

**TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED  
VIDYUT SOUDHA :: HYDERABAD**

**ABSTRACT**

APTRANSCO - Guide lines for wiring of tariff meters of Generators / Bulk load consumers - Orders- Issued.

T.O.O. (JMD/V&S), Ms. No.394

Dated: 19.01.2012

Read the following:

Ref: Note from DE/MRT Vigilance/APTRANSCO, Dt. 04.01.2012.

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ORDER:

Divisional Engineer/ MRT Vigilance/APTRANSCO submitted vide reference cited, the proposal for standardization of wiring for tariff meters of Generators/Bulk load consumers.

After careful consideration of the proposal of DE/MRT Vigilance/APTRANSCO, the Transmission Corporation of A.P. Limited accords approval for guide lines & diagrams for wiring of tariff meters of Generators/Bulk load consumers as per Annexure I, II & III appended to this T.O.O.

Encl: Annexure I, II & III.

**(BY ORDER AND IN THE NAME OF TRANSMISSION CORPORATION OF A.P. LIMITED)**

UMESH SHARRAF  
Joint Managing Director  
(Vigilance & Security)

To  
The Chief Engineers/Metro Zone, Hyderabad/ Rural Zone, Hyderabad /Kadapa zone/  
Warangal Zone / Vijayawada Zone / Visakhapatnam Zone.

The Chief General Managers/Operation/APCPDCL, APEPDCL, APNPDCL, APSPDCL.

Copy communicated to

- The Chairman & Managing Director/ APTRANSCO/ VS/ Hyderabad
- The Chairman & Managing Director/ APEPDCL/ Visakhapatnam
- The Chairman & Managing Director/ APCPDCL/ Hyderabad
- The Chairman & Managing Director/ APNPDCL/ Warangal
- The Chairman & Managing Director/ APSPDCL/ Tirupati

Chief Engineer (EA, Opn, RE&IT) APTRANSCO, VS, Hyderabad-82.	
Order No.....	420
21 JAN 2012	
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*AB-6 for my 21/1/12*

*AG*

*21/1/12*

The Joint Managing Director / Comml., IPC & IT / APTRANSCO / Hyderabad  
The Joint Managing Director / HRD & Distribution / APTRANSCO / Hyderabad  
The Director (Transmission)/ APTRANSCO/ VS/ Hyderabad  
The Director (Projects)/ APTRANSCO/ VS/ Hyderabad  
The Director (Grid Operation)/ APTRANSCO/ VS/ Hyderabad  
The Director (Finance & Revenue)/ APTRANSCO/ VS/ Hyderabad  
The Director/ Operation/ APCPDCL/ Hyderabad  
The Director/ Operation/ APEPDCL/ Visakhapatnam  
The Director/ Operation/ APNPDC/ Warangal  
The Director/ Operation/ APSPDCL/ Tirupati

Copy to

The Executive Director/Planning, RAC & Reforms/ APTRANSCO/VS/Hyderabad  
The Chief Engineer/Transmission/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/Power Systems/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/SLDC/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/Construction-I/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/Construction-II/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/Lift Irrigation/ APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/400 KV Construction/APTRANSCO/Vidyut Soudha/Hyderabad  
The Chief Engineer/Commercial/APPCC/Vidyut Soudha/Hyderabad  
The Chief Engineer/IPC/APPCC/Vidyut Soudha/Hyderabad  
✓ The Chief Engineer/RAC, Reforms & IT/APTRANSCO/Vidyut Soudha/Hyderabad - with a request to place the T.O.O on APTRANSCO website.

// Forwarded by Order //



Divisional Engineer  
MRT Vigilance



Annexure-I to T.O.O. (JMD/V&S), Ms. No.394 Dated 19.01.2012

- 1) The meters should be installed as near to the instrument transformers as possible to reduce the secondary loop resistance and potential drop in the secondary leads.
- 2) Dedicated cores of the CTs and PTs should be used for the tariff meters. Other instruments like indicating meters, recording meters and protective relays should not be connected in the tariff metering circuit.
- 3) For connecting the secondary cores of the CTs and PTs to the Main and Check meters, flexible multi-strand copper cable with colour code (RED, YELLOW, BLUE and BLACK) of size not less than 2.5 Sq.mm should be used through G.I. conduits.
- 4) The length of the flexible copper multi-strand cables from CTs & PTs to main & check meters should be such that there is no extra length / loop.
- 5) Separate TTBs (Test Terminal Block) are to be provided for both main & check meters.
- 6) Ferrules, indicating secondary terminals of instrument transformers (like S1, S2, a, n etc.) and terminating points (M, L etc.) should be provided to the CT & PT wiring.
- 7) The Main and Check meters should be connected in series to the same core of the CTs.
- 8) The Main and Check meters should be connected in parallel to the same core of the PTs.
- 9) The Primary Terminal "P1" of CTs should be connected towards BUS side and "P2" should be connected towards the line. The secondary terminal 'S1' should be connected to 'M' of main meter and 'S2' should be connected to 'L' of the check meter as shown in the diagrams.
- 10) It is to be ensured that the meters record energy in EXPORT mode when the power flow is away from the BUS and in IMPORT mode when the power flow is into the BUS.

