

**TECHNICAL SPECIFICATION FOR 11KV INDOOR/OUTDOOR & 22KV/33KV
OUTDOOR METERING CUBICLE
SPEC NO.CE (DIST)/MM-IV/09/ 23.10.2007
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1.0 SCOPE:-

1.1 This specification covers the design, fabrication, painting and supply of metal cabinet, supply of components, wiring, testing at works, packing and supply on destination basis and performance testing of 11kV, & 22kV & 33KV self equipped metering cubicle. Trivector meter is not in the scope of supply. The metering cubicle shall be suitable for indoor/outdoor application.

1.2 It is not the intent to specify completely herein all details of the design and construction of equipments. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship mentioned in clause 4.0 and shall be capable of performing in continuous commercial operation upto the supplier'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 this judgment, is not in accordance therewith. The equipments offered 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 supplier's supply, irrespective of whether those are specifically brought out in this specification and / or the commercial order or not.

2.0 SPARES:-

Anticipated requirement of spares like CT, PT etc., shall be submitted. The tenderer shall quote unit rates for these spares. The purchaser reserves the right of selection of items and quantities of these spares to be ordered. The costs of such spares shall not be considered for tender evaluation.

3.0 SERVICE CONDITIONS:-

- i. Location - Any where in the state of Maharashtra
- ii. Maximum altitude above mean sea level - 1000 meters
- iii. Maximum ambient average temp. - 50 Degree C.
- iv. Maximum temperature in shade - 45 Degree C.
- v. Minimum air temperature in shade - 3.5 Degree C.
- vi. Relative humidity (%) - 10 to 100%
- vii. Maximum annual rainfall (MM) - 1450 MM
- viii. Maximum wind pressure (kg/sq.mm) - 150 (kg/sq.mm)
- ix. Seismic level (Horizontal acceleration) - 0.3g (as per IS1893)
- x. Isoceraunic level (days/year) - 50 (days/year)
- xi. Climate – Moderately hot, humid, tropical, conducive to rust and fungus growth.
- xii. The highest temperature in the cubicle may go up to 85 deg.c

4.0 STANDARD:

Unless otherwise specified elsewhere in this specification, the rating , performance and testing of the metering cubicle and accessories shall conform to the latest revisions, available at the time of submission of tender of all relevant standards listed in Annexure I

5.0 PRINCIPAL PARAMETER

The equipment covered in this specification shall meet the technical requirements listed in Annexure II.

6.0 GENERAL TECHNICAL REQUIREMENTS:

6.1 GENERAL ARRANGEMENT

The metering cubicle shall be installed electrically in between the incoming supply point and the step down transformer of consumers' installation. The general arrangement of the cabinet shall be as per the enclosed drawing and final drawing approval has to be obtained after approval of prototype sample, as mentioned at clause 11.0 As shown in the general arrangement drawing, the metering cubicle shall be provided with following components suitably mounted:

1. 3 Nos. 11/22/33 kV class current transformer (CTs).
2. 3 Nos. 11/22/33 kV class Potential transformer (PTs).
3. Tinned copper busbars/connecting links totally covered by resin casting.
4. The secondary wires from the terminals of CTs & PTs in the CT/PT. Compartment shall be covered by resin cast blocks and the secondary wires shall be brought in the metering compartment through rubber bush and shall be left open duly crimped with suitable pin type copper lugs.
5. Resin cast bushing board/s with arrangement to receive Reychem or equivalent type of cable terminations for incoming and outgoing supply points.
6. Adequate number of PVC cable glands to receive purchaser's incoming and / or outgoing cables.
7. Electronic safety lock (optional).

The principal parameters of all the above said components are listed in Annexure II and the General technical requirements are described hereinafter.

6.2 CONSTRUCTIONAL FEATURES OF THE CABINET

The metering cubicle shall consist of four metal enclosed compartments as follows:

- | | |
|-----------------------------------|--------|
| I. C.T. / P.T. Compartment | 1 Nos. |
| II. Cable termination compartment | 2 Nos. |
| III. Meter compartment | 1 Nos. |

6.2.1 C.T. / P.T. Compartment :

3 nos. of C.T.s & 3 nos. of P.T.s shall be mounted in this compartment. Resin cast boards shall be provided on the two sides leading to two cable compartments.

