# TECHNICAL SPECIFICATIONS FOR LT DISTRIBUTION BOX MADE FROM THERMOSETTING PLASTIC HAVING 63/100/200 /400 AMP CAPACITY.

## SCOPE:

This specification covers the design, manufacturing and testing of anti-corrosive, dust proof, rust proof, shock proof, self extinguishing property, resistant to heat, vermin & water proof, Ultra Violet Stabilized and pilfer resistant LT distribution box made from Thermosetting Plastic i.e. Glass Reinforced Polyester Sheet Moulding Compound (SMC) Confirming to IS: 13410 -1992 and attached technical specification, drawing and IS: 14772-2000 with isolator (switch disconnector) confirming to IS/IEC 60947-1:2004, IS/IEC 60947-2:2004 & IS/IEC 60947-3:1999 and HRC fuse with base confirming to IS/IEC 60269: Part 1:2014 with amended up to date.

## 2.0 GENERAL REQUIREMENT:

L.T. Distribution Box should be designed to have maximum utilization of transformer capacity and shall be well equipped with adequate protection to transformer against overload and short circuit and minimum interruption in power supply.

## 2.1 SERVICE CONDITION

### a) TEMPERATUARE

The materials used in Construction of the Distribution Box shall be suitable for use under following conditions.

| | | |
|---|---|---|
| (a) | Maximum ambient temperature | 55 ° C |
| (b) | Maximum daily average ambient temperature. | 37 ° C |
| (c ) | Minimum temperature. | 00 ° C |
| (d) | Altitude | 0 to 1000 meter |
| (e) | Maximum yearly average air temp. | 35 ° C |

### b) RELATIVE HUMIDITY

This does not exceed 50% of maximum temperature of 40 ° C and 90 % at 20 °C Care shall be taken for moderate condensation which may occasionally occur due to variation in temperature. Even on sea shore side having heavy pollution the box should function satisfactorily.

### c) MODE OF INSTALLATION

The boxes are normally to be mounted either on plinth near transformer or on M.S. Channels fixed between two PSC / Girder Poles with suitable size of hot dip galvanized bolts and nuts.

## 3.0 CONSTRUCTION OF BOX:

**3.1** The minimum size of box from inside shall be 570 X 280 X 220 mm. for 200Amp. & 650X350X255 mm for 400Amp. and thickness minimum 2 mm.

**3.2** Distribution Box shall be molded in a single piece forming the body of the dist box with a cover fitted with base by minimum three nos. concealed stainless steel hinges. The lid/cover shall rest on the collar of the Distribution Box base in such a way that any access from outside is not possible. The stainless steel hinges shall be fitted with the Distribution Box body base and covers rigidly, thereby making the Distribution Box pilfer resistant.

**3.3** The door in closed position should be overlapped in such a manner that no direct entry or access is possible. The Distribution Box shall be closed by SS 'U' Clamp for holding and locking of the door with body base. The "U" Clamp shall have 4 mm. diameter holes through which it is possible to seal the box

with M.S. Bolt of 4 mm diameter of suitable length with nut. The bolt shall have 2 mm diameter hole at the end for sealing purpose.

**3.4** The door shall open at 90 degree(Min.). The top surface of box shall have little tapering shape towards both sides of the distribution box for easy flow of rainwater. Two MS hot deep galvanized Strips should be provided on the upper and lower portion of the front side of the back wall with 4 holes having 6mm diameter for fixing of box on the wall.

**3.5** Cable Entry and Exit holes to be provided on bottom and upper side wall of 70 mm diameter with good quality rubber grommet. One Cable exit hole of 25 mm. diameter shall be provided on sidewall of box with good quality plastic gland as shown in the drawing. Earth bolt of 6 mm diameter X 20 mm. length with 2 nos. nuts and 2 nos. washers shall be provided. The earthing arrangement shall be of M.S. with Zinc passivation. All corners of the box should be round & not pointed ones. All metal parts shall be zinc passivated.

**3.6** The Distribution Box should have a three pole AC-23 - 200/400 AMP Protection isolator (Switch disconnector) with bolted **HRC F**uses which can provide Isolation and Protection. 200/400 AMP Protection Switch should be as per IS/IEC 60947-1:2004, IS/IEC 60947-2:2004 & IS/IEC 60947-3:1999, having test reports either from NABL or COFRAC accredited lab for AC-23 A utilization test, short circuit test for 80KA rms.

**3.7** Anodized aluminum operating instructions in GUJARATI shall be fixed inside the door. The letter should be cleared legible and readable. The letters of the instructions should be of sufficient size to read with normal eye.

## 4.0 GUARANTEED TECHNICAL PARTICULARS:

4.1 Guaranteed Technical particulars are given in enclosed Annexure A and B. Bidder shall submit the data in given Performa.

