

**TECHNICAL SPECIFICATIONS OF THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)**

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**1.00 SCOPE:**

This specification covers design, manufacturing, testing at works and supply of Meter Box along with single phase resin cast ring type 03 nos. LT CTs. The Meter Box shall be made out of CRCA M.S. Sheet confirming to IS: 13947 or Sheet Moulding Compound (SMC) confirming to IS: 13410 / 1992 amended upto date & IS: 14772 / 2000 (amended upto date) for use in electrical distribution system in Maharashtra. The system shall be AC three phase, four wires, 415 V, 50 Hz with effectively grounded neutral. The Meter Box shall be suitable for housing LT AC Three Phase Four Wire CT operated Static TOD Tri - Vector Energy Meters with single phase resin cast ring type CTs and modem & antenna in indoor as well as outdoor applications.

**2.00 QUALIFYING REQUIREMENTS:**

- 2.01 Offers of manufacturers / suppliers of Energy Meters Boxes shall be accepted against the Tender.
- 2.02 The following qualifying requirement shall be fulfilled by the bidders.
- (a) The bidder shall have turnover of 60 % of the estimated cost of the tender during any one of the last three financial years.
  - (b) The bidder shall have supplied one lacs energy meter boxes during the last three financial years.
  - (c) The bidder shall have minimum experience of three years of supply or manufacturing for meter boxes upto the end of the last financial year.
- 2.3 The offers of Indian subsidiary company, whose parent company is located abroad fulfilling the qualifying requirements, shall be considered provided the Indian participant subsidiary company fulfils the minimum experience of three years of supply or manufacturing of meters boxes upto the end of the last financial year. However, the conditions of turnover of 60% of the estimated cost of the tender during any one of the last three financial years and supply of minimum quantity of one lakh meter boxes during last three financial years can be fulfilled by the parent company located in abroad on behalf of their Indian subsidiary company. The parent company shall furnish undertaking for accepting responsibility for supplying quality meter boxes as per specifications and execution of the contract on behalf of its India based subsidiary unit who has participated in the tender in Annexure U-I.

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- 2.4 In case of offers of foreign bidders/manufacturers, they shall fulfil Qualifying Requirement as per Sr. No. 2.1 and 2.2 above.

**3 SERVICE CONDITIONS:**

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

Maximum ambient temperature	50 <sup>0</sup> C
Maximum temperature in shade	45 <sup>0</sup> C
Minimum temperature of Air in Shade	3.5 <sup>0</sup> C
Relative Humidity	10 to 100 %
Maximum annual rain fall	1450 mm
Maximum wind pressure	150 Kg / m <sup>2</sup>
Maximum altitude above mean sea level	1000 meter
Isoceraunic level	50 days per year
Seismic level (Horizontal Acceleration)	0.3 g
Climate	Moderately hot and humid tropical climate conducive to rust and fungus growth.

**4 APPLICABLE STANDARDS:**

Unless otherwise modified in this specification, the meter box shall generally conform with the provisions of IS: 14772 / 2000 (Amended upto date) and material of construction i.e. for SMC to IS: 13410 / 1992 & for M.S Sheet to IS: 13947 & requirement of this specification.

**5 DESIGN & CONSTRUCTION:**

- 5.01 The meter box shall be made by DEEP drawn process conforming to the requirements of IS: 13947 or from thermosetting plastic i.e. glass reinforced polyester sheet moulding compound Grade S-3 conforming to IS: 13410 / 1992, & requirement of this specification.
- 5.02 The boxes shall be made by Hot Press compression moulding Process.
- 5.03 The base and cover of meter box shall be individually in one piece except for fixing of accessories like hinges, clamp, handles etc.
- 5.04 The meter box shall be so constructed as to have roof tapering down for easy flow of rainwater.

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- 5.05 The box / cover shall be drawn from CRCA M.S. Sheet metal thickness not less than 2 mm. Alternatively, if SMC is used then the Meter Box shall be moulded using 100% virgin SMC, grade S-3 material. The box shall be weather proof, unbreakable and scratch resistant & shall have good workmanship. For SMC, the wall thickness of the meter box base shall be minimum 3.0 mm on load bearing side and 2.00 mm on all other sides, thickness of cover shall be minimum 2 mm.
- 5.06 The surface of the Meter Box made from CRCA M.S. Sheet shall be properly pre-treated / phosphated in 7-tank process and shall be applied with a powder coating of 40 micron thickness on outer side and inside, Powder coating shall be of smoke grey colour. Powder coating shall be weather proof & corrosion resistant and suitable for outdoor usage.
- 5.07 The SMC meter box shall be made of anti corrosive, dust proof, rust proof, vermin and water proof, ultra violet stabilized and flame retardant high grade SMC material having good dielectric and mechanical strength property.
- 5.08 The surface appearance or part of meter box must be smooth, non porous and homogeneous, free from ripples, defects and marks. No fillers or fibres shall be visible at any place.
- 5.09 The meter box shall have base raised by about 20 mm in the box for easy wiring for fixing the meter, modem and antenna. The meter screws shall not protrude outside.
- 5.10 The Meter Box shall facilitate wireless data communication with minimal disruption for AMR purpose.
- 5.11 A partition shall be provided inside the base such that box is divided in two parts. The lower partition shall house the single phase resin cast ring type CTs and the upper partition shall house the LT CT operated Static TOD Tri-Vector Energy Meter, modem & the antenna.
- 5.12 The box shall be provided with two separate doors.
- 5.13 Three holes with rubber glands of I.D. 15 mm. shall be provided in the partition sheet for Secondary CT wires and potential terminal wires along with neutral.
- 5.14 The boxes shall be suitable for outdoor application.
- 5.15 Corners of the Meter Box shall be round and not pointed ones.
- 5.16 Doors with locking arrangement shall be provided.

