

SCHEDULE 'A'

TECHNICAL SPECIFICATION

FOR

11 kV , 22 kV & 33 kV HORN GAP FUSES

FOR

DISTRIBUTION NETWORK IN MAHARASHTRA

**SPECIFICATION NO: DIST/MM/I/HGF2006
(24.07.2006)**

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.

SCHEDULE - ' A '

TECHNICAL SPECIFICATION FOR 11 kV , 22 kV & 33 kV HORN GAP FUSES

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SCHEDULE - ' A '

TECHNICAL SPECIFICATION FOR 11 kV , 22 kV & 33 kV HORN GAP FUSES

SPECIFICATION NO: DIST/MM/I/HGF2006

1. SCOPE :-

This specification covers the Design, manufacture testing at works and supply of Horn Gap Fuses of 11 kV , 22 kV & 33 kV voltage class.

2. CLIMATIC CONDITIONS :

The Horn Gap Fuses are required for mounting on outdoors structures for protection of transformers and tapping points where the climatic conditions will be as follows :

- i) Temp. variation : 3 Deg.C to 50 Deg.C
- ii) Relative Humidity upto 100
- iii) Altitude : 0 to 1000 meters.

3. MATERIALS :

The Horn Gap Fuse units shall be manufactured as per details given in the Drawing No.63.725 (R-2). The various components shall conform to the following specifications :

- a. M.S. Channel, flat and round (Steel) conform to I.S.:2062 amendment up to date (structural steel standard quality having tensile strength of 42-54 kg/sq.mm.)
- b. **Bolt and Nuts** : These shall conform to the following IS specifications :
 - IS : 1367 - 1980 (amended upto date)
 - IS : 4218 - 1976 (amended upto date)
 - IS : 1363 - 1984 (amended upto date)
- c. For galvanizing, zinc conforming to Grade 98.50 of IS-209/1979 specification for zinc (Revised) shall be used.
- d. Arcing Horn and Connectors of one piece Aluminium strip.

Aluminium strips as per enclosed drawing.

4. INSULATORS : (PIN)

The pin type insulators used for the Horn Gap Fuse Unit shall conform to IS:731-1971 (amended upto date) in all respects with regard to mechanical and electrical requirements.

a. **The electrical characteristics** of the insulators shall be as follows :

System Voltage	Power Frequency withstand voltage in kV		Flashover voltage in kV		Impulse withstand voltage in kV	Creepage Distance in mm		
	Dry	Wet	Dry	Wet		Moderately polluted atmosphere	Heavily polluted atmosphere	Protected
<u>Pin Insulator</u>								
1. 11 kV	55	35	85	50	75	230	N.A.	N.A.
2. 22 kV	75	55	120	85	125	N.A.	560	N.A.
3. 33 kV	95	75	135	95	170	580	N.A.	420

b. **Mechanical loads** : 1. Pin Insulators-540 kg. as min. failing load.

5. **GENERAL REQUIREMENTS** :

The Horn Gap Fuse sets are required for protection on 11, 22 and 33 kV systems. They will be mounted outdoors on suitable structures. These sets will be exposed to atmospheric conditions and therefore, shall be robust in construction.

In the drawing, the construction of the fuse units has been shown using pin type of insulators.

6. **WORKMANSHIP** :

The casting shall be of good finish and free from flaws, blow holes and other defects. The edges of the fittings shall be smoothly rounded.

The M.S. flat, round etc. before any work is done on them, shall be carefully leveled, straightened and bent or forged to the shape given in the drawing by methods which will not injure the materials. No rough edges shall be permitted anywhere through out the work.

Similar parts shall be uniform and interchangeable with each other.

The welding work wherever mentioned in the drawing shall be carried out properly and the same shall not open under climatic conditions.

Holes in channel shall be drilled or machine punched. All burrs left by drilling or punch shall be completely removed. The Bolts and Nuts shall be well forged and free from inequalities, flaws and other defects. The heads shall be solid and in every respect well formed and shall not fail when the bolts are tested to fracture at their full section for Tensile Stress.