## 5.0 TYPE TEST CERTIFICATE:

5.1 The bidder shall submit type test report for box as per IS-14772-2000 & IS: 13410- 1992 from CIPET, Ahmedabad/ERDA, Baroda or NABL accredited lab. for the box as well as isolator & HRC fuse& link along with the offer. Type Test Certificate should not be older than 7 years as on the date of tender opening.

**5.2** **ROUTINE TEST:** Manufacturer has to carryout routine test during production to check the essential requirements that are likely to vary during production. Manufacturer has to keep records of the same and to be produced for verification of inspector when asked at the time of inspection of lot.

- **TYPE TEST (For SMC box):**

From the offered lot sample may be picked up at discretion of purchaser for type test at CIPET, Ahmedabad/ERDA, Baroda or NABL accredited lab for every 5000 nos. supply. The charges for the type test shall be borne by bidder. On passing the type test successfully, the lot shall be accepted. In case, the boxes are not confirmed to type test, another sample form the lot shall be selected and the tested again. On receipt of unsatisfactory results, the lot shall be rejected and new lot shall be offered for inspection keeping aside old lot offered and rejected earlier by the Company. However Company reserves the right to accept the boxes by levying penalty as per description of the company.

- **TYPE TEST (For Isolator/box):**

Type test reports not more than 7 years old from the date of tender from Government approved and NABL accredited lab.

1) Type Test for complete dist. box- as per IS/IEC 61439-1:2011
2) Type test report for Switch Disconnector as per IS/IEC 60947-1:2004, IS/IEC 60947-2:2004 & IS/IEC 60947-3:1999 with its latest amendment.

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**5.3 ACCEPTANCE TESTS**:

The bidder should have all the testing facilities at their works & shall offer testing as under. Following acceptance tests shall be carried out, on 2% of the offered quantity on sample boxes selected at random, while inspecting the lot of materials offered.

**A.** Visual examination
**B.** Verification of dimensions as per approved drawings
**C.** Verification of fittings
**D.** HV test at 2.5KV
**E.** Insulation resistance test with 2.5KV DC megger.
**F.** Temperature rise test in accordance with relevant IS for the rated capacity of Isolator
**G.** Operation test on isolators as well **as HRC** fuse base & fuse link.

**6.0 DRAWING & CALIBRATION OF INSTRUMENT**

The tenderer shall submit detailed constructional and dimensional drawing of complete distribution box with details of Units and Distconnector, incoming and out going circuit, Louvers details, clearance details along with the offer.

(A) The firm has to submit list of testing equipment's instruments, stating Sr. No., Make, Capacity, date of last calibration along with test certificate of each instrument along with the offer, same is also required to be provided to inspecting officer at the time of prototype inspection as well as regular lots .The calibration shall be either from original manufacturer of the equipment's / instruments or from Government approved laboratory.

**7.0 PROTO TYPE :**

The successful tenderer shall have to offer 1 No. Prototype box for carrying out tests mentioned at specification clause No. 6 (c) at their works or at Government approved Laboratory, where no adequate testing facility is available at firm's work in presence of UGVCL's representative. In case of brought out items like **HRC** Fuse Units, Disconnector switch the same have to be either tested at firm's work or at the works of original manufacturer or at Government approved / recognized laboratory in case of non availability of adequate testing facility either at firm's works of original manufacturer. However, all the testing expenditures of prototype sample testing. Acceptance tests for routine inspection of lots will be borne by the firm only after successful passing of the prototype unit in all the tests and after obtaining the written approved from the competent authority of UGVCL for prototype box and drawing approval, the firm can commence bulk manufacturing of the ordered boxes. The expenses towards prototype test including visit of our Engineers (2 Nos.) other than your works shall be borne by the bidder.

**8.0 RAW MATERIALS**

Test certificate for the material used in the lot offered and document for purchase of raw material should be maintained by manufacturer and produced to inspector as and when required.

**9.0 FACILITY:**

The bidder shall have facility to test the box for routine tests and acceptance as per IS – 14772: 2000 and IS – 13410 & UGVCL's specifications at their works. The bidder has to submit list of Machinery & Equipment / Testing instruments etc. along with the offer.

**10.0 INSPECTION AND TESTING:**

During the inspection manufacturer will offer all facilities to inspector without any charge.

**11.0 DESPATCH:**

The Distribution boxes shall be dispatched duly packed so as to ensure that no damage occurs during transport where they may be subjected to rough handling to any of our divisional stores.

**12.0 TENDERS SAMPLES:**

**The tenderer shall have to submit two tender sample of each rating offered of L.T Dist. Box fitted with all the accessories like HRC Fuse units, Switch disconnector, bus bar, etc. duly tested as per the tender specification on or before the date of opening of tender to The Deputy Engineer, RSO, Uttar Gujarat Vij Company Ltd., Visnagar Road , Mehsana – 384001.**

**13.0 GUARANTEE:**

If the goods, stores and equipments found defective due to bad design or workmanship the same should be repaired or replaced free of charge if reported within **42** months of their receipt at site or **36** months from the date of commissioning of equipments whichever is earlier. Supplier will be responsible for the proper performance of the equipments materials for the respective guarantee period.