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- 5.17 The minimum inside dimensions of the meter box shall be suitable for installation of all types of meters purchased from various meter manufacturers.
- 5.18 The meter box shall be such that there shall be minimum 100 mm clearance at the bottom, 75 mm clearance on all three sides, 25 mm clearance at the front and 20 mm clearance at the back between the meter and meter box inner wall.
- 5.19 The provision of installation of modem shall be above 75 mm from the meter top side.
- 5.20 Hinges, locking arrangement shall be of stainless steel only.
- 5.21 For SMC, the base and cover must be UV stabilized to ensure that it does not get 'Yellow' over a period of time. It shall not change in colour, shape, size, dimensions when subjected to 200 hrs on UV ageing test as per ASTM: G53 (Cl. No. 9.3), 4 Hours UV at 60<sup>o</sup> C and 4 Hours Condensation at 50<sup>o</sup> C. The base and cover shall be capable of withstanding temperature of boiling water for five minutes continuously without distortion or softening.
- 5.22 Each cover of Box shall be fixed on two-tamper proof inside hinges not visible from outside. Hinges shall be made of 2.5 mm M.S. sheet and shall be 40 mm in length for lower partition and 60 mm in length for upper partition. The hinges / strip hinges for compartment cover shall be so designed that the door cannot be opened without breaking the seals, i.e. the hinges / strip hinges shall be provided from inside.
- 5.23 The door of Box shall open from right to left by 90<sup>o</sup>. Collar of each door (cover) in closed position shall rest on the collar of the body (base) of Box. The collar of the door shall overlap the collar of the body of Box by 8 mm such that direct entry of screwdriver, tool or film is not possible. The cover shall be provided with semi circular / circular gasket of 4 mm thickness to completely fit to the base. The gasket shall be made out of good quality neoprene rubber. Thickness of rubber lining shall be such that it provides proper sealing between the cover & base of Box to avoid penetration of dust & ingress of water.
- 5.24 The enclosure shall comply with the requirements of IP – 55 for SMC & IP – 55 for CRCA M.S. Sheet as per IS: 12063 or the latest version thereof.
- 5.25 Rubber lining should be fixed with suitable adhesive so that the same does not get removed by itself on opening of the door.

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- 5.26 Two numbers U-shaped latch arrangement shall be provided to each compartment to lock /seal the cover with base. A hole of 2 mm diameter shall be provided on U-shaped latch for sealing wires and additional hole of 8 mm shall be provided in the latch for locks. All holes should be aligned when latch is in closed position.
- 5.27 For meter reading and modem viewing, the box shall have two windows with Toughened / Triplex Glass Fixed with stainless steel frame from inside about 70 mm below top edge of cover for modem. The second window shall be 75 mm below the lowest edge of modem window. Glass shall have scratch proof “MSEDCL” logo on the right side top corner of the glass. This glass shall be fixed from inside of the cover of Meter Box, with single piece metal frame (Glass Holder) fixed with minimum four screws. The glass has to be fitted with a wrap around single piece rubber ring without joint made from good quality neoprene rubber so that it can withstand weather effect. The box shall have windows of size as per the table given below provided with Glass.

Particulars	Window for Meter (mm)	Window for Modem (mm)
Height (H)	160	120
Width (W)	140	140
Thickness (T)	5	5

- 5.28 The mounting arrangement of the meter and modem and antenna in the meter box shall be by way of adjustable slotted polymeric brackets / strips which shall be fixed on the base or moving slotted flat. The mounting arrangement shall be raised from the base of Box body by 20 mm. CT mounting plates shall be fixed with 2 screws & shall be provided as per the Drawings. For mounting of various makes of meter and modem & antenna, the supplier shall supply seven mounting MS screws, one for upper (M4 threads x length 12 mm) and six screws (M4 threads x 35 mm length with nut) in moving slotted flat. The mounting arrangement of the meter, modem, antenna & CTs shall be indicated by the Bidder through Drawings.
- 5.29 For mounting the box on pole, four strips of L-shape shall be welded / fixed on the box. Strips shall be 40 mm wide & 3 mm thick of M.S. sheet.

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- 5.30 4 Nos. holes with superior quality rubber cable glands of internal diameters 30 mm each for incoming and outgoing cables shall be provided at both the side walls of the box for passing of cable through CTs. Rubber glands shall be fixed with suitable adhesive so that the same do not get removed. Rubber glands shall be made such that internal diameter of glands should be closed with the rubber film of approximately 3 mm thickness. Cable will go through the cable glands by cutting the rubber film of the glands.
- 5.31 Four primary cable, connectors of Aluminium shall be provided with the box. Primary cable connectors shall be used for tapping main cable and providing primary wires for voltage supply to the meter. Each cable connector shall consist of two aluminium strips of size 10 mm x 55 mm. Both strips will have holes at the ends to clamp with cable by screws and nuts. The supplier shall supply four sets of cable connectors with 4 mm<sup>2</sup> cables crimped with suitable lugs at both ends complete with screws and nuts. The cable connectors shall be insulated from outer sides with epoxy insulation of 2 mm thickness.
- 5.32 Handles shall be provided to the doors to open and close the doors.
- 5.33 Two Earthing Bolts of size 25 x 8 mm fitted with the box from inside, shall be provided for external earthing with 2 plain washers, one spring washer & two nuts. Earthing bolt shall have no layer of powder coating and shall be property zinc plated.
- 5.34 All the screws and washers shall be properly zinc plated.
- 5.35 The tolerance permissible on the overall dimensions of the Box shall be (+/-) 2%. However, the tolerance for the fittings shall be (+/-) 3%
- 5.36 For SMC, the Meter Box shall comply with magnetic influence of AC / DC / 0.5 Tesla Permanent Magnet when tested as per Meter Testing Method of CBIP Report No. 88 with meter having 0.5 Tesla Magnetic Immunity mounted in it.
- 5.37** The minimum internal dimensions of the meter box shall be 1000 mm height (H) x 350 mm width (W) x 230 mm depth (D).

**6 TESTS:**

The meter box shall be fully type tested in accordance with the relevant standards and as per MSEDCL requirement. All the Type Tests specified in the technical specifications shall be carried out from laboratories which are accredited by the National Board of Testing and Calibration

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Laboratories (NABL) of Government of India such as ERDA, ERTL, CPRI, etc. to prove that equipments meet the requirement of the specification.