6.2.1.1 The inside terminals of the resin cast bushings, the primary terminals of CTs and primary terminals of PTs shall be connected by 25 mm X 6mm size links of electrolytic grade tinned copper. All the terminals and links shall be covered by resin casting in rectangular blocks so that no HT part is accessible.

6.2.1.2 The secondary wiring of CTs & PTs shall be carried out by 1100 V grade multi-stranded single core copper cable. Size of copper cable shall be 4 sq. mm. for CTs & 2.5 sq. mm. for PTs. Other end of these wires shall be brought to the meter compartment, crimped with suitable pin type of copper lugs. Entire wiring of cubicle except in the meter compartment shall be covered by resin casting in rectangular block so as not to have easy access without breaking of resin casting.

6.2.1.3 The CTs & PTs shall be firmly mounted on bottom plate of this compartment. Additional support if necessary may be provided for mounting CT/PT so that the bushing terminals, CT primary terminals & PT primary terminals are at same horizontal level.

6.2.1.4 The CT/PT Compartment shall be provided with detachable top cover having 5 to 10 degree slope from the front to rear side with the canopy on front side.

6.2.1.5 The detachable top cover shall be provided with suitable interlock so that the same can not be opened without opening the door of the meter compartment.

6.2.1.6 As the CT/PTs incorporated in the cubicles are of resin cast type, ventilation for sufficient air circulation will have to be provided. This should be done by providing air-vent pipes as shown in the drawing.

6.2.2 Cable compartments:

Cable compartments for housing purchaser's cable/ cable terminations shall be provided on both sides.

6.2.2.1 Detachable gland-plates shall be provided, at the bottom side of this compartment, for accommodating 11/22/33 kV XLPE, 3 core cables (120 Sq.mm. to 300 Sq.mm.).

6.2.2.2 Detachable covers shall be provided on sides of these compartments and the roof shall be sloping 5 to 10 degrees towards the ends with canopy.

6.2.2.3 Two No.s of danger boards of M.S. plate shall be provided as per enclosed drawing.

6.2.3 Meter Compartment :

Meter compartment with front door shall be provided on front side of the CT/PT compartment.

- 6.2.3.1 The rubber gaskets shall be provided on stationary part of the compartment so that edges of door shall rest on it.
- 6.2.3.2 The door shall be provided with Godrej-Ultra lock.
- 6.2.3.3 The door shall be provided with non-resettable mechanical impulse counter to monitor the number of times the door has been opened.
- 6.2.3.4 The door shall be supported by strong, heavy duty concealed type (hinges shall not be accessible from outside) hinges.
- 6.2.3.5 Toughened glass window of size 150 X 100 X 5 mm for easily viewing the energy meter should be provided. The glass should be provided with suitable weather proof seal to prevent ingress of rain water and any screws, bolts and nuts for fixing the glass should not be accessible from outside . Hinged metal cover to the glass window shall be provided to shield the glass from sun rays and mechanical damages.
- 6.2.3.6 The metering components shall be provided with 'Heat-Ion' lining all over the inside.
- 6.2.3.7 Roof of the metering component shall be slopping 5 to 10 degrees towards front side with canopy.
- 6.2.3.8 The words 'M.S.E.D.C.L.' of 100 mm height shall be punched/embossed on front side door.

6.2.4 General Features:

The metering cubicle shall comprise of rigid welded structural frame enclosed completely by M.S sheets of not less than 2 mm thickness. Structural frame and supporting angles should be of M.S angle of size 50x50x6 mm minimum. All the compartments of the cubicle shall be welded from inside and detachable covers/components should be bolted. Bolts with hole shall be provided for sealing purpose at opposite corners of the top cover. The fabrication of the cubicle should be such that there is no ingress of water.

