MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

SPECIFICATION NO: STORES/DB/Rural/SMC/2011/04

SPECIFICATION

FOR

63 /100 KVA SMC L.T. DISTRIBUTION BOX with KitKats for Rural Area

in MSEDCL

Technical Specifications

63 /100 KVA SMC L.T. DISTRIBUTION BOX with KITKAT for Rural Area

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63/100 KVA SMC L.T. DISTRIBUTION BOX

With Kitkats for Rural Area

SPEC NO: STORES/DB/Rural/SMC/2011/04

1 SCOPE:

Specification covers the design, manufacture, testing at works and supply of Distribution Boxes made out of thermosetting plastic i.e. **glass reinforced polyester sheet moulding compound (S_3 grade) conforming IS : 13410-1992** for controlling the L.T. feeders from the L.T. side of Distribution Transformers. The system shall be A.C. 3 phase, 4 wire, 433 V, 50 HZ with effectively grounded neutral.

2 SERVICE CONDITIONS:

The equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

2.1	Maximum ambient temperature (Degree C)	50
2.2	Maximum temperature in shade (Degree C)	45
2.3	Minimum Temperature (Degree C)	3.5
2.4	Relative Humidity (percent)	10 to 95
2.5	Maximum Annual rain fall (mm)	1450
2.6	Maximum wind pressure (kg/sq.m)	150
2.7	Maximum altitude above mean sea level (Meter)	1000
2.8	Isoceranic level (days per year)	50
2.9	Siesmic level (Horizontal Acceleration)	0.3 g

Moderately hot and humid tropical climate conductive to rust and fungus growth ….

3 SYSTEM DETAILS:

Distribution Boxes are meant for control and protection of Distribution Transformers with relevant parameters as under:-

S.N.	Particulars	Details	
1.	KVA rating	63 KVA	100 KVA
2.	Voltage	433 V	
3.	Frequency	50 HZ	
4.	Phases	3 phase, solidly grounded neutral	
5.	Approximate full load current of transformer	84 A	133 A
6.	No. Outgoing circuits	2 nos	

4 Applicable Standards:

a. IS :13947/1993 (Part 3) for Isolator (Switch Disconnector)

b. IS: 2086-1993 as amended upto date for L.T. KITKATs

c. IS: 8623/1993 (amended upto date) for enclosure Box & for degree of protection provided by enclosures of electrical equipments

d. IS: 4237/1982, IS:8623/1993 (amended upto date) – for general requirement of L.T. switchgears.

e. IS: 13703/1993(Part I & II) - amended upto date for HRC Fuse Base and HRC Fuse Link.

f. IS: 13410 / 1992 for SMC (Sheet Moulding Compound) Enclosure.

5 MANUFACTURE/CONSTRUCTION OF BOXES:

5.1 Distribution Boxes shall have Isolator (Switch Disconnector) and HRC fuse base with links on incoming circuit and Kitkats & Link Disconnector on outgoing circuits with necessary interconnecting Bus Bars/ Links.

5.2 Standard General Arrangement of Isolators, HRC fuse base with links, Kitkats, Link Disconnector, Neutral Links, Bus Bars, connecting links, Cable termination arrangement etc inside the Box is shown in the enclosed drawing No. ***Dist /DB/SMC/0210/02*** for 63/100 KVA (RURAL) Distribution Box.

6 INCOMING CIRCUIT –

6.1 Isolator (Switch Disconnector)-

Each distribution box shall have one triple pole Isolator (Switch Disconnector), conforming to relevant IS and MSEDCL specification. The bidder shall indicate makes and types of offered isolator in GTP. The **successful** bidder shall submit complete type test report of the Isolator as per this specification **Cl. No. 13 (C) and 13.5** for approval of CE (Stores) before commencement of supply. The makes of Switch disconnector provided in the Distribution Box to be supplied shall be as mentioned in the GTP of detailed purchase order from MSEDCL.

The Isolator should be front operated triple pole type. The casing of Isolator shall be of Non –tracking and heat resistant insulating material superior electrical and mechanical properties equivalent to Dough Moulding Compound (DMC), no separate enclosure is required. Isolator Base should withstand the breaking capacity of 80 kA. To extinguish the arc immediately in isolators, in each phase archutes with minimum 12 strips shall be provided.

The isolator should be front operated triple pole type. If the casing of Isolator is of non-tracking, heat resistant insulating material, no separate enclosure is required. The isolator shall be robust in construction and easy for operation. The handle of the isolator should be detachable easily for security purpose while working on L.T. circuits.

The characteristics of Isolator shall be as follows:

S.N	Characteristics	Rating	
		63 KVA	100 KVA
1.	Basic uninterrupted duty	250 A	

2.	Mechanism	Manual quick make quick break
3.	Standard applicable	IS : 13947 /1993 amended upto date
4.	Utilization category	AC –23 A
5.	Mechanical Endurance	As per IS 13497 /1993 amended upto date
6.	Electrical Endurance	As per IS: 13947 /1993 amended upto date
7.	Rated Duty	Uninterrupted
8	Making /Breaking capacity	Not less than requirement of AC –23 A category
9.	Two seconds rating	4 KA
10.	Rated insulation voltage	660 V

The terminal connector strips of the isolator shall be projecting out of isolator of 80 mm (minimum) in length on cable connection side and 60mm (minimum) on HRC fuse base side as shown in the drawings. In 63 /100 KVA distribution box, the cross section of the strips on outside of the isolator shall be provided as below:

63/100 KVA - 25X5 mm.

The material of isolator strips shall be EC grade tin-plated copper. The terminal strips shall be continuous from the point of contact separation inside the Isolator.

6.2 HRC FUSE:

HRC Fuse of suitable capacity shall be provided in between outgoing terminal of Switch Disconnector (Isolator) and incoming busbar as shown in the Drg.No. ***Dist/DB/SMC /0210 /04*** to facilitate electrical breaking of the circuit. Each Distribution Box shall have 3 Nos. of HRC Fuse Base with HRC Fuse Links (Blade type Contacts).

The bidder shall indicate the makes, types and capacity of HRC Fuse Base and Fuse Links offered in GTP.

6.2.1 **HRC FUSE BASE :**

The base of the HRC Fuse shall be of non-tracking, heat resistant insulating material of superior electrical and mechanical properties equivalent to Dough Moulding Compound (DMC). The Fuse Base shall be sturdy in construction.

The extension terminal connector strips of the Fuse Base shall be projecting out on both sides, made with two pieces (half portion of the terminal contact and extension strip should be continuous in one piece), as shown in the drawing. The dimensions shall be as shown in the drawing. The material for both strips shall be Silver Plated EC Grade copper. HRC Base & the fuse link should have withstand breaking capacity of 80 kA.

HRC Fuse base shall be suitable for fuse of 200A for 63/100 KVA distribution box .

6.2.2 HRC FUSE LINK :

The HRC Fuse Links shall be sturdy in construction of “Din Type”. Breaking Capacity shall be 80 kA. For fault indication red pop up indicator should come out instantly on fusing. Manufacturer’s name, current rating, breaking capacity and type shall be marked on HRC fuse link.

HRC Fuse link Current rating for 63/100 KVA distribution box shall be as follows:

63 KVA - 100 A

100 KVA - 160 A

The successful bidder shall submit the complete type test reports as per this specification clause **No 13 (C) and 13.6** for approval of CE (Stores) before commencement of supply. The makes of HRC fuse base with links provided in the Distribution Box to be supplied shall be as mentioned in the GTP of detailed purchase order from MSEDCL.

7 OUTGOING CIRCUITS :

7.1 KITKAT Fuses:

7.1.1 GENERAL REQUIREMENTS:

In the outgoing circuit, 6 nos of KITKATs of rating 63 A for 63 KVA Box and 100 A for 100 KVA in each distribution box shall be provided. The bidder shall be have to indicate makes of offered Kitkats in GTP. The successful bidder shall submit type test report of the Kitkat as this specification clause **No 13 (C) and 13.7** for approval of CE (Stores) before commencement of supply. The makes of Kitkats provided in the Distribution Box to be supplied shall be as mentioned in the GTP of detailed purchase order from MSEDCL.

7.1.2 **Rewirable fuse unit:**

a. The rewirable fuse unit shall be made of Electrical grade porcelain of fine grain, homogeneous, non-porous, chemically inert, of high mechanical and electrical strength and shall be thoroughly vitrified and smoothly glazed. The porcelain and the glaze shall be white or cream in colour. Any other colour shall be subject to the approval of CE (Stores). The glaze shall cover at least those surfaces, which are exposed when the fuse has been mounted in the intended manner. The design and dimensions of fuse unit (Porcelain part / DMC) shall be in accordance with the drawing enclosed with this specification i.e. as per MSEDCL's design.

b. The rewirable fuse unit shall also be made of non-tracking, heat resistant insulating material of superior electrical and mechanical properties equivalent to Dough Moulding Compound (DMC). The Fuse Base shall be sturdy in construction. Breaking Capacity of DMC part shall be 80 kA.

c. The asbestos paper to be provided in the fuse base shall be fire proof and insulating. The thickness of asbestos paper shall be as per manufacturer design.

d. The insulating compound shall conform to the requirements of B.S.1858/1957 or equivalent I.S.

7.1.3 RATED CURRENT: The rated current shall be 63/100 Amps.

7.1.4 CONTACTS:

A) For 100 Amp. Kitkats - Tinned brass contacts of the fuse base, fuse carrier and Continuous extension terminal strip shall be as per drawing No.CE/Dist/MM-III/MSEDCL/KITKAT/100/02/rev 02 attached with specification..

B) For 63Amp. Kitkats - Tinned brass contacts of the fuse base, fuse carrier and Continuous extension terminal strip/block shall be as per drawing No. CE/Dist/MM-III/MSEDCL/KITKAT/100/02/rev 02 attached with specification.

Current carrying pointed screws and washers shall be of tinned brass, while the screws/washers not carrying current shall be of MS Electro galvanized. Brass (tinned) used for contacts of KITKATs shall conform to IS as stated below :

It shall conform to grade DCB-I/DCB-II as per IS 1264/1981 (amended up-to-date)/IS 410 of 1977 (amended up-to-date). However, the metal composition as given below will be acceptable.

