STANDARD
TECHNICAL SPECIFCATION

FOR

3PHASE 3 WIRE CT/PT OPERATED FULLY STATIC, AMR COMPATIBLE TRI-VECTOR ENERGY METER, ACCURACY CLASS 0.5S FITTED WITH PILFER PROOF METER BOX SUITABLE TO HOUSE THE METER & TEST TERMINAL BLOCK (TTB)

FOR

11KV BOUNDARY METERING PROJECT

TECHNICAL SPECIFCATION FOR 3-PHASE 3-WIRE CT/PT OPERATED FULLY STATIC AMR COMPATIBLE TRI-VECTOR ENERGY METERS, ACCURACY CLASS 0.5S FOR 11KV BOUNDARY METERING PROJECT

1.0 SCOPE

Design, manufacturing, testing, supply and delivery of AC, 3-Phase, 3-Wire, CT/PT operated fully Static and AMR compatible Tri-Vector Energy Meters fitted with Pilfer Proof Meter Box for measurement of different electrical parameters listed elsewhere in the document including Active Energy (KWH), Reactive Energy (KVARH), Apparent Energy (KVAH) etc. The detail scope is given below.

2.0 APPLICATION

- 11KV HT feeders,

3.0 STANDARDS TO WHICH METERS SHALL COMPLY

Guidelines on "Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification" enclosed with this document as annexure.
IEC 62056-21 Electricity metering: Data exchange for meter reading, tariff and load control- Part 21: Direct local data exchange.
IEC 62056-31 Electricity metering: Data exchange for meter reading, tariff and load control -Part 31: Local Area Network data exchange.
IEC 62056-61 Electricity metering: Data exchange for meter reading, tariff and load control- Part 61: Object identification system (OBIS).
IS-14697 Specification for AC Static Transformer operated Watt Hour&VAR-Hour meters(class 0.5S). IEC 62052-11 Electricity metering equipment (AC) –General requirements, tests and test conditions -Part 11: Metering equipment.
IEC 62053-22 Electricity metering equipment (AC) –Particular requirements - Part-22: Static Meters for Active Energy (Class 0.5S).
IS-15707 Specification for Testing, evaluation, installation & maintenance of AC Electricity Meters-Code of Practice.
The equipment meeting with the requirements of other authoritative standards, which ensure equal or better quality than the standard mentioned above, also shall be considered; in case of conflict the Guidelines on "Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification" enclosed with this document as annexure shall prevail upon.

4.0 GENERAL TECHNICAL REQUIREMENTS

1	TYPE	AMR Compatible Static, 3 Ph, 3 Wire(11KV) Tri-Vector Energy Meter
2	FREQUENCY	50 Hz ±5%
3	ACCURACY CLASS	0.5S
4	SECONDARY VOLTAGE	Suitable for operation from 110V Ph-Ph (11KV)
5	BASIC CURRENT (Ib)	-/1 Amp as per existing CT for -11KV feeders
6	MAXIMUM CONTINUOUS CURRENT	2.0 Ib ; Starting and Short time current shall be as per IS-14697
7	POWER CONSUMPTION	The active and apparent power consumption, in each voltage circuit, at reference voltage, reference temperature and reference frequency shall not exceed 1. 5 W and 8 VA. The apparent power taken by each current circuit, at basic current, reference frequency and reference temperature shall not exceed 1.0 VA
8	POWER FACTOR	0.0 Lag -Unity- 0.0 Lead
9	DESIGN	Meter shall be designed with application specific integrated circuit (ASIC) or micro controller; shall have no moving part; electronic components shall be assembled on printed circuit board using surface mounting technology; factory calibration using high accuracy (0.05 class) software based test bench. Assembly of electronic components shall be as per ANSI /IPC-A-610 standard.

5.0 CONSTRUCTIONAL REQUIREMENT/ METER COVER & SEALING ARRANGEMENT

Wherever poly carbonate cover is specified, it shall conform to IS 11731 (FH-1category) besides meeting the test requirement of heat deflection test as per ISO 75, glow wire test as per the IS:11000 (part 2/SEC-1) 1984 OR IEC PUB,60695-2-12, Ball pressure test as per IEC--60695-10-2 and Flammability Test As per UL 94 or As per IS 11731(Part-2) 1986

5.1 CONSTRUCTION

The case, winding, voltage circuit, sealing arrangements, registers, terminal block, terminal cover & name plate etc. shall be in accordance with the relevant standards. The meter should be compact & reliable in design, easy to transport & immune to vibration & shock involved in the transportation & handling. The construction of the meter should ensure consistence performance under all conditions especially during heavy rains / very hot weathers. The insulating materials used in the meter should be non-hygroscopic, non-ageing & have tested quality. The meter should be sealed in such a way that the internal parts of the meter becomes inaccessible and attempts to open the meter shall result in viable damage to the meter cover. This is to be achieved by using continuous Ultrasonic welding on the Meter body or any other technology which is either equally or more efficacious.