The washers shall be clearly cut off or punched and entirely free from cracks after punching.

7. GALVANIZING :

All ferrous parts (Bolts, Nuts, Washers, M.S. Flats, Clamps and M.S. round holding clamps etc. for the insulator and Horn Gap Fuses) shall be hot dip galvanized. The galvanizing shall conform to IS:2633/1972 (amended up to date) in all respect. After galvanizing, the surfaces shall be free from all sharp edges and metal.

The threading on nut and bolt shall be cut before galvanizing.

The quality of the galvanizing shall be determined by the tests given in IS:2633 of 1972.

Wherever the welding is done, the galvanizing shall be done after welding.

8. TESTS :

8.1 The following Type Tests shall be carried out on H.G. Fuses as per IS: 9385/1980 (Part-II) :-

- a) Dielectric Tests ,
- b) Temperature Rise Test shall be done at 100A current.

8.2. The manufacturer/tenderer shall clearly indicate what testing facilities they have got for testing the H.G. Fuses.

8.3 HORN GAP FUSES :

The tenderer shall furnish detailed type test reports of the offered 11k V / 22 kV Horn Gap Fuses for the tests as per clause - 8.1 of this specification . All the above type tests shall be carried out as per the procedures given in IS-9385/1980 (Part2) amended upto date at laboratories which are accredited by the National Accreditation Board of Testing and Calibration Laboratories (NABL) of Govt. of India. . These tests should have been carried out within five years prior to the date of opening of this tender .

The tenderers who have supplied these material and having approved type test reports may seek exemption from submission of type test reports. Such tenderers shall furnish an undertaking in the format scheduled 'F' enclosed herewith.

The detailed type test reports alongwith the relevant oscillograms/ certified drawings etc. or undertaking seeking exemption from their submission in the format schedule 'F', are to be submitted in sealed cover on or before 14.00 hours on the same date of the month two months after the date of tender opening (e.g. if the tender is opened on 3rd June, the submission of type test reports shall be on or before 3rd August) or the next working day in case the same date is a holiday duly superscribed on it following details :

" Type Test Reports of 11 kV & 22 kV Horn Gap Fuses against Tender SP/T-0912/0506 "

The sealed covers shall be opened at 15.00 hours on the same day in presence of the tenderers who choose to be present.

The purchaser reserves the right to demand repetition of some or all the Type Tests in presence of purchaser's representative at purchaser's cost. For this purpose, the tenderer shall quote unit rates for carrying out each Type Test. However, such unit rates will not be considered for evaluation of the offer. In case the unit fails in the type tests, the complete supply shall be rejected.

The successful tenderer shall take approval / waiver of type tests from C.E.(Dist.), M.S.E.D.C.L, Prakashgad, Bandra , Mumbai prior to commencement of supply.

8.4 **PIN INSULATOR:-** The supplier/tenderer will clearly and specifically indicate the name of manufacturer of the pin insulator. The type test certificates issued by Laboratories Accredited to National Accreditation Board for testing and calibration Laboratories (NABL) showing the results of the type tests carried out on Pin insulators as per IS:731/1971 (amended upto date) will have to be submitted before commencement of supply. In case the Pin insulators are type tested prior to five (5) years before the date of opening of the tender at the laboratory enjoying the status of approval from National Accreditation Board, for Testing and Calibration Laboratories, New Delhi (NABL), all the type tests as per relevant standards shall be carried out by the successful tenderer in the presence of purchaser's representative, on the unit selected and sealed by purchaser, without any extra cost, before commencement of delivery, at NABL approved laboratory.

9.: INSPECTION :

- i. The supplier/tenderer will have to give guarantee of the composition of the aluminum used and strength by actual test. The supplier / tenderer shall therefore mention in the offer the name of the manufacturer from whom the raw materials are purchased and also submit the Test Certificate.
- ii. Original manufacturer's test certificate of insulator shall be made available to the E.E. (IW). If required these insulators shall be inspected at the cost of supplier at any laboratory acceptable to the Company in the presence of E.E. (IW).
- iii. Original copies of invoice, documentary evidence of payment of Excise Duty, Challan and Certificate of insulator manufacturer for original cementing shall also be made available to E.E. (IW) and the attested copies of the same shall be submitted to C.A.O.(Accounts), M.S.E.D.C.L., Mumbai.

