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## 1. SCOPE:

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at stores/ site and performance of CT & PT Junction Box made out of GI sheet with painted for trouble free and efficient operation.

## 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 conform to the regulations of the local authorities:

S.NO	Indian Standard	Title
1	IS 5039	Specification for distribution pillars below 1000V AC
2	IS: 8623	Specification for enclosure Box & for degree of protection provided by enclosures of electrical equipment's.
3	IS: 4237	Specification for general requirement of L.T. switchgears.
4	IS 2062	Hot Rolled Medium and High Tensile Structural Steel (MTD 4 : Wrought Steel Products)

## 3. CLIMATIC CONDITIONS:





1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	1500 mm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m

8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPWODL/TPNODL/TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

Sl.No.	Particulars	CT JB	PT JB
1	Material	GI sheet with RAL 7032 Painted	GI sheet with RAL 7032 Painted
2	Thickness	3 mm	3 mm
3	Door	Double Hinged with pad locking arrangement (Hinged Material _ Stainless Steel)	Double Hinged with pad locking arrangement ((Hinged Material _ Stainless Steel)
4	Gasket	Doors, removable covers and plates shall be gasketed all around	Doors, removable covers and plates shall be gasketed all around
5	Provision for glands	Knock out type / holes fixed with Grommet for following gland size. <b>19 mm- 23mm - 25 mm-</b> <b>Number of holes to be finalised during detailed engineering.</b> Bidder to provide the holes considering the gland of aforesaid cable dia./Sizes	Knock out type / holes fixed with Grommet for following gland size <b>19 mm- 23mm - 25 mm-</b> <b>Number of holes to be finalised during detailed engineering.</b> Bidder to provide the holes considering the gland of aforesaid cable dia./Sizes
6	Colour	RAL 7032	RAL 7032
7	Overall Size of the box (refer sample drg.)	500(L) x 470(H) x 150(W)	500(L) x 470(H) x 150(W)
8	Make of Disconnecting Switch	Elmex , Connect well, Phoenix Contact	Elmex , Connect well, Phoenix Contact
9	Voltage Grade	1100 V	1100 V
10	Degree of Protection	IP55	IP55

   	<b>Specification No:</b> ENG-HV-4025  <b>Specification Name:</b> Technical Specification for CT & PT Junction Box
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11	Earthing	Connection between neutral busbar and earth to be provided. Same shall be ensured by providing two separate M10 screw arrangement.	Connection between neutral busbar and earth to be provided. Same shall be ensured by providing two separate M10 screw arrangement.
12	Terminal Block details	Stud- Disconnecting Type, Screwdriver operatable. <b>Elmex-M4 or equivalent 20A</b>	Stud- Disconnecting Type, Screwdriver operatable. <b>Elmex-M4 or equivalent 20A</b>
13	Preferred Make	Elmex, Connect well, Phoenix	Elmex, Connect well, Phoenix

## 5. GENERAL CONSTRUCTION:

The junction box shall be made GI sheet(3mm) with Painted requirement of this specification.

The junction box shall be so constructed as to have roof tapering down for easy flow of rainwater

The surface appearance or part of junction box must be smooth, non-porous and homogeneous, free from ripples, defects and marks.

4 nos. of pads with holes of minimum diameter 12 mm shall be provided at the four corners at the backside of the junction box to facilitate mounting of the junction box.

### 5.1 JUNCTION BOX FOR CT:

5.1.1.A suitable weatherproof and dust proof CT junction box of suitable thickness shall be installed at each bay near the position of CT installation at the switchyard/substation for termination of all the CT secondary connection. CT junction box shall be made of GI sheet having 3mm thickness CT junction box shall be provided with double hinged doors with padlocking arrangements. The distance between two hinges shall be adequate to ensure uniform sealing pressure against atmosphere. All doors, removable covers and plates shall be gasketed all around. All gasketed surfaces shall be smooth, straight and reinforced if necessary to minimize distortion and to make a tight seal.

5.1.2.CT junction boxes shall be designed for the entry of cables from bottom by means of weather proof and dust proof connections. Design shall be such that there shall not be any interference between the wiring entering from below and any terminal blocks or accessories mounted inside the junction box.