The type test report shall clearly indicate the constructional features identifying material of construction and its grade / composition as per respective IS.

The tenderer shall also furnish certificate from laboratories where type tested that required test facility available in-house for that particular test. Type Test Reports conducted in manufacturers own laboratory and certified by testing institute shall not be acceptable.

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

The detailed type test reports shall be furnished with relevant oscillogram and certified drawings of the equipment tests. The offers without type test reports shall be rejected.

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 type test reports shall be got approved from the Chief Engineer (Distribution), MSEDCL, 5th Floor, Prakashgad, Bandra (E), Mumbai – 400 051 before commencement of supply.

The type test reports of M S Sheet Meter Box as given below shall be furnished with certified drawings to prove that equipment offered meets the requirement of the specification.

- (a) Temperature rise test as per IS: 8623 / 1993 amended upto date.
- (b) IP – 55 Test
- (c) Overall Dimension Test,
- (d) Powder Coating thickness,

The Type Test reports of SMC Meter Box as per table below shall be furnished with certified drawings to prove that the equipment offered meets the requirement of the specification and shall be get approved from the Chief Engineer (Distribution) before commencement of supply.

<b>Sr. No.</b>	<b>Test</b>	<b>Reference Standard</b>	<b>Required Value</b>
(1)	Flammability	UL-94 / IS: 1173	V2



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(2)	Heat Deflection Temperature @ 1.8 MPA	IS: 13411 Annex. H / ISO 75	$\geq 150^{\circ} \text{C}$
(3)	Glow Wire Test	IS: 11000 (P2 / S1) or IEC - 695-2-1	$= 850^{\circ} \text{C}$
(4)	Ball Pressure Test	IS: 14772 / 2000 or IEC 335	Confirms
(5)	Water Absorption	IS:14772 / 2000	$= \leq 0.25\%$ .
(6)	Mechanical strength	IS:14772 / 2000	$\geq 50 \text{ MPA}$
(7)	Marking, Dimension & Construction	IS:14772 / 2000	As per IS
(8)	Material Identification	IS 13410 / 1992	Sheet Moulding Compound
(9)	Resistance to ageing to humid conditions, ingress of solid objects & to harmful ingress of water	IS:14772 / 2000	Confirms
(10)	UV Ageing Test for 200 Hours	ASTM G53 (9.3)	Confirms
(11)	IP-55	IS:12063 / 1987	Confirms

In addition to above, all other tests according to IS: 14772 / 2000 (amended upto date).

For Acceptance Test, 10 Samples for each lot offered for inspection shall be selected randomly.

**7 GUARANTEED TECHNICAL PARTICULARS:**

The tenderer shall furnish the particulars giving specific required details of Meter box in schedule 'A' attached (As per Guaranteed Technical Particulars uploaded on e - Tendering site). The offers without the details in Schedule 'A' stand rejected.



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**8 TESTING AND MANUFACTURING FACILITIES:**

**8.01 TESTING FACILITIES:**

The Tenderer must clearly indicate the details of testing facilities available in the works of manufacturer and whether the facilities are adequate to carry out all the Routine and Acceptance tests. These facilities shall be available to MSEDCL Engineers, if deputed to carry out or witness the tests in the manufacturer's works. The tenderer must have all in-house testing facility to carry out acceptance & routine tests on the meter box as per relevant IS. If any test cannot be carried out in the manufacturer works, the same shall be clearly stated. All testing equipments shall be duly calibrated in the NABL approved laboratories.

The Bidder shall have the testing facility of flammability test of V2 for SMC Meter Box.

**8.02 MANUFACTURING FACILITIES:**

The CRCA M.S. Sheet Meter Box manufacturer shall have following minimum manufacturing facilities in-house to prove his reliability as a manufacturer of Energy Metering Box.

- (a) Power operating shearing machine.
- (b) Power operated press break.
- (c) Power operated power presses.
- (d) Welding machines.
- (e) Assembling tools.
- (f) Assembly lines for fabrication and fitting.

The tenderer shall furnish detailed process of painting. In case the painting is to be carried out from outside agency, the tenderer shall furnish the facilities available with sub-contractor.

If SMC Meter Box is offered, the tenderer shall have the following minimum manufacturing facilities in house to prove his reliability as a manufacturer of Energy Metering Box.

- (a) SMC material manufacturing machine
- (b) Hydraulic press for hot press compression moulding
- (c) Assembly lines for fabrication and fitting

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- 9 **GUARANTEE:**The meter box shall be guaranteed for a period of five years from the date of commissioning or five and half years from the date of dispatch whichever is earlier.

The meter boxes found defective within above guarantee period shall be replaced by the supplier free of cost within one month of receipt of intimation. If the defective material is not replaced within specified period as above, the Company shall recover an equivalent amount plus 15% supervision charges from any of the bills of the supplier.

**10 NAME PLATE AND MARKINGS:**

The meter box shall have an anodized aluminium name plate clearly visible, effectively secured against removal and indelibly and distinctly marked with all essential particulars as per relevant standards. In addition to the requirement as per relevant standard, following information shall clearly & indelibly be embossed on the cover of the meter box.

- a) Name of Purchaser: MSEDCL
- b) Code name of manufacturer: ....
- c) Purchase order number & date: ....
- d) Year and month of manufacture: ....
- e) Guarantee: ... Years
- f) Sign of Danger

**11 INSPECTION:**

All Acceptance tests and inspection shall be carried out at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and purchaser at the time of purchases. The manufacturer shall offer to the inspector representing the purchaser all the reasonable facilities, free of charge, for inspection and testing, to satisfy him that the material is being supplied in accordance with this specification. Inspection of the first lot shall be carried out jointly by representative of the Chief Engineer (Distribution) and Executive Engineer of Inspection wing.

The MSEDCL representative / Engineer attending the above testing shall carry out testing as per IS: 13947, IS: 13410 / 1992 (amended upto date) & IS: 14772 / 2000 (amended upto date) & this specification and issue a test certificate approval to the manufacturer and give clearance for dispatch.

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The manufacturer shall give minimum 14 days notice for inspection of material.