10. : REJECTION CLAUSE : The purchaser will select at works two assembled horn gap fuse units at random from each lot of 100 . These two selected horn gap fuses would be subjected to the type tests specified above at supplier's cost. If the units fail to comply with the requirements, the whole lot of 100 will be rejected. The testing under this clause will be done in any laboratory of the Company's choice including Company's laboratory.

Notice of such test will be given by the Company by ordinary post to the supplier after intimation of the lot is received and the date of test may not be altered to the convenience or at the request of the supplier. The supplier is at liberty to be present during the testing.

11.: SCHEDULE :

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

SCHEDULE - 'C' - Tender's Experience.

SCHEDULE – ' F ' - Proforma of Undertaking .

11.2: The tenderer shall submit the list of orders for similar type of equipment, executed or under execution during the last three years, with full details in the schedule of Tenderer's experience (Schedule 'C') to enable the purchaser to evaluate the tender.

12.0: Drawing No. : 63.725 (R-2) enclosed herewith form the part of the offer. The supplier has to supply Horn gap fuse units manufactured as per the details given in the enclosed drawing. Hence , tenderer successful in getting LOA/Order , is not required to take drawing approval from Chief Engineer (Dist).

SCHEDULE ' F '

PROFORMA OF UNDERTAKING

We hereby confirm that 11 kV & 22 kV Horn Gap Fuses offered by us against this tender are of the same design and type as have been supplied to M.S.E.D.C.L. against earlier order No. _____ dated _____ and all the type test reports thereof were approved by C.E.(Dist.) vide letter No. _____ dated _____ (copy enclosed).

We further confirm that the said type tests have been carried out at the laboratories accredited by NABL within five years prior to the date of opening of the present tender.

