cross sectional are must be equivalent to the Incomer bus bar size. Spreader needs to be L-shaped for R and B-phase and straight type for Y-phase
30	*Glands*	Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box.
31	*Provision of LT switch & socket*	1 set of light, socket & switch is provided for availing power auxiliary single phase supply of 16Amp.
32	*Provision of Space for Energy Meter*	To be provided by Bidder
33	*Provision of Space for CT*	To be provided by Bidder
34	*Provision of LED Indication on Incoming supply R,Y, B with Fuse protection*	To be provided by Bidder
35	*Provision of NO & NC Contact for status monitoring of MCCB*	To be provided by Bidder

20. SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH TECHNICAL BID)

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

S. No	Clause No.	Details of deviation with justifications

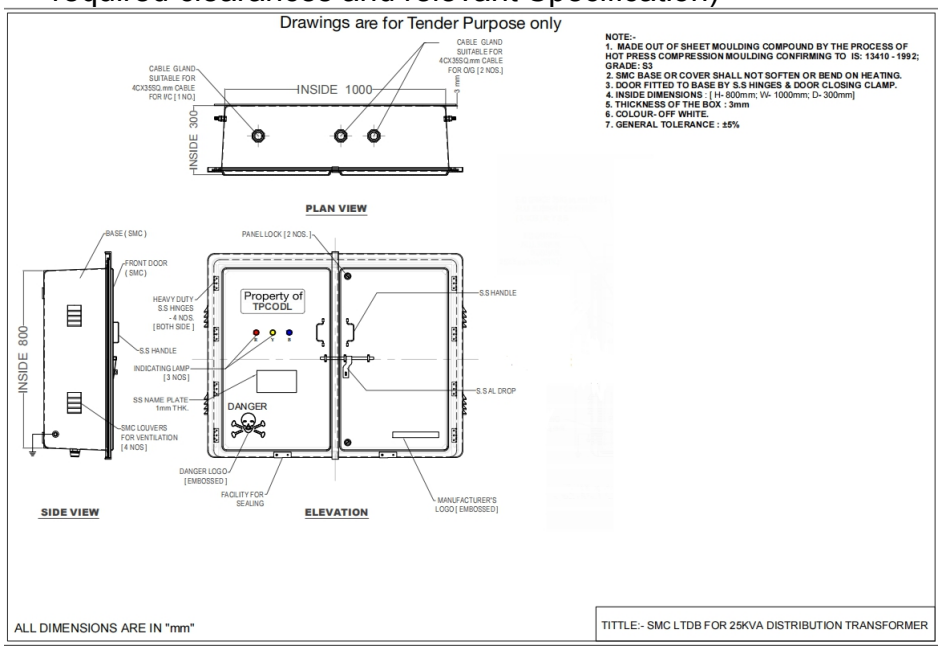
We confirm that there are no deviations apart from those detailed above.

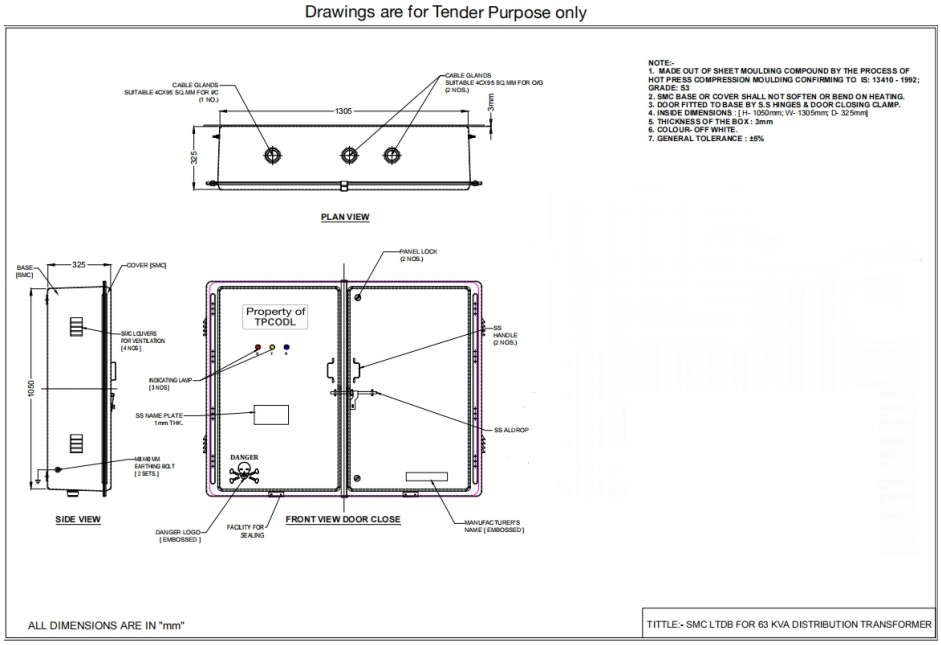
Seal of the Company:

Signature

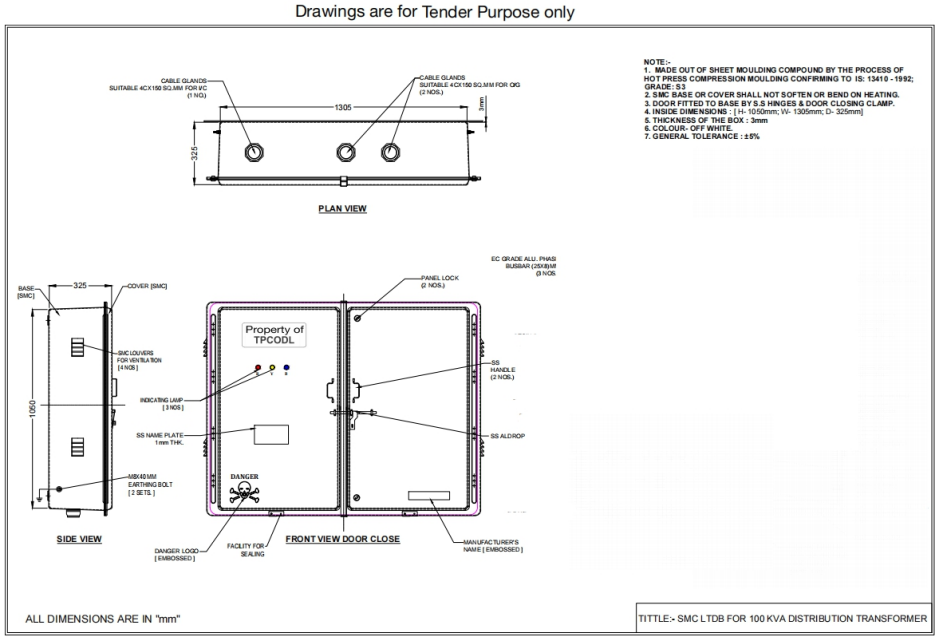
Designation

22. DRAWING (Subject to change as per manufacturers design while maintaining required clearances and relevant Specification)





Drawings are for Tender Purpose only



Annexure-2

TECHNICAL SPECIFICATION FOR RESIN CAST RING TYPE CURRENT TRANSFORMERS FOR USE INSIDE THE BOX.
(To be Housed Inside the DSS Box)

1.0 SCOPE

This specification covers resin cast ring type LT Current Transformers confirming to IS-2705/1992 or the latest version thereof are of class 0.5 accuracy, 5VA burden, for use in conjunction with -/5A or 100/5A energy meters of class 0.5. CTs will be design for indoor use to install in the metering box.

2.0 APPLICABLE STANDARDS:

LT CTs shall comply with the Indian Standard Specification IS: 2705/1992 (Part- I & II) and the latest version thereof.

3.0 TYPE AND RATING OF L.T.CURRENT TRANSFORMERS:

LT CTs shall be of the following type and ratings:

Sl.No.	Particulars	Requirement
1.0	Capacity or Rating	
	a) Rated Voltage b) No. of Cores c) Primary Current / Ratio d) Rated Output Burden. e) Rated Continuous Thermal current temperature rise over ambient f) Continuous Primary Current g) One Minute withstand Power Frequency Voltage for Primary & secondary winding h) ISF i) Rated Short Time Current j) Frequency k) Type	a) 415 V, 50 Hz (Phase to phase) b) One c) 50/5 ,100/5A, 200/5A, 400/5A, 800/5A, 1000/5A, 1500/5A d) 5VA e) As per IS:2705/1992 or latest version thereof f) 1.2 times of rated current g) 3 KV h) Less than 5 i) 5 kA for 1 Second j) 50 Hz k) Ring Type
2.0	Class of Accuracy	0.5

	Material i. Core ii. Conductor iii. Insulation	 High-grade non-ageing electrical low loss core Super enamelled copper wire of requisite diameter. Resin cast
3.0	**Primary & secondary Terminals** i. Primary ii. Secondary terminal	Primary Conductor (Bus Bar of required current carrying capacity) will pass through Ring type CT. Proper marking will be provided for current direction identification. Inner diameter (I.D.) of CT will be minimum 45mm or as per size of bus bar for all ratings of CT & will increase as per the current rating of CTs. Secondary Terminals S1 & S2 will be clearly marked.

4.0 TESTS:

4.1 Routine Test

Current Transformer shall comply with all routine tests including accuracy test prescribed in relevant IS: 2705/1992.

4.2 ACCEPTANCE TEST:

All routine tests as stipulated in the relevant standards shall be carried out by the manufacturer and to produce at the time of inspection before the inspector.

4.3 TYPE TEST

Type test of CT shall be submitted with the bid carried out as per IS:2705 by NABL approved laboratory / test house. Type test shall be not earlier than 5 years from the date of bid opening. Drawing of the CT and its arrangement on bus bar shall be submitted with the offer .

5.0 RATING PLATE:

Following shall be printed/engraved on the name plate of CTs.

i- Sl.No.

ii- CT ratio
iii- VA burden
iv- Class of accuracy.
v- Name of manufacturer
vi- Year of manufacturing
vii- PO No. & Date
viii- "Property of TPCODL" should be mentioned on name plate
viii- Polarity should be marked on the body of the offered LT CTs.

6.0 GENERAL TECHNICAL SPECIFICATION

i) Current transformer shall have an opening in the center to accommodate a primary conductor that will be bus-bar.

ii) Current transformers shall be of Resin cast type, suitable for indoor installation, type of resin shall be "Cycloaliphatic Resin" class of insulation shall be "F" as specified in IS:2705.

iii) The minimum internal diameter for ring type CTs should suitable to accommodate a primary conductor i.e. bus-bar of Distribution transformer.

iv) The polarity marking on the offered CT primary & secondary side should be embossed.

v) A two core (2.5sq. mm, as per relevant IS) HR FR PVC insulated flexible multi strand copper cable shall come out directly from the CT as secondary terminal. The length of the wire shall be around 2 Mtrs. Which is directly connected to the energy meter's terminals, pin type lugs shall be required on open end of cable.

Core details of cable shall be : Core–1 : S1, Core -2 : S2.

LT CTs shall be of Brick red colour.

