

MATERIAL SPECIFICATIONS CELL

TECHNICAL SPECIFICATION

OF

STREET LIGHT POLE JUNCTION BOX

TECHNICAL SPECIFICATION OF STREET LIGHT POLE JUNCTION BOX

1.0 SCOPE:

This specification covers the design, manufacture, testing of tamper proof, shock proof and rust proof Street Light Pole Junction Boxes duly fitted with aluminium Bus Bar. The Box is intended to be used for Street Light consumers. It should be suitable for out door use for mounting on pole as well as for mounting in meter cabinet of multistoried buildings. It is not the intent to specify herein complete details of design and construction. The Street Light Pole Junction Boxes 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. Bidder shall have proven experience of 3 years of manufacturing of similar products and supplying to electrical utilities

2.0 SERVICE CONDITION:

The Meter Box to be supplied against this specification shall be suitable for satisfactory continuous operation under the following service conditions.

Max. & ambient air temperature	50 degree C
Max. relative humidity	100%
Max. annual rainfall	1450 mm
Max. wind pressure	150 Kg/Sq.m
Max. altitude above mean sea level	1000 mtrs
Isoceraunic level	50 days/year
Seismic level (Horizontal acceleration)	0.3 g
Climatic condition	Moderately hot and humid Tropical climate conducive to rust and fungus growth
Ambient temperature for temperature rise	50 deg.C

3.0 APPLICABLE STANDARDS:

All components used in the manufacture of the materials shall conform to the relevant Indian standards and especially to the followings

3.1	IS:14772/2000	General Requirements for Enclosures for Accessories for Household and Similar Fixed Electrical Installations - Specification
3.2	IS:13947/1993 (Part 1)	Specification for Low-voltage Switchgear and Controlgear - Part 1 : General Rules& Annex 'C' for Degrees of Protection provided by enclosures of electrical Equipments
3.3	IS: 13410/ 1992	Glass reinforced polyester sheet moulding compounds (SMC)
3.4	IS: 13411/1992	Glass reinforced polyester dough moulding compounds (DMC)
3.5	IS: 732/1989	Code of Practice for Electrical Wiring Installations
3.6	IS: 4249/1967	Classification and methods of tests for non-ignitable and self-extinguishing properties of solid electrical insulating materials

4.0 DESIGN & CONSTRUCTION:

- 4.1 The Street Light Pole Junction box shall be made out of thermosetting plastic i.e. glass reinforced polyester sheet moulding compound (SMC) conforming IS: 13410-1992 grade and also conform to self extinguishing properties as per IS-4249 & requirements of this specification.
- 4.2 The enclosures shall be made of high grade virgin material with anti- corrosive, rust proof, shock proof, dust and vermin proof, U.V. stabilized with flame retardant property
- 4.3 The Street Light Pole Junction box shall comply with the requirement of IP- 44 type as per the IS - 13947 or the latest version thereof
- 4.4 The wall thickness of the box shall be minimum 2mm. The Street Light Pole Junction box should have minimum 40 mm clearance on all three sides and bottom clearance of minimum 60 mm for pole mounted boxes & 100 mm for boxes used in the metering cabinet.
- 4.5 The enclosures should be suitable for outdoor use, Pole mounting and should not soften, bend or melt at high temperature. It should have flame retardant properties and material of it should not generate burning droplets in the event of fire.
- 4.6 The Street Light Pole Junction Box shall be suitable for housing Bus Bar system with adequate clearances. The General arrangement drawing shall be as per the attached drawing.
- 4.7 The base and door should be single piece moulded individually with rounded corners without any construction/ fabrication joint.
- 4.8 The door in closed position should overlap on base such that direct entry of screw driver, tool or rod is not possible.
- 4.9 Concealed hinges should be provided to the Street Light Pole Junction boxes
- 4.10 The Box should have positive locking system by way of bolt and nuts in addition to “U” Clamp as shown in the Drawing. “U” clamp should have matching Holes on base and door to facilitate wire sealing.
- 4.11 Holes for in-coming and out-going Cables should be provided at bottom as shown in the G.A. Drawing. Suitable number of holes with rubber grommets of suitable size shall be provided at the bottom of Street Light Pole Junction box for incoming and outgoing cables
- 4.12 The box should have holes on the back-side as shown in Drawing for fixing it on Pole with suitable clamping arrangement or in metering cabinet in the buildings.
- 4.13 The Bus Bar mounting system should be angled and stepped so as to facilitate easy connection and disconnection of cable without twisting and sharp bending of wire/cable. The mounting steps shall be made out of Thermosetting Plastic insulating

material as given above.

