

TECHNICAL SPECIFICATION FOR METER BOXES SUITABLE FOR THREE PHASE METERS under TN-2639

3.01 Scope

This specification covers the fabrication/molding and supply of sheet metal boxes for three phase energy meters. The meters boxes in respect of three phase shall be suitable for wall mounting. The wall mounting of the meter boxes shall be achieved by providing four routed studs on the walls, two of them will be inside the meters box and two will be outside the meters boxes as shown in the attached drawing (s) of the M.S meter boxes.

3.02 REQUIREMENT

The total requirement for the meter boxes is as under:-

- a) Three phase meter boxes : 47,500 Nos.

3.03 TECHNICAL REQUIREMENT:

3.03.01 The Three Phase metering box dimension shall be 720 x280 x 180 mm as per drawing no. TN-2639/I enclosed herewith. It shall be suitable to house the L.T. Energy Meter (3 Phase). The box shall be suitable for wall mounting.

3.03.02 For load side cable, one hole of 50 mm dia shall be provided for fixing cable through proper size of gland. One GI elbow (Inner Dia=43 ± 2mm Outer Dia 55 ± 2 mm) shall be provided for entering the main /incoming cable to meter box section as shown in the attached drawing. Cable glands shall be provided at the bottom of the meter box to support incoming / outgoing power cable.

3.03.03 one triplex glass 3.0 mm thickness for window of size 170x120 mm will be provided on the upper door as per arrangement indicated in the drawing so that the meter inside the box can be read easily .

3.03.04 The scope of supply of meter box shall also include Supply of one set of ISI marked MCB-40 A Tripple pole& Neutral (TP&N) -415V, 50 Hz AC 9/10 KA Breaking capacity as per IS :8828 with latest amendment.

3.04 PAINTING

- i) Painting shall be in accordance with requirement of clause 3.10 under category having protection against corrosion of ISS-5133 PART –I: 1969 For Sheet metal boxes.
- ii) The three phase meter boxes shall be painted with light brown colour.

3.05 GENERAL REQUIREMENT FOR METER BOXES (MADE OF M.S. SHEET):

3.05.01 Standard:

The meter boxes along with the doors shall be fabricated out of MS sheets. The meter boxes are required to be fabricated from MS sheets of fine quality having 1.2 mm thickness and capable of withstanding the mechanical, electrical and thermal stresses as well as the effects of humidity which are likely to be encountered in the services, at the same time ensuring desired degree of safety. These meter boxes are required to be fabricated according to the specification and as per drawing attached. The box shall comply in all respect with the requirement of latest amended IS : 5133 (pt.-I)/1969 for boxes for enclosure of electrical accessories". In case of any discrepancy between write-up and drawing attached, the details given in drawing will prevail. The bill of material as indicted in the drawing shall be covered in the scope of supply.

3.05.02 FABRICATION AND DOOR DETAILS:

The box will be fabricated out of 1.2 mm thick M.S. sheet of fine quality .the two sides and rear will be fabricated out of one single sheet of 1.02 mm. Top and bottom will in one piece each from one 1.2 mm M.S sheets which will be welded from inside to form a complete box. The door will be in two parts which shall be fabricated out 1.2 mm M.S. sheets, each door will be fixed with the box with two inside hinges. The door of the box shall be hinged on the right side of the box and shall open in the clock wise direction. The doors shall be provided with handle .The doors shall also be provided with sealing arrangement from outside by fixing 25 X 9 mm long, bolts made of hot dipped G.I. at the top and bottom and the butter fly nuts as per arrangement shown in the enclosed drawings. These bolts shall be welded on the collars in such a manner that the fly nuts can be tightened from outside. These bolts should possess hole of 2mm as in the center of the head from where the sealing wire shall pass and meter boxes can be sealed properly. The doors will further be provided with a rubberized lining of 5 mm in order to make it dust proof. The box mounting brackets shall be as per details given in drawing.

3.05.03 EARTHING BOLTS :

The earthling bolts of 35 X 9 mm dia size made of hot dipped G.I. with four plain 1.2 mm thick G.I. washers, one G.I. spring washer and two G.I. nuts on either side of the box shall be provided.

