

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

MATERIAL SPECIFICATION CELL

TECHNICAL SPECIFICATION
OF
11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

Table of Contents

CLAUSE NO.	CONTENTS	PAGE NO.
1.00	SCOPE	3
2.00	SERVICE CONDITIONS	3
3.00	SYSTEM VOLTAGE	3
4.00	APPLICABLE STANDARD	3
5.00	CURRENT CAPACITY	3
6.00	NUMBER OF POSTS	4
7.00	GENERAL REQUIREMENTS	4
8.00	TESTS	6
9.00	TESTING FACILITIES	8
10.00	DRAWINGS	8
11.00	INSPECTION	8
12.00	DESPATCHES	9
13.00	SCHEDULE	9
	SCHEDULE 'A' : GTP 11KV AB SWITCH WITH PORCELAIN INSULATOR	10-11
	SCHEDULE 'A' : GTP 22KV AB SWITCH WITH PORCELAIN INSULATOR	12-13
	DRAWINGS	

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

1.00 SCOPE

This specification covers the Design, manufacture & testing at works and supply of Air Break Switches with Porcelain Insulator suitable for 11 kV & 22 kV System Voltages.

2.00 SERVICE CONDITIONS

The equipment to be supplied against this Specification shall be suitable for use under the following tropical conditions.

Environmental Conditions

- | | |
|--|-----------------------|
| a) Maximum ambient temperature | 50° C |
| b) Maximum ambient temperature in shade | 45° C |
| c) Minimum temperature of air in shade | 35° C |
| d) Maximum daily average Temperature | 40° C |
| e) Maximum yearly weighted average Temperature | 32° C |
| f) Relative Humidity | 10 to 100 % |
| g) Maximum Annual rainfall | 1450 mm |
| h) Maximum wind pressure | 150 Kg/m ² |
| i) Maximum altitude above mean sea level | 1000 meters |
| j) Isoceraunic level | 50 days/year |
| k) Seismic level (Horizontal acceleration) | 0.3 g |
| l) Climate: Moderately hot and humid tropical climate conducive to rust and fungus growth. | |

3.00 SYSTEM VOLTAGE

The systems on which the AB Switches will be installed will be:

- i) 11 kV, 3 Phase, 50 Hz with solidly earthed neutral system.
- ii) 22 kV, 3 Phase, 50 Hz with solidly earthed neutral system.

The rated voltage shall be 12kV/24kV.

4.00 APPLICABLE STANDARD

Unless otherwise stipulated in this Specifications, the A.B. Switches shall conform to IEC 62271-103 amended upto date. In case of difference, if any, between this specification and the IEC 62271-103 amended upto date the provisions of this specification will hold good.

5.00 CURRENT CAPACITY

5.01 Current Carrying Capacity

The continuous current carrying capacity for the different system voltages shall be as under:

<u>System Voltage</u>	<u>Current carrying capacity</u>
a) 11 kV	400 Amps.
b) 22 kV	400 Amps.

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

5.02 Rated Short Time Current

The rated short time current for 1 sec. shall be 16 kA.

5.03 Rated Peak Withstand Current

The value of peak current that the switch can withstand in the closed position shall be 40 kA.

5.04 Rated mainly active load breaking capacity

The rated mainly active load breaking capacity shall be 10 A.

5.05 Rated transformer off-load breaking capacity

The rated transformer off-load breaking capacity shall be 6.3 A(rms).

5.06 Rated line-charging breaking capacity

The rated line-charging breaking capacity shall be 2.5 A(rms).

5.07 Rated Cable charging breaking capacity

The rated cable charging breaking capacity shall be 10 A(rms).

6.00 NUMBER OF POSTS

Number of posts per phase for different system voltages shall be as under:-

- i) 11 kV three posts per phase. Each post having single Insulator unit.
- ii) 22 kV three posts per phase. Each post having stack of two 11 kV Post Insulators.

7.00 GENERAL REQUIREMENTS

7.01 A. B. SWITCH IN GENERAL

The A.B. switch shall be of outdoor type. They shall be of triple pole, gang operated type and shall be suitable for horizontal or vertical installation. The A.B. switch should be with arcing horns. The sizes of rods used for arcing horns would be 8 mm. M.S. hot dip galvanized. The current carrying connectors should be of two-bolt type having nuts and bolts, with spring washer & plane washers. Connectors shall be of tinned copper. All ferrous parts shall be hot dip galvanized and copper parts heavily tinned.

All current carrying parts should have current density less than 1.6 Amps/sq.mm. & the minimum cross section for fixed contact shall be 300 sq.mm. In case of flexible copper braided tape, the weight of tape shall be minimum 475 grams for 11 kV rating and 675 grams for 22 kV rating per phase including terminal bracket.

All joints in current carrying path shall be of two bolt type. Each joint shall be provided with one plane and one spring washer of not less than 2 mm thickness.

7.02 PORCELAIN POST INSULATOR

Design and manufacture of post insulator to be used in A. B. Switch assembly should be such as to avoid stress concentration due to direct engagement of the porcelain with the metal fittings and retention of water in the recesses of metal fittings.