CONTENTS

1. SCOPE

This Specification covers the design, manufacture, testing at works and supply of L.T Distribution Boxes made out of GI for controlling the L.T. feeders from the L.T. side of Distribution for Feeders . The system shall be A.C. 3 phase, 4 wires, 433 V, 50 HZ with effectively grounded neutral.

2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian, International standards and shall confirm to the regulations of the local authorities.

S.NO	Indian Standard	Title
1	IS 5039	Specification for distribution pillars below 1000V AC
2	IS :13947/1993 (Part 3)	Specification for Isolator (Switch Disconnector)
3	IS: 13947/1993 (Part2) (amended upto date)	Specification for L.T. MCCBs.
4	IS: 8623/1993 (amended upto date)	Specification for enclosure Box & for degree of protection provided by enclosures of electrical equipments.
5	IS: 4237/1982 IS: 8623/1993 (amended upto date)	Specification for general requirement of L.T. switchgears.
6	IS 13703/1993 (Part I & II amended upto date)	Specification for HRC Fuse Base and HRC Fuse Link.
7	IS 4759 : 1996	Hot-Dip Zinc Coating On Structural Steel and Other Allied Product
8	IS 2705	Current Transformer

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

a) Max. Ambient Temperature : 50 deg.C
b) Max. Daily average ambient temp : 40 deg.C
c) Min Ambient Temp : 0 deg.C
d) Maximum Humidity : 90%
e) Minimum Humidity : 10%
f) Average Annual Rainfall : 1458 mm

The atmosphere across coastal divisions of TPCODL is very Saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months.The area is Cyclone prone with wind speed upto 300KM.

4. GENERAL TECHNICAL REQUIREMENTS

Standard General Arrangement MCCB In the incoming & HRC fuse base with HRC fuse links in the Outgoing Circuit. Provision space for fixing 3 Phase energy meter.

5. GENERAL CONSTRUCTIONS

Distribution Boxes shall have triple-pole MCCB on incoming circuit and HRC fuse base with HRC fuse links on outgoing circuits with necessary interconnecting Bus Bars/Links. The distribution box shall have provision for installation of 3 Phase energy meter.
Enclosure shall be of GI (Hot Dip Galvanised).
LTDB for 250KVA & 500KVA LTDB will be PLINTH mounted.
Bidder has to supply GI frame along with Distribution box for 250KVA & 500KVA LTDB.
Process for Galvanisation shall be as per Annexure-1

5.1 INCOMING CIRCUIT

Each distribution box shall have 1 nos. of triple-pole MCCB rating suitable for 250 KVA /500 KVA Box to protect out going circuits. MCCB shall be conforming as mentioned below table. The bidder shall indicate the makes and types of MCCBs offered in GTP. The Bidder shall furnish detailed type test reports before or on due date & time of submission of tender. Opening & Closing of MCCB shall only be manual .MCCB should electrically open during fault. The MCCB should be front operated triple pole type.

5.2 OUTGOING CIRCUIT

1. HRC FUSE :

   HRC Fuse of suitable capacity shall be provided on outgoing terminal of MCCB to facilitate electrical breaking of the circuit. Each Distribution Box shall have HRC Fuse Base with HRC Fuse (Blade type Contacts) on Outgoing Circuit. The bidder shall indicate in GTP, the make, type,Fault Rating and capacity of HRC Fuse Base and Fuse offered.

2. HRC FUSE BASE

   The base of the HRC Fuse shall be of non-tracking, heat resistant insulating material of Dough Moulding Compound (DMC) of D3Grade as per IS: 13411/1992. The Fuse Base shall be sturdy in construction. The extension terminal connector strips of the Fuse Base shall be projecting out on both sides, made with two pieces (half portion of the terminal contact and extension strip should be continuous in one piece).

DT RATING	LTDB Incoming MCCB-3P	O/G-1 HRC Fuse Rating	O/G-II HRC Fuse Rating	O/G-III HRC Fuse Rating	O/G-IV HRC Fuse Rating
250KVA	500A	200A	200A	160A	100A
500KVA	800A	315A	315A	200A	160A

3. The Bidder shall furnish detailed type test reports before or on due date & time of submission of tender. The HRC fuse base with HRC fuse to be provided in the Distribution Box. Each Distribution box shall have provision for fixing of three phase tri-vector energy meter & suitable rating CTs for DT metering. CT arrangement will be the incoming side of MCCB.

4. Meter size 400mm x 400mm x 150mm.
   Metering Terminal Block shall be provided by bidder.
   Suitable arrangements to be given to physically isolate the meter from Busbar area for safety purpose.
5 Current Transformers :The Bidder has to supply Base Mounted Current Transformers .
   CT Specification as per Annexure-2.
   Suitable CT Ratios to be selected by Bidder.

5.3 BUSBARS AND CONNECTIONS:

The Incomer feeder should be on Left side of the distribution box and all outgoing feeders will be on Right side of the distribution box, with phase sequence RYB to be maintained. The phase bus bars and feeder droppers from bus bars shall be of electrolytic grade Aluminium with purity 99.5%.