**12 PACKING:**

The meter box shall be suitably packed in corrugated boxes in order to avoid damage during transit or handling.

**13 REJECTION:**

After dispatch of material against inspected lot to various store centers, the Chief Engineer, Distribution may select one complete meter box at random from the lot of each type that may be supplied to various store centers and shall test the same for all the acceptance and routine tests at any third party NABL Lab.

The 5 days advance intimation shall be given to the supplier and if the supplier fails to attend the same on the date informed, the testing will be carried out in absence of supplier's representative. The results of the testing lab shall not be disputed by the supplier. If the meter box fails in above random sample testing, the lot will be rejected.

**14 SCHEDULES:**

The tenderer shall fill in the following schedules which are part and parcel of the tender specification and offer and submit along with the offer. If the schedules are not submitted duly filled in with the offer, the offer shall be rejected.

Schedule 'A' ... Guaranteed Technical particulars (As per GTP parameters uploaded on e- Tendering site.)

Schedule 'C' ... Tenderer Experience

The discrepancies, if any, between the specification and the catalogues and/or literatures submitted as part of the offer by the bidders, shall not be considered and representations in this regard will not be entertained.

**15 Specification of LT Current Transformer : As per ANNEXURE - I.**

**16 Prototype & Drawings:-** The successful tenderer have to manufacturer the prototype Unit for each rating as per this specification before bulk manufacturing. The tenderer should intimate the readiness of prototype to Chief Engineer (Distribution) ,Prakashgad, 5th floor, MSEDCL, Mumbai. The representative of C.E.(Distribution) 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

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representative along with the drawings shall be submitted by the tenderer to C.E.(Distribution). The Tenderers should submit the final drawings in line with this specification and prototype to C.E.(Distribution ) for approval before bulk manufacturing. The approval of prototype & drawings shall be a responsibility of tenderer. No extra period will be allowed for getting approval of prototype and drawing & this will be inclusive in the period of delivery schedule given by the tenderer.

**SCHEDULES:**

The tenderer shall fill in the following schedules which are part and parcel of the tender specification and offer and submit along with the offer. If the schedules are not submitted duly filled in with the offer, the offer shall be rejected.

Schedule 'A' ... Guaranteed Technical particulars (As per GTP parameters uploaded on e- Tendering site.)

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The discrepancies, if any, between the specification and the catalogues and/or literatures submitted as part of the offer by the bidders, shall not be considered and representations in this regard will not be entertained.

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**ANNEXURE - I**

**SPECIFICATION FOR L.T. CURRENT TRANSFORMERS**

- 1.0 Scope** :- Specification covers the design, manufacture, Testing at works and supply of L.T. current transformers for use in connection with L.T. C.T. operated energy metering box in Electrical Distribution system in the State of Maharashtra. The system shall be A.C. 3 phase, 4 Wire, 415 Volts, 50 HZ with effectively grounded neutral.
- 2.0 Standards**:- Unless otherwise modified in this specification, the C.T. shall conform to IS:2705/1992 or its latest version thereof.
- 3.0 General Technical particular :-**
- 3.1 Current transformer should be resin cast, ring type construction. Construction shall be single phase single core type. The internal diameters of the C.T. shall be approximately 40mm for 200/5 Amp C.T.s. For carrying out Short Time current test the primary shall be considered as fixed bar primary. The current density for copper bus-bar for primary shall be 1.6A sq.mm at primary rated current.
  - 3.2 Suitable mounting robust clamp as per manufacturer design shall be provided.
  - 3.3 Secondary terminal shall be of brass stud type. The size shall be minimum 6.0 mm dia 20 mm outside length with spring washer and double nuts.
  - 3.4 Current ratio of 150/5 A or 200/5 A as per the requirement continuous maximum current shall be 120%.
  - 3.5 Rated voltage shall be Single Phase 240 V line to neutral (+15% to - 30%)
  - 3.6 Accuracy class of 0.5 as per IS.
  - 3.7 Rated burden shall be of 5 VA.
  - 3.8 The instrument security factor shall be less than or equal to 5.
  - 3.9 Rated short time current of 5 KA for 1 sec. Corresponding to rated dynamic peak current of 2.5 x 5 KA (peak)
  - 3.10 The ratio, name of manufacture / monogram and year of manufacturing shall be engraved on the body of C.T. In addition name plate of anodized aluminium indicating the necessary details, year of manufacture etc. engraved on it shall be provided

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in such a manner that the information is clearly visible after mounting.

3.11 The secondary and primary terminals shall be clearly marked as S1 & S2.

3.12 The bidders should submit the drawings of offered CTs.

**4.0 Name Plate and Marking :-**

Current transformer shall have a name plate clearly visible, effectively secured against removal and indelibly and distinctly marked with all essential particulars as per relevant stand. In addition to the requirement as per relevant standard following shall be marked on the name plate.

Purchase order No.

- 1) Month and year of manufacture
- 2) Name of purchaser i.e. M.S.E.D.C.L.
- 3) Five years Gurantee.

**5.0 Type Tests:-** The tenderer shall furnish detailed type test reports of the offered L.T. Current transformers along with offer for all the tests as per relevant standards. All the above type tests shall be carried out at laboratories which are accredited by the national Accreditation Board of Testing and Calibration Laboratories (NABL) of Government of India to prove that the Current transformers offered meet the requirements of the specification. These tests should have been carried out with 5 years prior to the date of opening of this tender.

The purchaser reserves the right to demand repetition of some or all the Type Tests in presense of purchaser's representative at purchasers cost. For this purpose, the tenderer shall quote unit rates for carrying out each Type Test. However such unit rates will not be considered for evaluation of the offer. In case the unit fails in the a type tests the complete supply shall be rejected.

The successful tenderer shall take approval of type test from C.E.(Dist.) MSEDCL, Prakashgad, Bandra, Mumbai prior to commencement of supply.