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

The post insulator unit shall be assembled in a suitable Jig, to ensure the correct positioning of the top and bottom metal fittings relative to one another. The faces of metal fittings shall be parallel and at right angle to the axis of insulator and corresponding holes on top and bottom metal fittings shall lie in a vertical plane containing the axis of the Insulator. The cap and the pedestal must not become loose. The pedestal should be of malleable cast iron and cap should be of malleable cast iron or aluminium. The vertical alignment of post Insulator must not vary after operations.

Each Porcelain Post Insulator shall have minimum creepage distance of 320 mm & should confirm to the requirements of IEC 60168 amended upto date.

7.03 FIXED AND MOVABLE CONTACT SYSTEM

The fixed & moving contacts material shall be electrolytic hard-drawn copper heavily tinned. The contact shall be of high pressure and self aligning type with positive wiping action and minimum contact pressure shall be 1/4 lb. per amp. of current carrying capacity.

Supplier has to supply A.B. Switch units manufactured only as per the details given in the enclosed drawings.

7.04 MECHANICAL STRENGTH

A.B. Switches shall withstand rated mechanical terminal load and electromagnetic forces without impairing their operational reliability or current carrying properties.

7.05 SECURING POSITIONS

A.B. Switches inclusive of their operating mechanism should not come out of their open or closed positions by gravity, wind pressure, vibrations or reasonable shocks.

A.B. Switches shall be capable of resisting in closed position the dynamic and thermic effects of the maximum possible short circuit current at the installation point and should not open under the influence of short circuit current.

7.06 NAME PLATE

A.B. Switches shall be provided with a nameplate containing following information.

Name of manufacturer.

Order reference.

Rated voltage-kV

Rated normal current in Amps.

Rated one second short-time current in Amps.

Year & Month of Manufacture.

Name of manufacturer should also be provided on the operating device. The nameplate should be riveted to the base channel at the center of each pole and operating mechanism including parts. Sticker may be used for parts of operating mechanism.

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

7.07 PHASE TO PHASE CLEARANCE

The phase to phase clearance shall be as under :-

System Voltage.	Phase to phase clearance
11 kV	75 cm.
22 kV	122 cm

7.08 ISOLATING DISTANCE

The minimum distance between the fixed and the nearest part on the moving contact in the completely open position should not be less than the following for different system voltage.

System Voltage	Min. Isolating Distance
11 kV	31 cm.
22 kV	46 cm.

7.09 OPERATING MECHANISM

This should comprise of 'B' Class G.I. Operating pipe of 32 mm outer diameter and 6 meter length in single piece without joint. The mechanism should give good mechanical leverage with minimum of loose/lost motion. There should be provision for pad-locking in both 'on' and 'off' position.

8.00 TESTS

8.01 TYPE TESTS:

A) A.B. SWITCH

The tenderer shall furnish following Type Tests carried out on A. B. Switches as per IEC 62271-103 amended upto date alongwith the offer.

- i) Lightning Impulse Voltage Withstand Test
- ii) Dry & Wet Power Frequency Voltage Withstand Test
- iii) Temperature rise test
- iv) Measurement of Resistance of Main Circuit
- v) Mechanical Endurance test
- vi) Short Time Withstand Current & Peak Withstand Current Test (The short time current rating for 1 second should be 16 kArms)

The A.B Switch should confirm to the following characteristics.

Sr. No.	System Voltage	Lightning Impulse Withstand Voltage with +ve & -ve Polarity		Power Frequency Withstand Voltage (Dry & Wet)	
		Across the Isolating Distance (kV Peak)	To Earth & between poles (kV Peak)	Across the Isolating Distance (kV Peak)	To Earth & between poles (kV Peak)
1.	11 kV	85	75	32	28
2.	22 kV	145	125	60	50

All the above type tests shall be carried out as per IEC 62271-103 amended upto date at laboratories which are accredited by the National Accreditation Board of Testing and Calibration Laboratories (NABL) of Govt. of India. These type tests should have been carried out within five years prior to the date of opening of the tender.

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

B) PORCELAIN POST INSULATOR:

The tenderer will clearly & specifically indicate the name of manufacturer of Porcelain Post Insulator. Accordingly, tenderer shall furnish following Type tests carried out on Porcelain Post Insulator as per IEC 60168 amended upto date alongwith the offer.

- i) Visual Examination
- ii) Verification of Dimensions
- iii) Visible Discharge Test
- iv) Impulse Voltage Withstand Test
- v) Dry Power Frequency Voltage Withstand Test
- vi) Wet Power Frequency Voltage Withstand Test
- vii) Temperature Cycle Test
- viii) Test for mechanical strength
- ix) Puncture Test [For Insulators in design categories 4) & 5) only as per Cl. No. 2.1.1 of IEC 60168 -2001]
- x) Porosity Test
- xi) Galvanizing Test

The Porcelain Post Insulators should confirm to the following characteristics.