5.1.3.CT junction box shall be provided with **45 Nos. of 'Elmex/Connetwell/Phoenix'** make non-disconnecting type 1100V grade terminal block for shorting of the CT secondary in the junction box itself. Jam nut should be provided with shorting link.

5.1.4.The terminal block to be used shall be of best quality, rust proof and suitable for

climatic condition at site as mentioned in the general condition of site.

- 5.1.5. Terminal blocks shall be 1100V grade and of continuous rating to carry the maximum expected current on the terminal. The terminal blocks shall be fully enclosed with removable covers of transparent, non-deteriorating type plastic material. Insulating barrier shall be provided between the terminals. The terminal blocks shall have locking arrangement to prevent its escape from the rails. There shall be a minimum clearance of 150 mm. between the columns of terminal block and the associate cable gland. The clearance between two columns of terminal blocks shall be maintained as 100 mm. All terminal blocks shall be suitable for connecting minimum of 2 nos. 2.5 sq .mm copper flexible.
- 5.1.6. 10 mm. wide minimum thickness of 1 mm SS Plate having details as per clause no-6 bearing identification mark shall be fixed under each connection at the CT Junction box to indicate the CT. The CT secondary used for metering shall also be marked similarly.
- 5.1.7. The CT junction box shall be placed at such a height that it becomes convenient for any person to work on the CT secondary terminal block. Sufficient space shall be provided that all terminals become easily accessible. All incoming and outgoing connections in the CT junction box shall be properly marked with ferrule.
- 5.1.8. The enclosure of CT junction box shall provide with a degree of protection of not less than IP-55 and type test report of one identical box is to be submitted to TPCODL/TPWODL/TPNODL/TPSODL.
- 5.1.9. Necessary shorting links are to be provided in the terminal block for each connection.
- 5.1.10. Two no. of Connection between neutral busbar and earth to be provided. Same shall be ensured by providing two separate M10 screw arrangement.

## 5.2 JUNCTION BOX FOR PT

- 5.2.1 A suitable weather and dust proof kiosk of suitable thickness shall have to be installed in each bay where PT is connected near the PT installation at the switchyard for termination of all PT secondary connections from Red, Yellow and Blue before it is taken to the terminal block of the respective control panel.
- 5.2.2 PT junction box shall be made of GI sheet having 3mm thickness. There shall be sufficient reinforcement to provide level surface, resistance to vibration and rigidity during transportation and installation. PT junction box shall be provided with double hinged doors with padlocking arrangement. The distance between two hinges shall be adequate to ensure uniform sealing pressure against atmosphere. All doors removable covers and plates shall be gasketed all around. All gasket surfaces shall be smooth, straight and reinforced if necessary to minimise distortion and to make a tight seal.
- 5.2.3 PT junction box shall be provided with **45 Nos. of 'Elmex/ Connectwell /Phoenix'** make terminal block of 1100 V grade Jam nut should be provided. Terminal blocks shall be of 1100V grade and of continuous rating to carry the

maximum expected current on the terminals.

- 5.2.4 The terminal blocks shall be fully enclosed with removable covers of transparent, non-deteriorating material. Insulating barrier shall be provided between the terminals. The terminal blocks shall have locking arrangement to prevent its escape from the mounting rails.
- 5.2.5 PT junction box shall be designed for entry of cables from bottom by means of weatherproof and dust proof connections through cable glands. Design shall be such that there shall not be any interference between the wiring entering from below and any terminal blocks inside the PT junction box.
- 5.2.6 All terminal blocks shall be suitable for connecting minimum of 2 nos. of 2.5 sq. mm. copper flexible. There shall be a minimum clearance of 150 mm. between the column of terminal block and the associated cable gland. The clearance between columns of terminal blocks shall be maintained as 100 mm. (minimum).
- 5.2.7 Two no. Connection of neutral busbar and earth shall be ensured by providing two separate M10 Screws outside the box.
- 5.2.8 10 mm. wide with minimum thickness of 1 mm SS Plate having details as per Clause No 6 bearing suitable identification of the PT secondary terminals to be used for protection and metering shall be fixed under the terminal block shall be provided in the kiosk for easy access to the terminals.
- 5.2.9 The enclosure of PT junction box shall be provided with a degree of protection of not less than IP-55 and type test report of one identical box is to be submitted to TPCODL/TPWODL/TPNODL/TPSODL.