- 6.2.4.1 All doors and removable covers shall be gasketed all around with neoprene gaskets and the metering cubicle shall meet the requirements of IP – 55 protection as per IS- 12063, if the air –vents are closed.
- 6.2.4.2 The metering cubicle shall be mounted on concrete plinth of 2 feet height so as to bring the meter window at normal eye level. A bottom frame of M.S. angles as shown in the drawings shall be provided, duly welded, for mounting the cubicle on the plinth.
- 6.2.4.3 4 lifting hooks of suitable size shall be provided at the top for lifting the cubicle.
- 6.2.4.4 The metering cubicle shall be painted by powder coating after proper cleaning. The colour shall be 'Light Gray'. Finished painted appearance of equipment shall present an aesthetically pleasing appearance, free from dents and uneven surfaces.

7.0 **EARTHING:**

- 7.1 Nine independent G.I. earthing bolts of at least M 10 size should be provided on sides so that the inside and outside earthing can be done. It should be firmly welded to the sides.

- 7.2 An earthing bus of copper strip of size 25 x 3 mm shall be provided and extended throughout the length of the metering cubicle. It shall be bolted /brazed to the framework at two points. PT primarily earthing may be made at 2 locations by 25 x 3 mm copper strips.
- 7.3 All non-current carrying metal work of the switchboard shall be efficiently bonded to the earth bus.
- 7.4 Hinged doors shall be earthed through flexible earthing braid.

8.0 **Cable Glands:**

The sizes of 11/22/33 kV power cable being arranged by the purchaser for incoming and/or outgoing supply shall be 120 sq. mm to 300 sq. mm XLPE CABLES.

The bidder shall provide connecting leads of adequate size with terminal clamps for connecting cable terminals to busbars. The arrangements shall be suitable for double bolt connection as shown in the drawing. Two sets of one plain washer and one cup washer and two nuts and one bolt shall be provided for the purchasers incoming/outgoing cable connections. The bidders scope shall also include necessary number of heavy duty PVC cable glands for terminating 11/22/33kV power cables.

9.1 **Instrument Transformers:**

- 9.1.1 The current transformers (CTs) and potential transformers (PTs) shall conform to the requirement stipulated in relevant standards as well as in Annexure II.
- 9.1.2 The CTs & PTs shall be of cast resin type (Insulation Class 'E') and shall be able to withstand the thermal and mechanical stresses resulting from the maximum short circuit & momentary current ratings specified. These shall be completely encapsulated. The resin used for manufacturing of CT/PT and Bushing Board shall be of reputed make and resin casting shall be carried out under vacuum by hot setting process only. Cold setting epoxy resin of reputed make should be used for casting over complete inside wiring, connecting strips on HV side.
- 9.1.3 CTs /PTs shall have polarity marks indelibly marked on each transformer and at the associated terminal block.
- 9.1.4 CTs/PTs shall be of the single phase type
- 9.1.5 Core lamination shall be of high grade steel or other equivalent alloy.
- 9.1.6 Name plate showing particulars and connection diagram shall be provided. They shall be made of non-corrosive material, shall be indelibly punched/painted and shall be firmly fixed on the body of instrument transformer.
- 9.1.7 The CTs & PTs shall be suitable for floor mounting in the cubicle.

9.2 **Electronic Lock (Optional):**

A dynamic electronic locking system for the cubicle shall be offered as optional item. The dynamic lock shall consist mainly of -

- 1) Master Unit with LCD to programme REMOTE at purchaser's office,
- 2) Portable REMOTE with KEYBOARD to operate the door of the panel lock.
- 3) PANEL LOCK with sensor to lock/unlock door of cubicle.

MASTER UNIT:

The unit shall contain LCD display and a socket to connect REMOTE, when powered, it should show current date and time. The clock for this purpose shall be simple but tamper proof clock. Once connected to REMOTE using cable, the lock should open only when ID of MASTER matches with that of REMOTE. The REMOTE should be programmed for specific panel lock only. The secret code for transmission should be complete and should not follow normal arithmetic rules. Random codes should be generated which shall be unique for specific lock. The secret code should be a function of that particular date so that once a REMOTE is programmed; it shall be effective only for certain hours say end of the day. Transmission of secret code of PANEL LOCK should be done on dual transmission technique i.e. Infra Red (IR) and Radio Frequency (RF) encoding, using these two techniques coupled with Random Code generation technique mentioned above shall provide the secret code system which cannot be broken.