If the energy recording is not in order as described above, then the secondary connections of the CTs are to be interchanged at the incoming side of the metering panel (at CT TB, if available or at TTBs) so that secondary terminal 'S2' should be connected to 'M' of main meter and 'S1' should be connected to 'L' of the check meter.

Modifications done should be arranged to be displayed as a note in the metering cubicle.

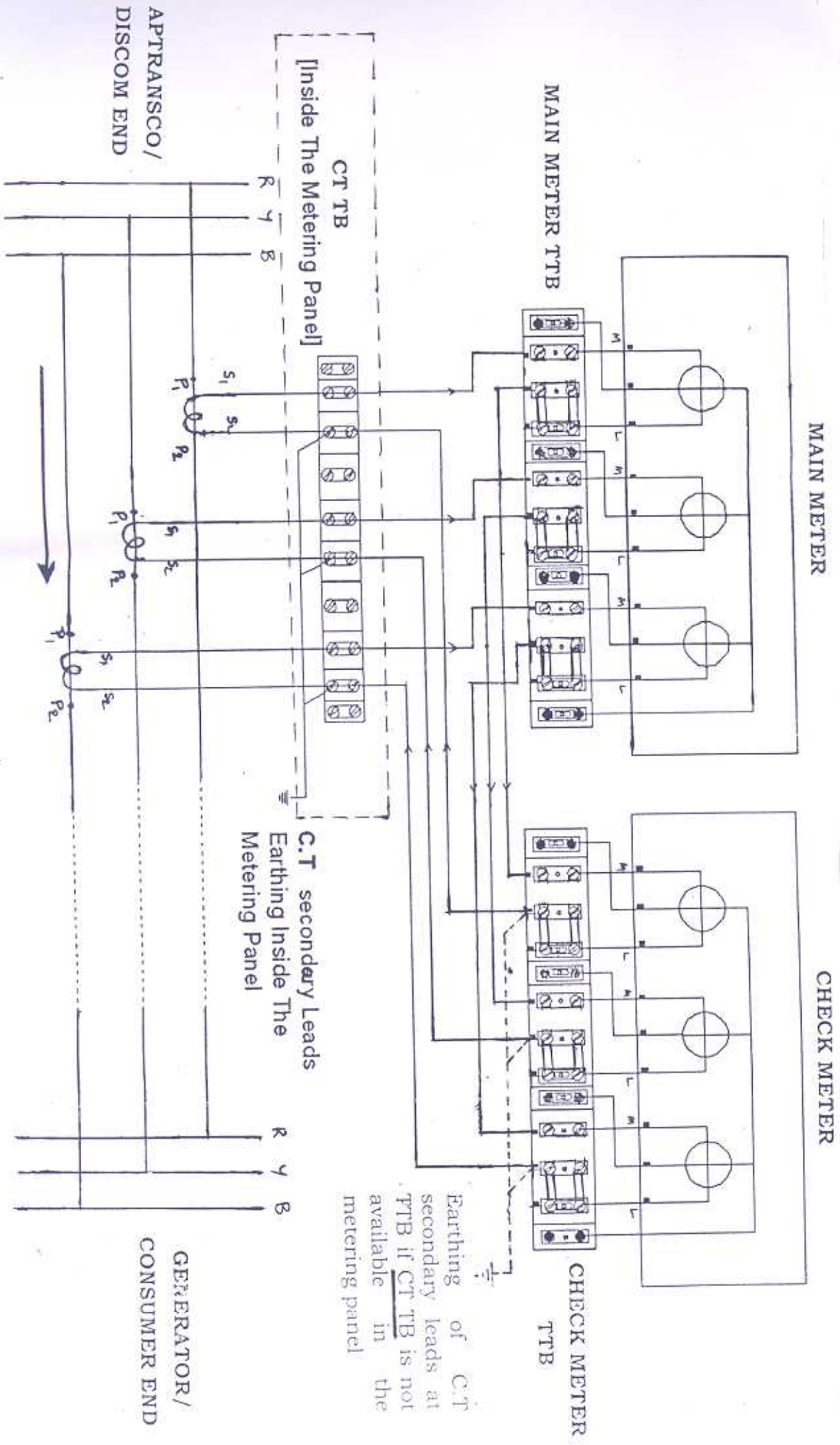
- 11) If the metering location is at the Power Plant/Consumer Switchyard, then the above points should be ensured considering the reference BUS at the power plant/consumer switchyard itself i.e. the meters should record energy in EXPORT mode when the power flow is from Power Plant/Consumer switchyard BUS to APTRANSCO/DISCOM and should record energy in IMPORT mode when the power flow is from APTRANSCO/ DISCOM to Power Plant/Consumer switchyard BUS.

