

**TECHNICAL SPECIFICATION FOR 11 KV 4 WAY H. T. PILLERS**

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## **TECHNICAL SPECIFICATION FOR OUTDOOR TYPE 11KV HT FEEDER PILLAR**

### **1.0 SCOPE:**

1.1 This specification covers design manufacture testing and inspection at manufacturer's works packing and delivery at purchaser's stores/sites of 11 KV HT feeder pillar of 4 way type, suitable for 11kV,3 PH, 50 Hz, 630 Amps, AC system. 11 KV HT feeder pillar shall be floor mounted type suitable for outdoor type installation,.

1.2 It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to relevant standard and high quality and workmanship capable to perform continuous and satisfactory operations in the actual service conditions at site.

### **2.0 SERVICE CONDITIONS:**

2.1 Maximum ambient temperature (deg C)	50
2.2 Minimum ambient temperature (deg C)	3.5
2.3 Relative humidity (%)	10 to 100
2.4 Maximum rainfall (mm)	1450
2.5 Maximum wind pressure (kg/sq m)	150
2.6 Maximum altitude above mean sea level (Meters)	1000
2.7 Isoceraunic level (days/year)	50
2.8 Seismic level (Horizontal acceleration) (g)	0.3
2.9 Climate Moderately hot and humid tropical climate, conducive to rust and fungus growth.	

### **3.0 STANDARDS:**

All components used in the manufacture of the pillars shall confirm to the relevant Indian standard specification and especially to the followings:

a	IS: 12063/1987	classification for Degrees of Protection provided by enclosures of electrical Equipments (IP-54 Out door type Construction)
b	IS: 5082/1998	Wrought aluminium and aluminium alloy bars, rods, tubes and sections for electrical purposes.
c	IS:613/2000	Copper Rods and Bars for Electrical Purposes - Specification
d	IS:1897/1983	Copper strip for electrical purposes
e	IS: 6005/1998	Code of practice for phosphating iron and steel
f	IS: 5/2004	Colour for ready mixed paints and enamel
g	IS: 732/1989	Code of Practice for Electrical Wiring Installations
h	IS: 8588: Part-1/1977	Thermostatic bimetals: General requirements and methods of tests
i		Clearances as per Indian Electricity Act 2003

#### **4.0 PRINCIPAL TECHNICAL PARAMETERS:**

- 4.1 Rated voltage : 3 ph 11 KV 50 Hz
- 4.2 Current rating : 630 Amps continuous type.
- 4.3 Insulation level : 11KV AC 50 Hz
  - Phase to phase : 18KV AC 5 Hz (1 Min withstand )
  - Phase to earth : 19KV DC
- 4.4 Temperature rise : Shall not exceed delivery operating temperature of components conforming to relevant standards limited to 30°C above ambient.

#### **5.0 GENERAL TECHNICAL REQUIREMENTS:**

##### 5.1 CUBICLE :

5.1.1 The cubicle of HT feeder pillars shall be made out of 10 SWG (3.25 mm thick) cold rolled M.S sheet steel, plates and shaped sections. All panel edges and door edges shall be reinforced against distortion by rolling, bending etc. The complete cubical shall be rigid self supporting and free standing and shall have following dimensions in mm.:

Dimensions	Over all Width	: 1400 MM
	Overall Height	: 1800 MM
	Overall Depth	: 850 MM

The above dimensions shall be without rain hood and are subject to maximum of – 2%to + 2% tolerances.

5.1.2 The HT feeder pillars shall have front and rear compartments. Front compartment shall be suitable for connecting the terminals of cables, and the rear for cable terminations. Bakelite sheet 12mm thick shall be provided for separation cable termination at front side .

5.1.3 The cubicles shall have centre lift up type slanting roof rain hood made up of 10 SWG MS sheets plates. The depth and width of the rain hood shall be at least 120% of the depth and width pillars.

