

## **TECHNICAL SPECIFICATION FOR THE LT HG FUSE SETS WITH POLYMER INSULATORS**

- 1.0 **SCOPE:** The Specification provides for manufacturers testing before dispatch, supply and delivery of L.T H.G Fuse Sets with polymer insulators (Protection Kits) for use of L.T Side of the distribution transformers as per the particulars given in the schedule attached.
- 2.0 **APPLICABLE STANDARDS:** The L.T H.G Fuse Sets with polymer insulators (Protection Kits) shall conform in all respects to the clause (5) Technical Particulars given below. The Insulators conform to relevant IS (Latest Version). **The insulators shall be invariably procured from registered vendors of EPDCL only.**
- 3.0 **CLIMATE CONDITIONS:** The climatic conditions under which the equipment shall operate satisfactorily are as indicated in Clause 23.1 of General and Financial terms and conditions for supply of materials.
- 4.0 **CONSTRUCTION:**
- 4.1. L.T H.G Fuse Sets (Protection Kits) are meant for mounting on Distribution Transformer Structure.
- A set of six No's Die Cast Alloy Aluminium single piece arcing horns to be fitted on the top of Polymer Insulators. This arcing horns are to be provided with Brass Bolts, Nuts and Washers for Fuse arrangement.
- 4.2. The Polymer parts shall be permanently secured at the supporting structure. Metal insert to the Insulators shall be done using good quality epoxy compound or phosphor cement.
- The Polymer shall be sound and homogenous, free from defects, laminations and other flaws of imperfections which might effect the mechanical or dielectric strength. Theses should be thoroughly vitrified and shall be tough, impervious to moisture and smoothly glazed.
- The Polymer and metal parts shall be assembled in such a manner that any thermal expansion differential between the metal and porcelain parts through out the range of temperature variation shall not loosen the parts or create undue internal stresses which may effect the electrical or mechanical strength and rigidity. **The Polymer insulators shall conform in all respects to relevant IS/IEC specification (with latest version as applicable).**
- 4.3. Pad type terminal connectors shall be Aluminium Alloy and rated for the following.
- i). Continuous Rating 140 A
  - ii). Short time rating 6 KA for one second.
- Three No's Pad Connectors shall suit to receive PVC Insulated Aluminium Wire of 25 to 95 Sq.mm. Three No's of Pad Connectors shall suit to receive Over Head Bare Aluminium Conductor of Squirrel/ Weasel/ Rabbit Conductor.
- 4.4. **All the ferrous parts shall be hot dip galvanized. The bolts and nuts shall be electroplated.**
- 5.1 **TECHNICAL PARTICULARS:**
- 5.1.1 Rated Current : 140 A

- 5.1.2 Rated Voltage : 440 V
- 5.1.3 Rated Insulation Level
- a). Dry power frequency withstanding voltage : 30 KV (RMS)
  - b). Wet power frequency withstanding voltage : 18 KV (RMS)
  - c). Impulse Withstand Voltage : 45 KV (Peak)
- 5.1.4 Temperature Rise : 50 Degree C above ambient temp
- 5.1.5 Resistance Across the Terminals  
(Excluding Fuse Wire Resistance) : 1 milli Ohm
- 5.1.6 The Gap for the Fuse Wire Shall be : 100 mm
- 5.1.7 Phase to Phase Clearance of the  
Fuse Sets shall be : 225 mm
- 5.1.8 Insulator Diameter / High shall be : 94 mm / 140 mm (+/- 5 mm)
- 5.1.9 Arcing Horn Straight Portion shall be : 100 mm
- 5.1.10 Arcing Horn Bending Portion shall be : 70 mm  
(i.e. From 30 Degree Angle)
- 5.1.11 a). Minimum Torsion Failing Load : 400 N
- b). Minimum Torsion Failing Load : 4000 N
- c). Minimum Compression Load : 6500 N