(P.T.O)



- 12) Secondary star points of CTs & PTs should be earthed individually with separate 4 or 6 Sq.mm copper wires (Looping of CT & PT Star points should be avoided).
- 13) Earthing of CT secondary star point should be done in the metering panel either at CT TB or at check TTB as shown in the CT wiring diagram (Annexure-II). Earthing of PT secondary star point should be done in the metering panel either at PT TB or at check TTB as shown in the PT wiring diagram (Annexure-III).  
Note: CT TB (CT Terminal Block) & PT TB (PT Terminal Block) are being provided inside the metering cubicle by some of the cubicle manufacturers.
- 14) Unused CT secondary cores should be properly shorted and earthed in the secondary box itself.
- 15) The earthing terminal provided in the metering panel should be connected directly to the earth flat.
- 16) Effective earthing of metering equipment, metering cubicle, CT secondary & PT secondary star points should be ensured.
- 17) Proper sealing of the instrument transformers, meter terminal covers, MD reset button, Optical port (If AMR is not installed), TTBs and meter cubicle/box should be ensured.
- 18) Further, the instructions issued vide T.O.O. (CE/Comml./APTRANSCO) Rt. No. 537, Dt. 23.03.2010 should be invariably followed for verification/ checking of the Energy meters of Generators, T-D Boundary meter points and Consumers.
- 19) While commissioning the metering CTs & PTs for the upcoming generators/ Bulk consumer services, the following are to be ensured.
  - a. The available CT ratio should be as near to the full load current as possible corresponding to Capacity of the generator/Contracted MD.
  - b. Provision of protection cores in the CTs & PTs meant for tariff metering should be avoided.
  - c. The rated secondary burden should be such that the burden connected on secondary side is at least 25% of the rated secondary burden.
  - d. Provision of TBs (Terminal Blocks) for PT secondary circuit inside the metering cubicle/box, to enable extension of PT supply to AMR modules, thus avoiding more loops & terminations at the TTB terminals.
  - e. Testing of metering CTs and PTs procured by Generators / Consumers at third party laboratories as per the instructions issued vide T.O.O. (CE-Construction-II) Ms. No. 507, Dt.15.03.2011.
- 20) Further, tariff meter wiring of the existing generators/bulk load consumers shall be modified in a phased manner to comply with the above guidelines.

WIRING DIAGRAM OF CTs FOR TARIFF METERS



Earthing of C.T secondary leads at TTB if CT TB is not available in the metering panel