Sr. No.	System Voltage	Impulse Withstand Voltage in kV	Impulse Flashover Voltage in kV	Power Frequency Withstand Voltage in kV		Power Frequency Flashover Voltage in kV	
				Dry	Wet	Dry	Wet
1.	11 kV	75	125	35	35	80	50
2.	22 kV	125	160	55	55	120	85

All the above Type Tests shall be carried out as per IEC 60168 amended upto date at laboratories which are accredited by the National Accreditation Board of Testing and Calibration Laboratories (NABL) of Govt. of India. These type tests should have been carried out within five years prior to the date of opening of the tender.

The Tenderer shall submit all the Type Test reports of A.B. Switch & Post Insulators as per relevant IS/IEC to the office of the Chief Engineer (Testing & QC) and get it approved as per Tender conditions.

8.02 ROUTINE TESTS

A) A.B. SWITCH

Each A.B. Switch manufactured & to be supplied will be subjected to following routine tests.

- i) Power Frequency Voltage (Dry) Test on AB Switches which are completely assembled at Manufacturer's work.
- ii) Measurement of resistance of main circuit
- iii) Design & Visual Checks
- iv) Mechanical operating test

B) PORCELAIN POST INSULATOR:

Each Porcelain Post Insulator will be subjected to following routine tests.

- i) Routine Visual Examination
- ii) Routine mechanical test
- iii) Routine Electrical test [For Post Insulators in design categories 4) & 5) only as per Cl. No. 2.1.1 of IEC 60168 -2001]

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

8.03 ACCEPTANCE TESTS

A) A.B. SWITCH

The following shall be acceptance tests for complete A.B. Switch.

- i) Temperature Rise Test
- ii) Measurement of resistance of main circuit
- iii) Power Frequency Voltage (Dry) Test on main circuit
- iv) Design & Visual Checks
- v) Mechanical operating test
- vi) Galvanizing test as per IS 2633 (amended upto date)

B) PORCELAIN POST INSULATOR:

The following shall be acceptance tests for Porcelain Post Insulator.

- i) Verification of Dimensions
- ii) Temperature Cycle Test
- iii) Test for mechanical strength
- iv) Puncture Test [For Insulators in design categories 4) & 5) only as per Cl. No. 2.1.1 of IEC 60168 -2001]
- v) Porosity Test
- vi) Galvanizing Test

- 8.04** It shall be sole responsibility of the supplier to carry out through inspection & quality checks on the Insulators at the Insulator supplier works, before offering the Insulators for MSEDCL's inspection. The AB Switch shall be supplied duly assembled.

9.00 TESTING FACILITIES

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 MSEDCL's Engineers if deputed or carry out or witness the tests in the manufacturer works.

10.00 DRAWINGS

A.B. Switch shall be manufactured as per details given in the drawings attached. The tenderer shall furnish following drawings to the office of Chief Engineer (Testing & QC) and get it approved as per tender conditions.

- i) GA drawing of AB Switch with Porcelain Post Insulator
- ii) Details of Fixed & Moving Contact
- iii) Drawing of Porcelain Post Insulator

11.00 INSPECTION

The inspection may be carried out by the MSEDCL at any stage of manufacture. The successful Tenderer shall grant free access to the MSEDCL's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the MSEDCL, shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective. The supplier shall keep the MSEDCL informed in advance, about the manufacturing programme so that arrangement can be made for inspection.

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

12.00 DESPATCHES:

From the A.B. Switches received in the stores, two sample switches shall be taken out by MSEDCL's authority and all dimensions will be checked & every sample cutout will be subjected to test for it's trouble free operation. A minimum 50 operations shall be performed on each sample. The payment/SR note shall be released only after satisfactory test for trouble free operation.

13.00 SCHEDULE:

The tenderer shall fill in the following schedules which form part of tender Specification & offer. If the schedules are not submitted duly filled in with the offer, the offer shall be liable for rejection.

SCHEDULE 'A' – GUARANTEED TECHNICAL PARTICULARS

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

**SCHEDULE – ‘A’
GUARANTEED TECHNICAL PARTICULARS
11KV AB SWITCH WITH PORCELAIN INSULATOR**

Sr. No.	Particulars	MSEDCL Requirement	To be offered by Bidder
1.	Name of Manufacturer	Mfg to give details	Text
2.	Works Address	Mfg to give details	Text
3.	Manufacturers Type	11kV 400Amp AB Switch With Porcelain Post Insulator	Text
4.	Relevant IS	IEC 62271-103 amended upto date	Text
5.	Rated Voltage	12 kV	Text
6.	Rated Frequency	50 Hz	Text
7.	Continuous current Rating	400 Amp	Text
8.	Rated Short Time Withstand Current for one second	16 kA rms	Text
9.	Rated Peak Withstand Current for one second	40 kA (Peak)	Text
10.	Lightning Impulse Withstand Voltage		
a.	Across the Isolating distance	85 kV (Peak)	Text
b.	To Earth & Between Poles	75 kV (Peak)	Text
11.	Power Frequency Withstand Voltage (Dry & Wet)		
a.	Across the Isolating distance	32 kVrms	Text
b.	To Earth & Between Poles	28 kVrms	Text
12.	Temperature Rise	Within permissible limit as per IEC 62271-103 amended upto date	Text
13.	Material of Fixed & Moving contact	Electrolytic Hard Drawn Tinned Copper	Text
14.	Cross Section area of Fixed contact (min.)	300 sq.mm. (min.)	Text
15.	Cross Section area of moving contact (min.)	250 sq.mm. (min.)	Text
16.	Material of connector	Tinned Copper	Text
17.	Cross Section area of connector (min.)	250 sq.mm. (min.)	Text
18.	Phase to Phase clearance	750 mm	Text
19.	Minimum isolating distance (In open Position)	310 mm	Text
20.	GI Operating Pipe	6 meter, 32mm OD, Class ‘B’	Text
21.	Weight of flexible Tinned copper braided tape including terminal bracket	475 grams/phase	Text

