	TP SOUTHERN ODISHA DISTRIBUTION LIMITED, BERHAMPUR		
	TECHNICAL SPECIFICATION		
Doc. Title	Specifications for Control cabinet for 33KV DBCR type Isolator		
Doc. No	ENG-EHV- Control cabinet for 33KV DBCR type Isolator	Eff. Date: 01/03/2021	
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## 1. SCOPE:


This specification covers for design manufacture, testing at manufacturer' works, supply and delivery Control cabinet for outdoor type 33 KV, 3-phase, triple pole, double break, gang operated, centre rotating type Isolator .

## 2. APPLICABLE STANDARDS:

**Control cabinet for** outdoor type 33 KV DBCR Isolator and all the accessories to be supplied shall conform to relevant Indian Standard of latest edition. 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 Statutory authorities:

Sr.No.	Standard No.	Title
1	IS:1818	Alternating current isolators (disconnectors) and earthing switches
2	IS:9921	-do-
3	IEC:129	-do-
4	IS:2544	Insulators
5	IS 2147	Degree of protection provided by enclosures
6	IS:4691	Degree of protection provided by enclosures
7	IS:4722	Rotating Electrical Machines
8	IS:2629	Recommended practice for hot dip galvanising of iron and steel
9	IS:4759	Hop dip galvanization coating on Structural Steel.
10	IS:2633	Method of testing weight thickness and uniformity of coating on fasteners
11	IS:1573	Electro plated coating of zinc on Iron & Steel.
12	IS:3033	Spring Washers

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<b>13</b>	<b>IS:2016</b>	<b>Plain washers</b>
<b>14</b>	<b>IE Rules 1956</b>	<b>Indian Electricity Rules</b>
<b>15</b>	<b>IEC:168</b>	<b>Tests on Indoor and Outdoor post Insulator</b>
<b>16</b>	<b>IS:3961</b>	<b>Recommended current rating for PVC Insulated and PVC Sheeted heavy Duty Cables.</b>
<b>17</b>	<b>IS: 5561</b>	<b>Power Connectors</b>
<b>18</b>	<b>IS:1554</b>	<b>PVC Cables</b>
<b>19</b>	<b>IS:5578</b>	<b>Guide for marking of Insulated conductors and arrangement for switchgear bus bar main connectors &amp; Auxiliary wirings.</b>
<b>20</b>	<b>IS:11353</b>	<b>Guide for Uniform system of marking and identification of conductors and apparatus terminals.</b>

If the standard is not quoted for any item, it shall be presumed that the latest version of Indian Standard shall be applicable to that item.


The equipment complying other internationally accepted standards, may also be considered if they ensure performance superior to the Indian Standards.

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

The material shall be suitable for following climatic conditions,

- |  |        |
|--|--------|
| 1. Maximum altitude above sea level                                  | 1,000m |
| 2. Maximum ambient air temperature                                   | 50°C   |
| 3. Maximum daily average ambient air temperature                     | 35°C   |
| 4. Minimum ambient air temperature                                   | 0°C    |
| 5. Maximum relative humidity   | 95%    |
| 6. Average number of thunderstorm days per annum (isokeraunic level) | 70     |
| 7. Average number of rainy days per annum                            | 120    |

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8. Average annual rainfall 150cm

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)

11 .Wind velocity: 300 km/hr, 200 km/hr and 160 km/hr.

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.


#### 4. GENERAL TECHNICAL REQUIREMENTS AND General Constructions:

##### CONTROL CABINET :

The control cabinet of each operating mechanism shall be made out of 12 SWG sheet steel in the form of plate or casting. Control cabinet shall be provided with hinged doors along with padlocking arrangement. Sloping rain hood shall be provided to cover all sides. 15 mm thick neoprene or better type of gaskets shall be provided to ensure degree of protection of at least IP55 as per IS: 2147. The cabinet shall be suitable for fixing on support structure.

##### GLAND PLATES AND GLANDS:

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A removable gland plate with double compression type brass cable glands shall be provided with each operating mechanism for terminating all cables.

#### AUXILLIARY SWITCH:

Main switch operating mechanism shall be equipped with reliable auxiliary switch(4NO and 4 NC contacts) exclusively for purchaser's interlocking and protection purpose. Auxilliary switch and contacts shall be capable of carrying atleast 10 Amp. Continuously. Quick make and break (QMB) type auxiliary switch shall have snap action built in within the switch. The auxiliary switch shall be actuated by a cam or similar arrangement directly mounted on the Isolator shaft without any intermediate levers, linkages etc. to ensure fool-proof operation.

#### TERMINAL BLOCK AND WIRING:

Main switch operating mechanism shall be provided with 1100 V grade stud type terminal block. Auxilliary switch shall be wired upto the terminal block with 20% extra. All wiring shall be carried out with 1100V grade PVC insulated 2.5 sq. mm copper conductor. Maximum conductor temperature shall be as per IS 3961.