## 5.2. **INSULATORS**

- 5.2.1 Make : Only standard make polymer Insulators shall be used.
- 5.2.2 Type : Polymer Insulators
- 5.2.3 Dry Power Frequency With Stand Voltage : 30 KV (RMS)  
Wet Power Frequency With Stand Voltage : 18 KV (RMS)
- 5.2.4 Impulse Withstand Voltage : 45 KV (RMS)
- 5.2.5 Visible Discharge Voltage : 3 KV (RMS)
- 5.2.6 Creepage Distance : 150 mm  
(Moderately Polluted Atmosphere)
- 5.2.7 Power frequency puncture withstand voltage : 78 KV
- 5.2.8 Total Length of the Insulator shall be : 140 mm (+/-5 mm)
- 5.2.9 Dia of the Insulator shall be : 94 mm

## 5.3 **Bill of Materials:**

Sl.	Particulars	Quantity
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No.		
1	LT Fuse Horn with terminal connectors made out of aluminium alloy casting with 4 nos. M6 x 40 mm long Hex Head Bolts, Nuts, Plain washers and spring washers	6 Sets
2	Provision for tinned copper fuse wire	3 nos.
3	Fuse wire fixing bolt of size M8 x 25 mm with nut and 2 nos. plain washers	6 Sets
4	Polymer insulator	6 nos.
5	LT Fuse Mounting Frame made out of	1 Set
	a) 32x32x3 mm MS Angle 682 mm long - 2 nos.	
	b) 32x32x3 mm MS Angle 154 mm long - 1 no.	
	c) 50x3 mm MS Flat 90 mm long - 2 nos.	
	d) 30x6 mm MS Flat 40 mm long - 1 no.	
	e) 50x6 mm MS Flat 220 mm long - 1 no.	1 Set
6	Cross support Angle (Brace) made out of	
	a) 40x40x5 mm MS Angle: 850 mm long - 1 no.	
	b) 50x6 mm MS Flat: 220 mm long - 1 no.	2 nos.
7	Flash plate made out of 50x5 mm MS Flat 220 mm long to fix frame and brace to the PSSC Pole	
8	Fuse Horn to Insulator top fixing bolt of size M8x25 mm with spring washer	6 sets
9	Insulator bottom to frame fixing bolt of size M10x25 mm with spring washer	6 nos.
10	Brace to frame fixing bolt of size M8x25 mm with nut and spring washer	1 set
11	Frame and brace to PSSC pole fixing bolt of size M12x175 mm with nut and plain washers	4 nos.

**Note: The mounting angles shall be painted with double coat of red oxide paint.**

## 6.0 TESTS

### 6.1. Type Tests

- Lightning Impulse Withstand Test.
- Power Frequency Voltage Withstand Test (Dry).
- Power Frequency Voltage Withstand Test (Wet).
- Temperature Rise Test.
- Measurement of Resistance.

### 6.2. Acceptance Tests

- Verification of Dimensions.
- Temperature Rise Test.
- Measurement of Resistance.
- Dielectric Test (with 1000V Megger)
- Power Frequency Voltage Withstand Test (Dry).

### 6.3 Routine Tests

- Verification of Dimensions.
- Temperature Rise Test.
- Measurement of Resistance.
- Dielectric Test (with 1000V Megger)
- Power Frequency Voltage Withstand Test (Dry).

- Note:**
- A copy of Type Test Certificates for L.T H.G Fuse Sets with polymer insulators (protection Kits) and Insulators shall be furnished along with tender without which the tender is liable for rejection.**
  - Type Test Certificates from reputed NABL Accredited Laboratories tested not earlier than 10 years shall be enclosed. If any change in design

as made latest type tests shall be furnished along with approved drawing. The Bids received without type test reports will be liable for rejection

7. **TESTS AND TEST CERTIFICATES:**

**The tests shall be carried out as per clause (6) above and relevant ISS for both L.T H.G Fuse Sets (Protection Kits) including the Insulators before dispatch and the test certificates shall be furnished for approval.**

8. **INSPECTION:**

All the routine and acceptance tests and inspection shall be made at the place of manufacturer unless otherwise especially agreed to by the manufacturer and purchaser at the time of purchase. The manufacturer shall offer the inspector representing the purchaser all reasonable facilities, without charge to satisfy him that materials are being furnished in accordance with this specification.