Copper %		Tin, Lead, Nickel, Iron, Aluminum, Manganese and other Impurities put together %	Zinc %
Min.	Max.	Max.	
58.00	63.00	8.6	Remainder

7.1.5 MARKING :

Every Fuse carrier shall be clearly and indelibly marked with the following minimum information:

a. Rated current.
b. Rated Voltage.
c. Size of fuse wire
d. Manufacturer's name or trade mark.
e. The words `M.S.E.D.C.L .'

And every Fuse Base the words ' **MSEDCL**' shall be clearly and indelibly marked as shown in the Kikat drawing.

7.1.6 TOLERANCES TO THE DIMENSION OF REWIRABLE FUSES :

1. Dimensional tolerances for Porcelain/ DMC Parts shall be + 0.3mm + 0.01 x length

2. Dimensional Tolerance for all contacts/current carrying parts shall be:

i. Upto and including 20 = + 0.5

ii. Above 20 = +1

iii. For thickness = Negative tolerance is not permissible.

7.1.7 Extension Terminal strips:
The terminal connector strips of the KITKAT shall be projecting out of the KITKAT for minimum length of 65 mm on Link Disconnector side and 65 mm on busbar side as shown in the drawings. The cross section of the strips shall be 25 X 4 mm on outside of the KITKAT and the length and cross section inside the KITKAT shall be provided as per manufacturer design. The material shall be EC grade tined brass.

7.1.8 Terminal block:
Busbar droppers on Kitkat side shall be rounded off suitably to fix at terminal block of Kitkat and link disconnectors strips shall be rounded off on Kitkat side to fit at terminal block of Kitkat. The design shall be such that the current carrying capacity should remain as per capacity of Kitkat.

7.2 LINK DISCONNECTOR :

Link Disconnector of 200 A capacity shall be provided between outgoing terminal of Kitkat & cable connection as shown in the ***Drg.No.Dist/DB /SMC/0210/06*** to facilitate mechanical breaking (manual isolation) of the circuit. 63 /100 kVA Distribution Box shall have 6 Nos. of Link Disconnectors.

The bidder has to indicate the makes and types of Link Disconnector offered in GTP. The successful bidder shall submit complete test reports of the Disconnector as per this

specification, **clause no. 13(C) and 13.8** for CE (Stores), before commencement of supply. The makes of link Disconnectors provided in the Distribution Box to be supplied shall be as mentioned in the GTP of detailed purchase order from MSEDCL.

The base of the Link Disconnector shall be of non-tracking, heat resistant insulating material of superior electrical and mechanical properties equivalent to Dough Moulding Compound (DMC). The Link Disconnector shall be sturdy in construction and easy in operation.

The link of Link Disconnector shall be of Tin-plated E.C. grade copper. The construction of the Link Disconnector shall be such that it shall be hinged type on cable connection end and disconnectable at the Kitkat end. The disconnection will be with the help of special handle/puller. One handle/puller shall be supplied alongwith each Distribution Box. The terminal connector strips of the Link Disconnector of 25X5 mm cross section, shall be projecting out of Link disconnector for minimum length of 80 mm. on cable connection side and 40 mm on Kitkat Outgoing side (as shown in the *Drg.No.* ***DIST/DB/SMC/0210/02***).

The cross section of knife edge link shall be 20 x 4 mm. The material for both the strips and links shall be tin-plated E.C. grade copper. The size of bimetallic lugs hole & the hole on the disconnectors strip on cable side should be same.

The base of Link Disconnectors for 63 /100/200 kVA distribution box shall be rated as follows :

63 and 100 KVA - 150 A .

8 BUSBARS AND CONNECTIONS:

As shown in Drawing No***. DIST/DB/SMC/0210/03***, the Incomer feeder should be on right side of the distribution box and all outgoing feeders will be on left side of the distribution box, with phase sequence RYB to be maintained. The phase busbars and feeder droppers from busbars shall be of tin-plated E.C. grade copper. The phase busbar strips shall be of size 25X5 mm for 63 KVA/100 KVA box. Feeder droppers shall be 25X5 mm. Incomer dropper of 25 x 5 mm cross section for 63 /100 KVA box shall be provided. All busbars and droppers shall be properly drilled and deburred. Each busbars shall be of one single strip without any joint.

Busbars shall be mounted on suitable size support insulators which should be tightened from inside. i.e. once fitted , should not be able to removed.

Busbars shall be provided with durable PVC insulating sleeves of standard colour code for different phases. Corrugated washers shall be used for Nut-Bolt connections.

Minimum clearances, wherever shown, shall be as per General Arrangement Drawing enclosed with this specification. Other clearances shall be as per requirement of IS: 4237/1982 amended upto date.

9 ENCLOSURES:

9.1 The enclosure shall be made up of thermosetting plastic i.e. glass reinforced polyester sheet moulding compound (SMC) (S_3 grade) conforming IS: 13410-1992 SMC material of 3 mm thickness.

9.2 The manufacturing process of Box shall be moulding type.

9.3 SMC distribution boxes, the rounding of corners and slope on Top shall be as shown in the drawing. No joints in the body of the Box are permitted.

9.4 The Switch Disconnector, HRC fuse base with link, Kitkats and Link Disconnector shall be housed in an enclosure. The enclosure shall comply with the requirement of Degree of

protection **IP- 33** as per IS – 13947 & 8623/1993 (amended up-to-date). Access to the Switch disconnector including operating handle shall be available only after the enclosure door is opened.

9.5 The general overall clear dimensions of 63 / 100 KVA Distribution Box shall be 1000 x 1010 x 325 (LXHXW)mm, without considering collor of box. The center height of distribution boxes on front side shall be 1010 mm and right & left side of the box shall be 995 mm. (Drg No./DB/01/B)

9.6 The Base and doors of enclosure shall be individually in one piece without any welding, except for fixing of the accessories like hinges, clamps, mounting clamps, bolts etc. The Box door (one) shall be fixed on right side of the box as shown in the indicative drawings attached with the specification. The Base and doors shall have flange / collars as shown in drawing. Base and doors shall have flange / collars as shown in drawing. Collar of Base and doors shall overlap by 10mm. Rubber gasket of suitable size shall be provided in between base and doors, such that it provides proper sealing between the door and base of box to avoid penetration of dust & ingress of water. Rubber Gasket shall be fitted with suitable adhesive. On right side of the box four hinges shall be provided from inside of the box to fix the doors. Hinges shall be minimum 50 mm in length & made from 2mm thick sheet. Hinge pin (stainless steel) diameter shall be 4mm. The hinges shall not be visible from outside.

9.7 Four Louvers (two on each side) shall be provided with suitable nut bolts. The perforated sheet of 20 SWG CRCA MS with 2.5mm holes shall be fitted from inside of the louvers.

9.8 Mounting of components inside the enclosure shall allow free air circulation keeping the electrical clearances as per attached drawing *No.**DIST/DB/SMC/0210/02*** with the specification.

9.9 Locking Arrangement to the Box:
The locking arrangements to boxes shall be such that the door (s) shall be automatically closed without applying external force. The door should be front operated with a common handle provided outside the door. In addition to this, C&R panel door locks shall be provided to the door at top & bottom. Key way shall be provided on the door for operating the lock from out side. Key way shall be provided with cover. A nylon washer shall be provided between the handle and door to avoid penetration of water.

9.10 The enclosure shall be dust proof, rust proof, vermin and water proof, ultra violet stabilized and flame retardant property.

9.11 The Colour of inside & outside of SMC distribution box shall be **Brown for 63 KVA box** and **Dark Admiralty Gray for 100 KVA box**. (IS :)

9.12 Necessary fixing arrangement shall be provided at the back of the enclosure to ensure proper fixing on double pole structure by means of suitable clamps at 4 places.

9.13 Adequate slope on the top of box shall be provided to drain out rainwater from the top.

9.14 A suitable cable termination arrangement with support insulators shall be provided by extending the EC grade tinned copper terminals of the incoming Isolator (25 x 5 sq.mm for 63/100KVA box) and outgoing Link Disconnector (25X5 sq.mm. for 63/100KVA box). It shall be such that after fixing relevant cable lugs, clearances and creepages shall be ensured.

9.15 Tin-plated EC grade copper Neutral Busbar of 300 x 30 x 5mm for 63/100 KVA box capable of carrying for full load current. Neutral Busbar shall be isolated with respect to body. The **bimetallic lugs** of adequate size, as per enclosed specification & drawing, shall be provided. Neutral Busbar shall be as shown in the drawing attached with the specifications.

9.16 Two galvanized earthing Bolts of M12 x 50 mm size shall be fixed from inside and projecting outside of the box as shown in the drawing. Two Nuts with washers shall be provided on each bolt.

9.17 Three bottom plates of the size 125mm x 125mm fixed with four screws from inside shall be provided for incoming and outgoing cables. Bottom plates shall be provided with suitable holes and rubber glands for the cables. Rubber glands shall be made such that internal diameter of glands provided for cables should be closed with the rubber film of minimum 1mm thickness. Cable will go through the glands by cutting the film of the glands. Bottom plates shall also be provided with cable clamps as shown in drawing.

9.18 Each distribution box shall be supplied with proper packing in five ply- corrugated box.

9.19 Good quality plastic sticker leaflet should be pasted inside of distribution box door. The matter of instruction leaflet is given alongwith this specification. All the instructions on leaflet should be in Marathi language.

9.20 Danger Board as shown in (***No.****DIST/DB/SMC/0210/09*) attached with specifications shall be riveted on the box as per IS:2551. Danger board marking by painting shall not be accepted.

9.21 Incoming and outgoing circuit should be duly highlighted with paint by stencil printing.

9.22 All components inside the Box shall be mounted on CRCA MS strips of 2 mm thickness. The mounting strips shall be provided with required bends or ribs to give the extra strength and shall be powder coated or zinc plated.

9.23 All joints for current carrying parts shall be made using non-magnetic stainless steel bolts, 2 nuts & bucket, spring washers. The nuts and bolts should be of hexagonal type with groove for bolt.

