



## TECHNICAL SPECIFICATION COVER SHEET

Document No. TPU-D-ENG-HV-20052-R1

Document Title: Technical Specifications for 11kV Gang Operated AB switch (Horizontal Operated) (Rating 200A & 400A)

### Revision: R0

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Rev. #	Date of revision	Clause No.	Summary of revisions/ comments (Attach separate sheet if required)	Initiated by	Revised /Reviewed by	Approved by
<b>R1</b>	02-02-2026	4. GTP 5. Construction 6. Marking 7. Type Test 8. Tests 13. Sample Evaluation	Attached in separate Sheet. Annexure-I	Pallavi Routray (CEG -TPSODL)	Udit Sankar Das (TPNODL) Santosh Patra (TPWODL) Sandeep Saurav (TPSODL) Smaranika Acharya (CEG - TPWODL)	

**TPC**⚡**DL**  
**TPW**⚡**DL**

**TPN**⚡**DL**  
**TPS**⚡**DL**

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for 11 kV AB Switch (Rating 200A & 400A)**

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# TECHNICAL SPECIFICATION

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**Technical Specification for 11 kV AB switch (400 A & 200 A)**

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## 1. SCOPE:

This specification covers design, manufacturing, testing at manufacturer's works, inspection, packing & delivery of 11 kV Air Break Switch with accessories for outdoor installation. Aforesaid item(s) shall include loading and unloading at anywhere in Odisha.


It is not the intent to specify completely herein all the details of design and construction of Air Break Switches. However, AB Switches will confirm in all respects to high standards of engineering design and workmanship and shall be capable of performing in continuous Commercial operation up to the supplier's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specifications and shall have the power to reject any material, which in his judgment i.e. not in accordance with the specifications/drawings.

The AB Switches offered shall be complete with all components necessary for its effective and trouble-free operation along with associated equipment etc. such components shall be deemed to be within the scope of supplier's supply, irrespective of whether those are specifically brought out in the specification and/or in order or not. Also similar parts particularly removable ones shall be interchangeable.

## 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:


Ref. IS	Description
IS 9920 (part-I to V)	Specification for helically formed fittings for Overhead lines up to 33 kV
IS 2633 (Part 1)	Method for testing uniformity of coating on zinc coated
IEC 62231 amended up to date	Composite station post insulators for substations with a.c. voltages greater than 1 000 V up to 245 kV – Definitions, test methods and acceptance criteria  Substations (station post insulators)
IEC 61109 amended up to date	Composite insulators for overhead lines with a nominal voltage greater than 1,000 V – Definitions, test methods, and acceptance criteria  Overhead transmission and distribution lines

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IEC 60168:1994+AMD1: 1997+AMD2:2000 CSV	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V
IS 9530	Recommended practice for silver plating
IS 5925	Recommended practice for silver plating for general engineering purposes
BS 2816	Testing of silver-plating thickness
IS 1239	GI pipe ('B' class or medium class)
IS: 5561	Electrical Power Connectors
IS 2062	Hot rolled medium and high tensile structural steel — specification

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL.NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120

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11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

Environmentally, some of the regions, where the work will take place include 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 atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. 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:

SL. NO.	TECHNICAL PARTICULARS	DESIRED VALUE	
		400 Amps AB Switch	200 Amps AB Switch
1	Rating of AB Switch	<b>IS 9920, IEC 129, IEC 62231</b> with up-to-date amendments, <b>IS 1239</b> , IEC 61109 with up-to-date amendments	
2	Reference standards (latest amend.)		
3	Installation	Outdoor	Outdoor
4	Suitable for Mounting	Horizontal Rotating Type	
5	Type	3 Pole	
6	Service Voltage	11 kV	
7	Rated Voltage	12 kV	



