

MODEL TECHNICAL SPECIFICATION

SECTION: LT SWITCHGEAR

1.22 ERECTION, TESTING AND COMMISSIONING

- 1.22.1 The Contractor shall unload, erect, install, test and put into commercial use all electrical equipment included in this specification.
- 1.22.2 Equipment shall be installed in a neat, workman like manner so that it is level, plumb, square and properly aligned and oriented. Tolerance shall be as established in Contractor's drawings or as stipulated by purchaser. No equipment shall be permanently bolted down to foundations until the alignment has been checked and found acceptable by the purchaser.
- 1.22.3 Contractor shall furnish all supervision, labour tools equipment rigging materials, bolts, wedges, anchors, concrete inserts etc. in proper time required to completely install, test and commission the equipment.
- 1.22.4 Manufacturer's and purchaser's instructions and recommendations shall be correctly followed in handling, setting, testing and commissioning of all equipment.

- 1.22.5 Contractor shall move all equipment into the respective room through the regular door or openings specifically provided for this purpose. No part of the structure shall be utilised to lift or erect any equipment without prior permission of Purchaser.
- 1.22.6 All boards shall be installed in accordance with *relevant code of practices* and at Purchaser's instructions. All boards shall be installed on finished surfaces, concrete or steel stills. Contractor shall be required to install and align any channel sills which form part of foundations. In joining shipping sections of switchboards together adjacent housing of panel sections or flanged throat sections shall be bolted together after alignment has been completed. Power bus, enclosures ground and control splices of conventional nature shall be cleaned and bolted together being drawn up with torque spanner of proper size or by other approved means.
- 1.22.7 All boards shall be made completely vermin proof.
- 1.22.8 Contractor shall take utmost care in holding instruments, relaying and other delicate mechanism wherever the instruments and relays are supplied separately they shall be mentioned only after the associated panels have been erected and aligned. The packing materials employed for safe transit of instrument and relays shall be removed after ensuring that panel have been completely installed and to further movement of the same should be necessary. Any damage shall be immediately reported to Purchaser.
- 1.22.9 Equipment furnished with finished coats of paint shall be touched by up Contractor if their surface is specified or marred while handling.
- 1.22.10 After installation of panels, power and control wiring and connections, Contractor shall perform operational tests on all switchboards, to verify proper operation of switchboards/panels and correctness of all equipment in each and every respect. The cable opening and cables entries for cables terminating to the panels shall be sealed with fire sealing materials.
- 1.23 **COMMISSIONING CHECK TESTS**
- The Contractor shall carry out the following commissioning checks, in addition to the other checks and tests recommended by the manufacturers.
- 1.23.1 **General**
- 1.23.1.1 Check name plate details according to the specification.
- 1.23.1.2 check for physical damage.
- 1.23.1.3 Check tightness of all bolts, clamps, joints connecting terminals.
- 1.23.1.4 Check earth connection.
- 1.23.1.5 Check cleanliness of insulators and bushings.
- 1.23.1.6 Check all moving parts for proper lubrication.
- 1.23.1.7 Check settings of all the relays.
- 1.23.2 **Circuit Breakers**

- 1.23.2.1 Check alignment of breaker truck for free movement.
- 1.23.2.2 Check correct operation of shutters.
- 1.23.2.3 Check control wiring for correctness of connections, continuity and IR values.
- 1.23.2.4 Manual operation of breaker completely assembled.
- 1.23.2.5 Power closing/opening operation, manually and electrically.
- 1.23.2.6 Breaker closing and tripping time.
- 1.23.2.7 Trip free and anti-pumping operation.
- 1.23.2.8 IR values, minimum pick up voltage and resistance of coils.
- 1.23.2.9 Contact resistance
- 1.23.2.10 Simultaneous closing of all the three phases.
- 1.23.2.11 Check electrical & mechanical interlocks provided.
- 1.23.2.12 Check on spring charging motor, correct operation of limit switches, and time of charging.
- 1.23.2.13 All functional checks.
- 1.23.3 **Current Transformers**
- 1.23.3.1 Megger between winding and winding terminals to body.
- 1.23.3.2 Polarity test
- 1.23.3.3 Ratio identification checking of all ratios on all cores by primary injection of current.
- 1.23.3.4 Spare CT cores, if available, to be shorted and earthed.
- 1.23.4 **Voltage Transformer**
- 1.23.4.1 Insulation resistance test
- 1.23.4.2 Ratio test on all cores.
- 1.23.4.3 Polarity test.
- 1.23.4.4 Line connections as per connection diagram.
- 1.23.5 **Cubicle Wiring**
- 1.23.5.1 Check all switch developments.
- 1.23.5.2 Each wire shall be traced by continuity tests and it should be made sure that the wiring is as per relevant drawing. All interconnections between panels/equipment shall be similarly checked.

- 1.23.5.3 All the wires shall be meggered to earth.
- 1.23.5.4 Functional checking of all control circuit e.g. closing, tripping control, interlock, supervision and alarm circuit.
- 1.23.6 **Relays**
 - 1.23.6.1 Check connections and wiring.
 - 1.23.6.2 Megger all terminals to body.
 - 1.23.6.3 Megger AC to DC terminals.
 - 1.23.6.4 Check operating characteristics by secondary injection.
 - 1.23.6.5 Check minimum pick up voltage of DC coils.
 - 1.23.6.6 Check operation of electrical/mechanical targets.
 - 1.23.6.7 Relays settings.
 - 1.23.6.8 Check CT and VT connections with particular reference to their polarities for directional relays, wherever required.
- 1.23.7 **Meters**
 - 1.23.7.1 Check calibration by comparing it with a sub-standard.
 - 1.23.7.2 Megger all insulated portions.
 - 1.23.7.3 Check CT and VT connections with particular reference to their polarities for power type meters.
- 1.24 **SPECIAL TOOLS AND TACKLES**
 - 1.24.1 The Bidder shall include in his proposal any special tools and tackles required for erection, testing commissioning and maintenance of the equipments offered.
 - 1.24.2 The list of these special tools and tackles shall be given in the bid proposal sheets alongwith their respective prices.
 - 1.24.3 The total price of the special tools and tackles shall be included in proposal sheets.