9.24 Name plate having details such as Month & year of manufacturing, Name of manufacturer/Trade mark, Sr.No, and rating of Distribution box, shall be riveted on the Distribution box door. The name plate should be of stainless steel of thickness 1 mm. Mahavitaran logo in Marathi Language shall be embossed on the door of the distribution box. Marathi slogans as per attached Annexure – I shall be painted in glowing colour (Red/ Yellow/ Bright Green/Orange). The letter size, font, height & length shall be suitable to the size of distribution boxes such that slogan can be clearly readable from 30 feet distance. There are total 15 nos Marathi slogans, out of them one slogan has to be painted per box. All slogans shall be covered equally on the ordered quantity. All above shall be so placed to give box good look.

9.25 Nos. of Kitkats and 3 Nos. HRC fuse links in spare should be invariably provided with each Box.

10 CABLE TERMINATION:

Adequate size of lugs shall be provided for 3 ½ core, LT XLPE cables on incoming side and for out going side for 63/100 KVA boxes as below :

	Incoming side	Outgoing side
63 kVA/100kVA	120 sq.mm	50/70 sq.mm

11 PROPERTIES OF MATERIALS USED FOR DISTRIBUTION BOXES:

11.1 The Enclosure Sheet Moulding Compound (SMC) conforming IS: 13410-1992 should have following properties

Sr.no	***Test Details***	***Requirement for S3 electrical Grade***	***Type of test***	***Reference standard***
1.	Glass Content , % by mass , minimum	*20*	*Type*	Annexure –A of IS : 13411: 1992
2.	Flow, mm, Min	*170*	*Acceptance*	Annexure – C of IS : 13411: 1992
3.	Mould shrinkage , linear percent, Max	*0.25*	*Acceptance*	Annexure – B of IS : 13411: 1992
4.	Density of Moulding , g/ml	*1.8 to 2.1*	*Routine*	IS:8543 (part 1/Sec2:1970)
5.	Water Absorption, % Max.	*0.01*	*Acceptance*	Annex. D of of IS : 13411: 1992
6.	Izod Impact Strength (Notched), KJ/m2, Min	*55*	*Type, Acceptance for S2*	Annex.E of IS : 13411: 1992
7.	Tensile Strength , MPa, Min	*70*	*Type, Acceptance for S2*	IS:8543 (part 4/1984)
8.	Flexural Strength, MPa	*170*	*Type*	Annex. F of IS 13411:1992.
9	Modulus of Elasticity, 103 MPa	*12 to 15*	*Type*	IS 8543 (Part 4/Sec 1) : 1984
10	Surface Resistivity (24H in Water), Ohm, Min	$1x10^{13}$	*Routine*	IS3396:1979
11	Volume Resistivity , Ohm-cm, Min	$1x10^{14}$	*Routine*	IS3396:1979
12	Tracking Resistance CTI, Min	*1000*	*Type*	IS2824:1975
13	Power Arc Resistance, sec, Min	*180*	*Type (Acceptance for S2)*	Annex. G of IS 13411:1992
14	Dielectric Strength at 90°C In Oil KV/Min	*11*	*Type*	IS 6262:1971
15	Dissipation factor (4 days at 80% RH & 1 KHz)	*0.01*	*Type*	IS4486:1967
16	Heat Distortion Temperature, C, Min	*150*	*Type*	Annex. H of 13411:1992
17	Oxygen Index, % Min	*24*	*Type*	IS 13360 (Part6/Sec6):1992
18	Flammability (Vo)	-	Type	UL 94 or IS : 11731 (Pt.II)
19	Glow wire test	-	Type	IEC – 695 –2-1 or IS:11000(Pt2/sec.1
20	Ball pressure test	-	Type	IEC : 335
21	Mechanical Strength	-	Type	IS : 14772

22	Marking, Dimensions and construction	-	Routine	IS : 14772
23	Spirit burner test (Self Extinguishing)	-	Type	IS : 4249
24	Melting point (to test up to 400ºC) should not melt		Type	IS :13360

11.2 The Metal parts such as Nuts, Bolts & Washers etc used in the Distribution Boxes shall be treated Electro galvanizing of Zinc except for bus bar & links.

12 SAFETY ARRANGEMENTS:

Two earthing studs of galvanized M.S. M 12 X 50 mm shall be provided for external earth and internal neutral connections. These should be complete with plain washer, spring washer, nuts etc. Earthing studs must be fitted to prevent removal of the same from the box.

13 TEST & TEST CERTIFICATES:

A. ACCEPTANCE TESTS (ON COMPLETE DISTRIBUTION BOX):

In case of bought out items, routine and acceptance tests as per relevant IS and this specification shall be carried out at the original manufacturers' works.

13.1 Routine Test (Carried out on all boxes):

13.1.1 Overall Dimensions Checking.
13.1.2 Insulation Resistance Tests.
13.1.3 High Voltage Test at 2500 V, 50 Hz AC for one minute.
13.1.4 Operation Test on Switch disconnector /Link Disconnector/ HRC fuse base and fuse Links /Kitkats.

Following tests shall be carried out as per acceptance tests in addition to routine tests on one random sample of each rating out of the lot offered for inspection:

13.2 Temperature rise test on one sample of each rating.
Temperature rise test will be carried out as per the procedure given below:
For temperature rise test, a distribution box with all assembly of KIKATs (only fuse base), Link Disconnectors, Isolator, HRC fuse base shall be kept in an enclosure such that the temperature outside the box shall be maintained at 50 degree C.

20 % more current than transformer secondary capacity i.e. for 63 kVA distribution transformers full load current 84A, 20% more is 100 A shall be kept in incoming circuit keeping outgoing circuits short, till the temperature stabilizes and maximum temperature rise should be recorded.

13.3 **Tests in line with Cl. 11.1 and IS: 13410-1992 for Sheet Moulding Compound (SMC) Enclosure for conformance to the values specified therein.**

B. TYPE TESTS:

13.4 ON COMPLETE BOX:

a. Temperature rise test:- The temperature rise test should be carried out as per IS: 8623/1993.

b. High voltage test as per IS:8623 amended up to date.

c. Short Time Withstand Current Test on Distribution Box as per IS: 8623 or latest version. The Distribution Box should be subjected to Short Time Withstand Current Test for value of 4KA for 2 seconds for all the circuits independently. The test should be carried out after by-passing KIKATs.

d. Degree of protection for **IP- 33** on complete unit as per IS 13947 or latest version thereof.

e. Tests in line with Cl. 11.1 and IS: 13410-1992 for Sheet Moulding Compound (SMC) Enclosure for conformance to the values specified therein.

13.5 ON ISOLATOR (SWITCH DISCONNECTOR):
All type tests on incoming isolator (Switch Disconnector) as per IS:13947 amended upto date.

13.6 ON HRC fuses base and HRC fuse links. All type tests on HRC fuses and HRC fuse links IS 13703/1993 (Part I & II amended upto date) for HRC Fuse Base and HRC fuse link.

13.7 On Kitkat: All type tests on Kitkat as per IS 2086-1993 (amended upto date).

a. TYPE TESTS on Kitkat:
The tests for rewirable fuses shall be carried out as per the procedure detailed in I.S.2086-1993. However, for the guidance of the tenderer, the different type tests are mentioned below :

1. Visual examination.
2. Test for dimensions.
3. Test for mechanical endurance.
4. Test for mechanical strength.
5. Test for temperature rise :- As per Clause No.9.6 of I.S. 2086/1993, temperature rise of different parts of the kitkats when tested in an ambient temperature of 40dec. C, should not exceed 55 deg.C.
6. Insulation Resistance test
7. High Voltage test.
8. Test for breaking capacity.
9. Test for water absorption.
10. Test on ceramic material.
11. Ignition test (for non-ceramic materials).
12. Test for withdrawal force.

b. ROUTINE TESTS on KITKAT:
Every rewirable fuse unit manufactured and to be supplied against MSEDCL's order will be subject to routine tests mentioned below:

c. High Voltage Test:
This test shall be carried out on fuse unit as per the procedure detailed in clause 9.8 of I.S.2086-1993 (amended upto date) The test voltage shall not be less than 2.5 kV A.C. with frequency 50 Hz and shall be maintained for one minute. There shall be no puncture of

arcing during the high voltage test. Immediately following the test, the insulation resistance by 1kV megger as per Clause 9.7 of I.S.2086-1993 (amended up to date) shall be measured which shall not be less than 10 mega ohms.

13.8 On Link Disconnector:

Following tests shall be carried out on link disconnector as per relevant IS.

1. Short Circuit withstand strength.
2. Temperature rise test.
3. Mechanical Operations

C) TEST CERTIFICATES:

The Distribution Box, Isolator (Switch Disconnector), HRC fuse, HRC Fuse Link, Link Disconnector and Kitkat 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 the supply. The detailed type test Reports shall be furnished with relevant oscillogram drawings and certified Drawings of the equipment 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.

All the above Type Tests shall be carried out from laboratories accredited by National Accreditation Board of Testing and Calibration Laboratories (NABL), Department of science & technology, Govt. of India such as CPRI Bangalore/Bhopal, ERDA Baroda, to prove that the complete Box, Isolator & Kitkat meets the requirements of the specification. The Tenderers should also furnish certificate from laboratories where Type Tested that requisite test facility available in house. The type test reports conducted in manufacturers own laboratory and certified by testing institute shall not be acceptable.

The Tenderer should furnish the particulars giving specific required details of Distribution Boxes, L.T. Circuit Breakers, Isolator and Link Disconnector in Schedule `A' attached. The offers without details in Schedule `A' stand rejected.

14 TESTING & MANUFACTURING FACILITIES :

The Tenderer must clearly indicate what testing facilities are available in the works of manufacturer and whether the facilities are adequate to carry out all Routine, Acceptance. These facilities should be available to MSEDCL's Engineers, if deputed to carry out or witness the tests in the manufacturer's works. The tenderer must have all the in-house testing facilities to carry out the acceptance tests on the Box.

The tenderer shall furnish detailed process of manufacturing of SMC enclosure and submit list of plant of machinery available for that.