1) **The Incomer Feeder dropper & Bus Bar for 250KVA LTDB will be 50 x 8 mm cross section.**
2) **The Incomer Feeder dropper & Bus Bar for 500KVA LTDB will be 75X12 mm cross section.**

All bus bars and droppers shall be properly drilled and deburred. Each bus bars shall be of one single strip without any joint. At the joint with copper part the aluminium end piece shall be bimetallic with sufficient thickness. There should be Heat Shrinkable bus bar insulation Sleeves of Red,Yellow,Blue & Black. . Bus bars shall be mounted on suitable size support insulators which should be tightened from inside. i.e. once fitted, should not be able to removed. Minimum clearances, wherever shown, shall be as per General

Arrangement shall be as per requirement of IS: 4237/1982 amended up to date.
1) Minimum Clearance between **Phase to Earth** to be maintained : **40mm**
2) Minimum Clearance between **Phase to Phase** to be maintained : **40mm**

5.4 ENCLOSURE:

The L.T. Distribution Cabinets shall be Plinth Mounted .These Distribution Cabinets are to be outdoor type and to be fabricated out of 3 mm GI sheet. The body of the boxes shall have sufficient re- enforcement with suitable size of channels keeping a provision for fixing these boxes on plinths.Enough reinforcement should be provided to make the enclosure suitable to be used in Cyclone prone/High intensity wind areas.
All GI Sheets and Supports shall be Hot Dip Galvanised.
The general clear dimensions of Distribution boxes without considering colour of box.
Note:(Dimensions are subject to small variations as per Manufacturer's Type Tested Design ensuring necessary clearance as per relevant IS between all Electrical Components)

Dimensions in mm (Height X Width X Depth) :
For 250KVA Distribution box :1800x1600x500
For 500KVA Distribution box : 2300x2000x500

The above dimension are indicative, the box should be able to accommodate all equipments with sufficient rating & required clearances as per relevant standards . The design should also be maintenance friendly so that the replacement of any equipment can be done without any difficulty.

The nuts, bolts, washers used in the box shall be galvanized to avoid rusting.
The box shall have two nos of solid Earthing points on either side .
Boxes shall have centre opening swing double door type with four hinges as shown in drawing. On closing of doors, right door shall rest on the left door. Base and doors shall have flange / collars. Collar of Base and

doors shall overlap by 10mm. Rubber gasket of suitable size shall be provided in between base and doors, such that it provides proper sealing between the door and base of box to avoid penetration of dust & ingress of water. Degree of protection shall be IP-55 . Rubber Gasket shall be fixed with suitable adhesive. Hinges shall be stainless type ,minimum 50 mm in length & made from 2mm thickness or suitable size to brovide enough strength.. The hinges shall not be visible from outside.Padlocking arrangement should be provided outside the Door.
The MCCBs, HRC Fuse, Meter, CT and HRC fuse base shall be housed inside the enclosure.

Four set of Louvers (two sets on each side) of suitable size shall be provided as shown in drawing. The louvers shall be provided such that heat dissipation is proper. The perforated sheet of 20 SWG with 2.5 mm holes shall be welded from inside of the louvers.
Mounting of components inside the enclosure shall allow free air circulation keeping the clearances as per drawings

Painting

All paint shall be applied on clean dry surfaces under suitable atmospheric conditions by seven tank process and powder coating. The overall paint thickness shall not be less than 70 microns.
The paint shall not scale off or crinkle or be removed by abrasion during normal handling.
The enclosure of the Panel shall be painted with shade light Grey, i.e. RAL 7032. The Panel should be painted with Anticorrosive paints. If any damage observed after delivery same need to be touch-up painted after delivery at site. The paint should sustain for harsh environment & saline weather , Corrosion Protection for Panel entire life cycle(minimum 10 yrs) .

5.5 LOCKING ARRANGEMENT TO THE BOX

A. The door should be front operated with a common handle provided outside the door. In addition to this, Pad lock to be provided in Centre & C&R panel door locks shall be provided to the door at top & bottom. Key way shall be provided on the door for operating the lock from outside. Key way shall be provided with cover. A nylon washer shall be provided between the handle and door to avoid penetration of water.
B. Electrolytic grade aluminium neutral busbar will be same rating as phase bus bar with current density 1 Amp/sqmm.
C. Neutral Busbar shall be isolated with respect to body. The bimetallic lugs of adequate size, as per enclosed specification & drawing, shall be provided. Neutral Busbar shall be as shown in the drawing attached with the specifications.
D. Two galvanized earthing Bolts of M8 x 40 mm size shall be fixed from inside and projecting outside of the box . There should be no powder coating on the earthing bolts. Two Nuts with washers shall be provided on each bolt.
E. Necessary fixing arrangement shall be provided at the back of the enclosure to ensure proper fixing on double pole structure by means of suitable clamps at 4 places.
F. All the components inside the Box shall be mounted on GI BOX. The mounting strips shall be provided with required bends or ribs to give the extra strength and shall be powder coated or zinc plated.

G. All joints of current carrying parts shall be bolted with 8.8 grade High Tensile SS Nuts & Bolts, Corrugated/spring & Plain Washers. The nuts & bolts should be of hexagonal type. All the nuts, bolts & washers should be properly zinc plated.
H. Each distribution box shall be supplied with proper packing in five ply - corrugated box.
I. Name plate having details such as Month & year of manufacturing, Name of manufacturer/Trade mark, Sr.No, and rating of Distribution box, shall be riveted on the Distribution box door. The name plate should be of stainless steel of thickness 1 mm. TPCODL logo shall be embossed on the door of the distribution box.
J. Incoming and outgoing circuit should be duly highlighted with paint by stencil printing.
K. Adequate slope on the top of box shall be provided to drain out rainwater from the top.
Good-quality plastic sticker leaflet should be pasted inside of distribution box door. The matter of instruction leaflet is given along with this specification. All the instructions in leaflet should be in Odia/Hindi/English language.

6. MARKING

The LTDB box shall carry the following information contained in a label attached to it:

a) Reference to the Standards.
b) Manufacturer's name
c) Year of manufacture.
d) The following shall be embossed on the LTDB," PROPERTY OF TPCODL."
e) Danger Name plates, Supply voltage-440v
f) Purchase Order number
g) Warranty has to be marked on the nameplate of the enclosure with another warranty sticker (Metal Riveted) to be placed inside the enclosure with date and other details related to warranty.