**6.0 Acceptance Test:** - All acceptance Tests as per IS : 2705 part 1 & part2.

**7.0 Routine Test :-** All routine tests as per IS : 2705 part 1 & part 2

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- 8.0 Guaranteed Technical Particulars:** - The tenderer should also furnish the particulars giving specific required details of CTs in Schedule 'A' attached. The offers without the details in Schedule 'A' stand rejected.
- 9.0 Drawing:** - The bidder should submit the detail constructional drawing of the CTs along with the offer. The successful bidder should submit & get approved the drawing from the C.E.(Distribution) before commencement of supply No. extra period will be allowed for getting approval of drawing & this will be inclusive in the period of delivery schedule agiven by the tenderer.
- 10.0 Guarantee:** - The CTs shall be guaranteed for the period of five years from the date of commissioning or five and half year from the date of dispatch whichever is earlier. The CTs found defective within the above guarantee period shall be replaced / repaired by the supplier free of cost within one month of receipt of intimation. If the defective CTs are not replaced / repaired within the specified period above, the Board shall recover an equivalent amount plus 15% supervision charges from any of the bills of the supplier.



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**SCHEDULE - "C"**

**TENDERER'S EXPERIENCE**

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

<u>Sr. No.</u>	<u>Name of client</u>	<u>Order No. &amp; date</u>	<u>Qty. ordered</u>	<u>Qty. supplied</u>
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NAME OF FIRM \_\_\_\_\_

NAME & SIGNATURE OF TENDERER \_\_\_\_\_

DESIGNATION \_\_\_\_\_

DATE \_\_\_\_\_

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**ANNEXURE - U-I**

**“INDEMNITY BOND”**

UNDERTAKING TO BE SUBMITTED BY THE PARENT COMPANY SITUATED ABROAD IN CASE OF THE PARTICIPANT BIDDER WHO IS AN INDIAN BASED SUBSIDIARY ON GENERAL STAMP OF RUPEES 200/-

To,  
The Executive Director (Stores),  
Maharashtra State Electricity Distribution Co. Ltd.,  
Prakashgad, Bandra (E),  
Mumbai – 400 051.

Sub: - Undertaking against Tender \_\_\_\_\_ for procurement of \_\_\_\_\_

Dear Sir:

We, M/s. \_\_\_\_\_ having registered office at \_\_\_\_\_ are the Parent Company of M/s. \_\_\_\_\_ who have participated against your tender No. \_\_\_\_\_ for procurement of \_\_\_\_\_.

We have carefully read and have thoroughly understood and agree to the terms and conditions of the subject tender.

We hereby undertake that in case of placement of order against the subject tender on our subsidiary company, M/s. \_\_\_\_\_ in the event of we accept all the responsibilities and liabilities for supply of quality meter box as per specification of the tender and execution of the contract. We further hereby undertake that we shall be responsible for any liability arising out of the contract placed on M/s. \_\_\_\_\_ and to pay MSEDCL on demand the sum of rupees as per agreement in the event of any breach of condition of the purchase order, loss and damage of the material till expiry of guarantee period as stipulated in the order. Our liability here under shall not be impaired or discharged by extension of time or variation or alteration made with or without our knowledge or consent by or between the parties to the said contract. This undertaking shall be valid and binding on us upto and including the execution and guarantee period of the order and shall not be terminable by notice or change in the constitution of any of the companies. In case of any dispute arising out of or in connection with this tender or contract, if concluded, the same shall be subject to the exclusive jurisdiction of the “Court in Mumbai (India).”

Yours faithfully,

(Authorised Signatory)  
FOR \_\_\_\_\_

**TECHNICAL SPECIFICATIONS OF THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)**

**SCHEDULE - "A"**

**GUARANTEED TECHNICAL PARAMETERS (TO BE FILLED ONLINE)**

<b>ITEM NAME</b>	<b>THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)</b>	
<b>SR. NO.</b>	<b>GTP PARAMETERS</b>	<b>GTP VALUES</b>
1.	MANUFACTURER'S / SUPPLIER'S NAME AND ADDRESS WITH WORKS ADDRESS	TEXT
2.	APPLICABLE STANDARDS	TEXT
3.	TYPE OF METER BOX, CRCA M.S. SHEET OR SMC	TEXT
4.	IF CRCA M.S. SHEET, (A) METER BOX IS PROVIDED WITH DEEP DRAWN PROCESS (YES / NO)	BOOLEAN
5.	(B) METER BOX PRE-TREATED / PHOSPHATED IN 7-TANK PROCESS (YES / NO)	BOOLEAN
6.	(C) SMOKE GREY COLOURED POWDER COATING OF 40 MICRON THICKNESS ON INNER & OUTER SIDE PROVIDED (YES / NO)	BOOLEAN
7.	(D) POWEDER COATING IS WEATHER PROOF & CORROSION RESISTANT & SUITABLE FOR OUTDOOR USE (YES / NO)	BOOLEAN
8.	(E) METER BOX COMPLIES WITH THE REQUIREMENTS OF IP – 55 (YES / NO)	BOOLEAN
9.	(F) THICKNESS OF METER BOX	TEXT
10.	IF MADE FROM THERMOSETTING PLASTIC, I.E. GLASS REINFORCED POLYESTER SHEET MOULDING COMPOUND GRADE S-3, (A) METER BOX CONFIRMS TO IS: 13410 / 1992 &	BOOLEAN

