

**TECHNICAL SPECIFICATION FOR HT TVR METERS 11KV/110V,10/5A, 0.2 CLASS  
ACCURACY MD INTEGRATION 30 MIN. IP ( CATEGORY-C FOR SERVICES)  
WITH DLMS (BI-DIRECTIONAL SOLAR NET METER)**

**1.0 SCOPE :**

This specification covers design, engineering, manufacture, assemble, stage testing, inspection and testing before supply and delivery free at destination stores of 11KV/110V,10/5A, 0.2 class Accuracy 30 Min. IP ( Category-C for Services) with DLMS 3 element 4wire CT & PT Operated HT Electronic Trivector Meters(Bi-Directional Solar NET meters) capable of performing the functions of metering for tariff purpose in all 4 quadrants energy audit, load survey at various H.T. consumers installations. All the meters should have suitable in built network interface hardware for CMRI,RMR ( Remote Meter Reading), AMR compatibility to read data through Dial – up, GSM and GPRS modems.

1.1 It is not the intent to specify completely herein all the details of the design and construction of material. However the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation 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 material 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:**

The equipment shall conform in all respects to the relevant Indian Standard Specification with latest amendments thereto.

<b>Indian Standard</b>	<b>Title</b>	<b>International &amp; Internationally recognized standard</b>
CBIP Technical Report No.88/304 (with latest amendments)	Specification for AC Static Electrical Energy Meters.	IEC 687/1992 –Static watt hour meters for classes 0.2S & 0.5S
IS 14697, 1999	AC Static Watthour Meters for active energy Meters of Class 0.5S & 0.2S.	
CBIP Technical Report No.111, May, 1997	Specification for Common Meter Reading Instrument	

IS-5133/1969 IEC 0687/1992 Static watt hour meters for classes 0.2S & 0.5S	Specification for Boxes for the Enclosure of electrical accessories (part-II Boxes made of Insulating material)	
<i>IS 15959:2011 (with latest amendments)</i>	<i>Data Exchange for Electricity meter reading tariff and Load Control Companion specification.</i>	

Equipment conforming to other internationally accepted standards. Which ensure equal or higher quality than the standards mentioned above would also be acceptable. In case the Bidder who wish to offer material conforming to the other standards, salient points of difference between the standards adopted and the specific standards shall be clearly brought out in relevant schedule, Four copies of such standards with authentic English Translations, shall be furnished along with the offer.

### 3.0 SERVICE CONDITIONS:

The equipment to be supplied against this Specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

Sl. No.	Location	At various Sub-stations in the state of Andhra Pradesh
i)	Max. ambient air temperature (deg.C)	50
ii)	Max. ambient air temperature in a closed (deg.C)	60
iii)	Min. Ambient air temperature (deg.C)	7.5
iv)	Average daily ambient air temperature (deg.C)	35
v)	Max. Relative Humidity (%)	100
vi)	Max. altitude above mean sea level (m)	1000
vii)	Average Annual rainfall (mm)	925
viii)	Max. wind pressure (kg/sq.m)	200
ix)	Isoceraunic level (days per year)	50
x)	Seismic level (Horizontal accn.)	0.10.g.
xi)	Noise Level	45 Db

Moderately hot and humid tropical climate, conducive to rust and fungus growth. The climatic conditions are prone to wide variations in the ambient conditions. Smoke is also present in the atmosphere. Heavy lightning also occurs during June to October.

#### 4.0 **PRINCIPAL PARAMETERS :**

The material shall conform to the following specific parameters:

Sl. No.	Item	Specification
1.	Type of Installation	To be installed in VCB panels and also in HT Services
2.	System voltage	110 V phase to phase (+20%,-30%.)
3.	System frequency	50 Hz +/-5%
4.	No. of phases	Three
5.	System of earthing	Solidly grounded

#### 5.0 **TECHNICAL REQUIREMENTS:**

##### 5.1 **MATERIAL USED:**

The meter shall be made out of high quality materials to ensure higher reliability and long life with self extinguishable type poly carbonate meter casing. It should be compact and of reliable design to make it immune to vibrations and shocks in normal transportation and should be capable of withstanding severest stresses likely to occur in actual service. The latest state of the art technology of surface mounting of components etc., may be used for the purpose. The soldering if any shall be perfect without dry solders. The construction of the meter shall be such as to permit sealing of the meter cover, terminal cover etc. independently to ensure that the internal parts are not accessible for tampering etc. without breaking the seals. The meter window shall be transparent and made out of UV stabilized material so that the window does not turn yellow after some years.

##### 5.2 **SUPPLY SYSTEM:**

The HT Trivector meters should be suitable on HV & EHV system by using necessary CT and PTs of.

### **11kV :**

Primary Voltage	11 kV
Secondary voltage	110V phase to phase
Primary current	As specified in the schedule
Secondary current	5A

The meter shall be suitable for balanced and as well as unbalanced loads at all power factors i.e., Zero lag-Unity-Zero lead.

The meter shall be suitable for three phase four wire systems for balanced and as well as unbalanced loads at all power factors i.e., Zero lag-Unity-Zero lead.

#### **5.3 POWER SUPPLY VARIATION:**

The extreme power supply variation which an operating meter should withstand without damage and without degradation of its meteorological characteristics when it is subsequently operated under its operating conditions:

Voltage	-30% to + 20%
Frequency	+/-5%
PF. range	Zero lag-unity-zero lead with recording in both import and modes i.e 0 to 360 degrees

However manufacturer can offer meters which can withstand higher variations

#### **5.4 ACCURACY:**

### **11kV :**

For 11KV, 10/5A Meters Class of accuracy of meter shall be 0.2 for both active and reactive energies as per CBIP technical report No. 88/304 with latest amendments. The accuracy should not drift with time.

#### **5.5 POWER CONSUMPTION:**

- i) Voltage Circuits: The active and apparent power consumption in each voltage circuit including power supply of the meter at reference voltage reference temperature and reference frequency shall not exceed 1.5 Watts and 8 VA per phase.
- ii) Current Circuit: The apparent power taken by each current circuit of the meter shall not exceed 1.0 VA/phase at basic current and reference frequency and reference temperature.

## 5.6 MEASURING PARAMETERS:

**5.6.1.** The meter should be capable of measuring the following electric parameters of poly phase supplies in all the four quadrants at all power factors lagging or leading.