Danger Board drawing attached with specifications shall be riveted on the box as per IS: 2551. Danger board marking by painting shall not be accepted.

7. TESTS

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All Acceptance Tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted on the LTDB components in additions to others specified in the IS/IEC Standards.All these Type Test should be conducted at CPRI/ERDA.Type Test report validity should not exceeded more than 5 Years from the date of testing.

TYPE TESTS

i. **ON COMPLETE BOX:**

- Temperature rise test:-The temperature rise test should be carried out as per IS: 8623 -1993 .
- High voltage test shall be carried out as per IS:8623/ 1993 amended upto date.
- Short Time Withstand Current Test on Distribution Box shall be carried out as per IS 8623 or latest version.
- Degree of protection for IP- 55 on complete box shall be carried out as per IS: 13947/1993 or the latest version thereof.
- Time /current characteristic test on MCCBs shall be carried out as per clause 7.2 of this specification as stated above.

ii. **ON HRC fuses base and HRC fuse** :
All type tests on HRC fuses and HRC fuse links IS 13703/1993 (Part I & II date) for HRC Fuse Base and HRC fuse link shall be carried out.

ii. **ON MCCB**:
All type tests on MCCB as per IS-13947 amended upto date shall be carried out.

ACCEPTANCE TESTS

Following tests shall be carried out as per acceptance tests in addition to routine tests on one random sample of each rating out of the lot offered for inspection:

1. Temperature rise test on one sample of each rating. Temperature rise test will be carried out as per the procedure given below: For temperature rise test, a distribution box with all assembly of MCCBs / HRC fuse base with HRC fuse link shall be kept in an enclosure such that the temperature outside the box shall be maintained at 50 ° C.
   20% more current than transformer secondary capacity i.e. for 63 KVA Distribution Transformers full load current 84A, 20 % more is 100 A shall be kept in incoming circuit keeping outgoing circuits short, till the temperature stabilizes and maximum temperature rise should be recorded.
2. Time-Current Characteristics The MCCB should be tested for time current characteristics at 1.05 & 1.2 times of overload release setting current and should pass the requirement given in clause- 7.2.

ROUTINE TESTS

1. Overall Dimensions Checking.
2. Insulation Resistance Tests.
3. High Voltage Test at 2500 V, 50 Hz AC for one minute.
4. Operation Test on MCCB/Link Disconnector / HRC fuse base and HRC fuse links.
5. Thermal overloading Test for MCCB
6. Contact Resistance Test

8. TYPE TEST CERTIFICATES

The Bidder shall furnish the type test certificates of the LTDB for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPCODL

9. PRE DISPATCH INSPECTION

The Material shall be subject to inspection by a duly authorized representative of the TPDCOL. 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 grant free access to the places of manufacture to TPCODL's representatives at all times when the work is in progress. Inspection by the TPCODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL.

Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPDDL
c) Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORES

The material received at TPCODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of 108 months from the date of commissioning or 120 months from the date of last supplies made under the contract, whichever is later. Bidder shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Purchaser, failing which the Purchaser 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. In case of any issue in LTDB and its components within the guarantee period the purchaser will immediately inform the Bidder who shall take back the LTDB components within 15 days from the date of intimation at his own cost and replace / repair the faulty component within forty-five days of date of intimation with a roll over replaced shall not be counted for arriving at the guarantee period.

12. PACKING

Supplier shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport and be packed in such a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly.

13. TENDER SAMPLE

Bidder shall submit the sample of material with the offer (in case of first supply to TPCODL).

14. 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. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

15. 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.

16. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

17. SPARES, ACCESSORIES AND TOOLS

Bidder shall provide a list of recommended spares with quantity and unit prices for 5 years of operation after commissioning. The Purchaser may order all or any of the spare parts listed at the time of contract award and the spare parts so ordered shall be supplied as part of the definite works. The Purchaser may order additional spares at any time during the contract period at the rates stated in the Contract Document.

Bidder shall give an assurance that spare parts and consumable items will continue to be available through the life of the equipment which shall be 25 years minimum. However, the Purchaser shall be given a minimum of 12 months' notice in the event that the Bidder or any sub-vendor plans to discontinue manufacture of any component used in this equipment. Any spare apparatus, parts or tools shall be subject to the same specification, tests and conditions as similar material supplied under the Contract. They shall be strictly interchangeable and suitable for use in place of the corresponding parts supplied with the plant and must be suitably marked and numbered for identification**.**

18. DRAWINGS AND DOCUMENTS

Following documents shall be prepared based on TPCODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

a) Completely filled in Technical Particulars.
b) General description of the equipment and all components including brochures.
c) Type test Certificates
d) Experience List/Performance Certificates from end users.

After the approval of the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser

Following Drawings/Documents shall be submitted after the award of the contract

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates.		√	√
4	Installation Instructions		√	√
5	Transport/shipping dimension drawing		√	√
6	QA & QC Plan	√	√	√
7	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