**TECHNICAL SPECIFICATIONS OF THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)**

	REQUIREMENT OF THIS SPECIFICATION (YES / NO)	
11.	(B) METER BOX MADE BY HOT PRESS COMPRESSION MOULDING PROCESS (YES / NO)	BOOLEAN
12.	(C) WHETHER SMC GRADE S3 IS USED FOR CONSTRUCTION OF METER BOX. (YES / NO)	BOOLEAN
13.	(D) SMC MATERIAL USED IS VIRGIN. (YES / NO)	BOOLEAN
14.	(E) SMC MATERIAL USED IS UV STABILIZED. (YES / NO)	BOOLEAN
15.	(F) METER BOX SHALL COMPLIES WITH MAGNETIC INFLUENCE OF AC / DC / 0.5 TESLA PERMANENT MAGNET (YES / NO)	BOOLEAN
16.	CONFIRM FLAMMABILITY AS V2 AS PER UL 94 / IS 1173 (YES / NO)	BOOLEAN
17.	CONFIRM HEAT DEFLECTION TEMPERATURE OF BASE > 150°C @ 1.8 MPA AS PER IS:13411, ANNEXURE 'H' / ISO 75 (YES / NO)	BOOLEAN
18.	CONFIRM GLOW WIRE TEST AT 850° C AS PER IS: 11000 (PART 2 / SECTION 1) / IEC-695-2-1 (YES / NO)	BOOLEAN
19.	CONFIRM BALL PRESSURE TEST AS PER IS: 14772/2000 / IEC 335 (YES / NO)	BOOLEAN
20.	CONFIRM 200 HRS UV AGEING TEST IS CARRIED OUT AS PER ASTM G53 (9.3). (YES / NO)	BOOLEAN
21.	CONFIRM WATER ABSORPTION VALUE ≤ 0.25% AS PER IS: 14772 / 2000. (YES / NO)	BOOLEAN
22.	CONFIRM MECHANICAL STRENGTH ≥ 50 MPA AS PER IS: 14772 / 2000. (YES / NO)	BOOLEAN
23.	CONFIRM FLEXURE STRENGTH ≤ 155 MPA. (YES / NO)	BOOLEAN
24.	CONFIRM MODULUS OF ELASTICITY 12 X 10 <sup>2</sup> MPA (YES / NO)	BOOLEAN
25.	CONFIRM IZOD IMPACT STRENGTH NOTCHED = 45 KJ /	BOOLEAN

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	METER <sup>2</sup> MINIMUM. (YES / NO)	
26.	CONFIRM MATERIAL SMC DOES NOT MELT TEST UPTO 400°C (YES / NO)	BOOLEAN
27.	2 PARTITIONS ARE PROVIDED (YES / NO)	BOOLEAN
28.	2 SEPARATE DOORS ARE PROVIDED (YES / NO)	BOOLEAN
29.	3 HOLES WITH RUBBER GLANDS OF I.D. 15 MM. PROVIDED IN THE PARTITION SHEET (YES / NO)	BOOLEAN
30.	DOORS HAVE LOCKING ARRANGEMENT (YES / NO)	BOOLEAN
31.	MODEM CAN BE INSTALLED IN THE BOX ABOVE 75 MM FROM THE METER TOP SIDE (YES / NO)	BOOLEAN
32.	MINIMUM INTERNAL DIMENSIONS OF METER BOX H X W X D	TEXT
33.	SHEET THICKNESS OF BASE OF METER BOX AT LOAD BEARING SIDE	TEXT
34.	SHEET THICKNESS OF BASE OF METER BOX EXCEPT AT LOAD BEARING SIDE	TEXT
35.	SHEET THICKNESS OF COVER OF METER BOX	TEXT
36.	MINIMUM INTERNAL DIMENSIONS OF THE METER BOX	TEXT
37.	DOOR WITH LOCKING ARRANGEMENT IS PROVIDED (YES / NO)	BOOLEAN
38.	INSIDE DIMENSIONS OF METER BOX ARE SUITABLE FOR INSTALLATION OF ALL TYPES OF METERS PURCHASED FROM VARIOUS METER MANUFACTURERS (YES / NO)	BOOLEAN
39.	COVER MADE OVERLAPPING TYPE HAVING COLLARS ON ALL FOUR SIDES (YES / NO)	BOOLEAN
40.	HINGES / STRIP HINGES ARE PROVIDED FROM INSIDE (YES / NO)	BOOLEAN

**TECHNICAL SPECIFICATIONS OF THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)**

41.	HINGES ARE MADE OF 14 SWG M.S. SHEET & ARE 40 MM IN LENGTH FOR LOWER PARTITION & 60 MM IN LENGTH FOR UPPER PARTITION (YES / NO)	BOOLEAN
42.	DOOR OPENS FROM RIGHT TO LEFT BY 90° (YES / NO)	BOOLEAN
43.	COLLAR OF DOOR OVERLAPS COLLAR OF BODY OF BOX BY 8 MM (YES / NO)	BOOLEAN
44.	COVER PROVIDED WITH SEMI CIRCULAR / CIRCULAR GOOD QUALITY NEOPRENE RUBBER GASKET OF 4 MM THICKNESS TO COMPLETELY FIT TO BASE (YES / NO)	BOOLEAN
45.	MATCHING WIRE SEALING HOLES FOR MSEDCL SEALING PURPOSE ARE PROVIDED (YES / NO)	BOOLEAN
46.	METER BOX CONFIRMS TO IP-55 (YES / NO)	BOOLEAN
47.	RUBBER LINING FIXED WITH ADHESIVE (YES / NO)	BOOLEAN
48.	TWO NUMBERS U-SHAPED LATCH ARRANGEMENT PROVIDED TO EACH COMPARTMENT (YES / NO)	BOOLEAN
49.	HOLE OF 2 MM DIAMETER PROVIDED ON U-SHAPED LATCH (YES / NO)	BOOLEAN
50.	ADDITIONAL HOLE OF 8 MM PROVIDED IN THE U-SHAPED LATCH FOR LOCKS (YES / NO)	BOOLEAN
51.	ALL HOLES ON U-SHAPED LATCH ALIGN WHEN LATCH IS IN CLOSED POSITION (YES / NO)	BOOLEAN
52.	2 WINDOWS WITH TOUGHENED / TRIPLEX GLASS FIXED WITH STAINLESS STEEL FRAME FROM INSIDE (YES / NO)	BOOLEAN
53.	MSEDCL LOGO PROVIDED ON WINDOW GLASS (YES / NO)	BOOLEAN
54.	GLASS FITTED IN FRAME WITH A WRAP AROUND SINGLE PIECE RUBBER RING WITHOUT JOINT MADE FROM GOOD QUALITY NEOPRENE RUBBER (YES / NO)	BOOLEAN

**TECHNICAL SPECIFICATIONS OF THREE PHASE ENERGY METER BOX SUITABLE FOR AUTOMATIC METER READING (AMR) OF DISTRIBUTION TRANSFORMER CENTRE (DTC)**