<b>Active energy</b> <b>Reactive energy</b>	kWh/MWh ( Import & Export & Net Energy with sign) kVARh / MVARh ( lag & lead) (Import & Export)
Apparent energy	kVAh/MVAh ( Import & Export & Net Energy with sign)
Max. demand with date & time	kVA / MVA ( Import & Export)
Power factor	
Elapsed time and raising demand	kVA / MVA
Maximum demand reached so far (reset to reset)	kVA / MVA
MD resent count	kVA / MVA
Cumulative MD	kVA / MVA
Display of No. of MD resets	Previous 12 Nos. MD values with date & time
Recording of missing potential, missing current & reversal of current with date and time	
Real time and date	
TOD register	
Phase Voltages ( instantaneous)	
Phase Current ( instantaneous)	
Tamper and fraud details	
Self diagnostics	
Frequency	
Harmonic content	

NOTE: 1) The parameters KWh, KVArh lag, KVAh, KVAh lead maximum demand and rising demand with elapsed time, 3 Phase voltages, 3 Phase currents, tamper event if any shall be displayed continuously in cyclic order on the meter to know the above parameters at any instant.

NOTE: 2) Up and Down push buttons ( Separate Button) shall be provided on the meter to read the meter parameters manually by pushing the button.

The details of (i) Display Parameters ( Auto display in cyclic order) (ii) Display Parameters ( Push button) ( iii) Readout Parameters ( through CMRI / RMR) are specified below:

- i) At the start of each sequence of display LCD healthiness anomaly and real time and date shall be displayed.
- ii) **In the absence of power supply, facility for display of meter reading should be available.**

#### **5.6.2. Display parameter ( Auto display):**

Active Energy ( Import & Export & Net Energy with sign)

- i. Reactive Energy ( Import & Export )
- ii. Apparent Energy ( Import & Export & Net Energy with sign)
- iii. Maximum Demand ( Occurrence, Date & Time, Import & Export)
- iv. Rising Demand with elapsed time
- v. M.D. Reset Count
- vi. Cumulative M.D.
- vii. Instantaneous Power Factor
- viii. Line Frequency
- ix. Self Diagnostic ( LCD segment check & battery check)
- x. Real time & date
- xi. Present status of the tamper ( if any)
- xii. Tamper count
- xiii. Phase association must be indicated. Any abnormalities in connections shall be displayed.
- xiv. No. of events of voltage missing, No. of events of current missing, No. of current reversals and No. of events other tampers.
- xv. Three voltages & Three Currents
- xvi. TOD parameters.
- xvii. *Last 6 months MD*
- xviii. *Last 6 months MD reset date (all modes of MD resets).*

#### **5.6.3 Display Parameter ( Push Button):**

- i. Active Energy ( Import & Export & Net Energy with sign)
- ii. Reactive Energy ( Import & Export )
- iii. Apparent Energy ( Import & Export & Net Energy with sign)
- iv. Maximum Demand ( Occurrence, Date & Time)
- v. Elapsed Time & Rise in Demand
- vi. M.D. Reset Count

- vii. Cumulative M.D.
- viii. Previous 12 Nos. M.D. Values with Date & Time
- ix. Instantaneous Power Factor & Average Power factor
- x. Line Frequency
- xi. Real time & date
- xii. Phase Voltages ( Instantaneous)
- xiii. Phase Current ( Instantaneous)
- xiv. Number of Tamper events ( total)
- xv. Self Diagnostic ( LCD segment check & battery check)
- xvi. Phase association must be indicated. Any abnormalities in connections shall be displayed.
- xvii. Active Power ( kw) ( Import & Export)
- xviii. Apperent power ( KVA) ( Import / Export)
- xix. High Resolution mode parameters
- xx. TOD parameters
- xxi. *CT Ratio & PT Ratio*
- xxii. *% THD for Voltage & current in each phase*
- xxiii.

#### **5.6.4. Read out Parameters with CMRI / RMR / Lap top:**

- (i) Meter Serial Number, Model & Make.
- (ii) All parameters at clause 5.6.3
- (iii) Energy Registers
- (iv) Billing Registers for last 12 months
- (v) T.O.D. Registers
- (vi) Load Survey Data
- (vii) Tamper & Fraud ( all event details with date & time)
- (viii) Self diagnostic details ( real time calendar, low battery)
- (ix) Daily kWh readings and KVAh readings at 00:00 Hrs. for the past 60 days to be available in the memory.
- (x) Phasor diagram between V (vs) I shall be displayed in CMRI / Laptop.

#### **5.7 MAXIMUM CURRENT:**

The maximum current of the meter is 120% Ib at which the meter purports to meet the accuracy requirements.

The meter should start registration of energy at 0.1% of basic current ( Ib).

#### **5.8. DISPLAY:**

The meter shall have a minimum 7 digit display of liquid crystal display ( LCD) of the best quality with another digit for legend. The minimum character height shall be 9 mm. Provision shall be made to read consumption in either whole units or decimal multiples or submultiples of one unit. The display shall be digital type with non destructive read out. It shall be possible to display content of relevant parameter with another digit displaying legend for

identification. The meter should have facility of auto display mode where all parameters automatically scroll with in the specified time and a manual mode where the parameters can be read by push button operation. In auto display mode each parameter shall on display for 10 seconds. The display “off” period between two cycles shall not exceed 30 seconds. The register should nor roll over in between this duration. The meter should have non volatile memory, so that the registered parameters will not be affected by loss of power. A provision shall be made to read the meter parameters such as MD and consumption etc. through the meter cover without actually opening the meter box cover. The nonvolatile memory should have a minimum retention time of 12 years.

#### **5.9. MAXIMUM DEMAND REGISTRATION:**

The maximum demand is to be monitored during each demand interval set with 30 min integration and the maximum of these in a month shall be stored. Whenever MD is resent the maximum demand value so registered shall be stored along with date and time. Under the current integration period, the rising demand should be displayed continuously along with the elapsed time. The registered demand and the number of times of MD reset shall also be displayed and the information stored.

#### **5.10 MD RESET:**

The meter should have provision of maximum demand resetting.

- a) Manually by operation of a button which is to be covered and sealing provision available for such cover.
- b) Resetting shall also be possible through a hand held common meter reading instrument ( CMRI / **Laptop**) capable of communicating with the meter.
- c) Auto MD reset.