REMOTE:

A REMOTE of simple design having a keypad as in the telephone instrument shall be provided. The REMOTE shall have a unique ID code to have dialog with MASTER. Once programmed the REMOTE shall be useful for operating PANEL LOCK for that particular day only.

PANEL LOCK:

The PANEL LOCK shall consist of an RF & IR sensor and motorised mechanical lock. The motor of the mechanical lock shall be operatable at 230 volt single phase A.C. power supply. The lock shall have minimum 4 nos of cylinders of 14mm diameter which shall engage the cubical door. The sensor shall also indicate power on/off and status of lock.

The MASTER and the REMOTE shall be programmable/usable for number of PANEL LOCKS- the limitations if any, may be specified by the bidders.

Any other techno-economical acceptable alternative designs shall be considered but indenter /Purchaser shall be final authority in this regard.

10.0 Testes & Test Certificate:

10.1 Acceptance and Routine Test:

Following tests shall be carried out as acceptance and routine tests.

10.1.1 For Current Transformers.

All tests as per clause No.9.1.2 of IS – 2705 (Part-I) 1992.

10.1.2 For Potential Transformer.

All tests as per clause No. 9.1.2 of IS-3156 (Part-I) 1992

10.1.3 For Complete Unit:

- i) Temperature rise test on complete unit at rated current of cubicle.
- ii) Power frequency withstand test at 28 kv, 50 kv and 70 kv for 11 kv, 22 kv and 33 kV cubicle respectively.
- iii) Overall dimension.

For CTs and PTs required tested shall be carried out at the original manufacturer's works in the presence of purchaser's representative.

10.2 Type Tests:-

For the CTs and PTs, the type tests shall be carried out for each voltage class and for each rating of short time withstand current with lowest CT ratio.

10.2.1 For Current Transformer:

All testes (Except High Voltage power frequency wet withstand test) as per clause No. 9.1.1 of IS-2705 (Part-I) 1992. Amended up to date, considering outdoor application of CTs.

- Short time current tests.
- Temperature rise test.
- Lightning impulse test for CT for service in electrically exposed installation.
- Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

10.2.2 For Potential Transformer:

All testes (Except High Voltage power frequency wet withstand test) as per clause No. 9.1.1 of IS-3156 (Part-I) 1992. Amended up to date, considering outdoor application of PTs.

- Temperature rise test.
- Lightning impulse test for PT for service in electrically exposed installation.
- Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

10.2.3 For Complete Unit:

- Temperature rise test on complete unit at the rated current of cubicle of each voltage class with highest C.T. ratio.(IS 3427(1997).
- Power Frequency Withstand Test at 28 kV, 50kV and 70kV for 11kV, 22kV and 33 KV cubicle respectively.

- Impulse Wave Withstand test at 75 kV, 125kV & 170kV for 11kV,22kV and 33 KV cubicles (considering that the cubicles are meant for outdoor use) as per IS-2071.
- Type test for IP-55 protection as per category '1' as mentioned as per clause no. 7.5 of IS 12063.
- Short time withstand current test, shall be performed on the cubicle by passing a current of 13.1 KA for 1 Sec. for 11kV and 26.2 KA for 1 sec. for 22/ 33kV, with CT/PT bypassed. (IS 3427-1997).

10.3 Type Test Reports:

The HT Metering cubicles, CTs and PTs shall be fully type tested as per relevant IS and this specification. The tenderer shall furnish detailed type test reports of all the type tests for offered CTs, PTs and HT Metering Cubicles. For these CTs & PTs, the type tests shall be for each voltage class and for each rating of short time current. These tests should have been carried within 5 years prior to the date of submission of type test reports. If TTRs as above are not submitted on or before due date and time, the offer shall stand rejected. The purchaser reserves the right to demand repetition of some or all TTRs in presence of purchaser's representative at purchaser's cost. In case the unit fails in any one type test, the complete supply shall be rejected.