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

22.	Number of breaks per phase	Single	Text
23.	Operating horizontal (solid) square Rod	25x25Sq.mm.	Text
24.	Type of installation	Vertical or Horizontal	Text
25.	Outdoor/Indoor	Outdoor	Text
26.	Size of Base Channel	75mmx40mmx5mm	Text
27.	Porcelain Post Insulator		
a.	Rated Voltage	12kV	Text
b.	Applicable Standard	IEC 60168 amended upto date	Text
c.	Make of Post Insulator	Mfg to give details	Text
d.	CD of Post Insulator (min.)	320mm (min.)	Text
e.	Post Insulators per phase	3 Nos.	Text
28.	Total weight of AB Switch	Mfg. to give details	Text

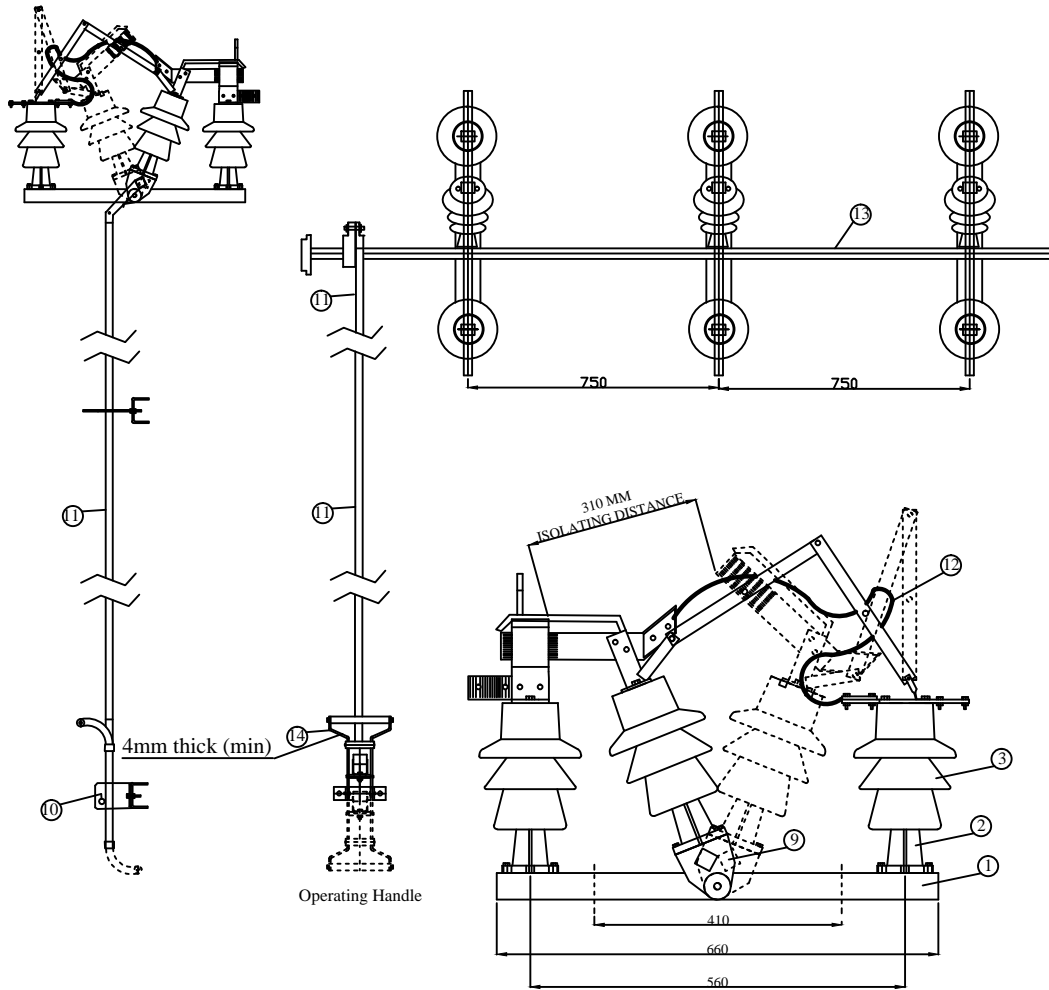
**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

