



### **SCHEDULE-III**

#### **TECHNICAL SPECIFICATION FOR MIP METER BOXES AGAINST TN-2734**

##### **1.0 SCOPE :**

This specification provides for the design, manufacture, stage inspection and testing before dispatch, supply and delivery of sheet metal meter boxes specified herein for their satisfactory operation. The HT meter box shall be suitable for floor mounting and MIP meter box for wall mounting as per requirement indicated in the drawings. The wall mounting of MIP meter boxes shall be achieved by providing four (4) grouted studs on the walls, two of them will be inside the meter box and two will be outside the meter box as shown in the attached general arrangement drawing. The mounting holes of the boxes must be accessible without removing any non-metallic sheet.

- 1.1** It is not the intent to specify completely herein all the details of the design and construction of equipment. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation up to the bidder's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which in his judgment is not in accordance therewith. The offered equipment shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of bidder's supply irrespective of whether those are specifically brought out in this specification and/ or the commercial order or not.

##### **2.0 STANDARDS :**

- 2.1** The meter boxes shall conform to the following Indian Standards which shall mean latest revisions, amendments/changes adopted and published, unless otherwise specified hereinafter.

S.No.	Indian Standard	Title
1.	IS:14772- 2000	General requirement for enclosure for accessories for household and similar fixed electrical installations.
2.	IS:1852 - 1985	Specification for rolling & cutting tolerances for hot rolled steel products
3.	IS:2036 - 1974	Specification for Phenolic laminated sheets (superseding IS:2038-1962).
4.	IS:4820 - 1968	Specification for Thin vulcanized fibre sheets for electrical purposes.

5. IS:808-1989 Specification for MS Channel (ISMB)  
**3.0 REQUIREMENT**

The requirement of HT and MIP meter boxes shall be as under :

S. No.	Item	Quantity
1.	MIP meter box	1000 Nos.

The above quantity is tentative which can be increased/ decreased at the time of placement of order.

**4.0 GENERAL TECHNICAL REQUIREMENTS:**

**REQUIREMENT FOR SHEET METAL METER BOXES:**

**a) STANDARD:**

The meter boxes along with the doors shall be fabricated out of MS sheet of fine quality and thickness as per relevant drawings attached 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 and at the same time ensuring the desired degree of safety. The same shall comply in all respect with the requirement of latest IS:14772(2000) for "Boxes for enclosure of electrical accessories". In case of any discrepancy between write-up and drawings attached, the details given in drawings will prevail. The bill of material as indicated in the drawings shall be covered in the scope of supply.

All sides of the box will be fabricated out of M.S. sheet of fine quality. The two sides and rear one will be fabricated out of one single sheet. Top and bottom will be in one piece each from one M.S. sheet, which will be continuously welded from inside to form a complete box. The door will be in two parts for HT meter box and in one part for MIP meter box which shall be fabricated out of M.S. sheet(s). Each door will be fixed with the box with inside hinges in such a way that door hinges can not be removed from out side. The doors shall be provided with handle. The door shall be provided with a lining of minimum 5mm thick felt in order to make it dust proof.

The door shall ensure reasonable safety against the spread of fire. They should not be ignited by thermic over-load of live parts housed by the box.

**b) SEALING ARRANGEMENT :**

The doors shall also be provided with sealing arrangement from out side by fixing 30x9 mm long , bolts at the top and bottom and the Hexagonal 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 2 mm as in the center of the head from where the sealing wire shall pass and the meter boxes can be sealed properly. The doors will further be provided with a felt lining of 5 mm in order to make it dust proof.

**c) EARTHING OF METER BOX :**

The earthing bolts of size 35x9 mm 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 as shown in the drawing for earthing of meter box. The earthing bolts provided in the meter box on both sides should have arrangement that the bolts cannot be loosened and removed from out side. The bolt should have the cottar pin arrangement.