- 4.14 Fixing of accessories like clamp, handles etc and all metal part excluding hardware shall be of stainless steel only.
- 4.15 The surface appearance or part of Street Light Pole Junction box must be smooth, non porous and homogeneous, free from ripples, defects and marks. No fillers or fibres should be visible at any place.
- 4.16 One no Earthing Bolt of size M6 having length of min 25mm with two washers & nuts shall be provided on the connection box for necessary earthing

5.0 ALUMINIUM BUSBAR:

- 5.1 The Bus Bars shall be made out of Aluminium bus bar. The size of Bus Bars shall be adequate as per rating
- 5.2 The Bus bar shall be made of aluminium with cross section & length as per the requirement
- 5.3 Provision for one incoming circuit of single/three phase with neutral of cable size 50 or 35 or 16 Sq mm cable & outgoing connections of cable size 2.5 to 6 sq mm. size as per requirement on each phase bus bar & neutral shall be provided
- 5.4 Street Light Pole Junction Boxes shall have one incoming and one outgoing combination.

6.0 TESTS & TEST CERTIFICATES

6.1 TYPE TESTS

Type tests as mentioned in annexure A shall be carried out on SMC material as per IS 13410/13411. In addition to above following type tests shall be carried out on complete box

- 1. High Voltage test on Bus bar as per IS 8623 (A.C. voltage 2.5KV applied for one minute.
- 2. Temperature Rise Test at 100% rated current as per IS 8623.
- 3. Degree of protection Test for IP44 as per IS 13947/1993 (Part 1).
- 4. Mechanical Strength Test as per IS 14772

6.2 ACCEPTANCE TESTS

Following acceptance tests shall be carried out.

- 1) Acceptance tests as mentioned in annexure A shall be carried out on SMC material as per IS 13410/13411.
- 2) Verification of dimensions & construction as per IS 14772.
- 3) High Voltage test

6.3 TEST CERTIFICATES

The material offered shall be fully type tested as per relevant IS and this specification. The successful Bidder shall furnish detailed type test reports before commencement of supply for necessary approval of the CE (Testing & QC). The detailed Type Test Reports shall be furnished with relevant oscillogram and certified Drawings of the

material tested. 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.

The type test report of meter box having identical constructional and other features carried out during last five years prior to due date of opening of offer shall be valid

All the Type Tests shall be carried out from laboratories which are accredited by the National Board of Testing and Calibration Laboratories (NABL) of Government of India such as CPRI Bangalore/ Bhopal, ERDA Baroda, to prove that the material offered meet requirements of the specification. The tenderer should also furnish certificate from laboratories that laboratories are having all the requisite test facility available in house. The type tests reports conducted in manufacturers own laboratory and certified by testing institute shall not be acceptable.

6.4 TESTING AND MANUFACTURING FACILITIES

The manufacturers must have necessary machinery for production of SMC Street Light Pole Junction Box. The manufacturer should have in house testing facilities for carrying out acceptance test as per mentioned above

7.0 GUARANTEE

The material supplied shall be guaranteed for the period of 60 months from the date of commissioning or 66 months from the date of dispatch whichever is earlier.

8.0 MARKING

The following information shall be legibly and indelibly marked to show the following

- a) Purchase order number and date
- b) Year and month of manufacture
- c) Name of Purchaser: MSEDCL
- d) Guarantee: 5 years
- e) Name and trademark of manufacturer
- f) Danger logo (Screen Printed)

9.0 SCHEDULES

The tenderer shall fill in the following schedules and submit along with the offer. If the schedules are not submitted duly filled in with the offer, the offer shall be rejected.

Schedule - A : Guaranteed Technical Particulars

10.0 DRAWINGS:

The successful bidder shall submit set of all above drawings of the distribution box and its components shall be submitted in triplicate to CE (Testing & QC) office and get approved before commencement of supply.

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Annexure 'A'

Specifications for Fiberglass Reinforced Plastic Sheet moulding compound

- 1) FRP Sheet Moulding Compound shall conform to IS:13410-1992
- 2) The Surface appearance of the door must be smooth, non porous, and homogeneous, free of ripples, defects, and marks. No filler or fiber shall be visible at any place.
- 3) Other properties of SMC material shall be as follows & shall pass the test mentioned against the same.

Sr. No.	Characteristic	Requirement	Type of test	Method of test Ref. to
1.	Material.	Thermosetting Plastic		
2.	Grade of material	SMC Electrical grade S3		IS:13410-1992
Material requirement for Sheet Moulding Compound				
4.	Glass content, percent by mass (Min.)	20	Type	Annexure A of IS:13411-1992
5.	Mould shrinkage, linear % Max	0.25	Acceptance	Annexure B of IS:13411-1992
6.	Flow, mm, Minimum	170	Acceptance	Annexure C of IS:13411-1992
Requirement for Moulded Sheet Moulding Compound				
7.	Water Absorption, % Max	0.20	Type	Annexure D of IS:13411-1992
8	Izod impact strength (Notched), KJ/m ²	55	Type	Annexure E of IS:13411-1992
9	Flexible Strength ,MPa , Min	170	Type	Annexure F of IS:13411-1992
10	Power Arc Resistance Sec. Min.	180	Type	Annexure G of IS:13411-1992
11	Modulus of Elasticity, 10 ³ , MPa	12 to 15	Type	IS: 8543 Part-4 (Sec-1)/1984
12	Tracking Resistance CTI, Min	1000	Type	IS: 2824/1975
13	Dielectric Strength at 90°C in Oil KV/mm	11	Type	IS:6262/1971
14	Dissipation factor (4 days at 80 % RH & 1 KHz)	0.01	Type	IS: 4486/1967
15	Heat Distortion Temperature, °C ,Min	150	Type	Annexure H of IS:13411-1992