The meter should comply latest technology such as Microcircuit or Application Specific Integrated Circuit (ASIC) to ensure reliable performance. The mounting of the components on the PCB should compulsorily be Surface Mounted Technology (SMT) type. Power supply component may be of PTH type. The electronic components used in the meter should be of high quality and there should be no drift in the accuracy of the meter for at least ten years. The circuitry of the meter should be compatible with 16 Bit (or better) ASIC with compatible processor and meter should be based on Digital measuring and sampling technique.

The meter should be housed in a safe, high grade, unbreakable, fire resistant, UV stabilized, virgin Polycarbonate casing of projection mounting type. The meter cover should be transparent, for easy reading of displayed parameters, and observation of operation indicators. The meter base may or may not be transparent, but it should not be black in colour. The meter casing should not change shape colour, size, and dimensions when subjected to 200 hrs on UV test as per ASTMD 53. It should withstand 650 deg. C. glow wire test and heat deflection test as per ISO 75.

The meter cover should be sealed to the meter base with at least 2 nos. seal by the Manufacturer.

The bidder shall submit relevant documents regarding the procurement of polycarbonate material.

The polycarbonate material of only the following manufacturers shall be used.

a) G.E. Plastics : LEXAN 943A or equivalent for cover & Terminal cover/ LEXAN 503R or equivalent base.
b) BAYER : Grade corresponding to above
c) DOW Chemicals : -Do-
d) MITSUBISHI : -Do-
e) TEJIN : -Do-
f) DUPONT : -Do-

5.2 METER CASE AND COVER

The meter should have a case, which can be sealed in such a way that the internal parts of the meter are accessible only after breaking the seal and cover. This is to be achieved by use of **Ultrasonic Welding** (Ultrasonically continuously welded at three sides so that the cover cannot be separated from the basic without breaking/damaging the case & cover) or any other technology which is either equally or more efficacious. In case, ultrasonic welding using plate / strip is used the material of plate / strip should be same as that of cover and base and the strip. The manufacturer's logo should be embossed on the strip / plate. The material of the meter body (case and cover) shall be of Engineering Plastic.

The meter cover should be fixed to the meter base (case) with Unidirectional Screws, so that the same cannot be opened by use of screwdrivers. These unidirectional screws should be covered with transparent caps, ultrasonically welded with the meter body and the screw covers should be embedded in the meter body in a groove. If proper Ultrasonic welding is already given against clause 5.1, further ultrasonic welding with a cap is not required for unidirectional screw.

The meter shall withstand external magnetic influence as per latest amendments of CBIP Technical Report No.88 & 304.

5.3 TERMINAL BLOCK AND COVER :

The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block should be made from best quality non-hygroscopic, flame retardant material (capable of passing the flammability tests) with nickel plated brass inserts / alloy inserts for connecting terminals.

The terminals in the terminal block shall be of adequate length in order to have proper grip of conductor with the help of screw adjustable metal plates to increase the surface of contact and reduce the contact resistance. The screws shall have thread size not less than M 4 and head having 4-6mm. diameter.

The screws shall not have pointed ends at the end of threads. All terminals and connecting screws and washers should be of tinned / nickel plated brass material.
The internal diameter of terminal hole should be minimum 5.5 mm. The holes in the insulating material shall be of sufficient size to accommodate the insulation of conductor also.
The terminal cover shall be transparent re-inforced Polycarbonate, Engineering Plastic with minimum thickness 2.0 mm and the terminal cover shall be of extended type completely covering the terminal block and fixing holes. The space inside the terminal cover should be sufficient to accommodate adequate length of external cables.

6.0 WORKING ENVIRONMENT

As per IS 14697-1999 (reaffirmed 2004). Meter to perform satisfactorily under Non-Air Conditioned environment (within stipulations of IS) IP51 housing for indoors use and IP55 degree of protection and sealing arrangement for outdoor use.