**d) INCOMING AND OUTGOING CABLE ARRANGEMENT :**

Two holes at the bottom just below the cable fixing bracket shall be provided for entry & exit of cable . Holes of 50mm dia shall be provided for fixing cable as shown in the drawing.

**e) WINDOW GLASS**

One unbreakable transparent sheet of toughened/triplex glass of thickness 6 mm for window of required size 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. The glass sides shall be lined up with V-shaped rubber gasket of 1mm thickness. This glass shall be fixed inside the box in a projected groove. The glass assembly shall be secured with a zinc passivized rectangular MS frame screwed at four corners.

**f) 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 fabricated/welded such that the rain water does not enter into it.

**g) TOLERANCE :**

The sheet metal boxes shall be subjected to a maximum of plus-minus one percent(+/-1%) tolerance on the overall dimensions and -ive rolling tolerance for sheet metal boxes shall be as per IS:1852/1985 & IS 513-1994 with latest amendment(s).However there shall be no limit for +ive tolerance in thickness. The rolling tolerance for nonmetallic bakelite base sheet shall be as per IS:2036/1995 with latest amendments. The tolerance in weight of meter box shall not be more than plus three percent and minus zero percent(+ 3% & - 0%).

**h) Painting/Protection against corrosion :**

The box(es) shall be adequately protected against rust, dust and corrosion both from inside and outside.

All sheet steel work shall be phosphated in accordance with IS:6005 code of practice for phosphating iron and steel.

Oil, grease, dirt and swarm shall be thoroughly removed by emulsion cleaning .

Rust and scale shall be removed by pickling with dilute acid followed by washing with running water rinsing with slightly alkaline hot water and drying. After phosphating thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying.

After phosphating the cabinet must be painted by electrostatic method only (powder coating) and the minimum coating should be 50 microns. The colour shade shall be 631 of IS - 5.

**i) GUARANTEED TECHNICAL PARTICULARS :**

The tenderer shall furnish all the necessary information as desired in the schedule of GTPs at Annexure-(A & B) 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 for each type of box of this schedule.

**j) PROTO TYPE SAMPLE :**

The successful bidder will offer for inspection a proto type sample of HT and/ or MIP meter boxes before commencement of supplies as per enclosed drawing.

The prototype sample is required to be offered for inspection prepared ,cut & made to size except welding. The prototype sample shall be verified by the inspecting officer of the Nigam as per following guidelines:-

Thickness of walls of MS sheet without paint & weld be verified. Thereafter getting the box welded , the weight of the box be taken and recorded. **Weight of proto type sample after approval of design shall be taken with paint/Powder Coating and same shall be verified during inspection.** Four sticker seals & two polycarbonate seals be provided on proto-type meter box keeping the door in open condition.

The inspecting officer will inspect accordingly and if any suggestion or modification are required same will be reviewed and a final revised drawing will be furnished by the bidder for approval of the purchaser before taking up mass production.

**Firms who have already supplied MIP Meter Box under previous two TNs of any of three Discoms may be exempted from approval of Proto-Type Samples, in case order is placed upon them.**

**k) EMBOSSING:**

The following information shall be clearly/ indelibly embossed on the meter boxes made of MS sheet.

- i) J.V.V.N.L (on the top of the door.)
- ii) Manufacturer's trade name
- iii) TN- 2734. (at the bottom of the door.)
- iv) Sign of Danger (in upper side of front door)
- v) H.T./M.I.P. Meter box

## **5.0 PRINCIPAL PARAMETERS:**

### **5.1 MIP METER BOXES :**

#### **TECHNICAL REQUIREMENT**

##### **a) GENERAL :**

The MIP metering cabinet dimensions shall be 1100x625x375mm as per enclosed drawing and shall be suitable to house the 3 phase static meter in the upper compartment and current transformers ( Resin Cast Bar Type) in the lower compartment. Both the compartments will be separated by a portion of 1.6 mm thick MS Sheet. The cabinet shall be suitable for wall mounting.