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16	Oxygen Index,% Min	24	Type	IS: 13360 Part-6 (Sec-6)/1992
17	Post shrinkage, % Max	0.01	Acceptance	Annexure B of IS:13411-1992
18	Tensile Strength ,MPa , Min	70	Acceptance	IS: 8543 Part-4 (Sec-1)/1984
19	Density of Moulding, g/ml	1.8 to 2.1	Routine	IS: 8543 Part-I /Sec 2/1979
20	Surface resistivity (24 H in water), Ohm,Min	1 x 10 ¹³	Routine	IS: 3396/1979
21	Volume resistivity, Ohm-cm, Min	1 x 10 ¹⁴	Routine	IS: 3396/1979
22	Exposure to flame	Self-Extinguishing		IS:4249
23	Melting Point	test up to 400°C		IS:13360 Part6 : Sec 10 : 1992
24	Cross Breaking Strength	(1723 Kg/sq.cm)		As per ASTM D790
25	Shear Strength	(879 Kg/sq.cm)		As per ASTM D732
26	Flammability (V2)	UL 94 or IS : 11731 (Pt.II)		IS : 11731 (Part- II)
27	Marking, Dimensions and construction			IS : 14772

SCHEDULE - A

GUARANTEED TECHNICAL PARTICULARS

For Street Light Pole Junction Box for L.T. Lines / Consumer Mains

Sr. No.	Parameter Name	Parameter type
1.	Name or Trademark of Manufacturer.	Text
2.	Type of Street Light Pole Junction Box (Type & total No. of Outgoing connections) provided	Text
3.	Rated normal voltage	Text
4.	Material of construction	Text
5.	Thickness of SMC sheet for enclosure	Text
6.	Dimensions of Street Light Pole Junction Box Width x Depth x Height (in mm)	Text
7.	Degree of protection of the Box	Text
8.	Sealing U clamps details {2 Nos. S.S."U" Clamp of minimum thickness (0.8 ± 0.1 mm)}	Text
9.	No. of Holes provided for cables A) Incoming Cable B) For Outgoing Cables	Text
10.	Minimum side clearances from spring loaded Bus Bar module in the box (in mm)	Text
11.	Marking on the box is as per the specifications	Text
12.	Fiberglass Reinforced Plastic Sheet Moulding Compound	Text
12.1	Material (Thermosetting Plastic)	Text
12.2	Grade of material (SMC as per IS:13410-1992)	Text
12.3	Heat deflection Temperature (As per IS:13411)(min 150°C)	Text
12.4	Exposure to flame (Ref. Std. IS:4249) (Self-Extinguishing)	Text
12.5	Melting Point (Ref. Std. IS:13360) (Does not melt)	Text
12.6	Door material (U.V. resistant & resistant to salty & humid atmosphere)	Text
12.7	Specific Gravity as per IS:10192 of SMC material (1.8)	Text
12.8	Dielectric Strength as per IS:1998	Text
12.9	Tensile Strength as per IS:867-1963 (1058 Kg/sq.cm)	Text
12.10	Cross Breaking Strength as per ASTM D790 (1723 Kg/sq.cm)	Text
12.11	Insulation Resistance (As per ASTM D257)	Text
12.12	Water Absorption as per IS:14772	Text
12.13	Mechanical Strength as per IS:14772	Text
13.	Type of clamping/fixing Arrangement for box	Text
14.	Type of hinges for door (Clause no. 4.1.9)	Text
15.	Number of hinges provided.	Text
16.	Earthing bolt as per specification with earthing logo provided	Boolean

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Sr. No.	Parameter Name	Parameter type
17.	Spring Loaded bus bar system	
17.1	Mounting Material of spring loaded Bus Bar & mounting Bus bar Supports (Thermosetting Plastic (SMC) as per IS-13410-1992)	Text
17.2	Material of Bus Bar (Aluminium)	Text
17.3	Cross Section area and length of Bus Bar (Total 100 Sq. mm)	Text
17.4	Length of bus bar (mm)	Text
17.5	No. of Bus Bar module complete with fitting	Text
17.6	Pressure Plate thick & MoC (Thickness 2.0 mm stainless)	Text
17.7	Distance between Bus Bars module (Center to Centre distance 35 mm (Min.))	Text
18	Details of Type Tests Carried out	Text
19	Other detail if any	Text

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