#### **5.11(a) LOAD SURVEY CAPABILITY:**

The meter should log the following parameters Three Phase Voltages, Three Phase Currents, KWH Import, **KWH Export** & KVAH Import, **KVAH Export**, **KVARH ( lag) & KVARH ( Lead)**, **KVA Import**, **KVA Export** & **KWH Net Energy** & **KVAH Net Energy** and Three phase voltages, Three phase currents for last 60 days in its memory. The meter shall be programmed to record (i) No. of hours supply is available in all three phases (ii) No. of hours supply is available partially in one or two phases and ( iii) No. of hours supply is not available in any phase for each day for 60 days memory period. It should be possible to transfer this data on to a base computer station through a DOS based CMRI / **Lap top**. The base computer shall give complete details of load survey particulars both in numeric data form and in graphic form. Necessary software for invoking the base computer station should be provided.

#### **5.11(b) Quality of Supply:**



The meter shall provide date and Time stamped profiles of each interruptions along with duration.

#### **5.12 TIME OF DAY TARIFF / DEMAND:**

The meter offered shall contain provisions for multiple tariff metering ( time of day metering / demand ) . The meter offered should have a real time clock based on a quartz crystal with a battery totally independent of power supply. The meter shall be capable of being set in to minimum of 8 time zones ( optionally more time zones can be offered) in 24 hours cycle to cover morning and evening on and off peak periods separately TOD register shall be provided for active energy and demand data.

Initially TOD registers for 6 time zones shall be programmed as detailed below to capture kWh, kVAh & kVA and shall be made them to read on **meter display**.

T1: 00.00 hrs. to 06.00 hrs.

T2: 06.00 hrs. to 10.00 hrs.

T3: 10.00 hrs. to 14.00 hrs.

T4: 14.00 hrs. to 18.00 hrs.

T5: 18.00 hrs. to 22.00 hrs.

T6: 22.00 hrs. to 24.00 hrs.

and T0: cumulative month end

and it should be possible for APEPDCL to invoke / change them through the use of CMRI with 2 level password protection and necessary software should be loaded by the meter supplier into the base computer station.

#### **5.13 REMOTE READ OUT FACILITY / COMMUNICATION CAPABILITY:**

- (i) The meter shall be provided with a galvanically isolated RS 232 optical communication port (such as IEC-1107 PACT port, ANSI Port, etc.), so that it can be easily connected to a CMRI / Laptop for data transfer or subsequently hooked to remote metering device such as modem etc. The optical communication port shall also have sealing provision. Companies may adopt protocol of their choice but should load the software and the protocol software into base computer station of the APEPDCL. It is the responsibility of the meter manufacturer to provide the software and all the facilities required by the [AP EPDCL](#) to use the DOS based hand held CMRI / Laptop for reading the meter and generating appropriate reports required by the [AP EPDCL](#). The data element size and its over head speed of transmission shall be such that the entire billing data can be transferred within maximum time of 3 minutes.

For remote read out there should be one RS 232 port at RJ 11.

(ii)**Software** : The following software shall be made available to interface with hand held meter reading instrument/CMRI / Laptop.

- (a) Software to be resident in hand held terminal/CMRI and laptop for the purpose of reading and programming the specific make(s) of static meters.
- (b) Base computer station software for accepting data from hand held terminal/CMRI, processing, generating reports and down loading instructions from the Base computer station to CMRI / Laptop.
- (c) Dial up software and protocol software for accepting the data from the meter through P&T lines to the base computer station / central computer station, processing and generating appropriate reports. Also the following should be supplied along with meters  
(i) API (ii) Protocols (iii) Memory maps.
- (iii) **Data Security** : You are responsible for maintaining the security of the data extracted from the meters using manufacturer specific algorithms in the software upto down loading to the base computer station.

The meter shall also have the following technical features

- a) Voltage and current sources will be available from star-star connected P.T. of the system and current transformer of suitable ratio, respectively.
  - b) The meter should record and continue to display so long as two potentials are available. The display and recording should have no relevance with reference to the availability of departmental neutral.
  - c) The meter shall be suitable for lag only tariff. In case of lagging load,  $KVA H^2 = KWH^2 + RKVA H^2$  and with leading load,  $KVA H^2 = KWH^2$ . The RKVA H lead contribution shall be blocked.
  - d) The meter shall be site programmable in case of necessity to use these meters in Import/ Export mode and also TOD features. As and when required TOD parameters must be field invokable.
  - e) Each parameter shall be on display for a minimum period of 10 seconds.
- Load survey with 30 min. integration for KWH, KVAH Three Phase voltages and R,Y & B currents for 60 days shall be available for the meters.
- f) The meter has to record potential missing only when phase voltage is less than 80% of  $V_n$  ( nominal voltage) i.e. if the voltage falls below 50.8V.
  - g) MD reset button and push button (display parameters) should be provided in different colours.
  - h) The phase indicators should flicker only on load but not on no loads which is presently available.

The Meters should also be compatible to Automatic Meter Reading and necessary APIs memory maps & Protocol commands should be provided for the same before claiming the bills.

#### **5.14. TERMINAL ARRANGEMENTS:**

The terminals shall be marked properly on terminal block for giving external connections. A diagram of connections should be provided inside the cover of terminal block. The terminal cover shall be extended such that when it is placed in position it is not possible to approach the connections or connecting wires. The terminals and the screws shall be suitable to carry up to 150% of I<sub>max</sub> safely. The terminals shall have suitable construction with barriers and covers to provide secure and safe connections of Current Transformers and Voltage Transformers leads of stranded copper conductors of 2.5 Sq.mm size.

#### **5.15. TEST TERMINAL BLOCK( TTB) WITH COVER:**

A separate TTB is to be provided. The TTB of skew type shall have transparent Polycarbonate cover suitable provision shall be made in the test terminal block for disconnecting the meter for testing purposes and for the purposes of testing the meter, the **Screws & bars are to be robust and made up with stainless steel material only and the dimension should not be less than as mentioned in the drawing enclosed.** The test terminal block shall have provision for isolating the meter from the instrument transformer secondary connections. Proper arrangements for sealing of test terminal blocks cover are to be made. The test terminal block shall also have extended terminal cover such that when it is placed in position is not possible to approach the connections or connecting wires. The live parts and current terminals shall not be accessible from the rear of TTB to prevent tampering. The terminal cover must be transparent so that the connections are visible.