8	Rated Frequency	50 Hz	
9	Current Carrying Capacity	400 Amps	200 Amps
10	Rated short time current	16 kA for 1sec	
11	Rated peak withstand current	40 kA	
12	Rated main active load breaking capacity	10 Amp	
13	Rated line charging breaking capacity	2.5A	
14	Rated Cable charging breaking capacity	10A	
15	Rated Transformer off load breaking Capacity	6.3A	
16	One minute power frequency with stand voltage Dry	35kV RMS	
17	One minute power frequency withstand voltage Wet	35kV RMS	
18	Dry flashover Voltage	55kV	
19	Power Frequency puncture withstand voltage	1.3 times of actual dry flashover Voltage	
20	Visible Discharge Voltage	9kV RMS	
21	1 Minute Power Frequency withstand voltage between pole and earth	28kV RMS	
22	1 Minute Power frequency withstand across the isolation distance	32kV RMS	
23	Impulse with stand voltage for positive and negative polarity (1.2 / 50) micro second wave)		
a	Across Isolating distance	85kV Peak	
b	To earth and between poles	75kV Peak	

24	No. of Post Per Pole (The percentage of silicon content on the polymeric post insulator should be above 40%)	2
25	Total No. of post	6
25. a	Make of Insulator	Sun Kouture / Scenario / Prithvi Industries / Yamuna Power/ Jainco Transmission/ Navitas Insulators/ Deccan Electricals
		Complete type test reports of insulator to be provided during tender evaluation process.
		Year of manufacturing to be properly engraved on the insulator.
25. b	Minimum Creepage Distance	320 mm
25. c	FRP Dia. of the Post Insulator (min.) Negative tolerance not allowed	24mm
25. d	Dai of Weather sheds	>100mm
25. e	Thickness of Housing (min)	3mm
25. f	PCD of Insulator	57mm
25. g	Type of Sheds	Aerodynamic
25. h	Phase to Phase Clearance	760mm
25. i	Isolation Distance in switch open condition	380mm
25. j	Vertical clearance from Top of insulator	254mm (min)
26	Copper contacts Temp in Air should not exceed	65 Degree C
27	Fixed & Moving Contact Material	Electrolytic Copper Grade (Min 99.9% Cu) silver plating of 15 Microns thickness



28	Size of fixed contacts (Copper Type)	80mmx50mmx8mm	70mmx35mmx6mm
	Electrolytic with silver plated)	(50x8x2 Fingers)	(35x6x2 Finger)
29	Fixed Contacts assembly	Fixed contact controlled by phosphorus stainless-steel high-pressure spring housed in robust Steel Cover. It is essential that provision shall be made in fixed female contacts to take the shock arising from the closing of moving contact blade without the same being transmitted to the post insulator.	
30	Size of Moving contacts (Copper Type Electrolytic with silver plated) (coating thickness not less than 10 microns)	220mmx50mmx8mm	220mmx35mmx6mm
31	Moving Contacts assembly	The switch shall have such a spring mechanism so as to ensure that the speed of the opening of contact is independent of speed of manual operation.	
32	Moving Contact supporting Angle	50mmx50mmx5mm	45mmx45mmx5mm
33	Size of rods used for arcing horns	10 mm	
34	Insulation for tinned Copper braid/rope	Polyolefin, (RSFR-H) type	
35	Copper Flexible BRAIDED Tape - 320mm Long, Tined plated with	450gm / Mtr	
	Brass Nut, bolt & Washers	M12 Brass Nut, bolt & Washers	
36	Minimum size*Length of Coupling Hot Dip GI Solid Pipe for Phase coupling pipe, B Class (Nominal Bore)	MS HDG 25 NB, 1800mm long for 3 Pole (as per IS 1239) Class: Medium OD (max): 34.2mm and (min): 33.3mm Thickness: 3.2mm Tolerance: +/-10% on thickness Make: Jindal	
37		MS HDG	