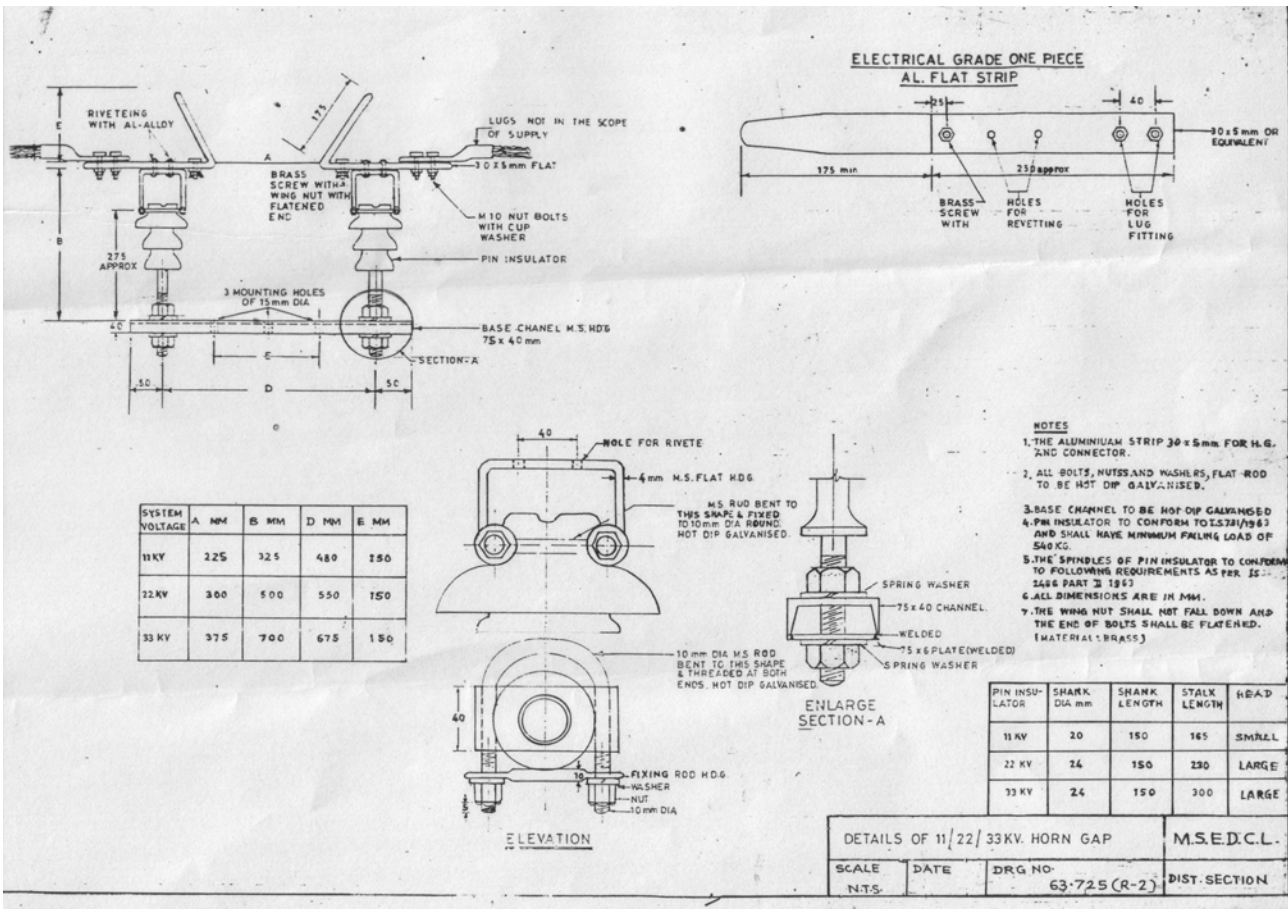
SEAL & SIGNATURE OF THE TENDERER

SCHEDULE ' B '

- 1) Testing facilities at manufacturer's works as per clause No. 8 (I) of Technical Specification (SCHEDULE-'A')
- 2) The name of the manufacturers from whom the raw materials are purchased as per clause No.9 (i) of Technical Specification (SCHEDULE-'A')
- 3) Schedule ' C ' – tenderer's experience as per clause No. 11.1 of Technical Specification (SCHEDULE-'A')

HAND DELIVERY

- 1) Test certificates as per clause No. 9 (i) of Technical Specification (SCHEDULE-'A') for the raw materials (alongwith original test certificates for verification).
- 2) Type test certificates of Horn Gap Fuse and certificate from testing laboratory as NABL accredited (alongwith original test certificates for verification) as per clause No. 8 (II) of Technical Specification (SCHEDULE-'A').



SYSTEM VOLTAGE	A MM	B MM	D MM	E MM
11KV	225	325	480	150
22KV	300	500	550	150
33KV	375	700	675	150

- NOTES**
1. THE ALUMINIUM STRIP 30 x 5mm FOR H.G. AND CONNECTOR.
 2. ALL BOLTS, NUTS AND WASHERS, FLAT ROD TO BE HST DIP GALVANISED.
 3. BASE CHANNEL TO BE HOT DIP GALVANISED
 4. PIN INSULATOR TO CONFORM TO IS 731/1963 AND SHALL HAVE MINIMUM PULLING LOAD OF 540 KG.
 5. THE SPINDLES OF PIN INSULATOR TO CONFORM TO FOLLOWING REQUIREMENTS AS PER IS 2486 PART 2 1962
 6. ALL DIMENSIONS ARE IN MM.
 7. THE WING NUT SHALL NOT FALL DOWN AND THE END OF BOLTS SHALL BE FLATENED. (MATERIAL - BRASS)

PIN INSULATOR DIA mm	SHANK LENGTH	STALK LENGTH	HEAD
11 KV	20	150	SMALL
22 KV	24	150	LARGE
33 KV	24	150	LARGE

DETAILS OF 11/22/33KV. HORN GAP			M.S.E.D.C.L.
SCALE N.T.S.	DATE	DRG NO. 63-725 (R-2)	DIST. SECTION