3.05.04 BASE SHEET FOR MOUNTING METERS

For fixing the energy meter a non-metallic base of Bakelite sheet 5mm/SRBGF sheet of 3mm shall be fixed at a distance of 25 mm from the rear wall of the box. This base sheet should be bolted on the four rectangular brackets of size mentioned in drawing.

3.05.05 Workmanship:

The fabrication of material shall be done in such a way that there is a good finish of fabricated material. The material shall be fabricated accurately to adhere to dimensions as per attached drawings. Holes must be perfectly circular and dimensional tolerance as given below shall be permissible. The box should be such fabricated /welded that rainwater may not / does not enter into it.

3.05.06 Tolerance in dimensions:

The sheet metal shall be subjected to a maximum of $\pm 2\%$ tolerance on the overall dimension and rolling tolerance for sheet metal boxes shall be as per IS : 1852/1973 with latest amendments(s) and for SRBG/BAKELITE sheet shall be as per IS : 10192/1982 and IS :2036 with latest amendments. The tolerance in weight of meter box shall not be more than $\pm 3\%$.

3.05.07 Protection against corrosion:

All boxes adequately protected against rust, dust and corrosion both from inside and outside.

3.06 Guaranteed technical particulars:

The tender shall furnish all necessary information as desired in the schedule of GTP of this specification. IF the tenderer desires to furnish any other information in addition to the details as asked for, the same may be furnished against the last item of this schedule.

3.07 Sample:

A sample of meter box offered shall be sent /delivered in the office of the superintending Engineer (M&P), JVVNL, Jaipur under intimation to the SE (MM-II) latest by 5:00 P.M. one day prior to the opening of Technical Bid. In the absence of required samples, the Technical Bid shall not be opened.

3.08 EMBOSING DETAILS :

The following information shall be clearly indelibly embossed on the meter boxes.

- i) JVVNL (on the top of the door)
- ii) P.O. No and date (on the top of the door)
- iii) Manufacture's name and TN- No. 2639 (at the bottom of the door)

3.09 TYPE TEST IN RESPECT OF MINIATURE CIRCUIT BREAKER :

Since MCB is for providing short circuit and over load protection, the successful tenderers shall have to furnish the over load curve and short circuit reports as per IS: 8828 at the time of their inspection offers.

3.10 NUT-BOLTS :

All the bolts, Nuts, spring washer shall be made of hot dip Galvanised steel.

3.11 WINDOW GLASSES :

The triplex glass shall be fixed on the window such that it cannot move. For this, four bolts shall be welded at four corners of the window for fixing a rectangular frame of M.S. Inside the box .This rectangular frame shall be such designed that it will completely cover the window glass along with a grooved rubber gas kit. M.S. Nuts of sufficient strength shall also be provided on the bolts for fixing the rectangular frame. The supplier shall also provide grooved rubber gasket for absorbing shocks during transportation of meter box.

3.12 The hole for outgoing cable from MCB should be at the bottom center of the box just below MCB.

3.13 MCB MOUNTING :

The MCB mounting shall be such that MCB may be operated Up and Down and MCB mounting Bar shall be horizontally mounted in the MCB Chamber. MCB mounting arrangement should be such that it cannot be removed easily. Suitable locking arrangement with DIN bar should be provided with MCB. The operating handle of MCB should be accessible from outside by making a window in the lower door of the box such that the level of the MCB handle remains below the surface level of the box so that a separate hinged door for operating the MCB can be provided. This door shall be hinged on the upper side of window and shall be made of same size of MS sheet as specified for box. The door will be closed by gravity and MCB can be accessed by fingers after lifting hinged door.

3.14 METER/BAKELLITE MOUNTING BRACKETS :

The rear of the box shall be provided with four rectangular brackets of size mentioned in the drawing so as to fix non-metallic base sheet on it at a distance of about 25mm from the rear on which the meter would be fixed. The supply shall include base sheet made of Bakelite sheet of 5mm / SRBGF SHEET OF 3MM

3.15 TYPE TEST REPORTS

The supplier shall be required to furnish type test report as per requirement of IS: 10192/1982 in respect of molded material sheet of which meter box is made of, from any Government of India approved / recognized laboratory / Institute along with the tender. The supplier shall also furnish following type test report in respect of meter boxes along with tender the type must be conducted at any government of India recognized/approved laboratory/institute.