19. GUARANTEED TECHNICAL PARTICULARS

GUARANTEED TECHNICAL PARTICULARS FOR LTDB 250 KVA DISTRIBUTION TRANSFORMER

Sr#	PARTICULARS	OFFERED
1	Material of the Meter Box	Galvanised Iron
2	Manufacturing Process.	Fabrication with GI
3	Color of Box	RAL 7032 as per IS 5
4	Dimension of Box (Height X Width X Depth)	1800x1600x500 (Dimensions are subject to small variations as per Manufacturer's Type Tested Design ensuring necessary clearance as per relevant IS between all Electrical Components)
5	*THICKNESS OF BOX*	
i	*Load Bearing Size*	4.0 mm (Min.)
ii	*Non Load Bearing size*	3.0 mm (Min.)
iii	*Type of Door*	The Door should be centre opening , Double door with Swing Type
6	*Strip Hinges*	Minimum 4 Hinges on each door.
7	*Panel Type Lock arrangement*	Provided
9	*Whether sufficient sealing provided to make dust, water and vermin proof?*	Rubber Gasket
10	*Provided Louvers For ventilation*	Yes 4 Nos
11 a	*Whether inlet and outlet arrangement for service cable provided. Please mention dimension of holes?*	Bottom Entry As per drawing
b	*Whether for incoming and outgoing cables provisions of glands of suitable size have been made. Please mention its dimension?*	1) Incoming cable suitable for Single core cable. There will be 8No's Holes. Each single core cable is of 300Sqmm .2) Outgoing Holes will be 3No's .Suitable Cable Size will be for 4CX185Sqmm
12	*In coming aluminum Bus Bar R,Y,B,N*	For 250 KVA: 50 x 8mm , (R,Y,B,N)
13	*Outgoing Aluminum Riser /Dropper*	50 x 8mm

16	*No.of connections on each bus bar*	Each phase bus bar 01 no Incomer and 03 nos outgoings circuit
17	*Bus bar arrangement*	As per drawing (Subject to change as per Manufacturer's Type Tested Design while maintaining Clearance as per Relevant Standards)
18	*Busbar mounting insulator*	Epoxy resin cast bus insulators
19	*Clearence between busbars.*	40 mm Min
20	*Clarence between busbar & Box walls.*	40 mm Min
21	*Sealing arrangement*	Hole for Wire Sealing
22	*Markings*	Danger name Plate, Supply voltage-440V ,SL no & Property of 'TPCODL',Screen Printed
23	*Degree of protection*	IP-55(Min)
24	*Packing*	Standard Corrugated box packing
25	*Earthing Provision*	M6 x 35 mm, 02 Nos
26	*Incoming arrangement*	For 250 KVA : 500 Amp 40KA TP MCCB- 01 Nos
27	*Make of MCCB*	ABB, Siemens, L&T, EATON,Schneider, Legrand.MCCB Should have intregated OL , SC & E/F Protection
28	*Outgoing arrangement*	For 250 KVA : OG-1:200A,OG-2:200A,OG-3:160A,OG-4:100A Fuse make- L&T, Siemens, EATON
29	*Terminal Spreader rating*	Minimum cross sectional are must be equivalent to the Incomer bus bar size. Spreader needs to be L-shaped for R and B-phase and straight type for Y-phase
30	*Glands*	Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box.
31	*Provision of LT switch & socket*	1 set of light, socket & switch is provided for availing power auxiliary single phase supply of 16Amp.
32	*Provision of Space for Energy Meter*	To be provided by Bidder
33	*Provision of Space for CT*	To be provided by Bidder
34	*Provision of LED Indication on Incoming supply R,Y, B with Fuse protection*	To be provided by Bidder
35	*Provision of NO & NC Contact for status monitoring of MCCB*	To be provided by Bidder

GUARANTEED TECHNICAL PARTICULARS FOR LTDB 500 KVA DISTRIBUTION TRANSFORMER

Sr#	PARTICULARS	OFFERED
1	Material of the Meter Box	Galvanised Iron
2	Manufacturing Process.	Fabrication with GI
3	Color of Box	RAL 7032 as per IS 5
4	Dimension of Box (Height X Width X Depth)	2300x2000x500 mm
5	*THICKNESS OF BOX*	
i	*Load Bearing Size*	4.0 mm (Min.)
ii	*Non Load Bearing size*	3.0 mm (Min.)
iii	*Door Type*	Centre opening Double Door Swing Type
6	*Strip Hinges*	Minimum 4 Hinges on each door.Hinges of Stainless Steel
7	*Panel Type Lock arrangement*	Provided
9	*Whether sufficient sealing provided to make dust, water and vermin proof?*	Rubber Gasket
10	*Provided Louvers For ventilation*	As per Drawing
11 a	*Whether inlet and outlet arrangement for service cable provided. Please mention dimension of holes?*	Bottom Entry As per drawing
b	*Whether for incoming and outgoing cables provisions of glands of suitable size have been made. Please mention its dimension?*	1) Incoming Cable Holes will be 12No's Holes .Each holes will be suitable for 1CX300Sqmm. 2)Outgoing 4No's holes will be required.Each Cable Holes will be suitable for 4CX300Sqmm .
12	*In coming aluminum Bus Bar R,Y,B ,N*	For 500 KVA: 75 x 12mm, (R,Y,B,N)
13	*Outgoing Aluminum Riser /Dropper*	50 x 6mm