The meter shall be suitably designed for satisfactory operation under the hot and hazardous tropical climate conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish, which provided suitable protection to them from any injurious effect of excessive humidity.

7.0 MANUFACTURING PROCESS, ASSEMBLY AND TESTING

Meters shall be manufactured using latest and 'state of the art' technology and methods prevalent in electronics industry. The meter shall be made from high accuracy and reliable surface mount technology (SMT) components. All inward flow of major components and sub assembly parts (CT, PT, RTCs / Crystal, LCDs, LEDs, power circuit electronic components etc.) shall have batch and source identification. Multilayer 'PCB' assembly with 'PTH' (Plated through Hole) using surface mounted component shall have adequate track clearance for power circuits. SMT component shall be assembled using automatic 'pick-and-place' machines, Reflow Soldering oven, for stabilized setting of the components on 'PCB'. For soldered PCBs, cleaning and washing of cards, after wave soldering process is to be carried out as a standard practice. Assembly line of the manufacturing system shall have provision for testing of sub-assembled cards. Manual placing of components and soldering, to be minimized to items, which cannot be handled by automatic machine. Handling of 'PCB' with ICs / C-MOS components, to be restricted to bare minimum and precautions to prevent 'ESD' failure to be provided. Complete assembled and soldered PCB should undergo functional testing using computerized Automatic Test Equipment.

Fully assembled and finished meter shall undergo 'burn-in' test process for 24 Hours at 55 degree Celsius (Max. temperature not to exceed 60 degree Celsius) under base current (Ib) load condition.

Test points should be provided to check the performance of each block/stage of the meter circuitry.
RTC shall be synchronized with NPL time at the time of manufacture. Meters testing at intermediate and final stage shall be carried out with testing instruments, duly calibrated with reference standard, with traceability of source and date.

8.0 DISPLAYS

The meter shall have 7 digits (with ±indication), parameter identifier, backlit Liquid Crystal Display (LCD) of minimum 10 mm height, wide viewing angle. Auto display cycling push button required with persistence time of 12 Seconds (10 to 12 sec). LCD shall be suitable for temperature withstand of 70 deg C; Sequence of display of various instantaneous electrical parameters shall be as desired by Purchaser at the time of order.

The data stored in the meters shall not be lost in the event of power failure. The meter shall have Non Volatile Memory (NVM), which does not need any battery backup. The NVM shall have a minimum retention period of 10 years.

9.0 PERFORMANCE UNDER INFLUENCE QUANTITIES

The meter's performance under influence quantities shall be governed by IS 14697-1999 (reaffirmed 2004). The accuracy of meter shall not exceed the permissible limits of accuracy as per standard IS: 14697 (latest version).

10.0 OUTPUT DEVICE

Energy Meter shall have test output, accessible from the front, and be capable of being monitored with suitable testing equipment while in operation at site. The operation indicator must be visible from the front and test output device shall be provided in the form of LED. Resolution of the test output device shall be sufficient to enable the starting current test in less than 10 minutes.

11.0 REAL TIME INTERNAL CLOCK (RTC)

RTC shall be pre-programmed for 30 Years Day / date without any necessity for correction. The maximum drift shall not exceed +/- 300 Seconds per year.

The clock day / date setting and synchronization shall only be possible through password/Key code command from one of the following:

a) Hand Held Unit (HHU) or Meter testing work bench and this shall need password enabling for meter;
b) From remote server through suitable communication network or Sub-station data logger 'PC'.

12.0 QUANTITIES TO BE MEASURED & DISPLAYED

The meter shall be capable of measuring and displaying the following electrical quantities within specified accuracy limits for polyphase balanced or unbalanced loads:

a) Instantaneous Parameters such as phase and line voltages, currents, power factors, overall kVA, kW, kVAr, power factor, frequency etc as per details given in the table below and enclosed annexure.
b) Block Load Profile Parameters such as kVAh, kWh, kVArh (lag, lead), Maximum Demand (MD) in kW & kVA, power factor, phase and line voltages, currents etc as per details given in the table below and enclosed annexure.
c) Daily Load Profile Parameters such as cumulative energy kWh (import, export), cumulative kVAh (while kW- import/export), cumulative energy kVArh (quadrant-1 / 2 / 3 / 4), reactive energy high (V > 103%)/low (V < 97%), etc as per details given in the table below and enclosed annexure.