APTRANSCO / DISCOM END

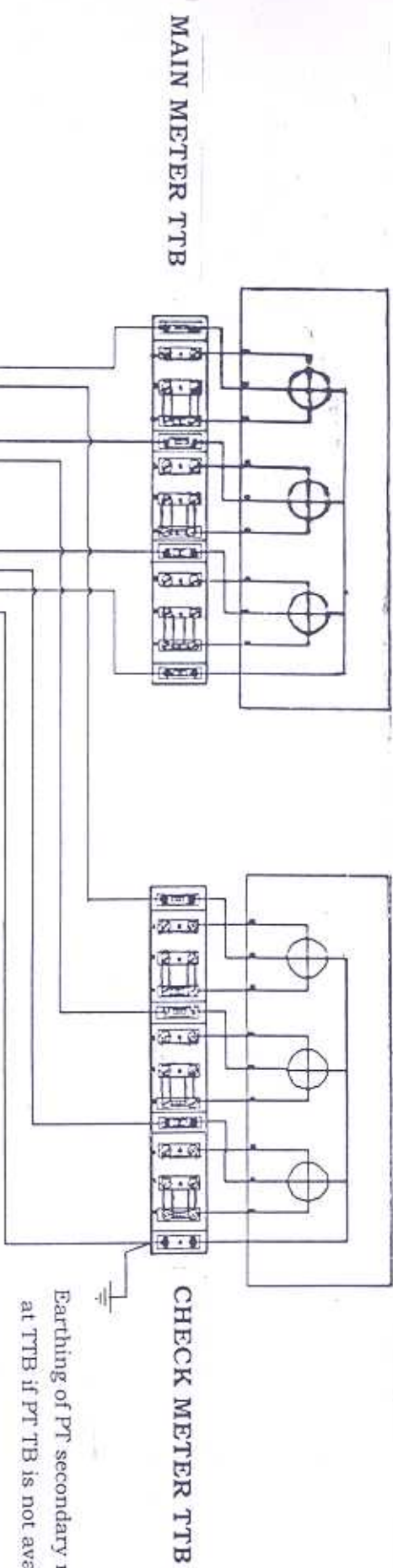
GENERATOR / CONSUMER END



WIRING DIAGRAM OF PT'S FOR TARIFF METERS

MAIN METER

CHECK METER

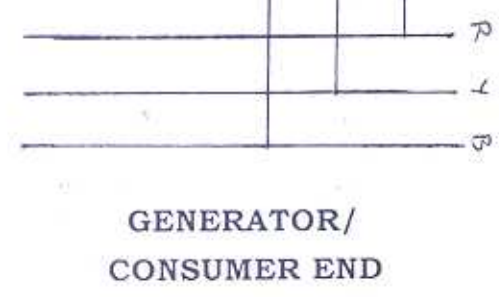
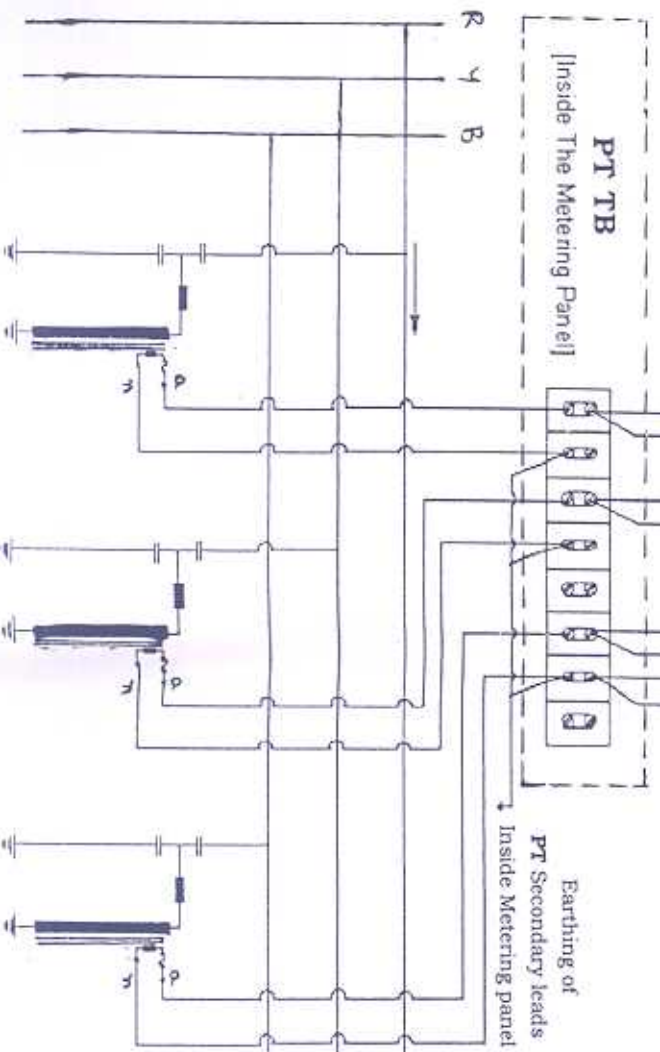


Earthing of PT secondary neutral at TTB if PT TB is not available

If PT TB is not available,

- 1) The secondary neutral points of all the three PTs shall be looped at the secondary boxes to form the star point and single wire shall be taken from that star point to the Main Meter TTB in the metering cubicle.
- 2) PT supply shall be extended to the check meter by providing loops from Main Meter TTB to Check Meter TTB.

APTRANSCO/  
DISCOM END



GENERATOR/  
CONSUMER END