**SCHEDULE – ‘A’
GUARANTEED TECHNICAL PARTICULARS
22 KV AB SWITCH WITH PORCELAIN INSULATOR**

Sr. No.	Particulars	MSEDCL Requirement	To be offered by Bidder
1.	Name of Manufacturer	Mfg to give details	Text
2.	Works Address	Mfg to give details	Text
3.	Manufacturers Type	22 kV 400Amp AB Switch With Porcelain Post Insulator	Text
4.	Relevant IS	IEC 62271-103 amended upto date	Text
5.	Rated Voltage	24 kV	Text
6.	Rated Frequency	50 Hz	Text
7.	Continuous current Rating	400 Amp	Text
8.	Rated Short Time Withstand Current for one second	16 kA rms	Text
9.	Rated Peak Withstand Current for one second	40 kA(Peak)	Text
10.	Lightning Impulse Withstand Voltage		
a.	Across the Isolating distance	145 kV (Peak)	Text
b.	To Earth & Between Poles	125 kV (Peak)	Text
11.	Power Frequency Withstand Voltage (Dry & Wet)		
a.	Across the Isolating distance	60 kVrms	Text
b.	To Earth & Between Poles	50 kVrms	Text
12.	Temperature Rise	Within permissible limit as per IEC 62271-103 amended upto date	Text
13.	Material of Fixed & Moving contact	Electrolytic Hard drawn Tinned Copper	Text
14.	Cross Section area of Fixed contact (min.)	300 sq.mm. (min.)	Text
15.	Cross Section area of moving contact (min.)	250 sq.mm. (min.)	Text
16.	Material of connector	Tinned Copper	Text
17.	Cross Section area of connector (min.)	250 sq.mm. (min)	Text
18.	Phase to Phase clearance	1220 mm	Text
19.	Minimum isolating distance (In open Position)	460 mm	Text
20.	GI Operating Pipe	6 meter, 32mm OD, Class 'B'	Text
21.	Weight of flexible Tinned copper braided tape including terminal bracket	675 grams/phase	Text

**TECHNICAL SPECIFICATION OF 11KV, 22KV AIR BREAK SWITCH
WITH PORCELAIN INSULATOR**

22.	Number of breaks per phase	Single	Text
23.	Operating horizontal (solid) square Rod	25x25Sq.mm.	Text
24.	Type of installation	Vertical or Horizontal	Text
25.	Outdoor/Indoor	Outdoor	Text
26.	Size of Base Channel	75mmx40mmx5mm	Text
27.	Porcelain Post Insulator		
a.	Rated Voltage	12 kV	Text
b.	Applicable Standard	IEC 60168 amended upto date	Text
c.	Make of Post Insulator	Mfg to give details	Text
d.	CD of Post Insulator (min.)	320 mm (min)	Text
e.	Post Insulators per phase	6 Nos.	Text
28.	Total weight of AB Switch	Mfg. to give details	Text



SR. No.	Description	Qty	Material	Specification
1	Base Channel	3	MS HD Galvanised 75 X 40 X 5MM	IS 2062
2	Base of Post Insulator	9	M.C.I. / Forged Steel	As per specification
3	Post Insulator	9	Porcelain	IEC 60168
4	Connector	6	Tinned Copper	As per specification
5	Arcing Horns	6	MS HD Galvanised 8mm	As per specification
6	Fixed Contact	3	Electrolytic Hard Drawn Tinned Copper	As per specification
7	Moving Contact	3	Electrolytic Hard Drawn Tinned Copper	As per specification
8	MS Supporters strip with spacer	3	MS HD Galvanised	IS 2062
9	CI Roller / MS HDG	3	Cast Iron/MS HD Galvanised	As per specification
10	Locking Arrangement	1	MS HD Galvanised	IS 2062
11	Operating Pipe Vertical 6 mtr. 32mm OD Class B	1	GI Pipe	IS 1239
12	Flexible Copper Braided Tape	3	Tinned Copper	As per specification
13	Operating Horizontal (Solid) Square Rod	1	GI 25 x 25 Sq.mm	As per IS
14	Operating ON / OFF Handle	1	M.S. HD Galvanised	

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LTD.