#### **5.16 SEALING OF METER:**

Proper sealing arrangement should be provided on meter to make it tamper proof and avoid mishandling by unauthorized persons. Meter cover shall be provided with minimum of 2 Nos. sealing provision. The meter terminal block and test terminal block. (TTB) with 2 Nos. each sealing screw and one number separate sealing arrangement to the MD reset push button. Separate sealing arrangement for optical port to be used for communication to CMRI should also be provided. The meter should be designed and constructed in such manner to make it pilfer proof once it is sealed.

#### **5.17 ENVIRONMENTAL ASPECTS:**

Meter shall be designed and constructed to be capable of withstanding all severe stresses and vibration and dust environments likely to be encountered in actual practice as the meter will be installed outdoor in boxes.

If any special precautions etc. are required as the meters are supposed to be installed in outdoor you may please specify them.

#### **5.18. NAME PLATE MARKING:**

The name plate shall be clearly marked etched embossed as per relevant Standards. The name plate shall indicate name of the project, purchaser's name, purchase order number and date, month year of manufacture etc. The word "APEPDCL" must be etched on the name plate. The name plate shall be provided in such a manner that it is not exposed to the open and is secured against removal.

#### **5.19 IMMUNITY TO ELECTRO MAGNETIC DISTURBANCE:**

The meter shall be designed in such a way that conducted or radiated electromagnetic disturbance as well as electrostatic discharge do not damage or influence the meter. The test report from any standard lab conducting the test as prescribed in the CBIP technical report No. 88 /304and ISS and test result shall be submitted.

#### **5.20 TAMPER AND FRAUD PROTECTION:**

The meter should have features to prevent / detect common ways of tamper and fraud.

- a) Phase sequence reversal: The meter should work accurately irrespective of phase sequence of the supply.
- b) i) CT shorting / by passing: The meter must have capability to record shorting / bypassing of one or any phases of the meter with the time and duration.  
ii) CT Polarity reversal: The meter should register Energy consumption correctly even though the CT polarities are reversed. The meter shall record such tamper data with Date & Time along with total No. of such occurrences for all phases during the above period.
- c) Missing potential: the meter shall be capable of recording occurrences of missing potential phase wise, and its restoration with date and time along with total number of such occurrences during the above period.
- d) Missing Neutral: The meter shall continue to record accurately even if the neutral of PT supply is accidentally or incidentally disconnected.
- e) External Magnetic Influence: The Meter shall not get influenced by any external permanent / electromagnet(s). The continuous Magnetic Induction of external origin: The value of magneto motive force to be applied as per the stipulations of CBIP Report No. 88/304 read with amendments for Static Electronic Energy Meters.  
The meter should be capable of recording any attempt of magnetic tamper and store the same in tamper data.

Minimum 200 events ( Occurrences and restorations) with date & time of event shall be recorded. Out of 200 Nos. events, 50 Nos. for power failure events and 150 nos. for other tampering events. Event means the occurrence and restorations shall be treated as one event only. The information shall be logged on first in first out basis and total No. of tamper events during the period. All these information, should be available in simple and easily understandable format.

While recording tamper events, fall in 20% of voltage when compared to other phases shall be recorded as “ Voltage failure tamper”.

At the time of occurrence of tamper event ( i.e. fall in voltage) energy values in each phase have to be recorded separately.

Meter internal errors are to be displayed with difference codes.

The meter memory should have all the cumulative logs of all the events in days, minutes, sec. so that even status can be analysed after long time also.

**5.21.External Magnetic Influence:** The meter should have the feature to detect the occurrence & restoration of the event ( Ext. magnetic effect). So that the magnetic tamper can be logged for tamper analysis.

#### **5.22 Self diagnostics features:**

The meter shall have indications for unsatisfactory / non functioning of the following:

- i) Time and calendar.
  - ii) Real Time Clock Battery
  - iii) All display segments
- And any thing else as necessary.

While installing the meter, it should be possible to check the correctness of Current Transformer, Potential Transformer connections to the meter and their polarity from the functioning of the meter for different voltage injections. For this purpose a suitable software for field diagnosis of the meter connections with the help of meter and meter reading instrument should be supplied. The details of the self diagnostic features shall be furnished by the bidder. Any abnormal connection should be reported on the meter display.

#### **5.23 Flexible shielded cables:**

### **5.23.1. Interface between meter and CMRI / Laptop:-**

The interface between a meter and CMRI / Laptop with flexible shielded cable of length 1500 mm  $\pm$  10 mm having (i) 9 pin D-type female connector with electrical circuit as illustrated in Appendix and (ii) USB connector to facilitate downloading of meter data either on to CMRI (or) Laptop. Both cables shall be supplied along with every 10 Nos. Meters. The two ends of the cable shall be stress relieved.

### **5.24. SALIENT FEATURES:**

The meter shall have the following additional salient features:

It should be possible to check the healthiness of phase voltages by displaying all the voltages on the meter display.

The meter shall have provision to be read through communication port in the absence of power through an external source. An inductive coupling arrangement shall be provided so that it should not be possible to damage the circuitry of the meter by applying excess voltage directly in the meter. The meter should power up using an external battery pack only in absence of power supply to the meter to enable taking of meter readings through display and communication port.

The meter should work accurately irrespective of phase sequence of the mains supply.

The meter should remain powered up and functional even when either of any two phases or any one phase along with neutral is available to the meter.

The meter should continue to record accurately as per prevailing electrical conditions even if the neutral of potential supply gets disconnected.

- a) The meter shall record active energy in forward direction even if one or more CT's are reversed. The current vector direction shall always be considered as positive ( import) for the computation of 3 phase active energy which shall be added in the main active energy ( import) register.
- b) The meter shall record apparent energy in forward direction even if one or more CT's are reversed.
- c) The maximum demand shall be computed from the main active and apparent energy registers.

### **5.25. TESTS:**

#### **5.25.1 TYPE TESTS:**

The equipment offered (i.e., meters where applicable) shall be fully type tested at any accredited national test laboratories by the Bidder as per the relevant standards. The Bidder shall furnish four sets of type test reports along with the bid. **Bids without type test reports will be treated as non responsive.**

Test certificate not more than three years old on the date of bid opening from a recognized accredited national laboratory shall be submitted.

**Tests for Trivector Meters :** As per CBIP Technical Report No. 88/304.( with latest amendments) IEC-687.

#### **5.26 ACCEPTANCE AND ROUTINE TESTS:**

All acceptance tests as stipulated in the relevant standards shall be carried out by the supplier in presence of purchaser's representative.