The box shall be fabricated out of 1.6mm thick MS sheet of fine quality. The two sides and rear one will be fabricated out of one single sheet of minimum 1.6 mm thick. Top & bottom will be in one piece each from 1.6 mm MS sheet which will be welded from inside to form a complete box. The top cover sheet shall be slopping by 15mm to 20 mm towards back side of the box. The approximate weight of the meter box will be more than 46 kgs. or as per approved prototype sample's weight.

##### **b) DOOR**

The door will be fabricated in one piece out of 1.6 mm sheet. M S angle of size of 25x25x3mm should be welded on the back of the door at ABCDE as per drawing enclosed at a distance of 20mm from rubber lining. The door shall be fixed with the box with two inside hinges. The door shall be provided with handle. The door shall also be provided with sealing arrangement from outside by fixing stud at the top middle & bottom and hexagonal nuts . These studs should possess hole of 2mm as in center of the head from where the sealing wire shall pass & meter box can be sealed properly. The door will further be provided with a lining of 5mm thick felts in order to make it dust proof. The door shall be provided with window with additional door having size as per relevant drawing will be provided on the door so that the meter inside the box shall be read easily. Four fixing clamps, two at top side and two at bottom of the meter box for fixing the box on wall.

##### **c) CABLE ENTRY/ EXIT**

Two holes of 50mm dia shall be provided for fixing cable as per drawing. The cable entry and exit holes should be fitted with metallic glands for proper closing and sealing after installation of the cable.

**d) ADDITIONAL DOOR WINDOW :**

- i) One additional door with window as per separate drawing shall be required to be provided with the box such that
  - a) Meter will not be accessible physically without opening the door of the box.
  - b) It will not allow any external thing to enter into the box.
  - c) It will have separate sealing arrangement as per drawing.
  - d) The meter shall be readable from outside through a unbreakable transparent sheet of toughened/ triplex glass of thickness 6 mm for window of required size provided on the upper door as per arrangement indicated in the drawing so that the meter inside the box can be read easily.
  - e) Opening for push button mode (as per drawing)-

The window of this additional door shall be provided with toughened/ triplex glass by securing the same with the help of a rectangular frame which can be tightened through 4 nos. nut bolts of appropriate size. The 4 bolts shall be welded inside the door from its head such that the nuts can be tightened to secure the rectangular frame. This glass shall be fixed inside the box in a projected groove. This additional door shall also be required to be provided with sealing bolts with holes and hexagonal nuts as shown in the drawing. This door shall be provided with 2 nos. suitable size hinges from inside such that the hinges are not visible from outside. This door shall be provided with u-shaped rubber gasket along the edges of the door.

**e) MOUNTING OF NON METALLIC BASE SHEET :**

The box shall be provided with 4 rectangular brackets of size mentioned in the drawing so as to fix bakelite sheet to mount the meter on it at a distance of about 50mm from the rear wall on which the meter & CTs will be fixed. The supply shall include bakelite sheet as per ISS.

**f) ARRANGEMENT OF CT MOUNTING :**

The primary terminal P1 of CTs shall be mounted on porcelain supports bolted on three Nos. The other side of CT (P2) shall also be mounted on another three Nos. porcelain supports/clits. The position should be adjusted by sliding clits to & fro horizontally as per the requirement of primary terminals of CTs.

**g) PARTITION PLATE**

There shall be one partition plate at the height of 700mm from the bottom of the box to facilitate 4 Nos. CTs

**6.0 TESTS :****6.1 TESTING FACILITIES :**

The tenderer must indicate clearly about the various testing facilities for routine/acceptance tests as per relevant ISS in respect of Meter Box as are available at their works. In case no testing facilities are available at the tenderer's works particulars of the place where such testing is proposed to be conducted during the course of inspection must be indicated.

**6.2 TEST VALUES :**

For all acceptance tests, the acceptance values shall be the values guaranteed by the bidder in the guaranteed technical particulars or the acceptance value specified in this specification or the relevant standard whichever is more stringent.