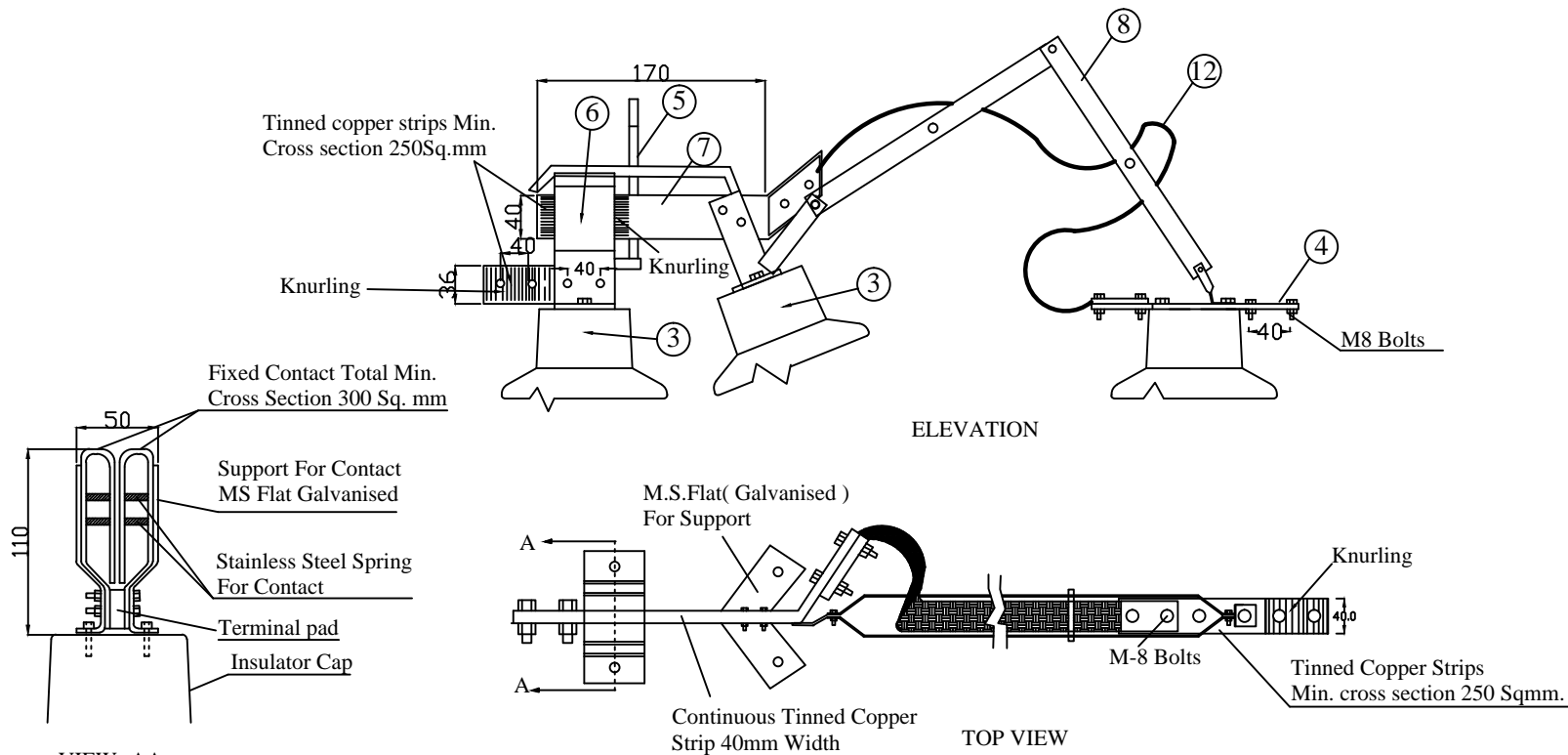
NAME:-GA DRAWING OF 11KV 400AMP AB SWITCH WITH PORCELAIN INSULATOR

DRG NO.:- 11KV /AB /PORCELAIN/001-Sheet 1 of 2

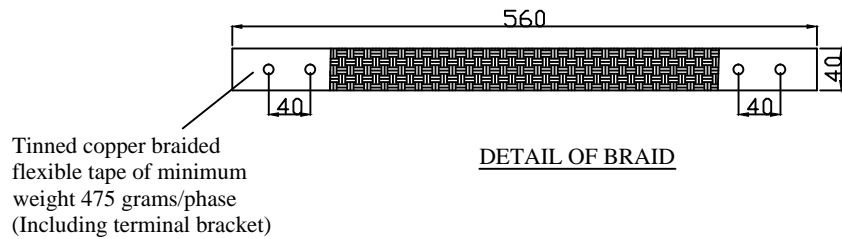
			REV. :-0.0
CHECKED BY	APPROVED BY	DATE	

Notes:-

1. All nuts, bolts for current carrying parts are of stainless steel only. Plain & spring washers are provided.
2. All nuts, bolts, washers used for assembly of non current carrying parts are H.D. Galvanised.
3. All ferrous parts are H.D. Galvanised.
4. Copper parts are heavily tinned.
5. All dimensions are in mm.
6. Riveting for MS support - 8mm