All routine tests as in the relevant standards shall be carried out and routine test certificates shall be submitted to each consignee while dispatching the material.

The purchaser reserves the right to insist for witnessing the acceptance/routine testing.

##### **5.26.1 amendments)**

**5.26.2 Tests during manufacture :** The Bidder shall furnish details of tests carried out during the process of manufacture and end inspection by the bidder to ensure the desired quality of the equipment to be supplied.

#### **5.27 ADDITIONAL TESTS :**

5.27.1 The purchaser reserves the right of having at suppliers expenses any other tests(s) of reasonable nature carried out at Bidders premises, at site, or in any other place in addition to the aforesaid type, acceptance and routine tests, to satisfy himself that the material comply with the specifications.

5.27.2 In case of failure in any type test, the supplier is required to modify the design of the material and the material shall be type tested again for the modified design, without any extra cost to the purchaser. No delivery extension shall be given for this additional testing.

#### **5.28 TEST REPORTS / TEST CERTIFICATES:**

5.28.1 Record of routine test reports shall be maintained by the Bidder at his works for periodic inspection by the purchaser's representative.

5.28.2 Test certificates of tests conducted during manufacture shall be maintained by the Bidder. These shall be produced for verification as and when desired by the purchaser.

#### **6.0 TEST FACILITIES :**

The tests shall be carried out as per relevant Standards and test certificates shall be furnished for approval. The Bidder shall indicate the details of the equipment available with him for carrying out the various tests as per relevant Standards. The bidder shall indicate the sources of all materials.

**NOTE :** The Meters used for conducting tests shall be calibrated periodically at reputed Government accredited Test Laboratories and test certificates shall be available at works for verification by purchasers representative.

## **7.0 INSPECTION:**

7.1 The purchaser's representative shall, at all times, be entitled to have access to the works and at all places of manufacture where equipment is offered, and manufactured and the representative shall have full facilities for unrestricted inspection of the bidder's works, raw materials and process of manufacture and conducting necessary tests as detailed herein.

7.2 The Bidder shall keep the purchaser informed in advance of the time of starting and of the progress of manufacture of the offered equipment in its various stages so that arrangements can be made for inspection.

7.3 The supplier shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing acceptance and routine tests.

7.4 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off, by the purchaser in writing.

7.5 The acceptance of any quantity of material shall in no way relieve the Bidder of any of his responsibilities for meeting all requirements of the specification, and shall not prevent subsequent rejection if such material is later found to be defective.

## **7.6 NOTE FOR FOREIGN BIDDERS :**

The bidder shall indicate the name(s) of reputed inspection agencies and the inspection charges clearly for each lot. The inspection charges shall be borne by the supplier. However the purchaser reserves the right to appoint at its cost any inspection agency to carry out the inspection.

## **8.0 QUALITY ASSURANCE PLAN :**

The bidder shall invariably furnish the following information along with his bid, failing which his bid shall be liable for rejection. Information shall be separately given for individual type of material offered.

- i) The structure of organization.
- ii) The duties and responsibilities assigned to staff ensuring quality of work.
- iii) The system of purchasing, taking delivery and verification of materials.
- iv) The system for ensuring quality of workmanship.
- v) The quality assurance arrangements shall conform to be relevant requirements of ISO 9001 or ISO 9002 as appropriate.



- vi) Statement giving list of important raw materials names of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested. List of test normally carried out on raw materials in presence of Bidder's representative, copies of test certificates.
- vii) Information and copies of test certificates as in (vi) above in respect of bought out accessories.
- viii) List of manufacturing facilities available.
- ix) Level of automation achieved and list of areas where manual procession exists.

List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

- xi) Lists 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.

The successful Contractor shall within 30 days of placement of order, submit following information to the purchaser.

List of raw materials as well as bought out accessories and the names of sub suppliers selected from those furnished along with offers.

Type test certificates of the raw materials and bought out accessories if required by the purchaser.

Quality assurance plan (QAP) with hold points for purchaser's inspection. The quality assurance plan and purchasers hold points shall be discussed between the purchaser and Contractor before the QAP is finalized.

The Contractor shall submit the routine test certificates of bought out accessories and central excise asses for raw material at the time of routine testing if required by the purchaser and ensure that the quality assurance requirements of specification are followed by the sub-contractor.

The quality assurance programme shall give a description of the quality system and quality plans with the following details.

#### **A) Quality System :**

The structure of the organisation.

The duties and responsibilities assigned to staff ensuring quality of work.

The system for purchasing, taking delivery and verification of materials.

The system for ensuring quality workmanship.

The system for control of documentation.

The system for the retention of records.

The arrangement for the contractor's internal auditing.

A list of administration and work procedures required to achieve and verify contract's quality requirements. These procedures shall be made readily available to the purchaser for inspection on request.

**B) Quality Plans :**

An outline of the proposed work and programme sequence.

The structure of the contractors organization for the contract.

The duties and responsibilities assigned to staff ensuring quality of work.

Hold and Notification points.

Submission of Engineering documents required by the Specification.

The inspection of materials and components on receipt.

Reference to the contractors work procedures appropriate to each activity.

Inspection during fabrication/Construction.

Final inspection and test.

**9.0 DOCUMENTATION:**

9.1 All drawings shall conform to International Standards Organization (ISO) 'A' series of drawings sheet/India Standards Specifications IS :656. All drawings shall be in ink and suitable for micro filming. All dimensions and data shall be in S.I. Units.

**9.2 LIST OF DRAWINGS AND DOCUMENTS:**

The bidder shall furnish the followings along with bid:

- i) Two sets of drawings showing clearly the general arrangements, fitting details, electrical connections etc.

ii) Technical leaflets (users manual giving operating instructions.)

iii) Dimensional drawings of the box for each quoted item.

9.3 The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the purchaser. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawing shall be at the supplier's risk.

9.4 Approval of drawings/work by purchaser shall not relieve the supplier of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirements of the latest revision of application standards, rules and codes of 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 the power to reject any work or materials which, in his judgment is not in full accordance therewith.

9.5 The successful Bidder shall, within 2 weeks of placement of order, submit three sets of final versions of all the drawings as stipulated in the purchase order for purchaser's approval. The purchaser shall communicate his comments/approval on the drawings to the supplier within two weeks. The supplier shall, if necessary, modify the drawings and resubmit three copies of the modified drawings for their approval.