UTTAR GUJARAT VIJ COMPANY LIMITED
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ANNEXURE - A

## GUARANTEED TECHNICAL PARTICULARS FOR DISTRIBUTION BOX

| SR. NO. | PARTICULARS | DETAILED PARTICULARS | TO BE OFFERED BY BIDDER |
|---|---|---|---|
| 1 | Maker's name | To be intimated by the supplier | |
| 2 | Material | Glass reinforced polyester sheet moulding compound | |
| 3 | Grade of Material | SMC confirming to IS: 13410:1992 Grade S 1 | |
| 4 | Properties of Material of Construction of Distribution Box | | |
| | Heat Deflection Temperature (Ref.Std. IS: 13411) | 180°C (Minimum) | |
| | Exposure to flame (Ref. Std. IS: 4249) | Self-extinguishing | |
| | Melting Point (Ref. Std. IS: 13360) | Does not melt | |
| | Glow wire test at 650 C | As per IS 11000 Part-2/sec-1 | |
| | Degree of protection | IP-42 as per IS-12063 / 87 | |
| | Dielectric Strength at 90 C in oil | 9 KV/mm (Min) as per IS: 6262-1971 | |
| 5 | Inside dimension of Box for **200 Amp.** | To be mentioned by the supplier | |
| | a. Height | 570 mm (min) | |
| | b. Width | 280 mm (min) | |
| | c. Depth | 220 mm (min) | |
| | d. Thick ness of sheet | 2.0 mm (Min) | |
| 6 | Inside dimension of Box for **400 Amp.** | To be mentioned by the supplier | |
| | a. Height | 650 mm (min) | |
| | b. Width | 350 mm (min) | |
| | c. Depth | 255 mm (min) | |
| | d. Thick ness of sheet | 2.0 mm (Min) | |
| 7 | **Earthing Arrangement** | | |
| | Earthing bolt | Two no. Zinc Passivated MS bolt with 2 nuts and 2 washers & 1 no. spring washer with each bolt. | |
| | Dia. & Length of earthing bolts | Dia. 6 mm Length 25 mm | |
| 8 | Door Locking | For holding of door with base 'U' shaped SS clamp to be provided | |
| 9 | Manufacturer short name and UGVCL shall be screen printed. Name plate indicating A/T no. and month & year of manufacture, words "Property of UGVCL" manufacture short name shall also be provided. | To be provided on the front side of the box | |
| 10 | Sealing arrangement | Holes for wire seal. | |

| Date: | Seal & Signature of Tenderer |
|---|---|

| | | | |
|---|---|---|---|
| 11 | Colour of Box | Off White / Grey | |
| 12 | 200/400 AMP Protection Switch | Having 3 Phase & 1 Neutral with 200/400 AMP Current Carrying capacity with pad locking arrangement | |
| 13 | **For Box:** | | |
| 14 | Name or Trademark of manufacturer | | |
| 14.1 | Rated Voltage | | |
| 14.2 | KVA Rating | | |
| 14.3 | Thickness of Enclosure | | |
| 14.4 | Hinges Inside / Outside specify | | |
| 14.5 | **For Isolator** | | |
| 15 | Name or Trademark of manufacturer | | |
| 15.1 | Type designation | | |
| 15.2 | Rated Current | | |
| 15.3 | Rated Duty | | |
| 15.4 | Utilization Category | | |
| 15.5 | Rated short time withstand current for 2 second | | |
| 15.6 | **HRC Fuse Base** | | |
| 16 | Name of Trade Mark of Manufacturer | | |
| 16.1 | Rated Current | | |
| 16.2 | Rated Voltage | | |
| 16.3 | Breaking Capacity | | |
| 16.4 | HRC Fuse Base Material &size | | |
| 16.5 | Contact Material | | |
| 16.6 | **HRC Fuse Link** | | |
| 17 | Name or Trade Mark of Manufacturer | | |
| 17.1 | Rated Current | | |
| 17.2 | Rated Voltage | | |
| 17.3 | One no. of Box Spanner is to provide with 100 nos. quantity supply | | |
| 18 | The Contact area of Lug & Busbar should not be lesser than each other | | |

**ANNEXURE B**

**TESTING**

Ordered goods should be type tested at NABL approved test house for tests and Parameters given in GTP/IS. The test report of more than 7 years before order date will not be accepted. The test report should be submitted to purchaser before completion of order.

Lot wise sampling plan: 2% Selected randomly from lot for testing at manufacturer's works.

| Sr. No. | TEST REQUIREMENT FOR DISTRIBUTION BOX | REFERENCE STANDARDS |
|---|---|---|
| A) | Marking | IS: 14772 |
| B) | Dimensions and Construction | IS: 14772 |
| C) | Melting Point (To test up to 400 °C)(1no.) | IS: 13360 |