15 PROTOTYPE SAMPLE:

The successful tenderer have to manufacture the prototype unit for each rating as per this specification before bulk manufacturing. The tenderer should intimate readiness of prototype to CE (Stores), Prakashgad, 5th floor, MSEDCL, Mumbai. The representative of CE (Stores) will inspect the prototype on any day within 15 days from the date of readiness intimated. The inspection report of prototype jointly signed by manufacturer and MSEDCL representative. The approval of prototype shall be responsibility of tenderer .The commencement period of supply shall include the time period required for getting the prototype approved from CE (Stores) and no additional time period for the same will be given.

16 INSPECTION:

All tests and inspection shall be made at the place of manufacturer. The manufacturer shall afford the Inspector (representing the purchaser), all reasonable facilities, without charge to satisfy him that the material is being supplied in accordance with this specification.
The first lot of each rating of distribution box shall be jointly inspected by the representative of CE (Stores) and Executive Engineer (IW).

17 REJECTION:

The purchaser may select one box at random from a lot of 100 Distribution Boxes of each type or part thereof as may be supplied from time to time. The Box so selected must pass any or all the Type Tests mentioned above otherwise the whole lot of 100 boxes or part thereof, from which one box was selected, will be rejected.

The testing under this clause will be done in any Laboratory of the MSEDCL's choice including MSEDCL's Laboratory. Notice of such tests will be given by the MSEDCL by ordinary post to supplier and the date of test may not be altered to the convenience or request of the supplier. The supplier is at liberty to be present during the testing.

The MSEDCL may, at its option, inspect the distribution boxes supplied to the different Stores at site or at departmental Stores. If any of the technical particulars are seen to be in variance than the guaranteed technical particulars, the whole lot of boxes will be rejected.

18 SCHEDULES:

a. The tenderer shall fill in the following schedule, 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 `A' - Guaranteed Technical Particulars
Schedule `B' - Tenderer's Experience.

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

19 DRAWINGS ENCLOSED:

A list of an indicative drawings of distribution box and its components is given below:

i. Dist/DB/01/B
ii. DIST/D/SMC/0210/02
iii. DIST/DB/SMC/0210/03
iv. DIST/DB/SMC/0210/04
v. DIST/DB/SMC/0210/06
vi. DIST/DB/SMC/0210/07
vi. DIST/DB/SMC/0210/08
vii. DIST/DB/SMC/0210/09
viii. CE/DIST/MM-III/MSEDCL/KITKAT/100/02 rev.02
ix. Annexure - I

The successful bidder shall submit set of all above drawings of the distribution box and its components in triplicate to CE (Stores) office and get approved before commencement of supply (i.e. Ist Lot of Distribution Boxes).

SCHEDULE – 'A'

E tendering GUARANTEED TECHNICAL PARTICULARS FOR DISTRIBUTION BOX.

SCHEDULE - `B'

SCHEDULE OF TENDERER'S EXPERIENCE

Tenderer shall furnish here a list of similar orders executed/under execution by him to whom a reference may be made by Purchaser in case he considers such a reference necessary.

Sr. No.	Name of Client & Description	Value of order	Period of supply and commissioning	Name & Address to whom reference may be made.
1	2	3	4	5

NAME OF FIRM _____

NAME & SIGNATURE OF THE TENDERER_____

DESIGNATION _____

DATE _____

SPECIFICATION OF BIMETALLIC LUGS

1. SCOPE:

Bimetallic terminal lugs are for use in Distribution Boxes/Distribution Transformer and other O&M application for Crimping Copper and Aluminum Cables and termination on surface namely Aluminum/Brass/Copper Plated terminals without the use of Bimetallic washers.

2. STANDARD:

Bimetallic lug crimped joint should conform to all tests laid down in IS-8337 e.g. clause 4.1.1 (6.2) for initial resistance and clause 4.1.3 (6.4) for Electrical Load Cycle test for 1000 Cycles and Tensile Test clause 4.2 (6.5). Type Test certificate to this effect giving numerical values obtained must be provided.

3. SERVICE CONDITION:

The Lugs to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

Maximum ambient temperature (Degree C)	50
Maximum temperature in shade (Degree C)	45
Minimum Temperature (Degree C)	3.5
Relative Humidity (percent)	10 to 95
Maximum Annual rain fall (mm)	1450
Maximum wind pressure (kg/sq.m)	150
Maximum altitude above mean sea level (Meter)	1000
Isoceranic level (days per year)	50
Siesmic level (Horizontal Acceleration)	0.3 g

Moderately hot and humid tropical climate conductive to rust and fungus growth.

4. MATERIAL SPECIFICATION:

Bimetallic lug should be made for electrolytic grade aluminum. Each lug should be copper coated by electrolytic process and rich layer of tin should be mounted through out the lug to protect from Galvanic Corrosion. The lugs shall be such that the rich layer of tin should not peel of during operation. Individual lot should be prefilled with conductive inhibition compound and lug should be duly capped to prevent oozing of compound. The ductility of material should be such that flow ability of material be adequate to flow in to the strand of the conductor and withstand on crimping pressure of 8500 PSI. The cut cross section of the joints shall be homogeneous.

5. GENERAL REQUIREMENTS:

The minimum dimensions of the bimetallic lug in respect of barrel thickness and holes diameter should conform to enclosed Drawing No. **DIST/DB/SMC/0210/08.**

6. TESTS:

i) Initial resistance test of bimetallic crimped joint as per IS 8337.
ii) Heating cycle test for 1000 cycles of crimped joint of bimetallic lugs as per IS 8337.
iii) Tensile strength test of the crimped joint of bimetallic lug as per IS: 8337.
iv) Dimensional test as per drawing/offer.

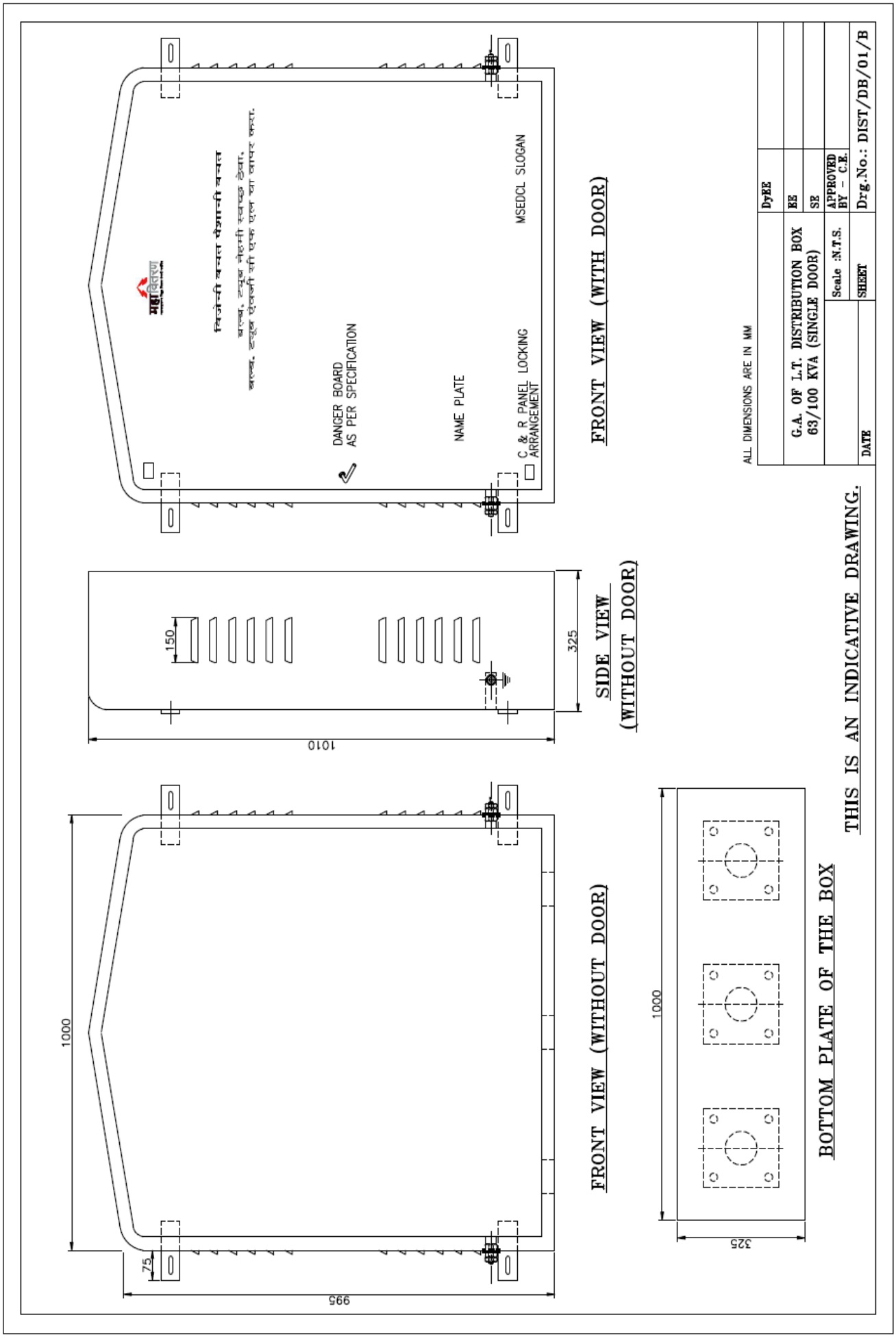
7. TEST CERTIFICATES:

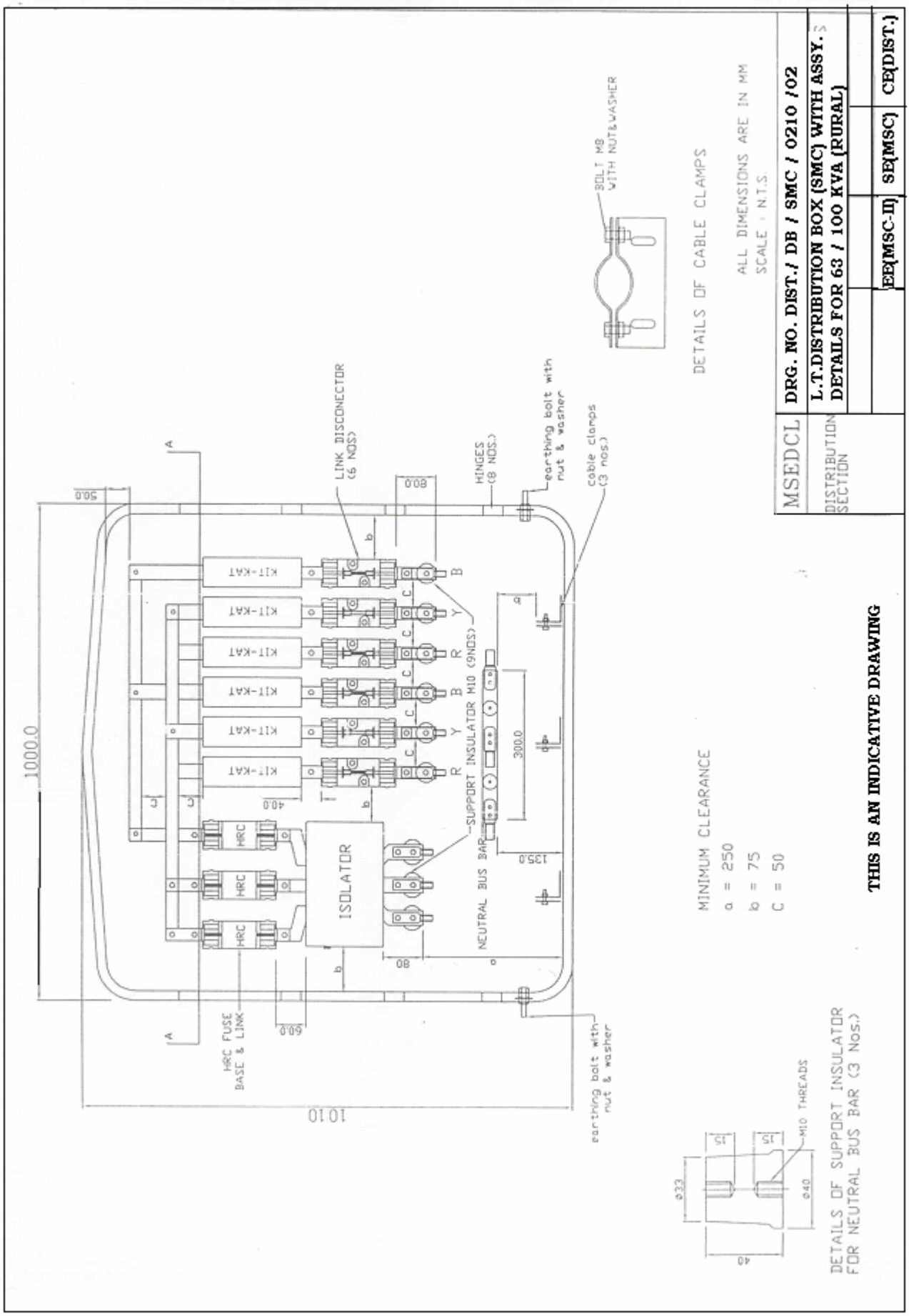
At present the following makes and types of bimetallic lugs are accepted by the MSEDCL.

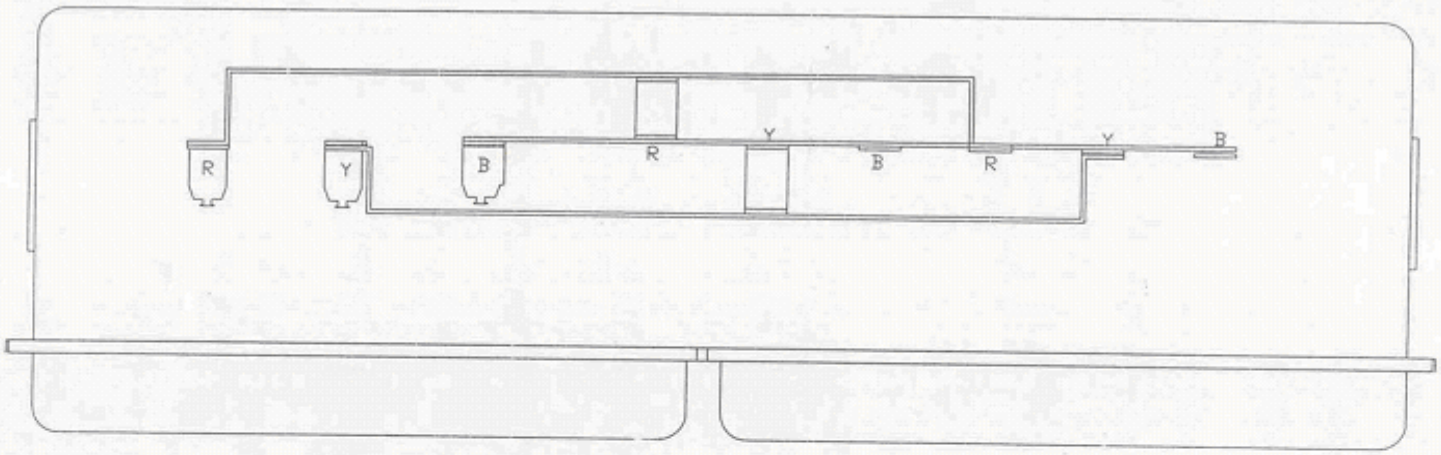
Usha Martin Industries, Ismail, Chetna, Klippon, SRI, Alcon, NES, Hames and HB.

In case any other equivalent make of bimetallic lugs, if bidder offer, they should indicate makes and types of bimetallic lugs in E-tendering GTP. The bidders should submit complete test reports of the bimetallic lugs as per this specification, clause No. 6 to CE (Stores) for approval before commencement of supply. The Tests on lugs should be done in any reputed independent laboratory.

8. DRAWING ENCLOSED: No. DIST/DB/SMC/0210/08.


FRONT VIEW (WITH DOOR)
DANGER BOARD AS PER SPECIFICATION
NAME PLATE
C & R PANEL LOCKING ARRANGEMENT
MSEDCL SLOGAN
SIDE VIEW (WITHOUT DOOR)
150
325
1010
FRONT VIEW (WITHOUT DOOR)
1000
75
995
BOTTOM PLATE OF THE BOX
1000
325
THIS IS AN INDICATIVE DRAWING.
ALL DIMENSIONS ARE IN MM
G.A. OF L.T. DISTRIBUTION BOX 63/100 KVA (SINGLE DOOR)
DyEE
EE
SE
APPROVED BY – C.E.
Scale :N.T.S.
SHEET
DATE
Drg.No.: DIST/DB/01/B


MSEDCL
DISTRIBUTION SECTION
DRG. NO. DIST./ DB / SMC / 0210 /02
L.T.DISTRIBUTION BOX (SMC) WITH ASSY.S
DETAILS FOR 63 / 100 KVA (RURAL)
EE(MSC-II)
SE(MSC)
CE(DIST.)
THIS IS AN INDICATIVE DRAWING
ALL DIMENSIONS ARE IN MM
SCALE - N.T.S
DETAILS OF CABLE CLAMPS
BOLT M8 WITH NUT&WASHER
MINIMUM CLEARANCE
a = 250
b = 75
C = 50
DETAILS OF SUPPORT INSULATOR FOR NEUTRAL BUS BAR (3 Nos.)
M10 THREADS
ISOLATOR
HRC
KIT-KAT
LINK DISCONNECTOR (6 NOS.)
HINGES (8 NOS.)
earthing bolt with nut & washer
cable clamps (3 nos.)
SUPPORT INSULATOR M10 (9NOS.)
NEUTRAL BUS BAR
HRC FUSE BASE & LINK
1000.0
1010

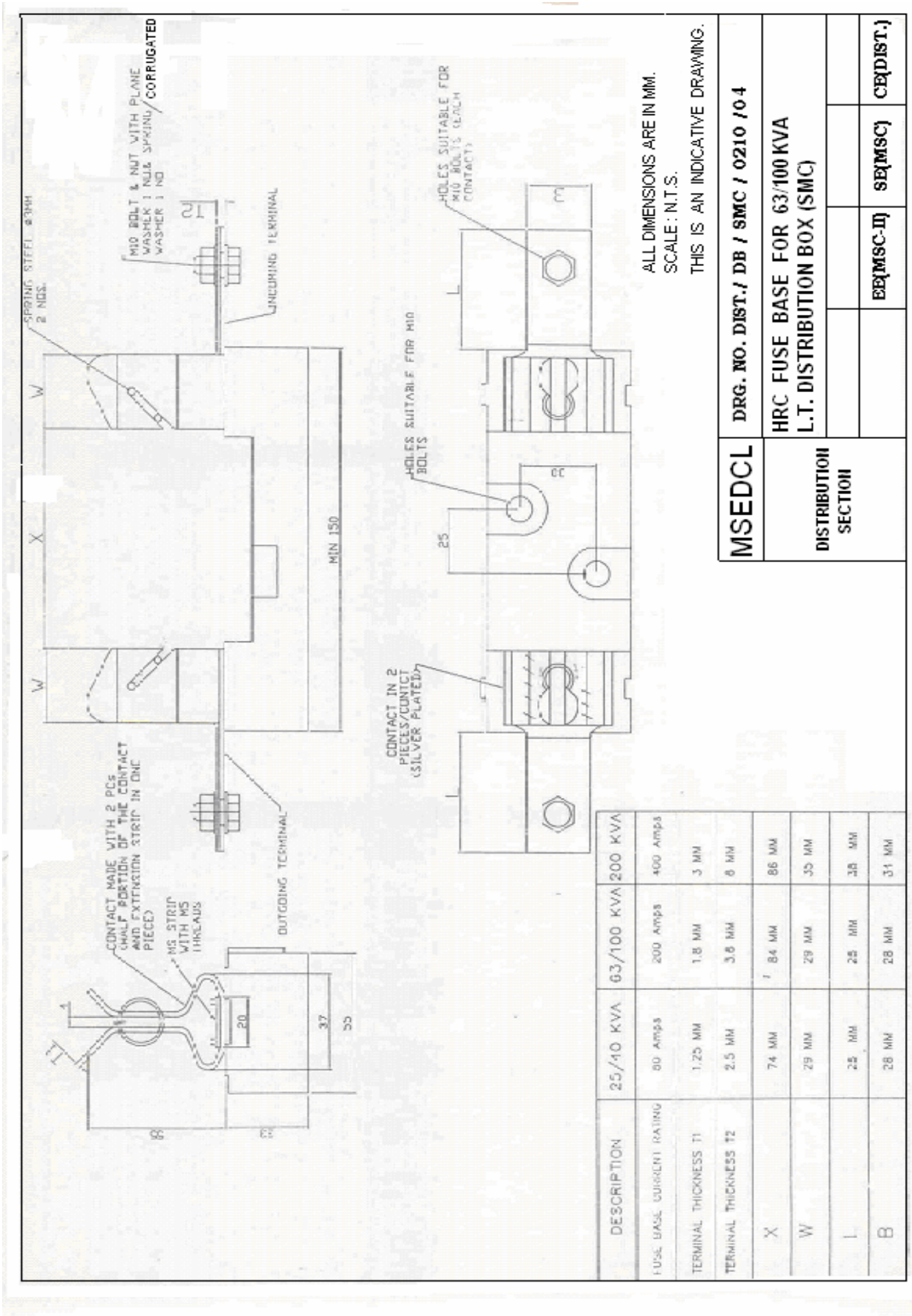


SECTION "A-A" WITH BUS BAR ASSEMBLY DETAILS.

