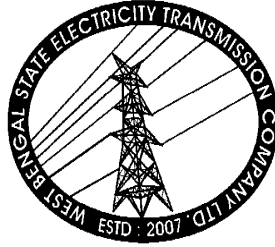


# JUNCTION BOX AND BAYMARSHALLING KIOSK

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*Engineering Department*

**WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED**

পশ্চিমবঙ্গ রাজ্য বিদ্যুৎ সংবহন কোম্পানি লিমিটেড  
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## **TECHNICAL SPECIFICATION FOR JUNCTION BOX & BAY MARSHALLING BOX**

### **1. SCOPE :**

The specification covers design, manufacture, shop assembly testing of CT junction box, PT junction box, CVT Junction Box and Bay Marshalling Kiosk as per guideline of Supply and Erection schedule & Technical Specification.

### **2. STANDARD :**

CT junction box, PT junction box, CVT Junction Box and Bay marshalling kiosk and all the accessories to be supplied shall conform to relevant Indian Standard of latest edition.

### **3. I) DEVIATION :**

Normally the offer should be as per Technical Specification without any deviation.

### **II) MODIFICATION :**

If any modification felt necessary to improve performance, efficiency and utility of equipment, the same must be mentioned in the 'Modification schedule' with reasons duly supported by documentary evidences and advantages. Such modifications suggested may or may not be accepted, but the same must be submitted along with Pre-Bid Queries. The modifications not mentioned in Schedule will not be considered.

### **4. JUNCTION BOX FOR CT & CVT CONNECTION :**

- 4.1. A suitable weather proof and dust proof CT/CVT junction box of suitable thickness shall have to be installed at each bay near the position of CT/CVT installation at the switchyard for termination of all the CT/CVT secondary connection. CT/CVT junction box shall be made of sheet steel having 3mm thickness. However 2mm thick cold rolled sheet steel with powder coating is also acceptable. There shall be sufficient reinforcement to provide level surfaces, resistance to vibrations and rigidity during transportation and installation. CT/CVT 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 minimise distortion and to make a tight seal. Ventilating louvers, if provided, shall have screen and filters. The screen shall be fine wire mesh made of brass.

All metal surfaces shall be subjected to treatment for anticorrosion protection. All ferrous surfaces shall be hot dip galvanised after fabrication. All steel conductors including those used for grounding shall also be galvanised according to IS:2629.

CT/CVT junction box shall be designed for 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. The outside of the CT/CVT junction box shall be coloured with same colour as that of control panel. The size of box shall be determined as per requirement.

- 4.2. CT/CVT junction box shall be provided with 'Elmex' /'Connetwell' make Disconnecting type 1100V grade terminal block for shorting of the CT/CVT secondary in the junction box itself. Jam nut should be provided with shorting link.
- 4.3. Suitable cable gland plate projecting at least 150 mm. above the base of CT and CVT junction box shall be provided along with proper blanking plates. Necessary number of cable glands shall be supplied and fitted on this blanking plates. The gland shall project at least 25 mm. above plate to prevent entry of moisture in cable crutch. Gland plate shall have provision for some future glands to be provided for future requirement.

The Nickel plated gland shall be dust proof, screw on and double compression type and made of brass. The glands shall have provision for securing armour of the cable separately and shall be provided with earthing tag. The glands shall conform to relevant IS Standard.

Connections of the CT secondary to the control and Relay board panel shall be connected either in Star/Delta.

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.

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. 20% spare terminals are to be provided and these spare terminals shall be uniformly distributed on all terminal rows. There shall be a minimum clearance of 250 mm. between the First/Bottom rows of terminal block and the associate cable gland plate. The clearance between two rows of terminal blocks shall be maintained as 150 mm. All terminal blocks shall be suitable for connecting minimum of 2 nos. 4 sq .mm copper flexible.