55.	SIZES OF WINDOWS AS PER SPECIFICATION (YES / NO)	BOOLEAN
56.	MOUNTING ARRANGEMENT OF METER, MODEM & ANTENNA IN METER BOX IS BY WAY OF ADJUSTABLE SLOTTED POLYMERIC BRACKETS / STRIPS AS PER SPECIFICATIONS (YES / NO)	BOOLEAN
57.	MOUNTING ARRANGEMENT RAISED FROM THE BASE OF BOX BODY BY 20 MM (YES / NO)	BOOLEAN
58.	SEVEN MOUNTING MS SCREWS, ONE FOR UPPER (M4 THREADS X LENGTH 12 MM) AND SIX SCREWS (M4 THREADS X 35 MM LENGTH WITH NUT) IN MOVING SLOTTED FLAT ARE PROVIDED (YES / NO)	BOOLEAN
59.	FOUR 40 MM WIDE & 3 MM THICK STRIPS OF L-SHAPE WELDED / FIXED ON THE BOX (YES / NO)	BOOLEAN
60.	4 NOS. HOLES WITH SUPERIOR QUALITY RUBBER CABLE GLANDS OF INTERNAL DIAMETERS 30 MM EACH ARE PROVIDED AT BOTH THE SIDE WALLS OF THE BOX (YES / NO)	BOOLEAN
61.	RUBBER GLANDS ARE FIXED WITH SUITABLE ADHESIVE SO THAT THE SAME DO NOT GET REMOVED (YES / NO)	BOOLEAN
62.	RUBBER GLANDS ARE MADE SUCH THAT INTERNAL DIAMETER OF GLANDS CAN BE CLOSED WITH RUBBER FILM OF APPROXIMATELY 3 MM THICKNESS (YES / NO)	BOOLEAN
63.	ALUMINIUM CONNECTORS ARE PROVIDED (YES / NO)	BOOLEAN
64.	CABLE CONNECTOR CONSISTS OF TWO ALUMINIUM STRIPS OF SIZE 10 MM X 55 MM (YES / NO)	BOOLEAN
65.	BOTH CABLE CONNECTOR STRIPS HAVE HOLES AT ENDS TO CLAMP WITH CABLE BY SCREWS & NUTS (YES / NO)	BOOLEAN
66.	4 CABLE CONNECTORS SETS WITH 4 MM <sup>2</sup> CABLES CRIMPED WITH SUITABLE LUGS AT BOTH ENDS COMPLETE WITH SCREWS & NUTS ARE PROVIDED (YES	BOOLEAN