The purchaser has the right to have the tests carried out at the supplier cost by an independent agency when ever there is dispute regarding quality of supply.

9. **PACKING:**

The L.T H.G Fuse Sets (Protection Kits) shall be delivered suitably packed. Although the method of packing is left to the discretion of the manufacturer, it should be robust for rough handling that is occasioned during transportation by Rail/ Road.

Each L.T H.G Fuse Sets (Protection Kits) system set may be marked as follows:

10. **Marking:**

- a). Name of the Manufacturer.
- b). Name of the Product.
- c). EPDCL Purchase Order No. & Date.
- d). Manufacture Month & Year.
- e) **EPDCL logo shall be embossed on separate plate and should be completely welded on LT Fuse mounting frame**

11. **GUARANTEE TECHNICAL PARTICULARS:**

The Technical Particulars as specified at clause (5) above shall be guaranteed and a statement of Guarantee Technical Particulars covering those listed in the enclosure to this section also shall be furnished along with the tender.

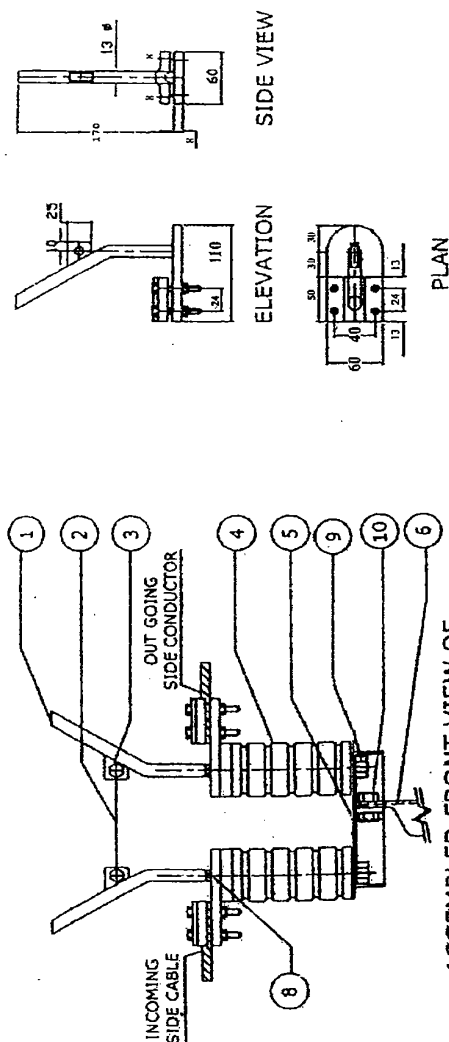
12. **DRAWINGS:**

Three sets of detailed dimensional drawings of each part of the complete L.T H.G Fuse Sets (Protection Kits) along with operating instructions shall to be submitted along with the tender.

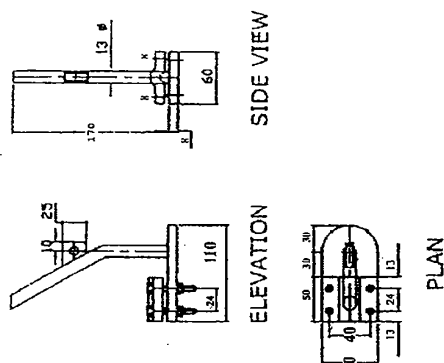
13. **GENERAL:**

- i). Only standard Polymer insulators are to be used in the manufacture of L.T H.G Fuse Set (Protection Kits). This shall be clearly confirmed in the tender.
- ii). Any design other than one specified herein may also be offered. However, the APEPDCL reserves the right to make purchase according to the specification.
- iii). The tenderer shall submit relevant Type Test Certificates of NABL along with the tender. If the Type Report is not enclosed with the tender, such tenders are liable for rejection.