*9.6 The successful bidder shall furnish a sample of box duly mounting the meter, TTB where applicable within two weeks of clear purchase order along with type tests certificates as per Clause 6.1.3. Supplies shall commence only after approval of these. – This clause is deleted.*

9.7. Eight sets of operating manuals/technical leaflets shall be supplied to each consignee for the first instance of supply.

**9.7.1 One set of routine test certificates shall accompany each dispatch consignment.**

9.7.2 The acceptance test certificates in case pre-dispatch inspection is routine, test certificates in cases where inspection is waived shall be got approved by the purchaser.

9.7.3. CDs containing protocol Software and RMR enabling software in 2 sheets shall be furnished.

## **10.0 PACKING & FORWARDING:**

The equipment 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 the appropriate caution symbol. 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 immediately by supplier without any extra cost.

10.2 Each consignment shall be accompanied with a detailed packing list containing the following information.

- a) Name of the consignee.
- b) Details of consignment.
- c) Destination.
- d) Total weight of consignment.
- e) Handling and packing instructions.
- f) Bill of Material indicating contents of each package.

10.3 The supplier shall ensure that the packing list and bill of materials, are approved by the purchaser before dispatch.

10.4 The packing shall be done as per the manufacturer's standard practice. However, he should ensure the packing is such that, the material should not get damaged during transit by Rail/Road.

10.5 The marking on each package shall be as per the relevant Standards and shall also contain "APEPDCL", PO reference, Name of the supplier, make, meter type and meter serial No.

#### **11.0 QUANTITY AND DELIVERY REQUIREMENTS:**

The quantity and delivery requirements are indicated in Annexure 2

#### **12.0 SUPERVISION SERVICES: NIL**

The purchaser will arrange for unloading of the consignments.

#### **12.1 MANDATORY SPARES & TOOLS:**

The bidder shall give the list of spares required for the equipment along with price list for them & shall keep a reasonable stock of the same during the warranty period. The bidder shall indicate the sources of spares like battery packs, interfacing cables in India and also mention the service agencies.

### 13.0 **SAMPLE:**

2 Nos. sample meters with Test terminal blocks of 11kV / 110V, 10/5A, 0.2 class with MD integration 30 min. ( for Cat-C for Services) with DLMS (Bi-directional Solar net meters) shall be supplied with the tender technical bid.. Tender received without samples as above are liable for rejection. The samples may be subjected to various tests as per CBIP technical report No. 88/304 ( with latest amendments) / IEC 1036 / IS wherever applicable & tamper and fraud protection tests as per specification. The samples shall comply with the specification.

### 14.0 **TECHNICAL DEVIATIONS :**

Any deviation in Technical Specification as indicated in Annexure-3 shall be specifically and clearly indicated in the enclosed Technical deviation format as per Annexure-5. .

### 15.0 **GUARANTEE:**

- 15.1. The material should be guaranteed for satisfactory operation for a period of 5 years from the date of receipt of material at destination stores by the consignee in good condition. During the guarantee period if the meter while in its normal operation is found defective, it shall be replaced by the supplier with a new meter free of cost within 15 days. If the meter is not replaced within 30 days of intimation the supplier should note that the guarantee period will be extended to that extent by the number of days delayed beyond 30 days. If the tenderer does not replace within 180 days the cost of the meter(s) will be recovered from the existing bills/ future bills/ Bank Guarantees available [AP EPDCL](#).

For the purpose of ensuring 5 years guarantee meter may be sealed at manufacturer's premises and despatch in sealed condition after inspection by the [AP EPDCL](#) representative.

### 15.2 **GUARANTEED TECHNICAL PARTICULARS**

The Bidder shall furnish the guaranteed Technical Particulars as per enclosed Annexure-III-A for HT ELECTRONIC TRIVECTOR METERS used in meters and submit the same with the Tender.

### 15.3 **GENERAL:**

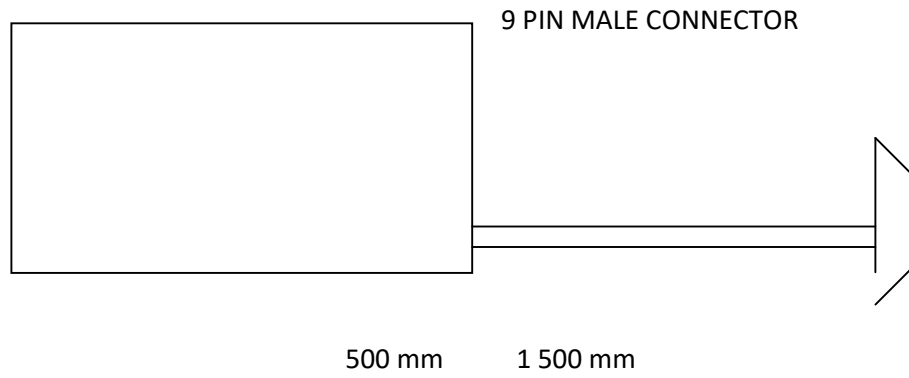
- a) Principle of operation of the meter, outlining the methods and stages of computation of various parameters starting from input voltage and current signals including the sampling rate if applicable shall be furnished by the bidder.
- b) The bidder shall indicate the method adopted to transform the voltage and current to the desired low values with explanation on devices used such as CT, VT or Potential divider as to how they can be considered superior in maintaining ratio and phase angle for variation of influence quantities during its service period.
- c) The bidder shall furnish details of memory used in the meter.

d) Details of testing facilities:

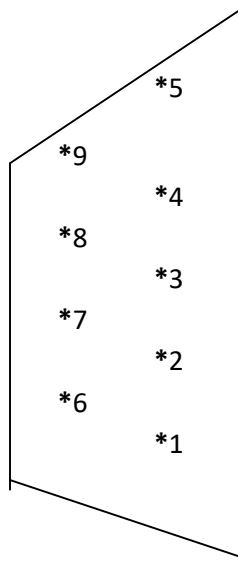
The manufacturer laboratory must be well equipped for testing of the meters. They must have computerized standard power source and standard equipment calibrated not later than a year (or as per standard practice). The details of testing facilities available for conducting (a) The routine tests and (b) Acceptance tests shall be furnished in a statement. Bids without these details will be treated as **non responsive**.