	Operating Down Pipe, B class (IS 1239) (Nominal bore)	32 NB, 7Mtr Long (Without Welding/joints) as per IS 1239 Class: Medium OD (max): 42.9 mm and (min): 42.0 mm Thickness: 3.2mm Tolerance: +/-10% on thickness Make: Jindal
38	Temperature Rise Limit (w.r.t ambient temp)	
	Tinned Copper contacts	65°C
	Terminals	65°C
	Metal Parts	40°C
39	Bearings	<b>4 nos. self-lubricating bearing</b> to be provided with grease nipple including <b>4<sup>th</sup> bearing being a thrust bearing. (Bearing make shall be SKF/ FAG)</b>
40	Locking arrangement (LOTO)	Provision for pad locking at both 'ON' & 'OFF' Position
		LOTO arrangement lock required
41	Earth Terminal	M12 Bolts with nuts and flat washer shall be provided at base channel as earthing Terminal.
42	'T' Connection	The T connection provided on the channel having 'Moving contact' shall be G.I Nut & bolt at the bottom end to facilitate replacement of this unit only during requirements & avoid entire change of arm.
43	'I' bolt	2 Nos of 'I' Bolt for down operating pipe to be provided. Threaded portion shall be 75mm.
		M12 Dia, Double nuts for each 'I' bolt to be provided.
44	Mounting Channel HDG 100 microns	75x40x4.8 mm hot dip galvanized channel length
		480 mm min. (C/C slotted hole 18x 36 mm- 250mm)

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		Zinc coating thickness: Min 100 Microns	
		(Make- TATA/ SAIL/ JINDAL/ RINL)	
45	Moving & Fixed Terminals	Terminal connectors for both movable and fixed should be of <b>copper flats</b> with 2 no. of 10 mm dia holes provided with suitable brass bolts, double nuts, washers & spring washers	
		Electrolytic copper (Min 99.9% Cu) with silver plating of 15 microns thickness	
46	Min Cross sectional Dimension of Fixed Terminal	80 x 50 x 8 mm	70 X 35 X 6 mm
47	Min Cross sectional Dimension of Moving Terminal	80 x 50 x 8 mm	70 X 35 X 6mm
48	Socket	One number solder less bimetallic socket (Electrolytic Copper tin plated) for each connector suitable sockets for each connector suitable up to 55- 100 mm <sup>2</sup> AAA conductor.	
		One no. of 12 mm dia. brass bolts, double nuts, plain washers & spring washers to be provided for socket.	
49	Pressure Spring	Stainless steel	
50	Nuts, Bolts & Washers	For current carrying parts: Brass	
		For non-current carrying parts: SS 316 nuts & bolts	
51	Marking/Engraving (Parameters should be embossed on Aluminium Sheet of thickness 0.4 mm with black background. It should be riveted on MS channel of AB switch) per each phase	1. Rated Voltage	
		2. Manufacturer Name	
		3. Month/Year of Manufacture	
		4. Serial No.	
		5. PO No.	
		6. Rated Normal Current in Amps	
		7. Rated One Second Short-Time Current	

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		<p>8. Property of TPCODL/ TPNODL/ TPWODL/ TPSODL</p>
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## 5. GENERAL CONSTRUCTIONS/ REQUIREMENTS:

- The Air break switch shall be outdoor type, rotating type gang operated and shall be suitable for horizontal installation having 2 no. of polymeric post insulators per phase.  
Make of the insulator- Sun Kouture / Scenario / Prithvi Industries / Yamuna Power/ Jainco Transmission/ Navitas Insulators/ Deccan Electricals  
The Rotating type operating mechanism shall be suitable for manual operation from ground level and shall be designed in such way that all the three phases shall open and close simultaneously in smooth way.
- The air break switch shall be with the arcing horns, the sizes of the rods used for the arcing horns would be 10mm for both 400 A and 200 A AB switch of M.S. Hot dip galvanized.
- The current carrying connectors should be two-bolt type having nuts and bolts, with spring washer and plane washer.
- Each joint shall be provided with one plane and one spring of not less than 2mm thickness.
- The minimum cross section for fixed contact shall be 400 sq.mm for 400 Amp AB Switch and 200 sq.mm for 200 Amp AB Switch.
- Tinned Copper braid/rope shall be insulated by Polyolefin (RSFR-H) type to prevent animal electrocution. It shall be 320 mm long minimum and shall weigh 450 G/M. It shall be punched at both ends.
- All ferrous parts shall be hot dip galvanized with heavy coating after proper surface treatment as per standards. Coating thickness shall not be less than 100 micron at any point.
- All Copper parts shall be silver plated as per relevant standards and coating thickness not less than 10 microns at any point.
- Equipment grounding shall be provided by bidder at two points with terminals. .
- All the nut, bolt & washers except terminal connector & flexible braided tape used must be Hot dip Galvanized and of size not less than M10. Brass nut, bolt & washers shall be provided for Terminal Connector and Copper Flexible BRAIDED Tape.