All above type tests shall be carried out at NABL Laboratories to prove that the complete HT Metering Cubicles, CTs and PTs offered meet the requirements of specification. The successful tenderer shall take approval/waival of type tests from CE (DIST), MSEDCL Mumbai prior to commencement of supply.

10.4 Minimum Testing Facilities:

The Tenderer must clearly indicate the details of testing facilities available at the works of manufacturer and that the facilities are adequate to carry out all routine and acceptance tests. These facilities should be available to MSEDCL's Engineers, if deputed to carry out or witness the tests at the manufacturer's works.

10.4.1 For CT/PT at original manufacturer's works:

- Class of accuracy test panel for CTs with phase angle and ratio error measuring unit with Current source, Burden box and standard CT.
- Class of accuracy test panel for PTs with phase angle and ratio error measuring unit with Voltage source, Burden box and standard PT.
- Partial discharge test setup.
- Resistance Voltage Divider.
- High Frequency Generator Set with control panel.
- Milli Ohms Meter.
- Over voltage inter turn test bequpment.

10.4.2 HT Metering Cubicle :

- Power Frequency Withstand Test Generator Set with control panel.

- Current source for temperature rise test with digital ammeter, volt meter, temperature indicators and Tong Tester.

10.5 Minimum Manufacturing Facilities :

The tenderer should have following minimum manufacturing facilities in house to prove his reliability as a manufacturer of HT Metering Cubicle.

- a. Power operated shearing machine.
- b. Power operated press brake.
- c. Power operated press.

The tenderer shall furnish details of Powder Coating process employed.

11.0 PROTOTYPE AND DRAWING:

The successful bidder will have to offer a prototype sample for inspection before bulk manufacturing. The prototype sample will be inspected by a team of purchaser's representatives. On approval of prototype the bidder will have to submit the drawings accordingly and get it approved from C.E. (Distribution) before bulk manufacturing and supply. No additional delivery period will be permitted for approval of prototype and drawings.

12.0 Inspection:

The inspection may be carried out by the purchaser at any stage of manufacture. The successful tenderer shall grant free access to the purchaser's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the purchaser shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective.

13.0 Documentation:

13.1 The tenderer shall furnish two sets of following drawings and documents along with his offer.

- Complete assembly drawings of the metering cubicle showing plan, elevation and typical sectional views and locations of cable boxes, busbars, metering compartment and TV meter.
- Foundation plan showing location of foundation channels, anchor bolts and anchors, floor plan and openings for cables etc.
- Type test certificates for type testing of bought out items, if already carried out.
- Descriptive pamphlets and literature of bought out items including CT characteristic curves etc.

13.2 All drawings and data shall be annotated in English

- 13.3 Successful tenderer shall be required to furnish four sets of final versions of all the above said drawings and documents within 15 days after Proto type inspection, for purchaser's approval.
- 13.4 Approval of drawings/work by purchaser shall not relieve supplier of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirement of the latest revision of applicable standards, rules and codes for practices. The equipment shall conform in all respects to high standards of engineering, design, workmanship and latest revisions of relevant standards at the time of ordering and purchaser shall have power to reject any work or materials which, in his judgment, is not in full accordance therewith.

14.0 Packing & Forwarding:

The equipments shall be packed in crates suitable for vertical/horizontal transport, as the case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit. due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with appropriate caution symbols. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc. shall be provided.

Any material found short inside the packing cases shall be supplied by supplier without any extra cost.

- 14.2 Each consignment shall be accompanied by a detailed packing list containing the following information.
- a) Name of the consignee
 - b) Details of consignment
 - c) Destination
 - d) Sign showing upper/lower side of the crate
 - e) Handling and unpacking instructions
 - f) Bill of material indicating contents of each package.
- 14.3 The supplier shall ensure that the packing list and bill of material are approved by the purchaser before dispatch.