- 4.4. 10 mm. wide unbreakable plastic plates bearing identification mark shall be fixed under each connection at the CT/CVT junction box to indicate the CT/CVT. The CT secondary used for metering shall also be marked similarly.
- 4.5. The CT/CVT junction box shall be placed at such a height that it becomes convenient for any person to work on the CT/CVT secondary terminal block. Sufficient space shall be provided that all terminals become easily accessible. All incoming and outgoing connections in the CT/CVT junction box shall be properly marked with ferrule.
- 4.6. The enclosure of CT/CVT junction box shall provide with a degree of protection of not less than IP-55 as IS:13947 (Part I) and type test report of one identical box is to be submitted to WBSETCL.
- 4.7. Star/Delta connection of CT secondary terminal from Red, Yellow and Blue phases are to be made here and necessary shorting links are to be provided in the said terminal block for each connection. Connection of the CT secondary to the C&R Board panel shall be made from respective marshalling kiosk after those terminals are connected either in Star/Delta.

- 4.8. Two separate earthing of the cabinet shall be ensured by providing two separate earthing pads. Earthing of hinged door shall be done by using separate earthwires.
- 4.9. LED lamp and 5/15A combined socket with switch are to be provided at each box.

## **5. JUNCTION BOX FOR P.T. :**

- 5.1. 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.

PT junction box shall be made of sheet steel having 3mm thickness. However 2mm thick cold rolled sheet steel with powder coating is also acceptable. 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 gasketed surfaces shall be smooth, straight and reinforced if necessary to minimise distortion and to make a tight seal. Ventilating Louvers, if provided shall have screen and filters. The screen shall be fine wire mesh made of brass.

- 5.2. PT junction box shall be provided with 'Elmex/'Connectwell' make terminal block of 1100 V grade Jam nut should be provided with shorting link where PT secondary from Red, Yellow and Blue shall be connected in star with the help of shorting link before it is taken to the respective control and relay panel. Both incoming and outgoing Control cables are to be marked with ferrules. Terminal blocks shall be of 1100V grade and of continuous rating to carry the maximum expected current on the terminals.

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.

PT junction box shall be designed for entry of cables from bottom by means of weatherproof 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 inside the PT junction box.

One no undrilled and removable type cable gland plate having minimum thickness of 3 mm. shall be provided along with necessary number of cable glands for entry of all the cables to the PT junction box through cable glands.

All terminal blocks shall be suitable for connecting minimum of 2 nos. of 2.5 sq. mm. copper flexible. At least 20% spare terminal shall be provided in PT junction box and these spare terminals shall be uniformly distributed on all terminal rows. There shall be a minimum clearance of 250 mm. between the First/Bottom rows of terminal block and the associated cable gland plate. The clearance between two rows of terminal blocks shall be maintained as 150 mm. (minimum).

Earthing of the cabinet shall be ensured by providing two separate earthing pads. The earth wire shall be terminated on the earthing pad and secured. Earthing of hinged door shall be done by using a separate earth wire.

- 5.3. 10 mm. wide unbreakable plastic plates 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.
- 5.4. The PT junction box shall be provided with HRC fuse and link of suitable rating for circuit to be taken out for connections to the control panel. The size of PT junction box shall be determined as per requirement.
- 5.5. The enclosure of PT junction box shall be provided with a degree of protection of not less than IP-55 as per IS: 13947 (Part I) and type test report of one identical box is to be submitted to WBSETCL.
- 5.6. Suitable cable gland plate projecting at least 150 mm. above the base of PT junction box shall be provided alongwith proper blanking plates. Necessary number of cable glands shall be supplied and fitted on this blanking plate. The gland shall project at least 25 mm. above plate to prevent entry of moisture in cable crutch. Gland plate shall have provision for some future glands to be provided for future requirement. The Nickel plated gland shall be dust proof, screw on and double compression type and made of brass. The glands shall be provision for securing armour of the cable separately and shall be provided with earthing tag. The glands shall conform to relevant Indian Standard.
- 5.7. LED lamp and 5/15A combined socket with switch are to be provided at each box.