**6.3 ADDITIONAL TESTS :**

The purchaser reserves the right for carrying out any other tests of a reasonable nature at the works of the supplier/laboratory or at any other recognized laboratory/ research institute in addition to the above mentioned acceptance and routine tests at the cost of the purchaser to satisfy that the material complies with the intent of this specification.

**6.4.1 TYPE TESTS :**

Tests carried out to prove conformity with the requirement of the standard. These are intended to prove the general qualities & design of a given type of product. This test shall be carried out on two sample of enclosure for accessories of the same type selected preferably at random from a regular production lot. Before commencement of tests, the sample shall be visually examined & inspected for obvious visual defects in respect of component, part and their assembly, construction, marking, mechanical hazards, earthing etc. The external surface finish shall be even and free from finishing defects.

The following tests as per IS: 14772/2000 shall constitute the type test:

<b><u>S.No.</u></b>	<b><u>Tests</u></b>
1.	Marking
2.	Dimensions
3	Protection against electric shock
4.	Provision For earthing
5.	Construction
6.	Resisting to aging, to humid condition, ingress of material.
7.	Mechanical Strength
8.	Resistance to heat
9.	Resistance to rusting.

Criteria of acceptance: Both samples shall successfully pass all type tests for providing conformity with the requirements of the standard. If any of

the sample fails in any of the type tests, the testing authority, at its discretion, may call for fresh sample not exceeding twice the original number and subject to all tests or to the test(s) in which failure(s) occurred.

#### **6.4.2 ACCEPTANCE TESTS :**

The following tests shall constitute the acceptance tests :-

##### **Tests**

1. Marking
2. Dimensions
3. Protection against electric shock
4. Provision for earthing
5. Construction

The verification of above tests shall be arranged by the supplier in the presence of purchaser's inspecting officer at the time of inspection.

#### **6.4.3 ROUTINE TESTS:**

The tests at s.no.(3) and (4) in the Cl.6.4.2 shall constitute this test as per IS:14772/2000.

#### **7.0 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.
- c) The Acceptance tests shall be carried out as per relevant ISS Latest Amended) , P.O. , GTP and the proto type sample approved by this office .For acceptance tests samples from the offered quantity for inspection shall be



selected by inspecting officer as per provisions of IS:14772/2000 (Latest amended).

- 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) The purchaser reserves the right to insist for witnessing the acceptance /routine testing of the bought out items. The bidder shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests. The inspection charges would be to the purchaser's account.

## **8.0 DRAWING**

The bidder shall furnish drawings of MIP meter boxes enclosed with the specification duly signed on each along with the tender , failing which the offer is likely to be ignored.

## **9.0 GUARANTEED TECHNICAL AND OTHER PARTICULARS :**

The guaranteed technical and other particulars shall be given in the Performa as per ANNEXURE- (A). Any deviation from the specifications referred to above shall be supported by adequate justifications.

## **10.0 STAGE INSPECTION DURING MANUFACTURE :**

The stage inspection/ testing during manufacture shall mean those tests which are to be carried out during the process of manufacture and end inspection to ensure quality control such that the end product is of the designed quality conforming to the intent of this specification. The inspection may be carried out by the purchaser at any stage of manufacture/before dispatch as per relevant standard.

## **11.0 QUALITY ASSURANCE PLAN :**

- 11.1 The Bidder hereunder shall invariably furnish following information along with his offer, failing which the offer shall be liable for rejection. Information shall be separately given for individual type of material offered.
  - i) Statement giving list of important raw materials, names of sub-suppliers for the raw material, list of standards according to which the raw materials are tested, list of tests normally carried out on raw materials in the presence of Bidder's representative, and copies of test certificates.
  - ii) Information and copies of test certificates as in (i) above in respect of bought out items.
  - iii) List of manufacturing facilities available.