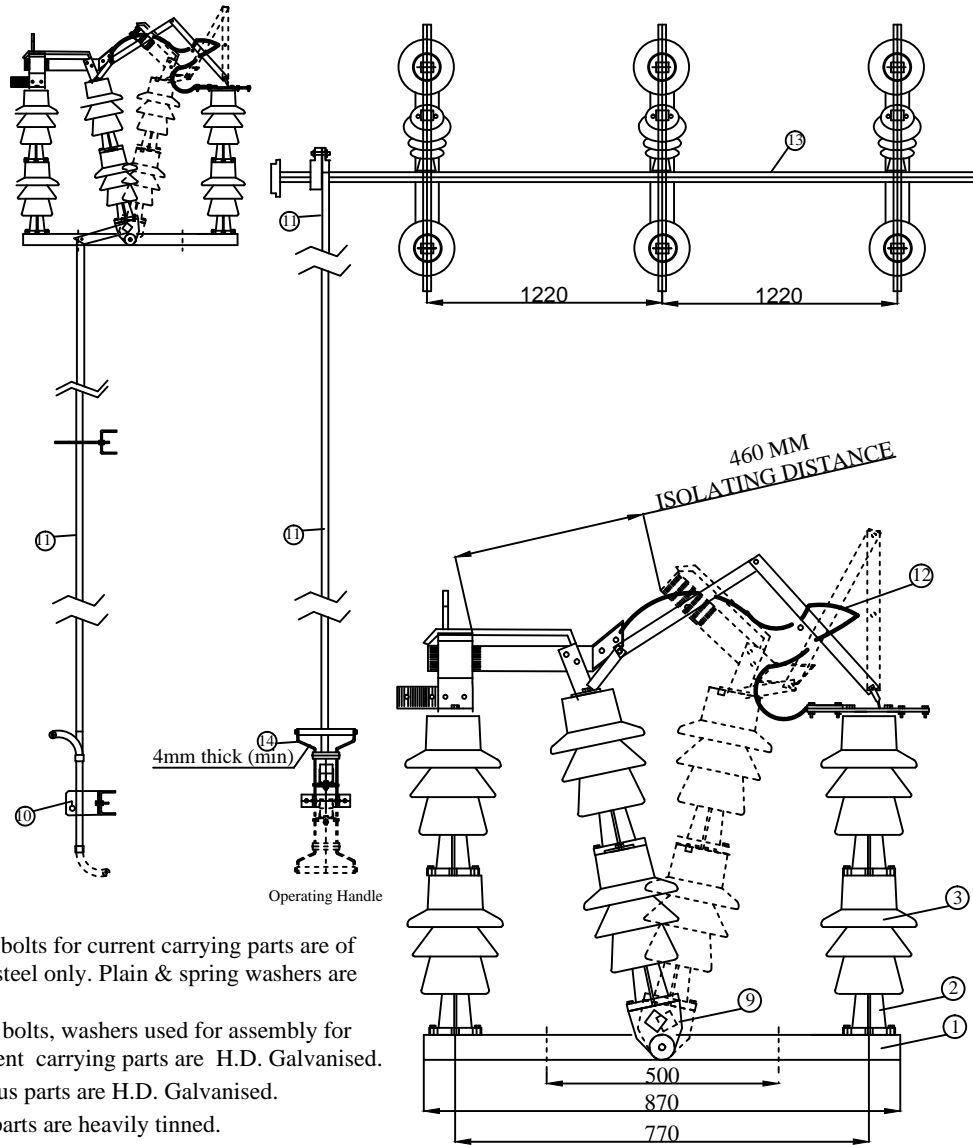
**VIEW -AA
DETAIL OF FIXED
CONTACT**



Tinned copper braided flexible tape of minimum weight 475 grams/phase (Including terminal bracket)

DETAIL OF BRAID

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LTD.			
NAME:-DETAIL OF FIXED AND MOVING CONTACT OF 11KV 400AMP AB SWITCH WITH PORCELAIN INSULATOR			
DRG NO.:- 11KV /AB /PORCELAIN/001-Sheet 2 of 2			
			REV. :-0.0
CHECKED BY	APPROVED BY	DATE	



Notes:-

1. All nuts, bolts for current carrying parts are of Stainless steel only. Plain & spring washers are provided.
2. All nuts, bolts, washers used for assembly for non current carrying parts are H.D. Galvanised.
3. All ferrous parts are H.D. Galvanised.
4. Copper parts are heavily tinned.
5. All dimensions are in mm.
6. Riveting For MS support- 8mm