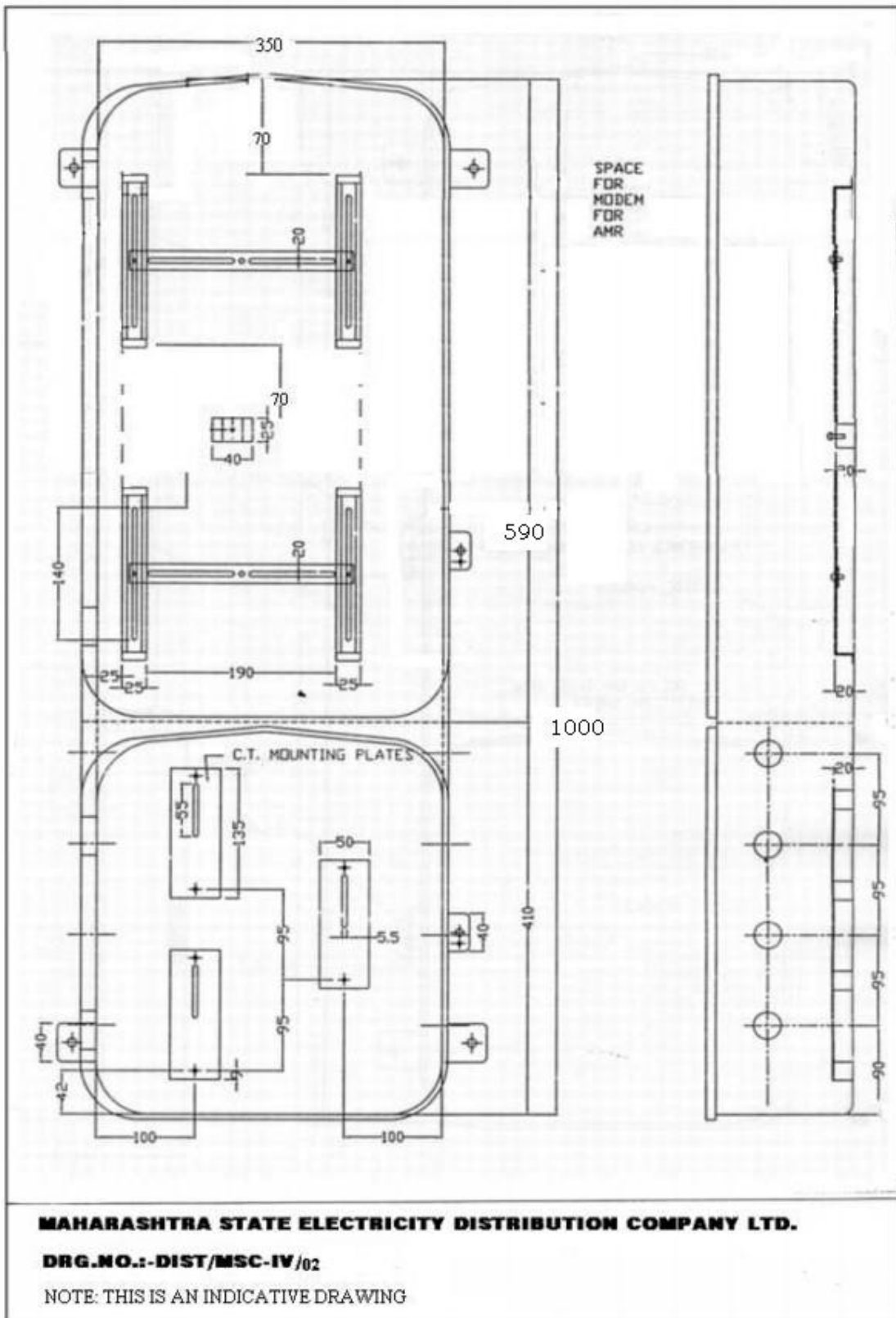


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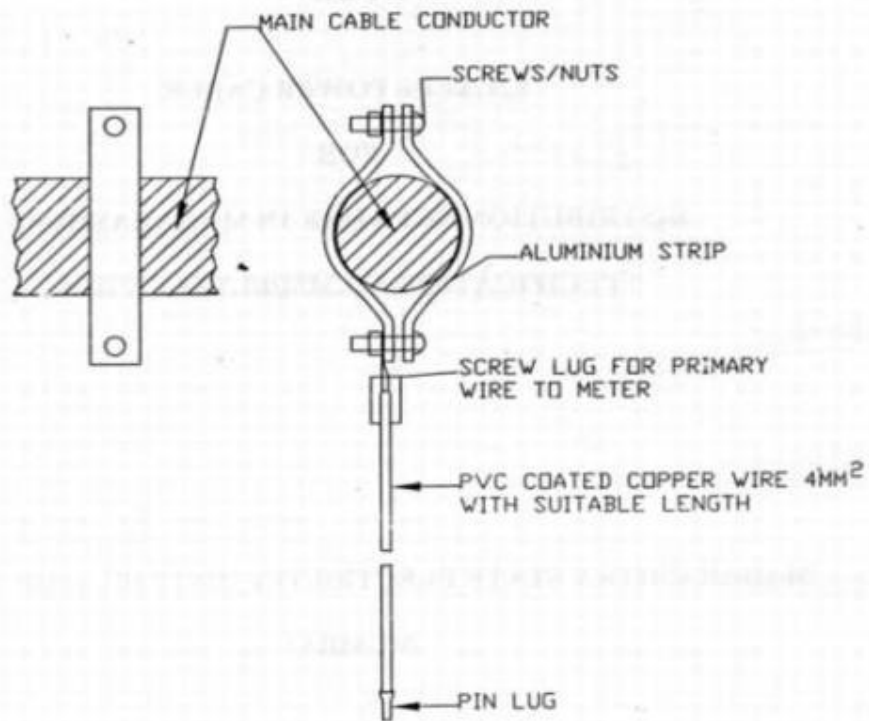
	/ NO)	
67.	CABLE CONNECTORS ARE INSULATED FROM OUTER SIDES WITH EPOXY INSULATION OF 2 MM THICKNESS (YES / NO)	BOOLEAN
68.	HANDLES ARE PROVIDED TO DOORS TO OPEN & CLOSE THE DOORS (YES / NO)	BOOLEAN
69.	TWO ZINC PASSIVATED WITHOUT POWDER COATING EARTHING BOLTS OF SIZE 25 X 8 MM ARE FITTED WITH THE BOX FROM INSIDE WITH 2 PLAIN WASHERS, 1 SPRING WASHER & TWO NUTS (YES / NO)	BOOLEAN
70.	ALL THE SCREWS AND WASHERS ARE PROPERLY ZINC PLATED (YES / NO)	BOOLEAN
71.	LIFE EXPECTED IS 5.5 YEARS (YES / NO)	BOOLEAN
72.	IN-HOUSE TESTING FACILITY AVAILABLE. (YES / NO)	BOOLEAN
73.	DETAILED DIMENSIONAL DRAWING SHOWING CLEARLY THE DIMENSIONS AND MATERIAL FOR METER BOX AND ITS CONSTRUCTIONAL FEATURES IS FURNISHED WITH THE OFFER (YES / NO)	BOOLEAN
74.	NAME PLATE AS PER SPECIFICATION (YES / NO)	BOOLEAN
75.	METER BOX IS TYPE TESTED (YES / NO)	BOOLEAN
76.	TYPE TEST REPORT NOS.	TEXT
77.	WHETHER YOU AGREE TO SUPPLY METER BOXES AS PER ANNEXURE – D, I.E. TECHNICAL SPECIFICATIONS OF THE TENDER (YES / NO)	BOOLEAN
78.	WHETHER TYPE TEST REPORTS ALONGWITH THE COPY OF THE SAME IN TWO CDS ARE SUBMITTED (YES / NO)	BOOLEAN
79.	<p><b>QUALIFYING REQUIREMENTS</b></p> <p>(A) BIDDER HAVE TURNOVER OF 60% OF THE ESTIMATED COST OF THE TENDER DURING ANY ONE OF THE LAST THREE FINANCIAL YEARS (YES /</p>	BOOLEAN

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	NO)	
80.	(B) BIDDER HAVE SUPPLIED ONE LACS ENERGY METER BOXES DURING THE LAST THREE FINANCIAL YEARS (YES / NO)	BOOLEAN
81.	(C) BIDDER HAVE MINIMUM EXPERIENCE OF THREE YEARS OF SUPPLY OR MANUFACTURING FOR METER BOXES UPTO THE END OF THE LAST FINANCIAL YEAR (YES / NO)	BOOLEAN
82.	GTP CURRENT TRANSFORMER	
a.	MAKE AND TYPE OF CT	TEXT
b.	APPLICABLE STANDARDS	TEXT
c.	CT RATIO	TEXT
d.	ACCURACY CLASS	TEXT
e.	RATED BURDEN	TEXT
f.	INSTRUMENT SECURITY FACTOR	TEXT
g.	RATED SHORT TIME CURRENT	TEXT
h.	REATED DYNAMIC CURRENT	TEXT
i.	INSULATION CLASS	TEXT
j.	RATED CONTINUOUS MAXIMUM CURRENT	TEXT
k.	TYPE TEST REPORT NO.	TEXT







PRIMARY CABLE CONNECTOR ASSEMBLY

**MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LTD.**

**DRG.NO.:-DIST/MSC-IV/03**

NOTE: THIS IS AN INDICATIVE DRAWING