5.1.4 The cubicles shall be provided with waterproof non-detachable hinged doors with suitable grip for opening and closing .as below:

Two nos of doors for front and for back side along with 3 Nos of Hinges on each door

5.1.5 The hinges shall be made up of heavy-duty M.S. rod with male having at least 45mm long head and 25 mm long 9.5 mm OD pin and female at least 45mm long with 10mm dia. ID brass bush. The hinges shall be welded on both sides to the pillar and grease lubricated for life. The doors shall not be detachable after fixing the rain hood.

5.1.6 A centrally operated three position locking arrangement (Godrej type) shall be provided for the doors. Two keys shall be supplied for each pillar. In addition, angle cleats shall be provided for putting two Nos. of padlocks for each size of doors.

5.1.7 Adequate ventilation by means of louvers with wire mesh shall be provided on both sides of the pillars and also at the top and bottom of pillars.

5.1.8 Asbestos sheets of at least 6 mm thick shall be provided on all doors inside.

5.1.9 The cubicles shall be provided with rigid M.S. foundation & bottom holes for grouting bolts on all four corners. The pedestal shall be covered from all sides with 10 SWG MS sheets.

5.1.10 Detachable gland plates made up of 10 SWG M.S. sheets. Size of the glands will be intimated to the successful tenderer along with approval of drawings.

5.1.12 Enameled name plate of the suppliers and M.S.E.D.C.L. mentioning Tender Number & date shall be displayed on front door.

5.1.13 Enameled danger board with “DANGER 11000 VOLTS” mark shall be displayed on the left hand side of front and back doors.

5.1.14 Earthing Bolt:

Two nos of earthing bolts shall be provided with the cubical . One each at front and rear side of Pillar. The same shall be easily accessible.

5.1.15 Cable Entry:

The cable entry shall be from rear side of the pillar. Removable gland plate of 10 SWG. M.S. sheet shall be provided. Cable chamber shall be provided with perforated metal sheet separate for each chamber.

5.1.16. Additional Inner Door:

Additional door on front side, with 14 swg G.I wire, shall be provided. Also the detachable frame with 14 swg GI wire mesh shall be provided at rear side. There shall be firm stop for these wire mesh doors and frame that it shall not move towards inside of Pillar/Live connections.

5.2 PAINTING:

5.2.1 The cubicles shall be provided with anti corrosive high quality post office red colour paint conforming to shade No 538 of IS.5 from inside and outside to withstand the corrosive and humid atmosphere.

5.2.2 All interiors and exteriors of the cubicle shall be degreased in 5% solution at 75°C for 15 minutes. They shall then be washed in hot water bath at 65°C to remove all rust, scale corrosion, grease and other adhering foreign material and shall be rinsed in cold running water.

5.2.3 The cubicles shall then be pickled in 25% hot sulphuric acid at 65°C for 5 minutes. Care shall be taken to avoid over pickling by addition of adequate quantities of inhibitor and avoid loss of tensile strength. The cubicle shall then be rinsed in cold running water and put in alkaline solution at 65°C for 1 to 2 minutes. The cubicle shall then be immersed in cold water (swill agitated) to remove all traces of alkali and unreacted salt. The cubicle shall then be dipped in deoxidize chamber to ensure complete removal of moisture.

5.2.4 Zinc oxide primer shall be applied and the cubicle stoved at 150°C for 10 to 12 minutes. It shall then be cooled, filled with putty to get smooth and flawless surface. Enameled paint shall then be sprayed and towed at 150°C for about 12 minutes.

### 5.3 BUS BAR:

5.3.1 The bus bars shall be made up of electrolytic grade copper conforming to latest grade of IS

5.3.2 The contacts shall be made up of electrolytic grade copper alloy with corrugated terminal pad and spring action to yield high contact pressure. G. I. spring ring shall be made out of at least 6 mm dia. Spring steel round. The spring action shall not get affected by operations and variations in operating temperatures in service.

