Group – A : Sl. No. - 1) 11 KV 200 Amp 3 Pole AB Switch

Technical Specification

01.0 **Scope: -**

This specification covers manufacturing testing and supply of 11KV 200 AMPS 50HZ Air Break switches for out door installation in horizontal configuration. The switches are suitable for operation under off load conditions only and are intended for use on Distribution Sub – stations and tapping sectionalizing points of 11 KV lines.

02.0 **Description of the materials: -**

The 11KV A.B. Switch sets shall confirm to the following parameters: -

a.	Number of poles	3
b.	Number of Post insulator per pole	2nos12KVpostinsulator.
c.	Nominal system voltage	11KV
d.	Highest system voltage	12KV
e.	Rated frequency	50Hz
f.	System earthling	effectively earthed.
g.	Rated nominal current	200 amps
h.	Altitude of installation	Not exceeding1000M

The post insulators used in the A.B. Switches shall have the following ratings :-

a.	Power frequency withstand voltage (dry)	25KV (RMS)
b.	Power frequency withstand voltage(wet)	35KV (RMS)
c.	Implies withstand voltage(dry)	75KV
d.	Power frequency puncture withstand	1.3

03.0 **Standards: -**

The AB Switch Set shall conform to the following standards: -

a. IS-9920 (Part-I to V)
b. IS-2544/1973 (for porcelain post insulators)
c. IS-2633, (for galvanization of ferrous parts.) or its latest amendments if any.

04.0 **Insulator make: -**

12KV post insulators complete with post and cap duly cemented to be used in the AB Switch Set conforming to IS-2544/1973.

The bidder shall furnish the type test certificate of the post insulators from their manufacturer for reference and scrutiny.

The bidder shall mention make, type of insulation materials, metal fittings, Creepage distance, protected Creepage distance, tensile Strength, compressing strength, torsion strength and cantilever strength.

05.0 **Climatic condition: -**

The A.B. Switch set shall be suitable for operation under the following climatic conditions.

a.	Maximum ambient air temperature	45 ^{o} C
b.	Maximum daily average air temperature	35 ^{o} C
c.	Maximum yearly average ambient air temperature	30 ^{o} C
d.	Maximum temperature attainably by a body	
e.	Exposed to the Sum.	50 ^{o} C
f.	Minimum ambient air temperature	0 ^{o} C
g.	Maximum relative humidity	100%
h.	Minimum number of rainy days per annum	70
i.	Average number of rainy days per annum	120
j.	Average annual rain fall	150cm.
k.	Number of months of tropical monsoon conditions	4
l.	Maximum wind pressure	260Kg./mm2
m.	Degree of exposure to atmospheric pollution	normally
n.	Atmosphere.	Polluted.

06.0 **Other technical details: -**

06.01 **General:** - The 11KV A.B. Switch Set shall be the gang operated rotating single air break type having 2 post insulators per phase. The operating mechanism shall be suitable for manual operation from the ground level and shall be so designed that all the three phases shall open or close simultaneously. The Switches shall be robust in construction, easy in operation and shall be protected against over travel or staining that might adversely affect any of its parts. The required base M.S. Channel (hot dip galvanized) 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. The operation rod shall be medium gage of 32mm diameter nominal bore G.I. pipe single length 6 meters. The phase coupling rod for gang operation shall be of medium gauge 25mm dia nominal bore G.I. pipe. The Rating post insulators shall be provide with suitable bearing mounted on a base channel with 8mm dia thrust collar and 6mm split pin made out of stainless steel. The operating down rod shall be coupled to the spindle (minimum dia – 32mm) for gang operation through another suitable bearing by two numbers 10mm dia stainless steel bolts with double nuts. All the bearings shall be provided with grease nipple. All metal (ferrous) parts shall be galvanized an polished. The pipe shall be galvanized in accordance with IS-4736/1968.The post insulators should be fixed with the base channel using Galvanized Nuts and Bolts.