**6. BAY MARSHALLING KIOSK FOR AC AUXILIARY POWER DISTRIBUTION IN THE SWITCHYARD :**

- 6.1. One no. bay marshalling kiosk for each 400KV, 220 KV & 132 KV bay and one no bay marshalling kiosk for 2 nos. of 33 KV bays are to be provided for new 400/220/132/33KV, 220/132/33KV, 132/33KV & existing 400KV, 220KV & 132KV AIS S/stn. For 400, 220 & 132 KV GIS substations number of bay marshalling kiosk is to be provided as mentioned in BOQ. Each Kiosk shall be weather and dust proof and made of sheet steel having suitable thickness. This kiosk shall be used for supply of auxiliary AC Supply to isolators, breakers, switchyard lighting etc. There shall be sufficient reinforcement to provide level surfaces, resistance to vibrations and rigidity during transportation and installation. BMK shall be made of sheet steel having 3mm thickness. However 2mm thick cold rolled sheet steel with powder coating is also acceptable

Marshalling kiosk shall be provided with double hinged doors one at front & one at rear 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 gasketed surfaces shall be smooth, straight and reinforced if necessary to minimise distortion and to make a tight seal. Ventilating Louvers, if provided shall have screen and filters. The screen shall be fine wire mesh made of brass.

All metal surfaces shall be subjected to treatment for anticorrosion protection. All ferrous surfaces shall be hot dip galvanised after fabrication. All steel conductors including those used for grounding shall also be galvanised according to IS:2629.

Marshalling kiosk box shall be designed for entry of cable 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 with any terminal blocks or accessories mounted inside the kiosk.

One no undrilled and removable type cable gland plate of sheet steel having minimum thickness of 3 mm. shall be provided along with necessary number of cable glands for entry of all the cable to the kiosk.

Earthing of the cabinet shall be ensured by providing two separate earthing pads. The earth wire shall be terminated on the earthing pad and secured. Earthing of hinged doors shall be done by using a separate earth wire.

- 6.2. Marshalling kiosk is to be provided with 'Elmex' /'Connect well' make terminal block, HRC fuse and link of suitable rating to be used for different circuits i.e interlocking circuits of Incomer 1 & 11. Normally there will be one incoming supply from A.C. Distribution Board to each kiosk. Provision of second incoming supply shall be made through interconnection of incoming of two nos. nearby placed marshalling kiosk. All the incoming supply shall be terminated to the terminal block at the kiosk through Four Pole MCB of suitable rating. There shall be auto changeover scheme.

The outgoing circuits from the kiosk shall be through either 4-Pole or 2 Pole MCB. Jam nut should be provided with shorting link. All terminal blocks shall be 1100V grade 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 terminal block. The terminal blocks shall have locking arrangement to prevent its escape from the mounting rails.

At least 20% spare terminals with HRC fuse and link shall be provided in each kiosk and these spare terminals shall be uniformly distributed on all terminal rows. There shall be a minimum clearance of 250 mm. between the First / Bottom rows of terminal block and the associated cable gland plate. The clearance between two rows of terminal block shall be maintained as 150 mm. minimum.

- 6.3. The marshalling kiosk shall be placed at such a height that it becomes convenient for any person to work on terminal blocks. Placement position of marshalling kiosk is to be indicated in related drawing. All incoming and outgoing connections in the marshalling kiosk shall be properly marked with ferrules.
- 6.4. 10 mm. wide unbreakable plastic plates bearing identification mark shall be fixed suitable under each circuit.
- 6.5. The rating of MCB, HRC fuse and link shall be such as it can maintain a co-ordination between itself and HRC fuse unit provided in the AC Distribution Board for local fault. The size of marshalling kiosk shall be determined as per requirement.
- 6.6. Suitable cable gland plate projecting at least 150 mm. above the base of Bay Marshalling Kiosk shall be provided along with proper blanking plates. Necessary number of cable glands shall be supplied and fitted on these blanking plates. The gland shall project at least 25 mm. above plate to prevent entry of moisture in cable crutch. Gland plate shall have provision for some future glands to be provided for future requirements.