## APPENDIX

### DIAGRAM SHOWING THE 9 PIN CONNECTOR



#### RS 232C 9 PIN D TYPE MALE CONNECTOR



**PIN FUNCTION LISTING:**

PIN	SIGNAL NAME
01	NC ( Not Connected)
02	Transmit Data TXD
03	Receive Data RXD
04	NC
05	Signal Ground (SG)
06	NC
07	NC
08	NC
09	Power supply ( +4.75 V to +12.5 V)



## *ACRONYMS*

Reference Abbreviations	Name and Address
IEC	International Electro Technical Commission Bureau Central de la Commission Electro Technique International, Rue de verembe Geneva, Switzerland.
ISO	International Organization for Standardization, Danish Board of Standardization Aurehoegyej – 12, DK – 2900, Heel prup, DENMARK.
ISS	Indian Standard Bureau of Indian Standards Nanak Bhavan, 9, Bhadur Shah Zafar Marg, NEW DELHI – 110002, INDIA.
CBIP	Central Board of Irrigation and Power, Malcha Marg, Chankyapuri, NEW DELHI – 110021, INDIA.
CT	Current Transformer
PT	Potential Transformer
Deg. C	Degrees centigrade
Max	Maximum
Accn.	Acceleration
db	Decibels
MD	Maximum Demand
TOD	Time off day
Min.	Minimum
CMRI	Common Meter Reading Instrument

For the purpose of ensuring 5 years guarantee meter may be sealed at manufacturer's premises and despatch in sealed condition after inspection by the APEPDCL representative.

## CORRIGENDUM

### CLARIFICATIONS OF HT TVR METERS OF 11KV/110V,10/5A, 0.2 CLASS ACCURACY MD INTEGRATION 30 MIN. IP (CATEGORY -C FOR SERVICES) WITH DLMS (BI-DIRECTIONAL SOLAR NET METER) AGAINST TENDER SPECIFICATION NO. CEMPT – 133/15-16

The following corrigendum is issued against CEMPT-133/15-16 and further extension of due date for submission of tender up to **17.05.16**.

M/s. Secure Meters Ltd., Udaipur has requested the following clarifications :

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
1	Clause No. 1.0 of Ann-3	DLMS category of the meters mentioned is Cat-C whereas tender requirement is for bi-directional energy measurement.	we would like to inform that as per IS: 15959 ( Indian Standard for DLMS), for bi-directional meters category mentioned is Cat-B.	Cat-B is accepted subject to the parameters required as per specification.
		Alos as per page no.22 of IS:15959 it is also mentioned that, “For customers who imports energy and also exports energy, use of category B is recommended”	We request you to kindly amend the category of the meters accordingly	Hence the DLMS category of meters of tender specification is amended as Category B in place of Category-C since the meter is Import & Export meter.
2	Cl. No.5.6 of Ann-3	( Measuring parameters):  It is mentioned the requirement of net apparent ( KVAH) energy in the meter display.	We would like to inform that meter records the apparent import energy / apparent export energy and displays the same in the meter display. Whereas, net apparent (KVAH) energy can be derived from apparent import and apparent export with a manual circulations.  Hence we request you to kindly waive off the requirement of net apparent (KVAB) energy in the meter display.	Accepted.
3	Cl.No. 5.6 ( Note-2) of Ann. -3	It is mentioned that separate Up and down push buttons required for display scrolling.	In this connection, we would likes to inform that our meters are having facility of Engineering Mode display where parameters can be	As per specification

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
			viewed up and down.	
		<p>Engineering mode display contains the following:</p> <p>i) Forwards</p> <p>ii) Reverse</p> <p>iii) Page 1</p> <p>iv) Page 2</p> <p>v) Page 3</p> <p>vi) Scroll lock</p> <p>vii) Exit</p>	<p>We also wish to inform that we have supplied similar kind of meters to APEPDCL and other utilities in Andhra, Telangana, Karnataka and Kerala etc., and the same are working satisfactorily.</p> <p>Hence we request you to kindly accept the same.</p>	
4	Cl. No 5.6 of Ann-3	Instantaneous power required in import and export modes.	<p>We would like to inform that instantaneous power will not be recorded in both import and export modes at a time, rather it will record any one of the power at that particular instant.</p> <p>Hence we request you to kindly amend the clause accordingly.</p>	Accepted, but parameters shall display with sign (Import or Export)
5	Cl.No. 5.6.4 (ix) of Annex.3	"Daily kWh readings and KVAh readings at 00.00 Hrs. for the past 60 days to be available in the memory".	Since the requirement is for import and export energies, kindly clarify the exact requirement of daily energies to be recorded.	<p>The clause 5.6.4 (ix) of annex-3 is amended as follows:</p> <p>"Daily kWh readings (import &amp; export) and KVAh readings (import &amp; export) at 00.00 Hrs. for the past 60 days to be available in the memory".</p>
6	Cl.NO. 5.11 (a) of Ann-3	Net KVAh should be available in the Load survey	In this connection as mentioned in the serial number (2) above, apparent import energy and apparent export energies will be available in Load Survey from where we can arrive the net apparent energy manually.	Accepted

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
7	Cl.No. 13.0 of Ann-3	2 Nos. samples meter to be submitted along with the bid	In this connection, we would like to inform that by looking at the quantity of the tender which is very less), we request you to kindly waive off the submission of tender samples	As per specification

The firm, M/s. Genus Power Infrastructures Ltd., Jaipur has requested the following clarifications:

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
1	Scope & Ann-4	The APEPDCL is opting for e-procurement for supply of HT TVR meters 11KV/ 110V, 200/1A,0.2S class accuracy MD Integration 30 min. IP ( Cat-A for Feeders ) with DLMS under IPDS scheme & for Regular works with the following Description.	As per revised / latest DLMS standard 'Category-A' and Category-C' is not applicable instead 'Category C1' is defined for all types of HT Meters. Further, since the requirement of HT Meters is very minimal and the DLMS is related to only meter communication protocol and we request DLMS certificate of 1A or 5A is acceptable.  Kindly amend the clause and confirm your acceptance.	EPDCL called tender for 11KV/ 110V, 10/5A,0.2 class accuracy MD Integration 30 min. IP ( Cat-C for Services).  As per Amendment no.3 Jan-2016 to IS 15959:2011 the DLMS category of meters of tender specification is amended as Category C1 in place of Category-C.
2	Cl.No.23 of Anne-1b & Anng.4	Eligibility Criteria : .... and supplied to power utilities at least 40% of the quoted quantity of the goods / equipment of same or higher voltage lass indicated in the " Schedule of Requirement" in one continuous period of 12 months. The bidder should furnish documentary evidence in proof of 40% supplies like copies of Form 13, acknowledged delivery	We understand supply proof of any HT Meters supplied to Power Utilities or to open access consumers through Power Utilities can be submitted. Kindly clarify / confirm your acceptance.	As per specification i.e supplied to power utilities will be considered.