15.0 Schedule:

- 15.1 The tenderer shall fill in the following schedules which form part of the tender specification and offer. If the schedule are not submitted duly filled in with the offer, the offer shall be liable for rejection.
- Schedule -'A' - Guaranteed and technical particulars.
 - Schedule -'C' - Tenderer's Experience
- 15.2 Unless otherwise brought out separately by the tenderer, the equipment offered shall be claimed to conform to the specification, scrupulously. The discrepancies between the specification and the catalogues or literature submitted as part of the offer shall not be considered as valid unless specifically brought out.

ANNEXURE - I
LIST OF APPLICABLE STANDARDS

| Sr.No. | STANDARD NO. | T I T L E |
|--------|------------------|--|
| 1 | IS – 2071 | Method Of High Voltage Testing |
| 2 | IEC- 185 | Current Transformers |
| 3 | IEC- 270 | Partial Discharge Measurement |
| 4 | IEC – 60 | High Voltage Test Techniques |
| 5 | IEC – 8263 | Method of RIV test on high voltage insulators |
| 6 | IEC – 186 | Voltage Transformers |
| 7 | IS – 2705 | Current Transformers |
| 8 | IS – 3156 | Voltage Transformers |
| 9 | IS – 11322 | |
| | IEC -44 - Part 4 | Partial Discharge Measurement |
| | IEC – 137 | |
| 10 | IS – 12063 | Classification of degree of protection provided by enclosures of Electrical equipments |
| 11 | IS – 3427 | HT switchgear and controlgear |

ANNEXURE – II
PRINCIPAL TECHNICAL PARAMETERS OF EQUIPEMNT

| Sr. No. | ITEM | Specification | | |
|-----------------------------|--|---------------|----------|----------|
| A) SYSTEM PARAMETERS | | | | |
| 1 | Rated voltage | 11kV | 22kV | 33kV |
| 2 | Highest System Voltage | 12 kV | 24 kV | 36 kV |
| 3 | short circuit withstand current and duration (KA rms/sec) | 11 kV | 22 kV | 33 kV |
| | FOR 100/5A | 13.10kA | 26.20 kA | 26.20 kA |
| | FOR 50,25/5A | 6.70 kA | 13.10 kA | 13.10 kA |
| | FOR 10/5A | 3.00 kA | 6.70 kA | 6.70 kA |
| | FOR 5/5A | 3.00 kA | 3.00 kA | 3.00 kA |
| 4 | Frequency | 50 Hz | 50 Hz | 50 Hz |

B) CURRENT TRANSFORMER

| | | | | |
|-----|--|-----------------------------|-------------|-------------|
| 1 | Type | Single Phase , cast resin | | |
| 2 | Insulation class | 'E' | | |
| 3 | Rated voltage | 11KV | 22KV | 33KV |
| 4 | Rated primary current (A) | 5,10,25,50,100 | | |
| 5 | Rated secondary current (A) | 5 | | |
| 6 | Basic insulation level (KV) | 12/ 28/ 75 | 24/ 50/ 125 | 36/ 70/ 170 |
| 6.1 | One minute power frequency Withstand voltage (KVrms) | 28 | 50 | 70 |
| 6.2 | 1.2/50 microsecond impulse voltage (KVP) | 75 | 125 | 170 |
| 7 | Rated contineous thermal current | 1.2 times the rated current | | |
| 8 | Burden (VA) | 10 VA | | |
| 9 | Accuracy class | 0.5 | | |
| 10 | Instrument security factor | 5 or less | | |
| 11 | Core details | Single core | | |

| | | | | | |
|----|--|--|---|---|--|
| 12 | Short circuit withstand current and duration (KA rms/sec) | 11 KV FOR 100/5A FOR 50,25/5A FOR 10/5A FOR 5/5A | 22 KV 13.10kA 6.70 kA 3.00 kA 3.00 kA | 33 KV 26.20 kA 13.10 kA 6.70 kA 3.00 kA | 26.20 kA 13.10 kA 6.70 kA 3.00 kA |
| 13 | Rated dynamic withstand current (KVP) | 2.5 Times STC | | | |
| 14 | Applicable standard | IS-2705 | | | |