06.02. **Mounting:**- The A.B. Switches shall be suitable for horizontal mounting in double pole sub-station structures. MS Galvanized base Channel & base support channel should be of min. size 75x40x6 mm.

06.03. **Switching Blades:** - It shall be made out of electricity copper with silver plated. The approximate size shall be 220mm X 50X 6mm. 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.

06.04 **Fixed Contracts: -** The Fixed Jaw type female contracts shall be made of electrolytic copper (minimum 95% copper composition) duly silver coated controlled by stainless steel high pressure spring housed in robust G.I. Cover. It is essential that provision shall be made in fixed female contracts to take the shock arising from the closing of move contract blade without the same being transmitted to the post insulator. The arrangement made in this regard shall be specifically shown in the drawing.

06.05 **Arcing Horn: -** As the switches are generally meant for isolating transmission line and distribution transformers, suitable arcing horns shall be provided for breaking the charging current horn shall be made of 10mm dia G.I. Rod with spring assisted operation.

06.06 **Terminal Connectors: -** Terminal connectors shall be robust in design. The size of fixed connector shall be (80 X 50 X 6 mm) and size of movable connector shall be of (80 X 50) X (80 X 50) X 6mm of copper casting with uniform machine finishing duly silver plated made out of minimum 95% copper composition with 2 nos. 12mm dia holes provided with suitable brass bolts and double nuts, flat washers & 2nos. bimetallic solder less sockets suitable upto 80 mm^2 conductor.

06.07**Spacing: -** The minimum clearance between phases to the switch shall be 760mm. The operation down rod shall be at a transverse distance of 300mm from the outer limb of the switch. The centre spacing between two post insulator sof the same phase shall be 380mm. In the open position of the A.B. switches the moving blade shall rotate through 90 ^{o}. This shall be exhibited in the drawing.

06.08 **Sample, Drawing & Literatures**: - Sample of each items 11KV 200 amps. A.B. Switch shall be furnished and three copies of drawings item similar to the sample shall be furnished along with the tender.

06.09 The details of construction and materials of different parts of the A.B. Switch shall clearly be indicate in the tender and illustrative pamphlet / literature for the same shall be submitted along with the tender.

07.0 **TEST & TEST CERTIFICATE: -**

07.01 **Type Test**: - Certificate for the following type tests conducted on a prototype set of A.B. Switch in a NABL approved test house/CPRI shall have to be submitted along with offer.

Dielectric Test (impulse and one minute were power frequency withstand voltage test.)

- Temperature rise test (for contracts and terminals)
- Shorts Time current and peak withstand current test.
- Mainly active load breaking capacity test.
- Transformer off-load breaking capacity test.
- Line charging breaking capacity test.
- Cable charging breaking test.
- Operation and mechanical endurance test.
- Mechanical strength test for post insulator, as per IS-2444/1937 shall be furnished.
- Test for galvanization of metal (ferrous) parts.

07.02 **Routine /Acceptance Test**: -

The inspection may be carried out by the Purchaser at any stage of manufacture. The successful bidder shall grant free access to the Purchaser's representative at a reasonable time when the work is in progress. The following routine tests shall have to be conducted on each set and results are to be furnished for consideration of deputing inspecting officer for inspection and conduction testing of the materials at the works of the manufacturer. the supplier shall give fifteen days advance intimation to the Purchaser to enable him to depute his representative for witnessing the tests.

1. Power frequency voltage dry test.
2. Measurement of resistance of main circuit.
3. Tests to prove satisfactory operation.
4. Dimension Check
5. Galvanization test.
6. Operational test.

08.00 **Guaranteed Technical Particulars: -**

The bidder shall furnish the guaranteed technical particular duly filled in the format along with the tender.

09.0 **Completeness of Equipment: -**

All fittings, accessories of apparatus which may not have been specifically mentioned in this specification but which are usual or necessary in equipment of similar plat shall be deemed to be included in the specification and shall be supplied by the Tender without extra charge. All plant and equipment shall be completed in all details whether such details are mentioned in the specification or not.