In addition to above the meter shall also record the Name plate details, programmable parameters (readable as profile), occurrence and restoration of tamper events along with the parameters (Table 5.1, 5.2 and 6.1 to 6.8 respectively of enclosed document)

Detail of category wise parameters requirement suitable for specific location such as feeder/DT metering, interface points/boundary points is given in following tables of guidelines document enclosed as annexure:

Annexure - I

Category	Parameter group	Annexure Table No.
Substation Feeder/ Distribution Transformer meter	Instantaneous parameters	A2.1
	Block Load Profile parameters	A2.2
Substation Feeder/ Distribution Transformer/Boundary/Ring fencing/Interface/HT Consumer Meters	Name Plate details	A5.1
	Programmable Parameters	A5.2
	Event Conditions	A6.1 to A6.8

12.1 MEASUREMENT OF HARMONICS

The total energy must be displayed in meter. The same energy shall be logged in the meter memory and be capable of downloading to the BCS through the HHU and be available for viewing at the BCS end.

13.0 DEMAND INTEGRATION PERIOD

As per enclosed guidelines document.

14.0 MD RESET

It should be possible to reset MD by any of the following options:

- Remote MD reset
- Local MD Reset for manually triggered at site.
- MD reset by HHU through Authenticated command.

15.0 MARKING OF METERS

The marking of meters shall be in accordance with IS: 14697 /1999 (reaffirmed 2004).
The meter shall also store name plate details as given in the table A5.1 of annexure. These shall be readable as a profile as and when required.

16.0 COMMUNICATION CAPABILITY

The meter shall be provided with two ports for communication of the measured/collected data as per document enclosed in the annexure, i.e. a hardware port compatible with RS 232 or RS 485 specifications which shall be used for remote access through suitable Modem (GPRS/GSM/EDGE/CDMA/ PSTN/LPR) and an Optical port complying with hardware specifications detailed in IEC-62056-21. This shall be used for local data downloading through a DLMS compliant HHU**.**

The RS 485 port shall be used at Substations suitable for multi-drop connections of the meter for exporting data to sub-station data logger/DCU/Computer and the remote end server. **The RS 232 port shall be used at boundary points meters** and Distribution Transformer meters capable to transfer and export data to the remote end server through suitable communication mediums (GPRS/GSM/EDGE/CDMA/ PSTN/LPR). Both ports shall support the default and minimum baud rate of 9600 bps.

17.0 HAND HELD UNIT (HHU)

To enable local reading of meter datas a DLMS compliant HHU shall be used. The HHU shall be as per specification given in the enclosed guidelines document. It shall be compatible to the DLMS compliant energy meters that are to be procured/ supplied on the basis of this specification.

18.0 TAMPER & FRAUD MONITORING FEATURES

The meter shall work satisfactorily under presence of various influencing conditions like External Magnetic Field, Electromagnetic Field, Radio Frequency Interference, Vibrations, Harmonic Distortion, Voltage/Frequency Fluctuations, and Electromagnetic High Frequency Fields etc. The meter shall be immune to abnormal voltage/frequency generating devices and shall record the occurrence and restoration of such tamper events along with parameters such as current, voltages, kWh, power factor event code, date & time etc. (listed in Table A 6.1 to A 6.8 except Table 6.7 in enclosed document).

Tamper details shall be stored in internal memory for retrieval by authorized personnel through either of the following:

i) HHU.
ii) Remote access through suitable communication network.

Minimum 200 numbers of events (occurrences & restoration with date & time) should be available in the meter memory.

19.0 TYPE TESTS

The meter offered should have successfully passed all type tests described in the IS 14697 and IEC 61000 4-5 and the meter Data Transfer and Communication capability as per enclosed guidelines document. Type test certificate shall be submitted along with the offer and the same shall not be more than 36 months old at the time of bid submission. Make & type of major components used in the type-tested meter shall be indicated in the QAP. The condition are to be relaxed by the purchasers (utilities) for the bids to be issued in next fourteen (14) months (i.e. upto Oct' 2010) to accommodate design, development and testing of the new standard meters, conforming to the guidelines document enclosed as annexure, by manufacturers. The bidder shall have to submit the required type test certificate along with tested energy meters (as per bid requirement)to the purchaser (utility) at the time of meters delivery.