11. A rigid base of galvanized steel channel (**Make- TATA/ SAIL/ JINDAL/ RINL**) of size approx. 75x40x4.8 mm Length 480 mm min. (C/C slotted hole 18x 36 mm- 250mm shall be provided with clamps and bolts for Horizontal mounting firmly on steel structure.
12. Each member of the switch shall be free from Rust, sharp edges, burr and any kind of deformation.
13. The phase coupling rod, operation rod with intermediate guide braided with flexible electrolytic copper, tail piece of required current carrying capacity and operation mechanism with 'ON' & 'OFF' positions shall be provided. Make: Jindal
14. The operation rod shall be medium gage of 32 nominal bore G.I. pipe single length 7 meters (welding or jointing is not accepted). The phase coupling rod for gang operation shall be of medium gauge 25 NB & 1800 mm length nominal bore G.I. pipe. Make: Jindal
16. Non-threaded type spindle shall be provided for connection with down pipe.
17. Provision for operating handle earth with flexible copper wire shall be provided.
18. Two Nos of 'I' Bolt for down operating pipe to be provided. Threaded portion shall be 75mm. M12 Dia, Double nuts for each 'I' bolt to be provided.

## 6. MARKING

Below parameters should be embossed on Al sheet of thickness 0.4 mm with black background. It should be riveted on MS channel of AB switch: There shall be three name plate for each phase.

1. Rated Voltage
2. Manufacturer's Name
3. Month/Year of Manufacture
4. Serial Number
5. PO no.
6. Rated normal current in Amps
7. Rated one second short-time current in Amps
8. Property of TPCODL/TPNODL/TPWODL/TPSODL

## 7. TESTS CERTIFICATE

### 7.1 Type Test for AB Switch:

The A.B. switches shall be subjected to the following type tests in accordance with clause No. 6 of IS-9920 (Part-1)/2002.

- (i) Tests to prove that the **temperature rise** of any parts does not exceed the values specified in part-2 of this standard.
- (ii) Tests to prove the capability of the switch to carry the **rated peak withstand current and the rated short time current**.
- (iii) Measurement of the **resistance of the main circuit**.
- (iv) Tests to prove the ability of the switch to **make and break the specified currents**.

(v) **Short Circuit withstand Test**

(vi) Tests to verify the **insulation level** including withstand tests at power frequency voltages on auxiliary equipment if any. Di-electric tests include impulse withstand tests, power frequency voltage withstand tests, and power frequency voltage withstand tests.

(vii) Tests to prove **satisfactory operation and Mechanical endurance**.

(viii) Tests to prove the integrity of the external insulation under conditions of the air pollution.

**7.2 Type test for Post Insulator:**

- i. Dry Lightning impulse with-stand voltage test
- ii. Wet power frequency test
- iii. Mechanical failing load test.
- iv. Radio interference test
- v. Recovery of hydrophobicity test
- vi. Salt fog test: On insulators for 1000 hr as per IEC
- vii. Chemical composition test for silicon content (Min 40%)
- viii. Galvanization test
- ix. Brittle fracture resistance test

**Note 1:** The type test certificate should not be more than 5 years old as on due date of opening of tender.

**Note 2:** Type test certificate of polymeric post Insulator shall be submitted and shall be issued from CPRI/ERDA or Government lab only. Make of the insulator- Sun Kouture / Scenario / Prithvi Industries / Yamuna Power/ Jainco Transmission/ Navitas Insulators/ Deccan Electricals

**The manufacturing year of the post insulator should not exceed one year from the date of tender.**

**7.3 Acceptance Tests:**

The following acceptance test should be carried out as per IS: 9920 (P4/1985) on number of samples selected from the offered lot.

- (i) Visual Inspection.
- (ii) Checking of Dimensions (of all parts as per the approved drawing).
- (iii) Power frequency voltage dry test.
- (iv) Measurement of the resistance of the main circuit.
- (v) Test to prove satisfactory operation
- (vi) Galvanizing test as per IS: 2633.
- (vii) Temperature rise test.