16	*No.of connections on each bus bar*	Each phase bus bar 01 no Incomer and 04 nos outgoings circuit
17	*Bus bar arrangement*	As per drawing (Subject to change as per Manufacturer's Type Tested Design while maintaining Clearance as per Relevant IS)
18	*Bus bar mounting insulator*	Epoxy resin cast bus insulators
19	*Clearance between bus bars.*	30 mm Min
20	*Clearance between bus bar & Box walls.*	30 mm Min
21	*Locking arrangement*	As per drawing
22	*Markings*	Danger name Plate, Supply voltage-440V ,SL no & Property of 'TPCODL',Screen Printed
23	*Degree of protection*	IP-55(Min)
24	*Packing*	Standard Corrugated box packing
25	*Earthing Provision*	M8x40mm, 2Nos.
26	*Incoming Arrangement*	For 500KVA :800 Amp 50KA TP MCCB-01No.
27	*Make of MCCB*	ABB, Siemens, L&T, EATON,Schneider, Legrand.MCCB Should have intregated OL , SC & E/F Protection
28	*Outgoing Arrangement*	For 500 KVA : OG-1:315A,OG-2:315A,OG-3:200A,OG-4:160A Fuse make- L&T, Siemens, EATON
29	*Terminal Spreader rating*	Minimum cross sectional are must be equivalent to the Incomer bus bar size. Spreader needs to be L-shaped for R and B-phase and straight type for Y-phase
30	*Glands*	Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box.
31	*Provision of LT switch & socket*	1 set of light, socket & switch is provided for availing power auxiliary single phase supply of 16Amp.
32	*Provision of Space for Energy Meter*	To be provided by Bidder
33	*Provision of Space for CT*	To be provided by Bidder
34	*Provision of LED Indication on Incoming supply R,Y, B with Fuse protection*	To be provided by Bidder
35	*Provision of NO & NC Contact for status monitoring of MCCB*	To be provided by Bidder

20. SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH TECHNICAL BID)

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

S. No	Clause No.	Details of deviation with justifications

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

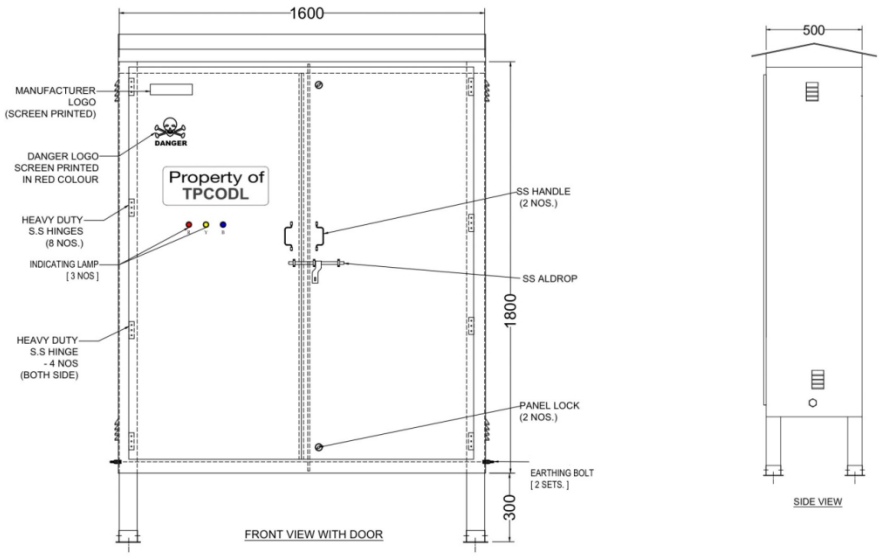
Seal of the Company:

Signature

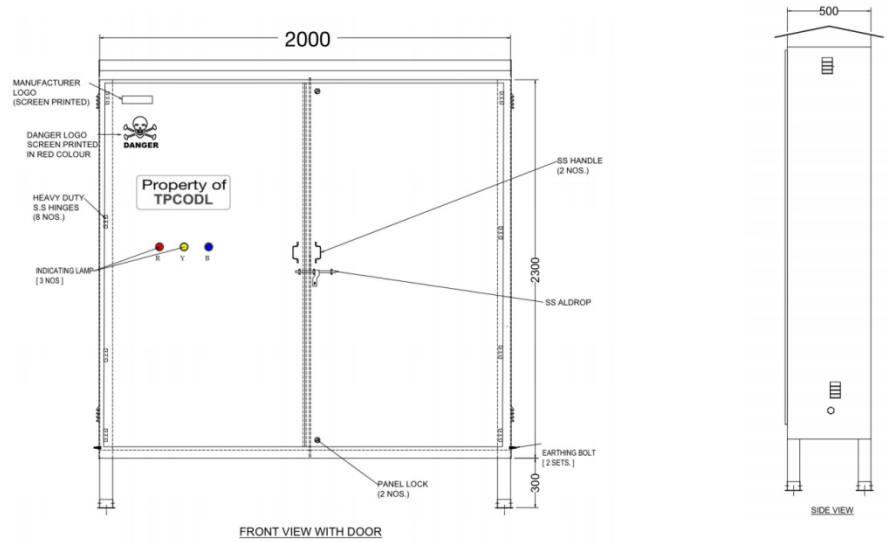
Designation

22. DRAWING (Subject to change as per manufacturers design while maintaining required clearances and relevant Specification)

Drawings are for Tender Purpose only



TITTLE:- GI LTDB FOR 250KVA DISTRIBUTION TRANSFORMER



TITTLE:- GI LTDB FOR 500 KVA DISTRIBUTION TRANSFORMER

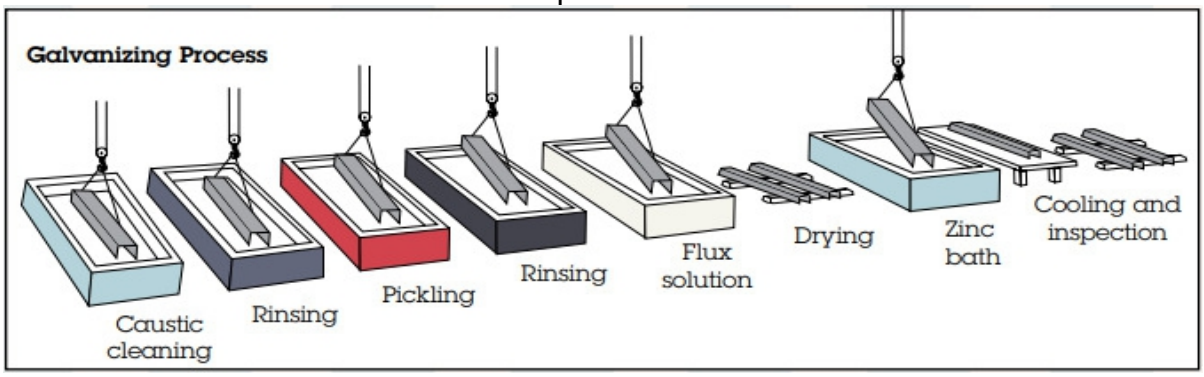
Annexure-1

GALVANIZATION (Spec: TPCO-OTH-010)