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
		challans etc.		
3	Cl.No. 23 of Ann. 1b & Ann. -4	Eligibility Criteria : ... At least 20% of similar material offered against this specification should be in successful operation since 2 years as on the date of opening of the Bid. ( Performance certificate shall be enclosed)	We understand performance proof of any HT Meters supplied to Power Utilities or to open access consumers through Power Utilities can be submitted. Kindly clarify / confirm your acceptance.	As per specification i.e supplied to power utilities will be considered.
4	Cl.No. 5.4 of Ann. -3	<p>ACCURACY:</p> <p>a) For 33KV, 200/1A &amp; 11KV 200/1A Meters class of accuracy of meter shall be 0.2S for both active and reactive energies as per CBIP technical report No. 88/304 with latest amendments. The accuracy should not drift with time.</p> <p>b) For 11KV, 10/5A Meters class of accuracy of meter shall be 0.5S for both active and reactive.</p>	As per IS 14697 standard the accuracy class of Reactive energy is one class inferior to Active energy. Kindly amend the clause accordingly.	As per specification class of accuracy of meter shall be 0.2 for both active and reactive energies only.
5	Cl.No. 5.8 & 9.6 of Ann.-3	<p>MD and consumption etc. through the meter cover without actually opening the meter box cover.</p> <p>The successful bidder shall furnish a sample of box duly mounting the meter, TTB where applicable within two weeks of clear purchase order along with type tests certificates as per clause 6.1.3. Supplies shall commence only after approval of these.</p>	<p>We understand Box is not in the scope of Bidder.</p> <p>Kindly clarify / confirm the same.</p>	<p>Meter box is not in the scope of Bidder.</p> <p>The clause 9.6 of Annexure-3 is already deleted in the specification.</p>
6	Cl.No. 15.0 of Ann.3	<p>GUARANTEE:</p> <p>...During the guarantee period if the meter while in its normal operation is found defective, it shall be replaced by the supplier with a new meter free of cost within 15 days. In the event of any correction of defects or replacement of defective material</p>	Replacement of within 15 days of intimation is practically difficult, we request your good office to amend the clause as "Replacement within 30 days from the date of intimation". We also request your good office that the guarantee period should be counted from the date of initial supply. Extension	As per specification

Sl.N o.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
		during the warranty period, the warranty for the connected / replaced material will be extended to a further period of 12 months and the performance bank guarantee for proportionate value will be extended 60 days over and above the extended warranty period	of guarantee period / bank guarantee is may be delted.	
7		It is the responsibility of the meter manufacturer to provide the software and all the facilities required by the APEPDCL to use the DOS based hand held CMRI / Laptop for reading the meter and generating appropriate reports required by the APEPDCL. The data element size and its over head speed of transmission shall be such that the entire billing data can be transferred within maximum time of 3 minutes.	We understand supply of CMRI / Laptop is not in the Bidder's scope. Only TTB & communication cable ( 1 No. on supply of 10 Nos. meters) to be supplied free of cost and no other free items are involved. Kindly confirm the same once.	As per specification supply of CMRI / Laptop is not in the Bidder's scope. Only TTB & communication cable ( 1 No. on supply of 10 Nos. meters) to be supplied free of cost and no other free items are involved
8	5.12	TO: CUM month end	Requirement in Technical specification is not clear. We can provide all 3 following Display parameters:  1)Present month maximum demand.  2)Cumulative maximum demand .  3) Billing maximum Demand.  Kindly confirm your actual requirement or confirm your acceptance.	Present month MD & Billing MD shall be provided.
9	5.23.1	9 PIN connector connection	Our standard 9 PIN connector configuration is :  2.RXD  3.TXD	As per specification.

Sl.N o.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
			4,7 & 8 DTR 5. GND Kindly confirm your acceptance	
10	Scope	Meter Category - A	As per DLMS revised / amendments of IS-15959 standard Category of meter should be Cl. Kindly amend the clause accordingly.	As per Amendment no.3 Jan-2016 to IS 15959:2011 the DLMS category of meters of tender specification is amended as Category C1 in place of Category-C

The firm, M/s. L&T Ltd., Hyderabad has requested the following clarifications .

Sl.N o.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
1		.	The firm requested to accept offer without samples, in case of order sample shall be submitted with as per GTP submitted.	Not accepted.  2 nos. sample meters shall be submitted as per specification.

The firm, M/s. EDM India Pvt. Ltd., Chennai has requested the following clarifications:

Sl.N o.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
1	NIT/5	Transaction Fee	No provision is given to pay the transaction fee through online E-procurement portal.	The firm is advised to contact e-procurement customer care.
2	Online Portal	Process Fee	Details of the payee for the processing fee are not mentioned in the bid document. Please provide the required information to whom the DD to be taken and the DD value.	The information is already available in tender document.

Sl.No.	Clause No.	Description of clause	Clarification required by the firm	Clarification given by EPDCL
3	Sample Form / 60	Bid Form	Whether bid form need to be submitted in hard copy along with technical bid	Yes
4	20. Bid Security / 48	The Bidder will furnish, as part of its bid, a Bid security in the amount of 2% of the Total Ex-works value of the materials offered against the bid of the amount specified by the Purchaser. This amount should be paid by way of a crossed demand draft drawn on any Nationalized bank in favour of the Pay Officer, APEPDCL and payable at headquarters of the Purchaser. The crossed DD should invariably be furnished along with the bids.	Whether Bid Security need to be enclosed separately in Part-I  Or  Whether Bid security need to be enclosed along with technical Bid in Part-I	The bid security shall be enclosed with tender document and same shall be uploaded in e-procurement website.
	Suggestions		Internal battery for downloading of data in the absence of power might not be required (it is only a suggestion) as these meters are required for feeders.	As per specification.
			It would be advisable to have 3 ports with simultaneous communication as the data might be required for local communication to the sub station on RS232, RS485 port to communicate to SCADA or Central Server and with a mandatory Optical port for downloading data using CMRI.	As per specification.