**7.4 Routine Tests:**

Supplier shall provide a control plan, which will be implemented on AB switches.

Routine test reports should be submitted by the manufacturer with inspection call. The following routine tests as outlined in clause No.4 of IS: 9920 (Part4/1985) shall be carried out by the manufacturer on each unit to check certain essential requirements.

- i) Power frequency voltage dry tests.
- ii) Measurement of the resistance of the main circuit.
- iii) Test to prove satisfactory operation.

The tenderer shall clearly indicate what testing facilities are available in the works of manufacturer & whether facilities are adequate to carry out all Acceptance & Routine Tests. These facilities should be available to TPCODL/ TPNODL/ TPSODL/ TPWODL's representative if deputed or carry out or witness the tests in the manufacturer works.

**8. TESTS:**

Along with the bid, the bidder must submit Type Test Reports on AB switches as per this technical specification, carried out within last five years from the date of opening of techno-commercial bid of the tender from CPRI/ERDA/ Govt Owned Labs only.

Otherwise the tender may be rejected.

**9. PRE DISPATCH INSPECTION:**

Equipment shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option of the TPCODL/TPNODL/TPSODL/TPWODL and the equipment if found unsatisfactory as to workmanship or material is liable to rejection.

Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL 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 TPCODL/TPNODL/TPSODL/TPWODL. Following documents shall be sent along with material

- a) Routine Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) Invoice in duplicate
- d) Packing list
- e) Drawings

- f) Delivery Challan
- g) Installation and maintenance Manual soft copy for all components
- h) Other Documents (as applicable)

**10. INSPECTION AFTER RECEIPT AT STORES/SITE:**

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store/Site will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection. If any deviation or anomaly observed at this stage same need to be rectified by bidder at bidders' own cost at earliest.

**11. GUARANTEE:**

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this 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 at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is earlier. Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, 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.

**12. PACKING:**

Bidder shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The packing should be in such manner that during storage and its components should not be damaged. No single use plastic to be used in packing material. Packing should be done with environment friendly recyclable materials

**13. TENDER SAMPLE:**

Bidder shall submit the sample of material (complete set) with the offer (in case of first supply to TPCODL/TPNODL/TPSODL/TPWODL).

During tender evaluation, Socket/lug sample needs to be submitted by bidder for sample evaluation.

**14. QUALITY CONTROL:**



The bidder shall submit with the offer, 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 after finishing, bought out items and fully assembled component and equipment including drives. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The TPCODL/TPNODL/TPSODL/TPWODL's or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections. To ensure proper operation of Product the bidder shall provide onsite training of TPCODL/TPNODL/TPSODL/TPWODL teams as and when required. To ensure quality of installations bidder shall provide supervision support during impartation.

**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 bidder shall get the approved drawing and GTP before start of manufacturing activity. The successful bidder will have to submit details of the offered design & components for approval as per specification. CAT-A/CAT-B is mandatory to start manufacturing.

**17. SPARES, ACCESSORIES AND TOOLS:**

Not applicable.

**18. DRAWINGS AND DOCUMENTS:**

Following documents to be submitted along with the bid for evaluation:

- a) Completely filled-in clause wise compliance of this specification.
- b) Signed and stamped copy of drawing
- c) Complete Type test reports
- d) Completely filled signed and stamped copy of tender document.
- e) Any other requisite document
- f) Experience List.

Following documents shall be submitted after award of RC/PO before manufacturing:

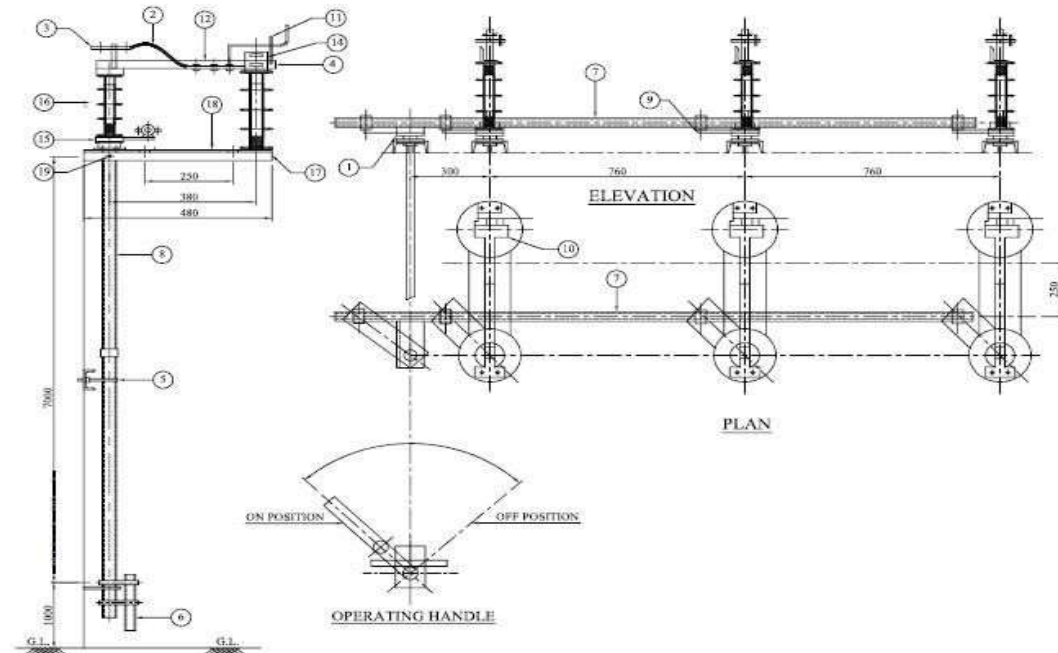
- a) Completely filled-in clause wise compliance of the specification.

- b) Signed and stamped copy of GA drawing
- c) Signed and stamped copy of installation drawing
- d) Compliance of all undertaking submitted during technical evaluation, if any.
- e) Type test Certificates for each specified test if not submit during technical evaluation

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.



Indicative drawing of 11 KV 400 A and 200 A AB Switch is only for reference purpose



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**19. GUARANTEED TECHNICAL PARTICULARS:**

Completely filled-in clause wise compliance of this specification along with bid.

**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:



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

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## Annexure-I

### Summary of Revisions/ Comments

Sl. No.	Clause No.	Parameter	Description
1	4.23.a	Make of Insulator	Sun Kouture / Scenario / Prithvi Industries / Yamuna Power/ Jainco Transmission/ Navitas Insulators/ Deccan Electricals Complete type test reports of insulator to be provided during tender evaluation process.
2	4.29	Fixed & Moving Contact Material	Terminal connectors for both movable and fixed should be of <b>copper flats</b> Electrolytic Copper Grade (Min 99.9% Cu) silver plating of 15 Microns thickness
3	4.35	Size of rods used for arcing horns	10 mm
4	4.38 & 39	Class of Coupling Pipe & Operating down Pipe.	Medium Duty, B Class, 3.2mm thickness (as per IS 1239)
5	4.45	'I' bolt	2 Nos of 'I' Bolt for down operating pipe to be provided. Threaded portion shall be 75mm. M12 Dia, Double nuts for each 'I' bolt to be provided.
6	4.50	Socket	One number solder less bimetallic socket (Electrolytic Copper tin plated) for each connector suitable sockets for each connector suitable up to 55- 100 mm <sup>2</sup> AAA conductor.  One no. of 10mm dia. brass bolts, double nuts, plain washers & spring washers to be provided for socket.
7	4.52	Nuts, Bolts & Washers	For current carrying parts: Brass For non-current carrying parts: SS 316 nuts & bolts
8	4.53	Name Plate	Aluminium Sheet of thickness 0.4 mm with black background. It should be riveted on MS channel of AB switch) <b>per each phase</b>
9	5.	General Constructions/ Requirements:	According to changes in clause no 4 similar changes done in clause no 5 of point no 1, 2, 13, 14, 18.
10	7.	Type Test	Short Circuit withstand Test added in the list
11	8.	Tests	Test reports from CPRI/ERDA/ Govt Owned Labs only.
12	13.	Tender Sample	During tender evaluation, Socket/lug sample needs to be submitted by bidder for sample evaluation.