Zinc Coating thickness/ Mass of Zinc Coating to be as per mentioned in Tender /TPCODL requirements. Minimum Zinc Coating to be as detailed below:

Sl.No.	Product	Minimum Value for Average Mass of Coating (g/m²)	Coating thickness in microns (No of Dip)
1	Fabricated steel articles: a)5 mm thick and over b)Under 5mm,but not less 2mm c) Under2 mm,but not less than1.2mm	705 610 340 850	100 (6Dip) 86 (5 Dip) 48 (3 Dip) 120 (7 Dip)
2	Threaded items(Not bolts etc.)other than tubes and tubefittings: a) 10 mm dia and over b)Under 10 mm dia	460 320	65 45
NOTES: 1. The requirements for the minimum mass of coating shall be increased as agreed to between the galvanizer and the purchaser.			

Detailed Process Flow of Galvanization Steps:



Annexure-2

TECHNICAL SPECIFICATION FOR RESIN CAST RING TYPE CURRENT TRANSFORMERS FOR USE INSIDE THE BOX.

(To be Housed Inside the DSS Box)

1.0 SCOPE

This specification covers resin cast ring type LT Current Transformers confirming to IS-2705/1992 or the latest version thereof are of class 0.5 accuracy, 5VA burden, for use in conjunction with -/5A or 100/5A energy meters of class 0.5. CTs will be design for indoor use to install in the metering box.

2.0 APPLICABLE STANDARDS:

LT CTs shall comply with the Indian Standard Specification IS: 2705/1992 (Part- I & II) and the latest version thereof.

3.0 TYPE AND RATING OF L.T.CURRENT TRANSFORMERS:

LT CTs shall be of the following type and ratings:

Sl.No.	Particulars	Requirement
1.0	Capacity or Rating	
	a) Rated Voltage b) No. of Cores c) Primary Current / Ratio d) Rated Output Burden. e) Rated Continuous Thermal current temperature rise over ambient f) Continuous Primary Current g) One Minute withstand Power Frequency Voltage for Primary & secondary winding h) ISF i) Rated Short Time Current j) Frequency k) Type	a) 415 V, 50 Hz (Phase to phase) b) One c) 50/5,100/5A, 200/5A, 400/5A, 800/5A, 1000/5A, 1500/5A d) 5VA e) As per IS:2705/1992 or latest version thereof f) 1.2 times of rated current g) 3 KV h) Less than 5 i) 5 kA for 1 Second j) 50 Hz k) Ring Type
2.0	Class of Accuracy	0.5

	Material i. Core ii. Conductor iii. Insulation	 High-grade non-ageing electrical low loss core Super enamelled copper wire of requisite diameter. Resin cast
3.0	**Primary & secondary Terminals** i. Primary ii. Secondary terminal	Primary Conductor (Bus Bar of required current carrying capacity) will pass through Ring type CT. Proper marking will be provided for current direction identification. Inner diameter (I.D.) of CT will be minimum 45mm or as per size of bus bar for all ratings of CT & will increase as per the current rating of CTs. Secondary Terminals S1 & S2 will be clearly marked.

4.0 TESTS:

4.1 Routine Test

Current Transformer shall comply with all routine tests including accuracy test prescribed in relevant IS: 2705/1992.

4.2 ACCEPTANCE TEST:

All routine tests as stipulated in the relevant standards shall be carried out by the manufacturer and to produce at the time of inspection before the inspector.

4.3TYPE TEST

Type test of CT shall be submitted with the bid carried out as per IS:2705 by NABL approved laboratory / test house. Type test shall be not earlier than 5 years from the date of bid opening. Drawing of the CT and its arrangement on bus bar shall be submitted with the offer .

5.0 RATING PLATE:

Following shall be printed/engraved on the name plate of CTs.

i- Sl.No.

ii- CT ratio
iii- VA burden
iv- Class of accuracy.
v- Name of manufacturer
vi- Year of manufacturing
vii- PO No. & Date
viii- "Property of TPCODL" should be mentioned on name plate
viii- Polarity should be marked on the body of the offered LT CTs.

6.0 GENERAL TECHNICAL SPECIFICATION

i) Current transformer shall have an opening in the center to accommodate a primary conductor that will be bus-bar.

ii) Current transformers shall be of Resin cast type, suitable for indoor installation, type of resin shall be "Cycloaliphatic Resin" class of insulation shall be "F" as specified in IS:2705.

iii) The minimum internal diameter for ring type CTs should suitable to accommodate a primary conductor i.e. bus-bar of Distribution transformer.

iv) The polarity marking on the offered CT primary & secondary side should be embossed.

v) A two core (2.5sq. mm, as per relevant IS) HR FR PVC insulated flexible multi strand copper cable shall come out directly from the CT as secondary terminal. The length of the wire shall be around 2 Mtrs. Which is directly connected to the energy meter's terminals, pin type lugs shall be required on open end of cable.

Core details of cable shall be : Core–1 : S1, Core -2 : S2.

vi) LT CTs shall be of Brick red colour.