Further Purchaser shall reserve the right to pick up energy meters at random from the lots offered and get the meter tested at third party lab i.e. CPRI / agencies listed at Appendix-C of CBIP 88 / NPL / CQAL/ ERTL / ERDA at the sole discretion of the Purchaser. The supplier has no right to contest the test results of the third party lab or for additional test and has to replace/take corrective action at the cost of the supplier.

It shall be the responsibility of the supplier to arrange such tests and Purchaser shall be informed of the date and time of conduction of tests well in advance to enable him to witness such tests. Test charges of the testing authority, for such successful repeat type tests, shall be reimbursed at actual by the Purchaser.

20.0 ACCEPTANCE & ROUTINE TESTS

Criteria for selection for such tests and performance requirements shall be as per IS 14697-1999 (reaffirmed 2004)

Additional acceptance shall include Surge withstand (SWC), Lightning impulse and HF disturbance as per IEC 62052-11. For these specific tests, one sample meter per order from one of the offered lot shall be subjected Type Test including SWC / other semi-destructive tests. Meters after tests shall not be used. Lightning Impulse test, listed under 'SWC' shall be done for 6 kV_p and 300 Joules. The cost of type test (one time) will be brawn by the manufacturer.

Accuracy tests shall be performed at the beginning and at the end of the acceptance tests specified.

20.1 INSPECTION :

The inspection shall be carried out at any stage of manufacture by the authorised representatives of WBSEDCL with 15 days prior intimation to the supplier. The manufacturer shall grant all reasonable facilities free of charge for inspection and testing to satisfy the purchaser that the materials to be supplied are in accordance with their specification.
The supplier shall keep the WBSEDCL informed in advance, about the manufacturing programme so that the arrangement can be made for inspection.

The representative / Engineer of the WBSEDCL attending the above testing shall carry out testing as per relevant standards and issue test certificate approval to the manufacturer and give clearance for dispatch.

21.0 QUALITY ASSURANCE:

The manufacturer shall have a comprehensive quality assurance program at all stages of manufacture for ensuring products giving reliable, trouble free performance. Details of the bidder's quality assurance and test set up shall be furnished with the bid. A detailed quality assurance program shall be finalized with the successful bidder during the award stage. Bidder shall furnish following information along with his bid:

i) Organization structure of the manufacturer and his main sub-suppliers (PCBs, SMT cards, CT/PT) with details of 'QA' setup, overall workflow;
ii) Copy of system manual showing 'QAP' (Quality Assurance Plan) as actually practiced during manufacturing and final testing.
iii) List of raw materials and critical components (ASIC chip, crystal clock, memory register Chip, transformers, optical ports etc.) with their suppliers;
iv) Stage inspection of product before final testing;
v) Procedure adopted for 'In-situ' testing of PCBs, after placement of surface mounted component, for quantitative parametric variation of tolerance by self or sub-contractor.
vi) Testing and calibration facility, date of calibration of test bench, manpower data of bench operators;
vii) Sample copies of test certificate of bought out components.

22.0 QUALIFYING REQUIREMENTS

i) Bidder should be a manufacturer;
ii) He should have all the facility in his works for design, assembly, quality assurance, burn-in test (Fully assembled Energy Meter), testing (all routine and acceptance tests), automatic calibration of Energy Meter on software based test bench, qualified team of technical and software engineers. All Test Report must be computer generated.
iii) The average annual turnover of the manufacturer for Energy meters for the three (3) best financial years out of last five (5) years, should be at least Rs.3.00 Crore.
iv) Notwithstanding anything stated herein under, the Purchaser reserves the right to assess the capacity and capability of the bidder to execute the work, should the circumstances warrant such assessment in the overall interest of the Purchaser.

22.1` TESTING AND MANUFACTURING FACILITIES:

The Bidder shall have at least the following testing facilities to ensure accurate calibration:

a) Insulation resistance measurement
b) Running at no load
c) Starting current test
d) Limits of error
e) Range of adjustment
f) Power loss in voltage and current coil
g) Repeatability of error
h) Transportation test
i) Low load run test
j) Heating test

The Bidder shall give a detailed list of bought out items with name of the manufacturer and details about quality control.