C) POTENTIAL TRANSFORMER

| | | | | |
|-----|--|------------------------------------|--------------------------|--------------------------|
| 1 | Rated primary voltage (V) | 11000/ $\sqrt{3}$ | 22000/ $\sqrt{3}$ | 33000 / $\sqrt{3}$ |
| 2 | Rated secondary voltage (V) | 110/ $\sqrt{3}$ | | |
| 3 | Ratio Tap | Single Ratio | | |
| 4 | Core details & purpose | Single core & commercial metering. | | |
| 5 | Type | Resin Cast | | |
| 6 | Insulation class | E | | |
| 7 | Insulation level | | | |
| 7.1 | One minute power frequency Withstand voltage (KVrms) | 28 | 50 | 70 |
| 7.2 | 1.2/50 microsecond impulse voltage (KVP) | 75 | 125 | 170 |
| 8 | Applicable standard | IS - 3156 | | |
| 9 | Ratio(V) | $\frac{11000}{\sqrt{3}}$ | $\frac{22000}{\sqrt{3}}$ | $\frac{33000}{\sqrt{3}}$ |
| 10 | Rated burden | 50VA | | |
| 11 | Class of accuracy | 0.5 | | |

D) METAL CABINET

| | | |
|----|--------------------|----------------|
| 1. | Overall dimensions | As per drawing |
| 2. | Material | Mild Steel |
| 3. | Plate Thickness | |
| | Side plates (mm) | 2 mm |
| | Bottom Plates (mm) | 2 mm |
| | Top Plate (mm) | 2 mm |

E) BUSBARS/ connecting strips.

1. Material
2. Cross Section

E. C. Grade Copper
Rectangular
25mm X 6mm

Schedule "A" : GTP in e-tendering.

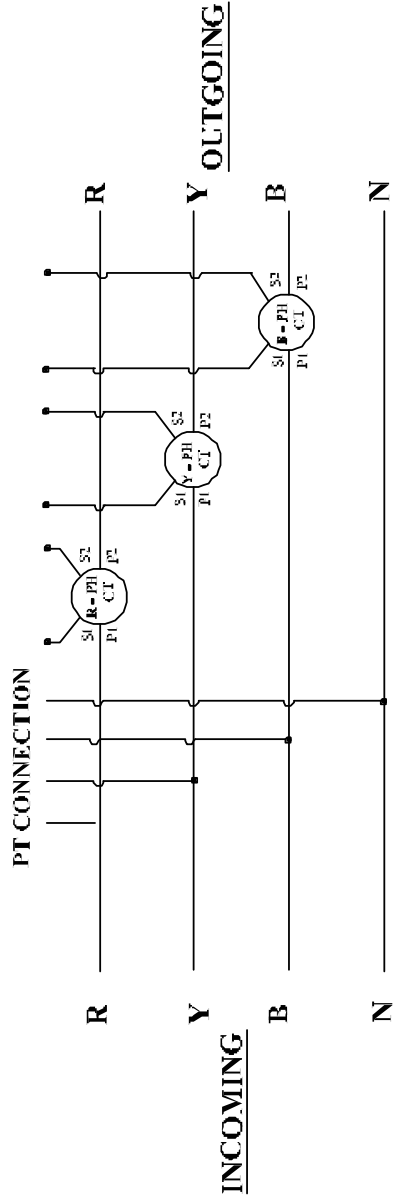
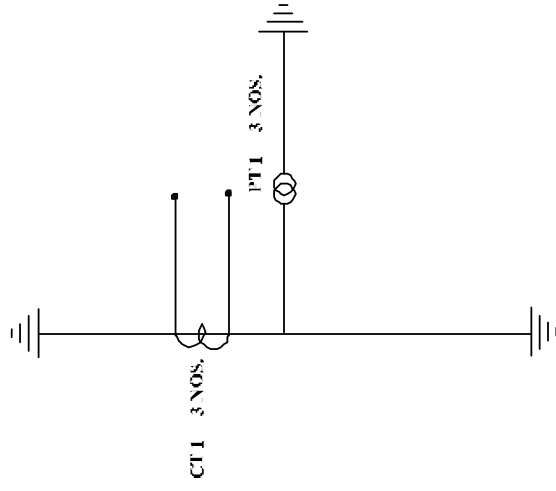
Schedule "C"