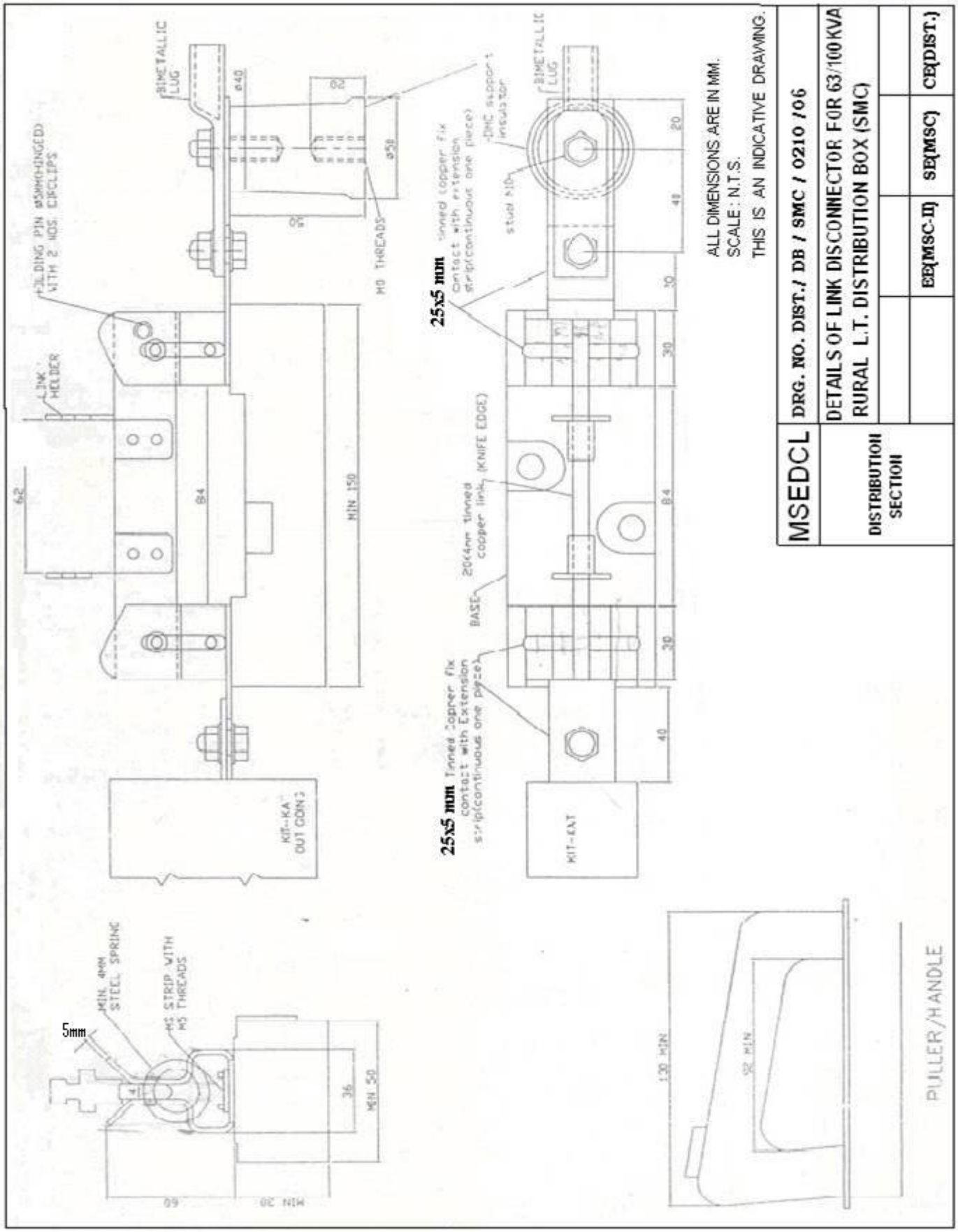
ALL DIMENSIONS ARE IN MM.
SCALE : N.T.S.

MSEDCL	DRG. NO. DIST./ DB / SMC / 0210 /03			
DISTRIBUTION SECTION	L.T. DISTRIBUTION BOX (SMC) WITH BUS BAR DETAILS FOR 63/100 KVA (RURAL/URBAN)			
		EE(MSC-II)	SE(MSC)	CE(DIST.)

THIS IS AN INDICATIVE DRAWING.



DESCRIPTION	25/10 KVA	63/100 KVA	200 KVA
FUSE BASE CURRENT RATING	80 Amps	200 Amps	400 Amps
TERMINAL THICKNESS T1	1.25 MM	1.8 MM	3 MM
TERMINAL THICKNESS T2	2.5 MM	3.6 MM	6 MM
X	74 MM	84 MM	86 MM
W	29 MM	29 MM	35 MM
L	25 MM	25 MM	38 MM
B	28 MM	28 MM	31 MM


BIMETALLIC LUG
FOLDING PIN ASSMHINGED WITH 2 NOS CIRCLIPS
LINK HOLDER
M10 THREADS
MIN 150
KIT-KA OUT CONN
25x5 mm tinned copper fix contact with extension strip(continuous one piece)
DHC support insulator
stud M10
20
40
30
30
84
BASE
20Kmm tinned copper link (KNIFE EDGE)
KIT-KNT
5mm
MIN. 4MM STEEL SPRING
M5 STRIP WITH M5 THREADS
36
MIN 50
MIN 20
60
130 MIN
32 MIN
PULLER/HANDLE
ALL DIMENSIONS ARE IN MM.
SCALE : N.T.S.
THIS IS AN INDICATIVE DRAWING.
MSEDCL
DISTRIBUTION SECTION
DRG. NO. DIST./ DB / SMC / 0210 /06
DETAILS OF LINK DISCONNECTOR FOR 63/100 KVA RURAL L.T. DISTRIBUTION BOX (SMC)
EE(MSC-II)
SE(MSC)
CE(DIST.)

महाराष्ट्र स्टेट इलेक्ट्रीसिटी डिस्ट्रीब्यूशन कंपनी लिमिटेड

एल. टी. डिस्ट्रीब्युशन बॉक्स् _____ के. व्ही. ए. ट्रान्सफॉर्मरसाठी

हया डिस्ट्रीब्युशन बॉक्स् मधील साधनांची माहीती.

१) इन्कमींग स्वीचची क्षमता = _____ अॅम्पिअर्स

२) सिंगल फेज एम. सी.सी.बी. / किटकॅट ची एकूण संख्या = _____

३) एम. सी.सी.बी चे करंट सेटिंग / किटकॅट चे रेटिंग (प्रत्येक फेज साठी) = _____ अॅम्पिअर्स.

४) लिंक डिस्कनेक्टर्सची एकूण संख्या = _____

५) डिस्ट्रीब्युशन बॉक्स् जोडताना खाली दिल्याप्रमाणे काळजी घ्यावी.

१) वरीलप्रमाणे सर्व साधने बॉक्समध्ये आहेत याची खात्री करा.

२) सर्व नट बोल्ट कनेक्शन्स योग्य प्रमाणशीर हत्यारे वापरुन घट्ट करा. कारण कनेक्शन सैलपणामुळे ढिले होण्याची शक्यता असते.

३) नट–बोल्ट आवळताना बॉक्स् सोबत दिलेल्या ग्लॅरिटकपिशवीतील / साधन विशिष्ट ग्रीसचा वापर सढळ हाताने करावा. नट–बोल्ट आवळल्यानंतर राहिलेले / वर आलेले ग्रीस तसेच राहू द्या. ते काढू नका.

4) इन्कमिंग (येणाऱ्या) व आऊटगोईंग (जाणाऱ्या) साठी खाली दिलेल्या आकाराची केबल वापरा.

ट्रान्सफॉर्मरची क्षमता	डिस्ट्रिब्युशन बॉक्समधील केबल	
	इन्कमिंगचा आकार (ट्रान्सफॉर्मरकडून येणारी)	आऊटगोईंगचा आकार (लाईन-कडे जाणारी)
२५ के. व्ही. ए.	३.५ वेअर ५० स्क्वेअर एम. एम.	३.५ वेअर ३५ स्क्वेअर एम. एम.
६३ के. व्ही. ए.	३.५ वेअर ७० स्क्वेअर एम. एम.	३.५ वेअर ३५/५० स्क्वेअर एम. एम.
१०० के. व्ही. ए.	३.५ वेअर १२० स्क्वेअर एम. एम.	३.५ वेअर ५०/७० स्क्वेअर एम. एम.
१०० के. व्ही. ए.	३.५ वेअर १२० स्क्वेअर एम. एम.	३.५ वेअर ५०/७० स्क्वेअर एम. एम.
२०० के. व्ही. ए.	३.५ वेअर १८० स्क्वेअर एम. एम.	३.५ वेअर १२० स्क्वेअर एम. एम.