5.3.3 Thermostatic bimetal device shall be provided between terminal pad and bus bars and between terminal pad and cable terminals to prevent bimetallic deterioration.

5.3.4 The complete assembly shall be so fixed and secured that there shall be no turn, fall out displacement and vibration of any part during any fault feeding conditions.

#### 5.3.5 Maximum rated current

Maximum rated current shall be 630 Amps continuous rating. The current rating adopted shall generally not exceed the current density limit of 1.6 Amps/sqmm. And shall be subject to successful temperature rise tests carried out in reputed laboratory.

### 5.4 INSULATING MATERIAL:

5.4.1 The insulating material used shall be Epoxy type Insulator, with uniform equally spaced rings, suitable for 18 KV Class insulation.

5.4.2 Mounting of these insulators, with 4 Nos of threaded holes on the central vertical, 10 SWG M.S. plate.

5.5 DISCHARGE ROD:

5.5.1 The Insulated discharge rods shall be with 11 KV Post Insulator and with zinc passivated chain of 2 met Length. One end shall be connected with the earthing terminal on front side.

**6.0 TESTS:**

**A. TYPE TESTS:**

The type tests mentioned below should be carried out on H. T. Pillar offered by the tenderer.

1. Verification of the Degree of protection (IP- 54) of H.T. Pillar as per IS:13947/1993 or the latest version thereof.
2. Verification of dielectric properties.
3. Verification of clearance and creepage distances.
4. Verification of short circuits strength.

**B. ROUTINE TEST:**

Test for verification of dielectric properties shall be carried out as routine test.

**C. TEST CERTIFICATE:**

The tenderer shall furnish detailed type test reports of the offered H.T. Pillar as per clause of the Technical Specifications at the NABL approved laboratories to prove that the H.T. Pillar offered meet the requirements of the specification. These Type Tests should have been carried out within five years prior to the date of opening of this tender. However, the tenderers who have supplied the H.T. Pillars to the Board against order from Central Purchase Agency of M.S.E.D.C.L. shall be exempted from submission of Type Test Report against this tender provided.

- i) The offered H.T. Pillars are already fully type tested at approved Laboratory within five years prior to the date of opening of this tender.
- ii) There is no change in the design of type-tested H.T. Pillar and those offered against this tender.

Following test certificates and documents shall be furnished at the time of inspection.

- a) Chemical analysis certificate and documents showing genuine source of procurement of electrolytic grade conductivity Copper Sections.

- b) Document showing genuine source of procurement of steel sheet and sections.
- c) Certificate of temperature rise test.
- d) Certificate of painting with degreasing, pickling phosphate, and painting and oven treatment by seven-tank oven process.

The supplier shall conduct voltage withstand test and operations tests at the time of inspection.

## **7.0 INSPECTION:**

- 7.1 The supplier shall prepare a prototype and offer the same for inspection and approval before taking up mass production
- 7.2 The supplier shall offer inspection of the material at his works before dispatch. If required the supplier shall also offer inspection of manufacturing painting and assembly processes and quality control system. If any material is not found in line with relevant specification the supplier shall carry out the modification and offer for re-inspection.
- 7.3 Inspection and acceptance shall not absolve the supplier of his responsibility to supply the material in accordance with the specifications. The purchaser reserves the right to reject the material not confirming the relevant specifications.

## **8.0 DRAWINGS AND DOCUMENTATION:**

- 8.1 The following information shall be clearly and indelibly be marked on all the pillars or on a label permanently attached to it.
  - a) 'M.S.E.D.C.L.' marking.
  - b) Rated Voltage of pillar.
  - c) Manufacturer's name or Trademark
  - d) MSEDCL's Order No.
  - e) Year of Manufacture.
  - f) Short circuit strength.
  - g) Degree of protection.
- 8.2 The tenderer shall furnish all details and clarifications required if any for scrutiny and evaluation of the offer.
- 8.3 Manufacture of material to be supplied shall be done strictly as per approved drawing.
- 8.4 Approval of drawing shall not absolve the supplier of his liability for ensuring

correctness according to applicable standards & regulations.