#### PROTECTIVE COATINGS :

All ferrous parts including bolt , nuts and washers of the switch assemblies shall be galvanised to withstand at least four nos. of one minute dips in copper sulphate solution of requisite strength as per IS : 2633.

#### PAINTING, GALVANISING AND CLIMATE PROOFING:

All interiors and exteriors of enclosures, cabinet and other metal parts shall be thoroughly cleaned to remove all rust, scales, corrosion, grease and other adhering foreign matter and the surfaces treated by recognised phosphating (seven tank process). After such preparation of surfaces, two coat of zinc oxide primer shall be given by suitable storing and air drying etc. before final painting. Colour of the final paint shall be of shade no. 631 of IS:5 i.e epoxy light gray. The final painted equipment shall present esthetically pleasing appearance free from any dent or uneven surface.

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Paint inside the metallic housing shall be of anti condensation type and the paint on outside surfaces shall be suitable for outdoor installation.

All ferrous parts not suitable for painting such as structural steel, pipes rods, levers, linkages, nuts and bolts used in other than current path etc. shall be hot dip galvanised. Galvanisation shall be done after completion of fabrication which shall be capable to prevent corrosion in view of the severe climatic conditions. Thickness of zinc coating shall not be less than 610 gm of zinc per sq. meter of surface. Zinc coating shall be smooth clean and of uniform thickness and free from defect. Preparation of galvanising and the galvanising itself shall not adversely affect the mechanical properties of the coated material. The quality shall be established by tests as per IS 2633. Galvanising of nuts and bolts shall be carried out by centrifugal or suitable process so that the bolts will easily fit into the tapped holes/nuts.

All components shall be given adequate treatment of climate proofing so as to withstand corrosion and severe service conditions.

Complete details of painting, galvanising and climate proofing of the equipments shall be furnished in the tender.

## 5. 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 TP Southern Odisha Distribution Ltd. /his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted on the Control cabinet in addition to others specified in IS/IEC standards.

Routine Tests  
Functional tests


## 6. TYPE TEST CERTIFICATE

The Bidder shall furnish the type test certificates of files for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI or NABL accredited Lab 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 TPSODL

## 7. PRE-DESPATCH INSPECTION

Material shall be subjected to Visual inspection.

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Unit shall be subject to inspection by a duly authorized representative of the TPSODL. Inspection may be made at any stage of manufacture at the option of the purchaser and the unit 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 TPSODL's representatives at all times when the work is in progress. Inspection by the TPSODL or its authorized representatives shall not relieve the supplier 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 TPSODL.

Following documents shall be sent along with material:

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

## 8. INSPECTION AFTER RECEIPT AT STORE


The material received at TPSODL, Berhampur, Odisha store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.

## 9. 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 12 months from the date of commissioning and 18 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.

Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by TPSODL.

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## 10. PACKING

Bidder shall ensure that all the materials covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

### 11. TENDER SAMPLE

Bidders are required to manufacture 2 sample as per the Purchaser's specification and submit the sample along with the bid to Contracts for approval.

### 12. QUALITY CONTROL

The bidder shall have a prove track of not less than 5 years in manufacturing and servicing of the items in Indian market .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 invariably furnish following information along with his bid, failing which the bid shall be liable for rejection. Information shall be separately given for individual type of equipment offered.

Statement giving list of important raw materials, names of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in the presence of Bidder's representative, copies of test certificates.

Information and copies of test certificates as in (a) above in respect of bought out accessories.

List of manufacturing facilities available.

Level of automation achieved and list of areas where manual processing exists.


List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspection.

List of testing equipment available with the bidder for final testing of equipment along with valid calibration reports shall be furnished with the bid. Manufacturer shall possess 0.1 class instruments for measurement of losses.

Quality Assurance Plan (QAP) withholds points for purchaser's inspection.

The successful Bidder shall within 30 days of placement of order, submit following information to the purchaser.

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List of raw materials as well as bought out accessories and the names of sub-Suppliers selected from those furnished along with offer.

Type test certificates of the raw materials and bought out accessories.

The successful Bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing.

#### 11. MINIMUM TESTING FACILITIES

Bidder shall have adequate in house testing facilities for carrying out all routine /acceptance tests and pre-dispatch inspection as per relevant International / Indian standards.

#### 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.

#### 12.SPARES,ACCESSORIES AND TOOLS

Bidder shall provide all spares, accessories and tools applicable.

#### 13. DRAWINGS AND DOCUMENTS

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

Completely filled in Technical Particulars.

General description of the equipment and all components including brochures.

Bill of Material

Type test Certificates

Experience List.

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 TPSODL.

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

S · N o	Description	For Appro val	For Revie w Inform ation	Final Submi ssion
1	Technical Parameters	√		√

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2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates of the component.		√	√
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.

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