## **6. MARKING:**

SS plate with 1mm thickness Plate in which following details are to be engraved.

- a) Reference to the Standards.
- b) Equipment Name:
- c) PO Number
- d) Manufacturer's name
- e) Serial No.
- f) Voltage grade.
- g) MM/YYYY of Manufacturing
- h) TPCODL/TPWODL/TPNODL/TPSODL

## **7. TESTS:**

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All Routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. The following tests shall be necessarily conducted on the Junction Box in addition to others specified in the IS/IEC/Other relevant standard.

### **7.1 TYPE TESTS**

- i) Degree of protection for IP- 55 on complete box shall be carried out as per IS: 13947/1993 or

the latest version thereof.

- ii) Mechanical test as per IS 2062 E250A
- iii) Chemical Composition Test as per IS2062 A
- iv) Galvanization Test as per IS 26029 & IS 2633 (If applicable)

## 7.2 ROUTINE TESTS

- i) Overall Dimensions Checking
- ii) Insulation Resistance Tests
- iii) High Voltage Test at 2500 V, 50 Hz AC for one minute.
- iv) Galvanisation Tests (If applicable)

## 7.3 ACCEPTANCE TESTS

- i) Overall Dimensions Checking
- ii) Insulation Resistance Tests
- iii) High Voltage Test at 2500 V, 50 Hz AC for one minute.
- iv) Galvanisation Tests (If applicable)

## 8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the equipment for the tests as mentioned as above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/Other Govt. Lab** as per relevant IS. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, or any/all type tests (including additional same shall be carried out without any cost implication to TPCODL/TPWODL/TPNODL/TPSODL.

Type Test Validity: As per latest CEA Guideline

## 9. PRE-DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPCODL/TPWODL/TPNODL/TPSODL. 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/TPWODL/TPNODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPWODL/TPNODL/TPSODL 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/TPWODL/TPNODL/TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPWODL/TPNODL/TPSODL
- c) TPCODL/TPWODL/TPNODL/TPSODL 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 STORE:**

The material received at TPCODL/TPWODL/TPNODL/TPSODL, Odisha 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 Engineering department and contracts 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 Company up to a period of 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 his own costs, within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be 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. PACKING AND TRANSPORT:**

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/TPWODL/TPNODL/TPSODL).

**14. QUALITY CONTROL:**

The bidder shall submit Quality Assurance Plan (QAP) 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. 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 FACILITIES:**

The successful bidder shall 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.

**17. SPARES, ACCESSORIES AND TOOLS**

The bidder shall provide a list of complete set of accessories and tools required for erection and maintenance of Junction Box & BMK along with the installation procedure.

**18. DRAWINGS AND DOCUMENTS:**

Following drawings and documents shall be prepared based on TPCODL/TPWODL/TPNODL/TPSODL Specifications and statutory requirements with complete BOM and shall be submitted with bid.

- a) Completely filled in Schedule "A" Guaranteed Technical Particulars.
- b) Work Experience details
- c) Type test certificates.

d) General descriptions of the equipment and all components including brochures.

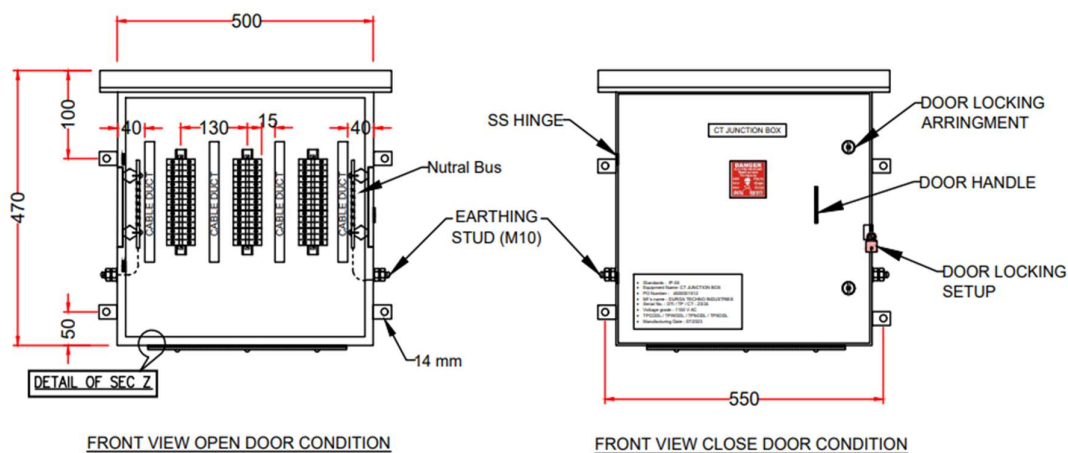
After the award of the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch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