The Nickel plated gland shall be dust proof, screw on and double compression type and made of brass. The glands shall be provision for securing armour of the cable separately and shall be provided with earthing tag. The glands shall conform to relevant IS Standard.

- 6.7. The enclosure of marshalling kiosk shall provide with a degree of protection of not less than IP-55 as per IS:13947.

- 6.8. Suitable space heaters with thermostat shall be provided to prevent condensation and maintain a cubicle temperature approximately 10° C above ambient.
- 6.9. LED illumination lamp with door switch shall be provided. A 230 V, A.C., 5A/15A combined socket and switch shall also be provided. Isolating arrangement with use of suitable rated HRC fuse for illumination lamp, Heater and combined socket and switch are to be provided at phase side. Suitably rated one no 2-pole MCB is to be provided for above circuit.
- 6.10. MCCB & MCB to be provided in Marshalling Kiosk, all Junction boxes shall be from one of the following manufacturer complying with technical specification & relevant IS & IEC
- a) M/s Siemens
  - b) M/s L & T
  - c) M/s ABB
  - d) M/s Schneider
- 6.11. Two separate earthing of cabinet shall be ensured by providing two separate earthing pads. Earthing of hinged door shall be done by wing separate earthwire.

## **7. GUARANTEE:**

Electrical characteristics shall be guaranteed by the bidder. In case of failure of materials to meet the guarantee, WBSETCL shall have right to reject the material. Guaranteed Technical Particulars are to be submitted by successful bidder during detailed engineering along with submitted drawings/documents. However format for submission of GTP shall be handed over to intending bidders at the time of sale of tender documents.

## **8. CONTRACT DRAWINGS AND CATALOGUE :**

- 8.1. After placement of Letter of Award six (6) copies of following drawings and literature shall be submitted for approval.

General arrangement drawing of CT junction box, CVT Junction box, PT junction box and Bay marshalling kiosk showing clearly the location of HRC fuses, links terminal blocks MCB etc.

- 8.2. Four (4) sets of approved drawings of CT junction box, PT junction box, CVT junction box and Bay marshalling kiosk for each sub-station along with four (4) sets of relevant manuals for each sub-station both in hard and soft copy shall be submitted for our record and distribution to site.

## **9. TEST AT MANUFACTURER'S WORKS AND TEST CERTIFICATES :**

Acceptance and routine test at manufacturer's works shall be carried out on each junction box and Bay marshalling kiosk as per stipulation of relevant Indian Standard.

The following tests shall be carried out at manufacturer's works and Three (3) copies of test certificates to be submitted to the Chief Engineer, Engg. Deptt. for approval and distribution at site.

- (i) Visual and Dimensional Checking.
- (ii) Checking of wiring and continuity of the circuit.
- (iii) Application of 3KV rms for 1 minute between wiring and earth terminal.
- (iv) Insulation resistance value of all equipment used in all junction boxes and marshalling kiosk.
- (v) Functional test if any.

All the above tests shall be carried out in presence of representative of WBSETCL.

The entire cost of acceptance and routine tests that are to be carried out shall be treated as included in the quoted price of all junction boxes and marshalling kiosk. Six (6) copies of test reports shall be submitted for approval and distribution of site.

The contractor shall give at least 15 (fifteen) days advance notice intimating the actual date of inspection and details of all tests that are to be carried out.

#### **10. TESTS REPORTS AND TYPE TEST:**

Junction Boxes and Bay Marshalling Kiosk are to be offered conforming to our technical specification, and relevant IS and IEC. Junction Boxes offered should be similar with ones on which type testing has been carried out as per relevant IS and IEC. Three sets of complete type test reports carried out in Govt. recognized Test House or Laboratory /NABL accredited laboratory shall have to be submitted by successful bidder positively along with submission of drawings during detailed Engineering. Successful bidder may require producing original copies of type test reports at the time of detail Engineering if asked by WBSETCL.

Each type test report shall comply the following information with test result

- i) Compete identification, date and serial no .
- ii) Method of application, where applied, duration and interpretation of each test.
- iii) Relevant drawings as documented with test report.