इन्कमिंग स्विचला/लिंक डिस्कनेक्टरला केबल जोडण्यासाठी लग्जचा वापर करा.

५) केबलच्या वायरचा आकार हा वायरशी त्रिवेणीसारखा असतो. तो लग्ज वापरण्यापूर्वी गोल करून घ्या. वायर लग्जमध्ये घालताना व केबलरहित लग्ज जोडताना विशिष्ट ग्रीसचा (पेट्रोलियम जेलीचा) वापर करा. इन्कमिंग (येणाऱ्या) व आऊटगोईंग (जाणाऱ्या) वायरी लग्जशिवाय टर्मिनलमध्ये सेट जोडू नका. ते त्रासदायक आहे.

बोल्टने आवळून घट्ट करा. त्यामध्ये फ्लॅट (सपाट) वॉशर, स्प्रिंग वॉशर व ग्रीस वापरण्यास विसरू नका.

६) डिस्ट्रिब्युशन बॉक्सची वापरात न घेतलेली छिद्रे उघडी असल्यास ती बंद करा म्हणजे उंदीर, घूस, साप, पाल, चिमणी वगैरेसारखे प्राणी आतमध्ये जाणार नाहीत व शॉर्ट सर्किटचा धोका टाळला जाईल.

७) बॉक्ससोबत दिलेल्या पी.व्ही.सी. च्या जिवा बाराच्या रिंग (ग्लैंड) डिस्ट्रिब्युशन बॉक्सच्या इन्कमिंग व आऊटगोईंग वायरींच्या छिद्राभोवती पक्कलगा बसवा म्हणजे वायरी तीक्ष्ण वापरल्या जाणार नाहीत.

८) सर्व काम संपल्यानंतर डिस्ट्रिब्युशन बॉक्सचा दरवाजा व्यवस्थित बंद करून कुलुप लावण्यास विसरू नका.

९) नियमित सर्व जॉईंट्स (साधे) तपासा व आवश्यकतेनुसार घट्ट करा.

ब) पुश. सी. सी. बी. वापरण्याबाबत घेण्याची काळजी.

१) एम. सी. सी. बी हा सर्विस ब्रेकर असून दिलेल्या ठराविक करंट सेटिंगवर तो ट्रिप होत असतो म्हणून लाई नवरील वीजभार त्या मर्यादेतच ठेवा.

२) एम. सी. सी. बी ट्रिप झाल्यानंतर थोड्या वेळानंतर "नॉब" ऑफपोझिशनवर आणा म्हणजे एम. सी. सी. बी. रीसेट होईल. एम. सी. सी. बी ऑन/ऑफपोझिशनवर नव.

३) लाईनवर काम करण्याचे असल्यास प्रथम एम. सी. सी. बी. बंद करा टेस्टरने खात्री करा ऑफपोझिशनला आहे

४) एम. सी. सी. बी. बंद करून सिंगलफिरव्होल्टर ऑफ करा, तसेच लाईनला स्पर्श करण्यापूर्वी अर्थिंग रॉडचा वापर करून लाईन "अर्थ" करा. एम. सी. सी. बी. वापरास करण्याचा किंवा करंट सेटिंग बदलण्याचा प्रयत्न करू नका. लाईनचे काम झाल्यानंतर प्रथम सिंगलफिरव्होल्टर क्लोज करा व नंतर एम. सी. सी. बी. ऑन करा.

५) एम. सी. सी. बी. बदलताना तो त्या नमुद केलेल्या / योग्य करंट सेटिंगमध्ये वापर करा.

क) इन्कमिंग स्विच वापरण्याबाबत सूचना :

१) इन्कमिंग स्विच वापरताना "ऑन / ऑफ" करू शकाल अशा पध्दतीचा आहे. "ऑन / ऑफ' इन्डीकेशन ऑपरेटिंग हॅन्डलवर आहे.

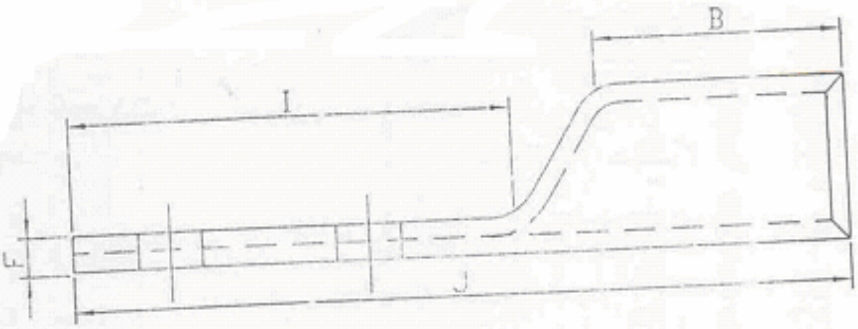
२) इन्कमिंग स्विच "ऑन" करण्यासाठी हॅन्डल क्लॉकवाईज (घड्याळाच्या) दिशेने फिरवा.

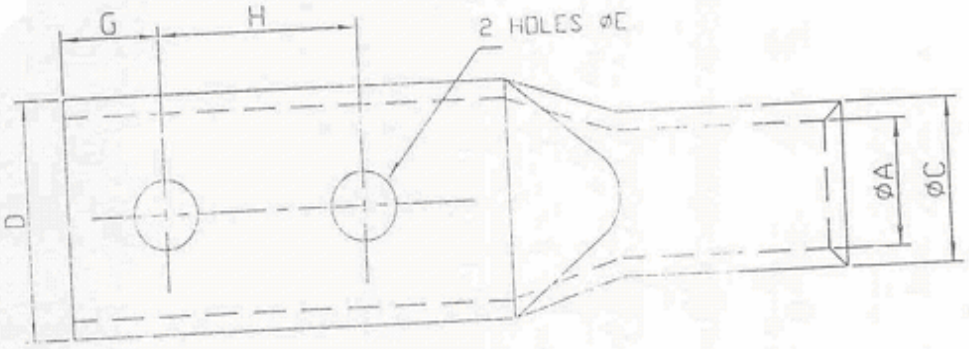
३) इन्कमिंग स्विच "ऑफ" करण्यासाठी हॅन्डल अॅन्टिक्लॉकवाईज (घड्याळाच्या विरुद्ध) दिशेने फिरवा.

४) इन्कमिंग स्विच बदलताना तो त्या नमुद केलेल्या / योग्य अॅम्पिअर क्षमतेचा वापरा.

ध्यात ठेवा हा डिस्ट्रिब्युशन बॉक्स व्यवस्थित हाताळल्यास ट्रान्सफॉर्मरचे व इतर मालमत्तेचे नुकसान टाळता येते. तसेच लाईन स्टाफला सुद्धा अधिकसुरक्षितता मिळते

MSEDCL	DRG. NO. DIST./ DB / SMC / 0210 /07			
DISTRIBUTION SECTION	INSTRUCTIONS LEAFLET IN MARATHI			
		EE(MSC-II)	SE(MSC)	CE(DIST.)

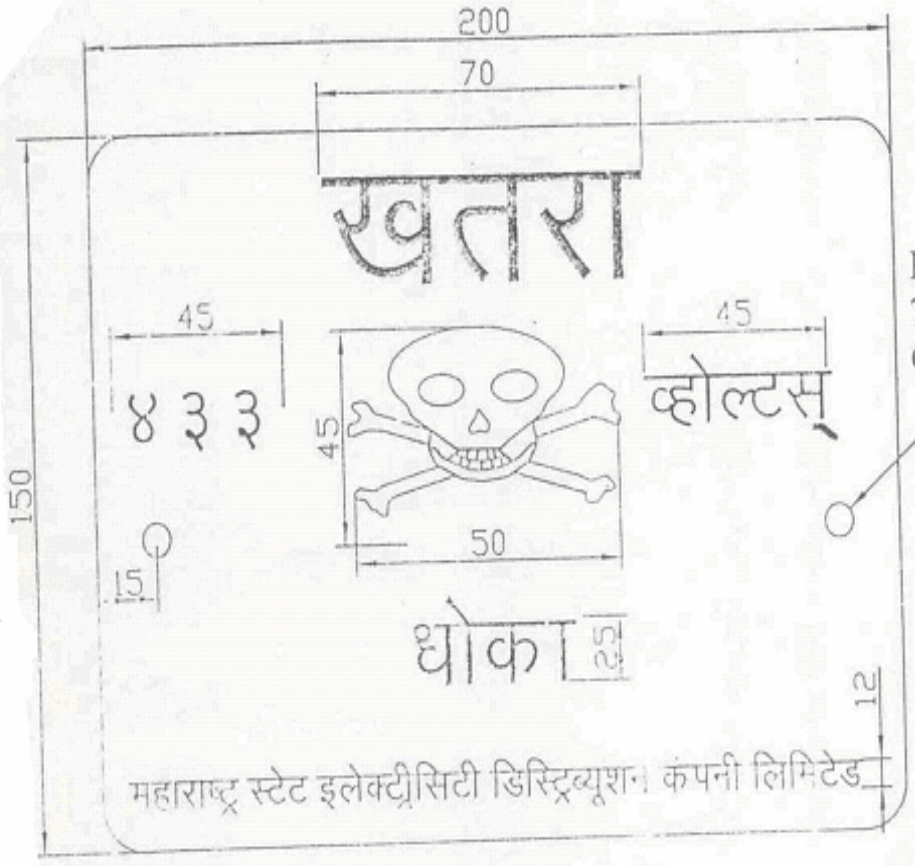




CABLE SIZE	ØA	ØC	D	F	ØE	B	G	H	I	J
(25 SQ MM)	7.0	9.7	13.7	2.7	8.2	21	11	20.0	-	70
(35 SQ MM)	8.0	10.8	15.4	2.8	8.2	21	11	20.0	-	70
(50 SQ MM)	9.6	13.6	20.0	3.5	10.3	30	13	40	65.0	115
(70 SQ MM)	11.8	17.0	24.0	5.3	10.3	30	13	40	65.0	115
(95 SQ MM)	13.0	17.0	30.0	3.9	10.3	30	13	40	65.0	115
(120 SQ MM)	15.6	21.9	30.0	6.0	13.0	50	20	40	81.0	145
(150 SQ MM)	16.5	22.0	31.5	5.3	13.0	50	20	40	90.0	156
(185 SQ MM)	18.2	27.6	50.0	9.0	13.0	50	20	40	90.0	156
(225 SQ MM)	21.8	30.0	50.0	7.5	13.0	50	20	40	90.0	156
(240 SQ MM)	21.0	30.0	50.0	7.5	13.0	50	20	40	90.0	156
(300 SQ MM)	24.0	31.0	45.0	6.8	13.0	50	20	40	90.0	156

ALL DIMENSIONS ARE IN MM
SCALE : N.T.S.
THIS IS AN INDICATIVE DRAWING.