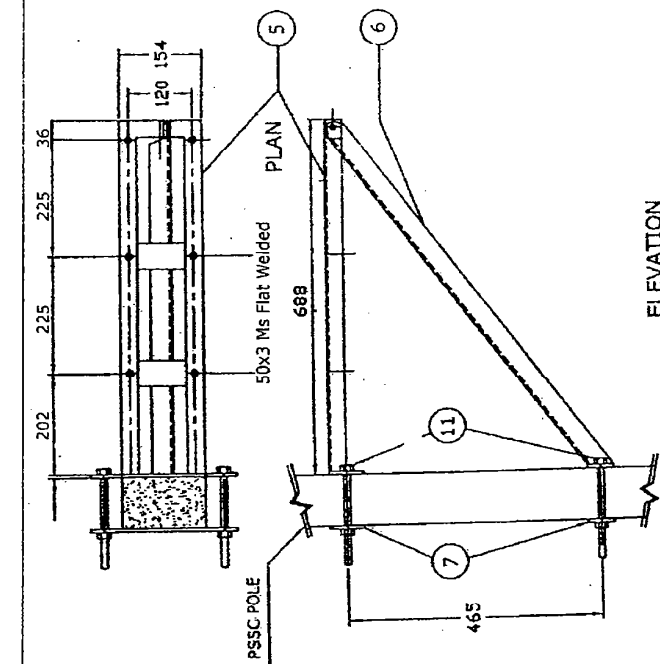
BILL OF MATERIAL		
S NO	ITEM DESCRIPTION	
1	LT Fuse Horn with Terminal connectors made out of Aluminium alloy Casting with 4 Nos M6 x 40 mm long Hex Head Bolts, Nuts, Plain washers	5 Sets
2	Provision for Tinned Copper Fuse wire	-
3	30mm Long Brass Bolts and Nuts with Plain washers	5 Sets
4	Solidcore Porcelain Insulator with top metal & bottom Bolt inserted	5 Nos
5	LT Fuse Mounting Frame made out of : a. 32x32x3 MM MS Angle : 882 MM Long - 2 Nos b. 32x32x3 MM MS Angle : 154 MM Long - 1 No c. 50x3 MM MS Flat : 90 MM Long - 2 Nos d. 30x6 MM MS Flat : 40 MM Long - 1 No e. 50x8 MM MS Flat : 220 MM Long - 1 No	1 Set
6	Cross support Angle (Brace) made out of : a. 40x40x5 MM MS Angle : 850 MM Long - 1 No b. 50x6 MM MS Flat : 220 MM Long - 1 No	1 Set
7	Fish Plate made out of 50x5 MM MS Flat 220 MM Long to fix Frame and Brace to the PSSC Pole	2 Nos
8	Fuse Horn to Insulator top fixing Bolt of size M8 x 20 MM	6 Sets
9	Insulator bottom to Frame fixing Bolt of size M10 x 25 MM with washer	5 Nos
10	Brace to Frame fixing Bolt of size M8 x 25 MM with Nut and washer	1 No
11	Frame and Brace to PSSC Pole fixing Bolt of size M12 x 175 MM with Nut and Plain washers.	4 Nos
NOTE : 1. ALL FERROUS PARTS ARE HOT DIP GALVANISED 2. ALL BOLTS, NUTS & FLAT WASHERS ARE ELECTRIC PLATING		



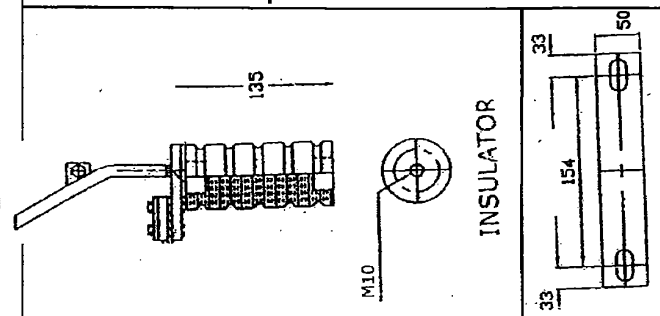
ASSEMBLED FRONT VIEW OF LT PROTECTION KIT



LT FUSE HORN



LT FUSE MOUNTING FRAME AND BRACE



INSULATOR

FISH PLATE