- a) Test for mechanical strength as per clause No.5.4.2 of IS: 5133 (Part. II)/1969.

- b) Test for water absorption as per Clause No.5.5 of IS: 5133 (part .II)/1969
- c) Test for stability at high temperature as per clause No .5.6 of IS.5133 (part .II) 1969.
- d) Test for verification of resistance to abnormal heat and to fire (Glow wire test) as per clause No.9.15 of IS: 8824/1996 for the temperature range of 650+/-10 Degree centigrade.
- e) Test for fire retardancy : In this test a sample piece of size 4"x 4"(2/3 mm thickness) may be lighted by the candle at one of its corners till it catches fire. After the flame is established, the candle be removed and within 30 sec. the flame should extinguish itself.
- f) Test for Dielectric strength on the piece of insulating material. A test voltage of 10KV (r m s) 50HZ shall be gradually applied between the two electrodes of high voltage supply with the piece of insulated material kept in between the two electrodes .The sample piece of box must not break down for one minute duration.
- g) Since MCB is provided for short circuit and over load protection, The successful tenderers shall have to furnish the over load curve and short circuit report as per IS:8828 at the time of their inspection offers.

3.16 The tenderer (s) may give an alternative offer for meter boxes with the cover of meter box chamber and MCB chamber made of transparent sheet of polycarbonate.

3.17 INSPECTION & TESTING :

The inspection and testing shall be carried out by the purchaser's representative as per provisions of relevant ISS, specification & GTP and shall be governed by clause No.1.27 entitled "inspection and Testing" of Schedule-2" General conditions of Contract" except mentioned hereunder.

- a) The supplier shall arrange fifteen days advance notice to enable the purchaser to depute the inspecting officer for conducting necessary testing at supplier's works. Any delay beyond fifteen days in arranging the inspection shall be to the purchaser's account.
- b) In case the manufacturer does not have adequate facilities for getting all the required tests conducted in his laboratory, the purchaser at his option may get these tests conducted in any reputed testing laboratory. All the expenses for such tests to be conducted outside shall be borne by the supplier.
- c) In case material/equipment is not found ready by the representative of the purchaser deputed for inspection to the extent of the quantity indicated in the inspection call with tolerance of (-) 10% or if the inspection is not got carried out by any reasons on account of the supplier the re-inspection charges shall be 7,500.00 for the supplier works located in Rajasthan and ` 15,000.00 for the supplier works located outside Rajasthan will become payable by the supplier on this account to the Accounts Officer (MM) JVVNL, Jaipur.

- d) The Routine/Acceptance tests shall be carried out as per relevant ISS and IEC (Latest Amended) , P.O. and GTPs on each equipment at your works.
- e) The inspection may be carried out by the purchaser's representative at any stage of manufacture/before dispatch as per relevant standard. Inspection and acceptance of any material under the specification by the purchaser shall not relieve the bidder of his obligation of furnishing material in accordance with the specification & shall not prevent subsequent rejection if the material is found to be defective. The bidder shall keep the purchaser informed in advance, about manufacturing program so that arrangements can be made for inspection.
- f) Inspecting officer shall also verify the Guaranteed Technical particulars attached with the purchase order.

3.18 PACKING & FORWARDING :

The Polycarbonate meter boxes shall be suitably packed in order to avoid damage during transit and handling.

3.19 PRICES:

The prices/ rates quoted shall be FIRM & strictly as per BOQ (Price Schedule-IV) enclosed with the tender documents clearly indicating Ex-works, Freight & Insurance and GST.

3.20 DELIVERY SCHEDULE

The delivery schedule of the material shall be quoted on Monthly basis to be indicated in Schedule-VIII, enclosed with the tender documents. The commencement period for supply shall be 30 days from the date of issue of purchase order. The supply shall be completed within 5 months from the date of issue of purchase order (including commencement period)

3.21 ADDITIONAL ORDER

Repeat orders for additional quantities, up to 50% of original ordered quantities, may be placed by the Nigam, on the same rates, terms and conditions given in the contract.