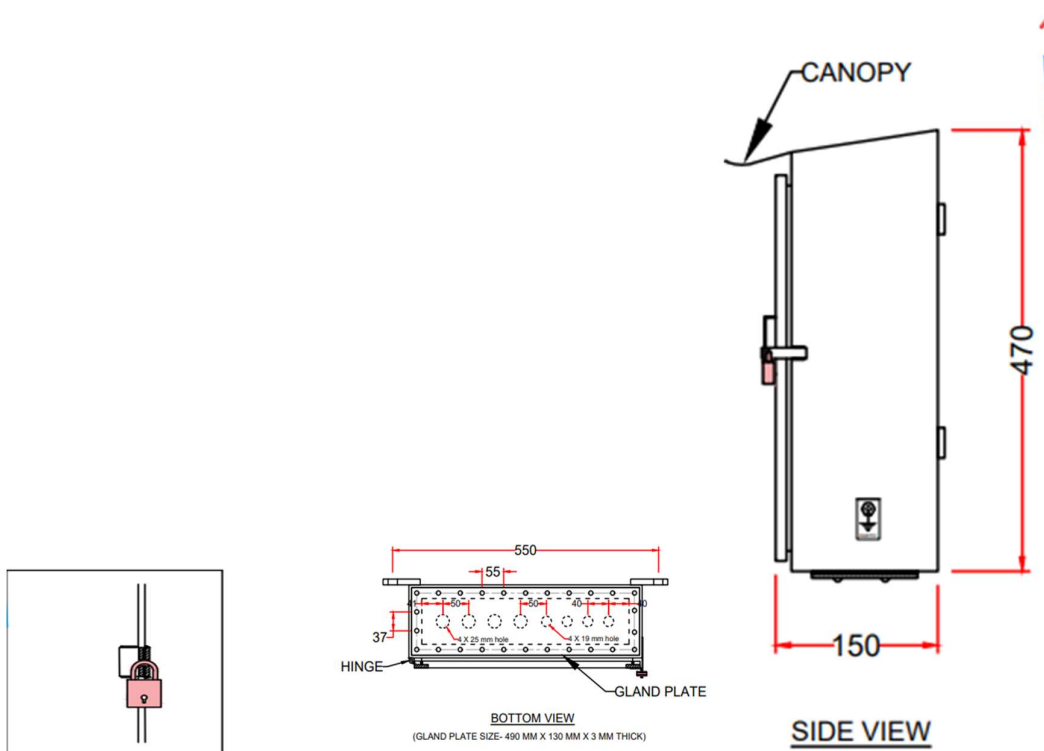
Following Drawings/Documents shall be submitted after the award of the contract.

S.No	Description	For Approval	For Review information	Final Submission
1	Technical Particulars	✓		✓
2	Manual/Catalogues/drawings for all components		✓	
3	Installation instructions		✓	✓
4	Instructions for use		✓	✓
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 only.

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.





**SAMPLE DRAWING. FOR TENDER PURPOSE ONLY.**

**19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS: (To be furnished by bidder)**

Sl.No.	Particulars	CT JB	PT JB
1	Material		
2	Thickness		
3	Door		
4	Gasket		
5	Provision for glands		
6	Colour		
7	Size of the box		
8	Make of Disconnecting Switch		
9	Voltage Grade		
10	Degree of Protection		
11	Earthing		
12	Termial Block details		

**20. SCHEDULE “B” 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:

SL. 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