- iv) Level of automation achieved and list of areas where manual processing exists.
- v) List of areas in manufacturing process, where stage inspections are normally carried out in quality control and details of such tests and inspections.
- vi) Special features provided in the equipments to make it maintenance free.
- vii) List of testing equipment available with the Bidder for final testing of equipment specified and test plant limitation, if any, vis-a-vis the type, special, acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in schedule of deviations from specified test requirements.

11.2 The Supplier shall within 30 days of placement of order submit the following information to the Purchaser.

- i) List of raw material as well as bought out accessories and the names of sub-suppliers selected from those furnished along with the offer.
- ii) Type test certificates of the raw material and bought out accessories.
- iii) Quality Assurance Plan (QAP) with hold points for Purchaser's inspection. The QAP and Purchaser's hold points shall be discussed between the Purchaser and the Supplier before the QAP is finalized.

11.3 The Supplier shall submit the routine test certificates of bought out items and raw material at the time of routine testing of the equipments.

#### **12.0 TEST REPORTS :**

- i) All records of routine test reports shall be maintained by the Supplier at his works for periodic inspection by the Purchaser.
- ii) All test reports of tests conducted during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when requested for by the Purchaser

#### **13.0 PACKING & FORWARDING :**

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

#### **14.0 Prices:**

The prices/ rates quoted shall be FIRM & strictly as per Price Schedule-IV enclosed with the tender documents clearly indicating Ex-works, Freight & Insurance, Goods and Service Tax and other levies/ duties, if any. If no duty/ tax is applicable and/ or same is applicable at concessional rate, the same shall be clearly mentioned.

#### **15.0 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 successful bidder shall furnish proto type sample for approval before commencement of supplies within 30 days from the date of receipt of Purchase Order. The commencement period for supply shall be 30 days from the date of letter conveying approval of sample. The supplies shall be completed latest within 8 months from the date of receipt of Purchase Order. The time taken in inspection & testing , approval of proto type sample and any other clarification/ amendment/ contractual formalities shall, therefore, be accounted for by the successful bidder while completion of supplies within 8 months from the date of Purchase Order.

## 16.0 **ADDITIONAL ORDER**

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

### **DRAWINGS:**

#### **1. MIP METER BOX**

ANNEXURE-I	DRAWING of front elevation with front door closed
ANNEXURE-II	DRAWING of front elevation with front door removed
ANNEXURE-III	DRAWING of Panel's side view
ANNEXURE-IV	DRAWING of Panel's plan
ANNEXURE-V	DRAWING of Panel's window door, bus bar cleat

### **ANNEXURE-A**

#### **STATEMENT OF GUARANTEED TECHNICAL PARTICULARS AND OTHER DETAILS FOR MIP METER BOXES AGAINST TN-2734.**

S. No.	Particulars	
1 (a)	Name & address of / firm / bidder.	
b)	Work's complete address of manufacture	
2	Dimensions of Box in mm	
3	Thickness of M.S.Sheet in mm	
a)	For three sides, top & door	
b)	For bottom.	
4	Dimensions of Bakelite/ Acrylic sheet in mm.	
a)	Sheet for mounting meter.	
b)	Sheet for cleats	

5	Window/window door details :	
a)	Inner dimension of window	
b)	Window door dimension.	
c)	Viewing window dimension.	
d)	Toughened/triplex glass	
e)	Metal frame for fixing acrylic Sheet	
i)	Inner dimensions.	
ii)	Outer dimensions.	
6	Dimensions of sealing/earthing bolts in mm.	
a)	Door sealing bolts.	
b)	Earthing bolts.	
7	Approximate weight of complete Box in Kgs.	
8	Details of painting.	
9	Shade No. of colour/paint.	
10	Tolerance in fabrication :	
a)	In overall dimension.	
b)	Rolling tolerance.	
11	Dimensions of fixing brackets As per drawings in mm.	
12	Embossing details.	JVVNL
		Trade mark of manufacturer
		TN-2734
		Sign of danger
		MIP meter box
13	Dimensions of felt lining to make box dust proof.	
14	Details of Bus bar cleats	
15	Details of drawing	