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

| Sr.No. | Name of client & description of items ordered | Value of order | Period of supply & commissioning | Name & Address to whom reference may be made |
|--------|---|----------------|----------------------------------|--|
| 1 | 2 | 3 | 4 | 5 |

Name of the Firm :
Name & signature of tenderer :
Designation :
Date :

INCOMING



WIRING DIAGRAM


SINGLE LINE DIAGRAM

| ALL DIMENSIONS IN MM | | DISTRIBUTION SECTION | |
|------------------------|------|----------------------|--|
| DESIGNATION | SIGN | DATE | TITLE |
| JE (MM) | | | SINGLE LINE DIAGRAM INDOOR - OUTDOOR HT METERING CUBICLE |
| EE (MM-IV) | | | |
| SE (MM) | | | |
| CE (DIST) | | | |
| THIRD ANGLE PROJECTION | | | SCALE: 1:1 |
| | | | DRG NO. |

TECHNICAL SPECIFICATION :-

1. FABRICATION : (14 G) 2. MM M.S. SHEET WITH SUPPORTING ANGLES & CHANNEL.
2. PAINTING : POWDER COATING SHADE LIGHT GRAY.
3. BUSBAR : TINNED ELECTROLYTIC COPPER.
4. METER DOOR HINGES WILL NOT BE VISIBLE FROM OUT SIDE WITH ELECTRONICS SECURITY LOCK & GODREJ VIA MECHANICAL LOCK.
5. TOP SIDE COVER (CT PT COVER) INTERLOCK WITH METER DOOR.
6. PROVISION FOR FOR INCOMING & OUTGOING SUPPLY THROUGH CABLE.
7. THE IDENTIFICATION MARK (V.V.B & EARTH TERMINAL WILL BE MARKED BY PAINT OR EMBROSSING.
8. THE EMBROSSING MARK OF MANUFACTURER WILL BE PROVIDED ON EPOXY MOULD OF CT & PT.
9. ENCLOSURE PROTECTION AS PER IP-55 OF IS 13063.

| Sr. No. | Description | QUANTITY NOS. |
|---------|--|---------------|
| 1) | CUBICLES MADE OF 2MM (14 SWG) SHEET METAL. | 1 |
| 2) | CURRENT TRANSFORMER | 3 |
| 3) | POTENTIAL TRANSFORMER | 3 |
| 4) | DOOR WITH GODREJ TYPE MECH. LOCKING ARRANGEMENT | 1 |
| 5) | INCOMING TERMINAL CONNECTION | 3 |
| 6) | OUTGOING TERMINAL CONNECTION. | 3 |
| 7) | COPPER BUSBAR SIZE: 25 X 6 mm INSULATED WITH RESIN CASTBLOCKS | 3 |
| 8) | LIFTING HOOK. | 4 |
| 9) | DANGER BOARD AS PER SPECIFICATION. | 2 |
| 10) | CABLE BOX | 2 |
| 11) | EARTH BOLTS | 5 |
| 12) | SECURITY LOCK ELECTRONICS (OPTIONAL) | 1 |
| 13) | CABLE GLAND PLATE DETACHABLE TYPE | 2 |
| 14) | TOUGHENED GLASS & METALLIC SHUTTER | 1 |
| 15) | TRIVECTOR METER (SUPPLIED BY MISEDCL). | 1 |
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| M.S.E.D.C.L. | | | |
| ALL DIMENSIONS IN MM | DISTRIBUTION SECTION | | |
| DESIGNATION | SIGN | DATE | TITLE |
| DRAWN BY | JE (MM) | | |
| CHECKED BY | EE (MM-HV) | | INDOOR / OUTDOOR HT METERING CUBICLE |
| APPROVED BY | SE (MM) | | |
| | CE (DISE) | | SCALE: N/A |
| THIRD ANGLE PROJECTION | |  | DRG NO. |