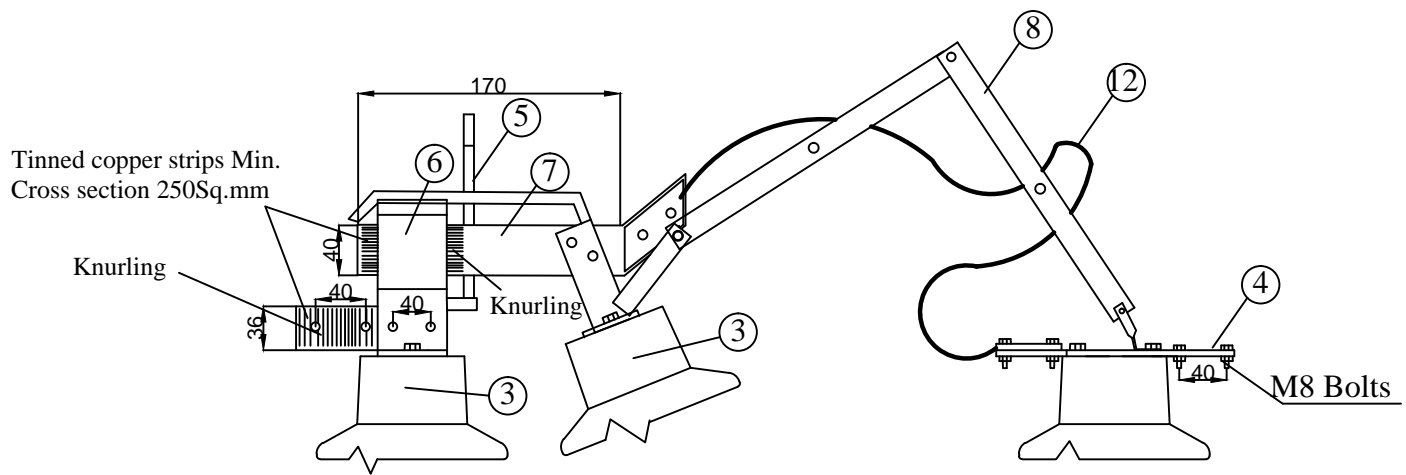
SR. No.	Description	Qty	Material	Specification
1	Base Channel	3	MS HD Galvanised 75 X 40 X 5mm	IS 2062
2	Base of Post Insulator	18	M.C.I. / Forged Steel	As per specification
3	Post Insulator	18	Porcelain	IEC 60168
4	Connector	6	Tinned Copper	As per specification
5	Arcing Horns	6	MS HD Galvanised 8mm	As per specification
6	Fixed Contact	3	Electrolytic Hard Drawn Tinned Copper	As per specification
7	Moving Contact	3	Electrolytic Hard Drawn Tinned Copper	As per specification
8	MS Supporters strip with spacer	3	MS HD Galvanised	IS 2062
9	CI Roller / MS HDG	3	Cast Iron / MS HD Galvanised	As per specification
10	Locking Arrangement	1	MS HD Galvanised	IS 2062
11	Operating Pipe Vertical 6 mtr. 32mm OD Class B	1	GI Pipe	IS 1239
12	Flexible Copper Braided Tape	3	Tinned Copper	As per specification
13	Operating Horizontal (Solid) Square Rod	1	GI 25 x 25 Sq. mm	As per IS
14	Operating ON / OFF Handle	1	MS HD Galvanised	

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LTD.

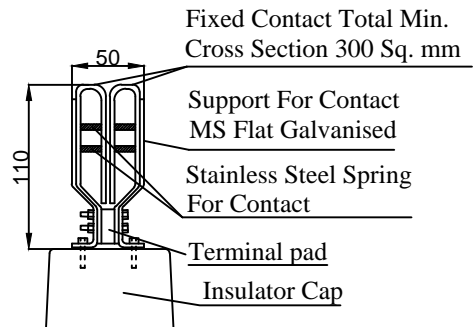
NAME:- GA DRAWING OF 22KV 400AMP AB SWITCH WITH PORCELAIN INSULATOR

DRG NO.:- 22KV / AB / PORCELAIN / 001- sheet 1 of 2

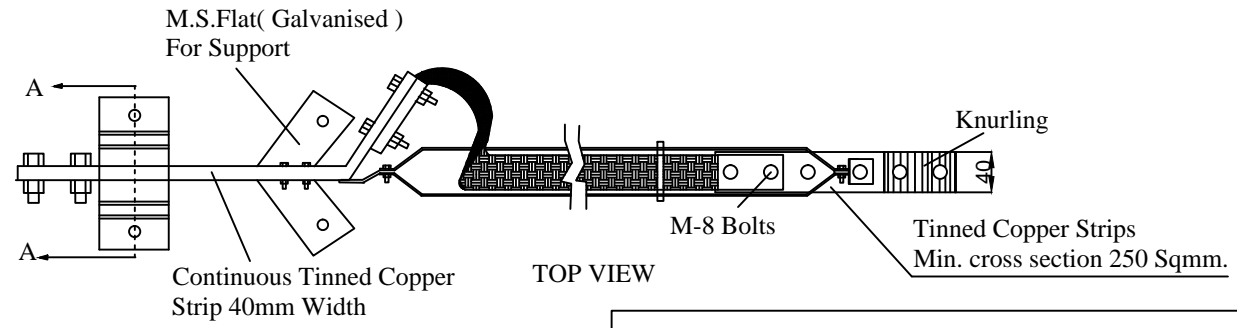
			RIV. :-0.0
CHECKED BY	APPROVED BY	DATE	



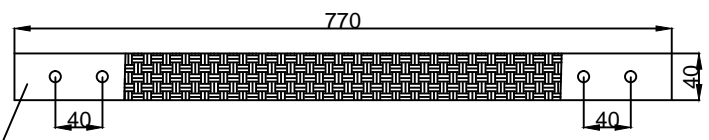
ELEVATION



VIEW -AA
DETAIL OF FIXED
CONTACT



TOP VIEW



DETAIL OF BRAID

Tinned copper braided flexible tape of minimum weight 675 grams/phase (Including terminal bracket)

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LTD.			
NAME:- DETAIL OF FIXED & MOVING CONTACT OF 22KV 400AMP AB SWITCH WITH PORCELAIN INSULATOR			
DRG NO.:- 22KV /AB / PORCELAIN / 001- Sheet 2 of 2			
			RIV. :-0.0
CHECKED BY	APPROVED BY	DATE	