8.5 The tenderer shall fill-in the following schedules which form part of the specification if any schedule is not filled or incompletely filled the offer is liable to be treated as incomplete and rejected.

Schedule-A: Guaranteed technical particulars

Schedule-B: Deviations from specifications

Schedule-C: Tenderer's Experience

**9.0 DESPATCH:**

9.1 The material to be supplied shall be packed and dispatched only after inspection and approval.

9.2 Supplier shall be responsible for packing, transporting and delivery to the consignee.

9.3 Copies of packing list and inspection report duly approved shall be sent along with each consignment.



**SCHEDULE – A**

**GUARANTEED TECHNICAL PARTICULARS OF 11KV 4 WAY H.T. PILLER**

<b>Sr. No.</b>	<b>Parameter Name</b>	<b>Parameter type</b>
1.	Name of Manufacturer.	Text
2.	Type of H.T. Pillar	Text
3.	Rated normal voltage	Text
4.	One Minute P. F. withstand voltage	Text
5	Rated normal current of Busbars	Text
6	Rated short time current	Text
7	Rated temperature rise	Text
8	Rated safe temperature of Busbars	Text
9	Dimensions of busbars	Text
10(a)	Grade and specification of material of Busbars	Text
10(b)	Grade and specification of material of -spring steel round	Text
11	IACS conductivity of bus bars	Text
12	Dimensions of spring steel round	Text
13(a)	Dimensions of cubicle without rain hood -Width	Text
13(b)	Dimensions of cubicle without rain hood – Depth	Text
13(c )	Dimensions of cubicle without rain hood – Height	Text
14(a)	Dimensions of rain hood – Width	Text
14(b)	Dimensions of rain hood -Depth	Text
14(c )	Dimensions of rain hood -Height of centre lift	Text
15(a)	Hinges : Male - OD head	Text
15(b)	Hinges : -Length of head	Text
15 (c )	Hinges : Male - OD of pin	Text
15 (d)	Hinges : -Length of pin	Text
16 (a)	Female - OD	Text
16 (b)	Female - ID of brass bush	Text
17	Number of hinges per door	Text
18	Thickness of sheet steel	Text
19	Type of locking arrangements	Text
20	Number of padlocking arrangements	Text
21	Number and size of ventilating louvers with wire mesh	Text
22	Details of painting	Text
23	Dimensions and details of asbestos sheets	Text
24	Dimensions and details of bakelite sheets	Text
25	List of test conducted on similar equipments	Text
26	List of copies of test certificate enclosed	Text
27	Marking on the pillar is as per specification	Text
28	Type test reports and any other details	Text

NAME & SIGNATURE OF TENDERER

**SCHEDULE -B**

**DEVIATIONS FROM SPECIFICATION**

All deviations from this specification shall be set out by the tenderer clause by clause in this schedule. Unless mentioned in this schedule the tender shall be deemed to confirm to the specification.

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Clause Number	Details of deviations	Justification
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NAME OF FIRM\_\_\_\_\_

NAME & SIGNATURE OF TENDERER\_\_\_\_\_

DESIGNATION\_\_\_\_\_

DATE\_\_\_\_\_

**SCHEDULE – C**

**SCHEDULE OF TENDERERS' EXPERIENCE**

The tenderer shall furnish a list of similar orders executed under execution by him and name of persons to whom reference may be made by the purchaser in case such a reference is considered necessary.

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Sr. No.	Name and Description of work executed	Month and year of Commissioning	Client	Name of person
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NAME OF FIRM\_\_\_\_\_

NAME & SIGNATURE OF TENDERER\_\_\_\_\_

DESIGNATION\_\_\_\_\_

DATE\_\_\_\_\_