MSEDCL	DRG. NO. DIST./ DB / SMC / 0210 / 08			
DISTRIBUTION SECTION	BIMETALLIC LUGS			
		EE(MSC-II)	SE(MSC)	CE(DIST.)



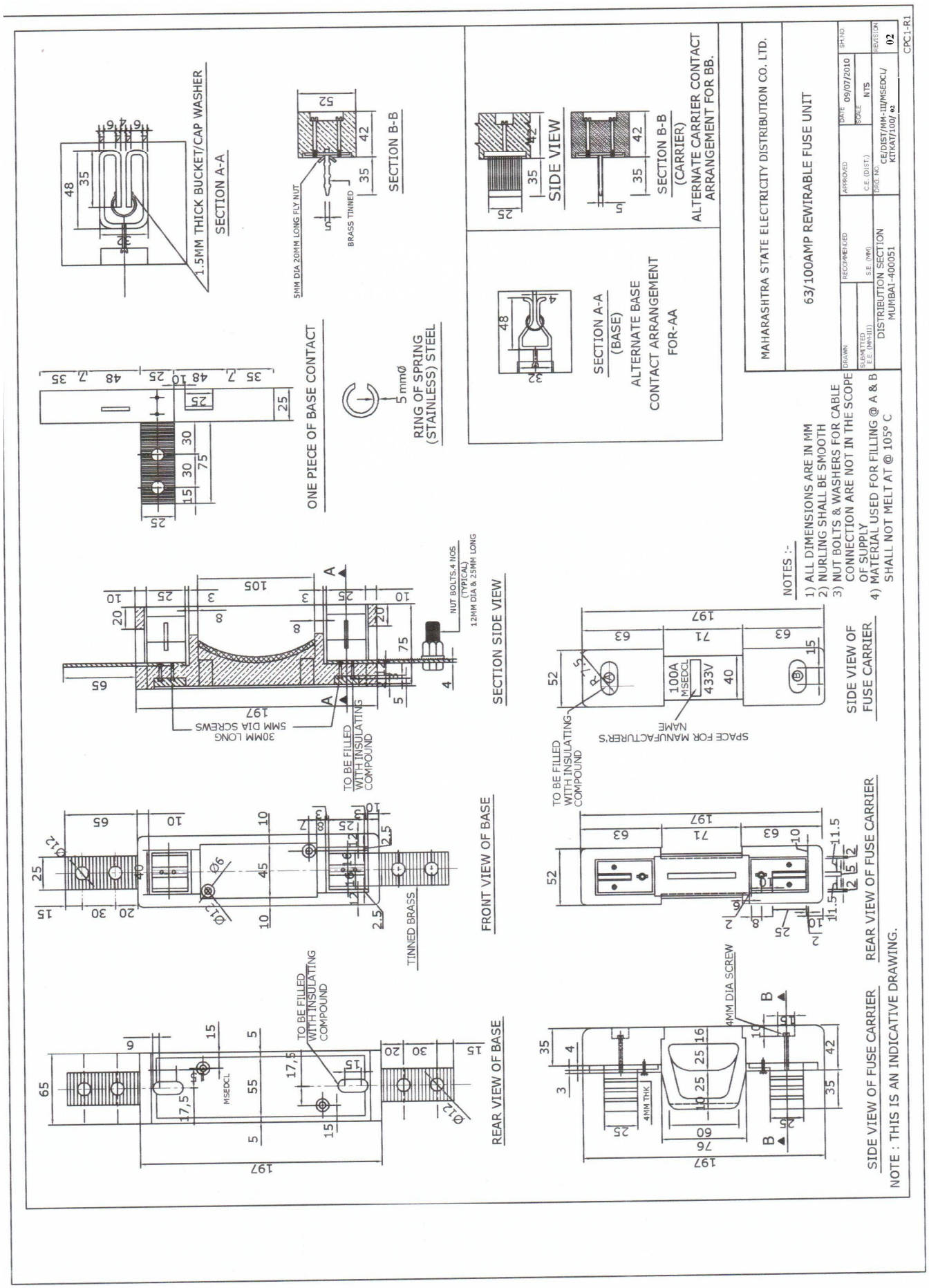
A. SPECIFICATION FOR THE BOARD.

1. MATERIAL : 18 SWG M.S. SHEET.
2. SIZE : 200mm X 150mm.
3. FRONT SIDE (BACKGROUND) ENAMMELED WIRE.
   LETTERING, FIGURES OF VOLTAGE,
   PAINTING OF SKULL AND BONES
   SHALL BE IN SIGNAL RED COLOUR
4. BACKSIDE : ENAMELLED AS PER IS :2551.
5. BOLT HOLES : 2 Nos. 7mm Ø FOR 6Ø G.I. BOLTS.

NOTE : CORNERS OF THE PLATE SHALL BE ROUNDED.
ALL LETTERINGS SHALL BE CENTRLLY SPACED.

ALL DIMENSIONS ARE IN MM.
SCALE : N.T.S.
THIS IS AN INDICATIVE DRAWING.

MSEDCL	DRG. NO. DIST./ DB / SMC / 0210 / 09			
DISTRIBUTION SECTION	DANGER BOARD			
		EE(MSC-II)	SE(MSC)	CE(DIST.)


1.5MM THICK BUCKET/CAP WASHER
SECTION A-A
5MM DIA 20MM LONG FLY NUT
BRASS TINNED
SECTION B-B
ONE PIECE OF BASE CONTACT
5 mmØ
RING OF SPRING (STAINLESS) STEEL
SIDE VIEW
SECTION B-B (CARRIER)
ALTERNATE CARRIER CONTACT ARRANGEMENT FOR BB.
SECTION A-A (BASE)
ALTERNATE BASE CONTACT ARRANGEMENT FOR-AA
MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.
63/100AMP REWIRABLE FUSE UNIT
DRAWN
RECOMMENDED
APPROVED
DATE 09/07/2010
SCALE N.T.S
SUBMITTED
DISTRIBUTION SECTION MUMBAI-400051
DRG. NO. CE/DIST/MM-II/MSEDCL/ KITKAT/100/ 02
REVISION 02
SH.NO
CPC1-R1
NUT BOLTS 4 NOS (TYPICAL) 12MM DIA & 25MM LONG
30MM LONG 5MM DIA SCREWS
TO BE FILLED WITH INSULATING COMPOUND
SECTION SIDE VIEW
FRONT VIEW OF BASE
TINNED BRASS
REAR VIEW OF BASE
SPACE FOR MANUFACTURER'S NAME
100A MSEDCL 433V
SIDE VIEW OF FUSE CARRIER
REAR VIEW OF FUSE CARRIER
4MM DIA SCREW
4MM THK
NOTES :-
1) ALL DIMENSIONS ARE IN MM
2) NURLING SHALL BE SMOOTH
3) NUT BOLTS & WASHERS FOR CABLE CONNECTION ARE NOT IN THE SCOPE OF SUPPLY
4) MATERIAL USED FOR FILLING @ A & B SHALL NOT MELT AT @ 105° C
NOTE : THIS IS AN INDICATIVE DRAWING.

Annexure - I

1) विजेची बचत पैशाची बचत

बल्ब, ट्यूब नेहमी स्वच्छ ठेवा,
बल्ब, ट्यूब ऐवजी सी एफ एल चा वापर करा.

2) विजेची बचत पैशाची बचत

एक युनिट विजेची बचत म्हणजे
दीड युनिट विजेची निर्मिती

3) विजेची बचत पैशाची बचत

गरज नसेल तेव्हा दिवे, पंखे व
विजेची इतर उपकरणे बंद ठेवा.

4) विजेची बचत पैशाची बचत

सायंकाळी ६ ते रात्री १० या वेळेत
इस्त्री, मिक्सर, गिझर, ओव्हन
या उपकरणांचा वापर टाळा.

5) विजेची बचत पैशाची बचत

४० वॅटचा साधा बल्ब २५ तासात एक युनिट
वीज खातो तेवढाच प्रकाश देणाऱ्या १० वॅटच्या
सीएफएलसाठी १०० तास लागतात.

6) विजेची बचत पैशाची बचत

स्वच्छता गृह, शयनकक्ष, व्हरांडा अशा ठिकाणी मंद प्रकाश देणा-या कमी क्षमतेच्या दिव्यांचा वापर करा.

7) **विजेची बचत पैशाची बचत**
आवश्यक तेवढा गारवा निर्माण झाल्यावर एअर कंडिशनर, कुलर बंद करा.

8) **विजेची बचत पैशाची बचत**
एक दिवा येई अनेक कामी
पैशांची करी बचत नामी

9) **विजेची बचत पैशाची बचत**
विजेची बचत हा विजेचा नवा स्त्रोत
उज्ज्वल भविष्यासाठी आज करा बचत

10) **विजेची बचत पैशाची बचत**
थेंबे थेंबे तळे साचे
तुमच्या बचतीने वीज वाचे

11) **विजेची बचत पैशाची बचत**
असेल शक्य जेथे जेथे वीज वाचवा तेथे तेथे

12) **विजेची बचत पैशाची बचत**
मोफत व विपुल सूर्य प्रकाशाचा पुरेपूर वापर करा.

13) **विजेची बचत पैशाची बचत**
विजेचे साहित्य दर्जेदारच वापरा.

14) **विजेची बचत पैशाची बचत**
नैसर्गिक ऊर्जा स्त्रोतांचा पुरेपूर वापर करा.

15) **विजेची बचत पैशाची बचत**
सुर्यप्रकाश आहे फुकट
वीज मिळते विकत
विजेची बचत हीच विजेची निर्मिती.