23.0 GUARANTEE

Equipments (Meter & Meter Boxes) supplied shall be guaranteed for a period of 66 months from the date of supply or 60 months from the date of installation, whichever ends earlier. Bidders shall guarantee to repair or replace the meters and meter boxes (if supplied), which are found to be defective/inoperative at the time of installation or become inoperative / defective during guarantee period. Replacements shall be effected within 1(one) month from the date of intimation.

The bidder shall extend the guarantee of 5 years for replaced meters & meter boxes considering from the date of replacement. However the bank guarantee provided by the bidders shall be valid for 7 years from the date of supply both for supplied and replaced meters.

24.0 FIXING & CONNECTION ARRANGEMENT

Manufacturer shall ensure following technical points:

Energy Meter terminals block shall be adequately sized with regard to maximum conductor dimension, commensurate with current rating of Energy Meter.

25.0 SUPPLY OF POWER PACK & HHU

For every 50 nos. of meters and part thereof one power pack and one HHU (8MB RAM size with Li –ion battery) should be supplied free of cost.

26.0 SUBMISSION OF SAMPLE & DOCUMENTS

While submitting the Quotation to the Material Controller, Central Stores & Purchase Department, Vidyut Bhavan, 4th Floor, B - Block Kolkata- 700 091, a sample meter having all the mentioned features, BCS with allied software and sample of seal etc. along with the Type Test Certificates and with the test results and ISI Certificate is to be submitted *to* C.E. (DTD), Abhikshan within 16-00 hrs.(except Saturday) & within 12-00 hrs (Saturday) and copy of letter indicating acceptance of Sample by the Office of the C.E. (DTD) is to be submitted to the Material Controller prior to Opening of Offer. Offer will not be accepted without submission of sample and the Tender will not be opened. Any other accessories required for observing the performance & capabilities of the Meter are to be submitted along with offer.

Following sample shall be submitted to C.E. (DTD). A confirmation from C.E. (DTD) regarding submission of sample as detailed below shall have to be submitted along with the Techno-Commercial Bid (Cover-I).

a) 3-Phase 3-Wire 11KV, - /1A. Class of Accuracy 0.5 – 2Nos.

HHU, Power-Pack & Modem, if required, to be brought at the time of testing of sample meters submitted against the tender and to be taken back by the bidder after testing of the said meters.

The bidder shall have to submit one no. sample of Pilfer Proof Meter Box with Test Terminal Block (TTB) along with the sample prototype meter base and cover with body screw & caps and ultrasonic welding mounted inside the Pilfer Proof Meter Box.

27.0 PILFER PROOF METER BOX

The meter box shall be suitable for mounting energy meter and test terminal Block (TTB).it shall be suitable for outdoor installation on the pole and made of weather Proof ,unbreakable, high grade ,fire retardant ,engineering plastic /sheet moulded compound (SMC) with minimum thickness of 3mm for base and 2.5mm for other sides having sufficient di-electric &mechanical strength. it shall be capable withstanding mechanical ,electrical thermal stress as well as effects of humidity which are likely to be encountered in service . The material used should be adequately stabilized against detrimental effect of light &Weather. The surface appearance of the moulded parts must be smooth, on-porous &homogeneous, free of ripples, defects and marks. No fillers or fibers should be visible at any place.

Meter box shall be capable of withstanding boiling water temperature for 5 minutes continuously without distortion or softening. It shall withstand glow wire test as per IS. The box shall comply in all respect with the requirement of latest amendments of IS 13410, specification for “General requirements for enclosure for fixing electric installations”. Applicable degree of protection shall be IP54. Pilfer Proof Meter Box should comply IS 13410 only as specified in the technical Specification.

Size of the box shall be appropriate for mounting energy meter and (TTB) inside the box. Inner dimensions of the box shall be such that there shall be sufficient clearance from all sides of the meter after installation inside the box.

The colour of Pilfer Proof Meter Box shall be either Grey, White or Ivory.

The cover of the meter box shall be provided with neoprene rubber gasket of sufficient size to completely fit in the grooves of the base for protecting against entry of dust & water. The Pilfer Proof Meter Box shall be hinged type but not to push to fit type.

Suitable circular holes with engineering plastic cable glands shall be provide at the bottom of the box for securely holding inlet and outlet control cables from CT & PT.

Internal wiring for connection between TTB and Meter is to be provided.

One viewing window made of scratch and break resistance transparent high grade engineering plastic / polycarbonate materials is to be provided on the cover of the box, so that display of the meter parameters are clearly visible from outside. It is to be fitted from inside and minimum thickness should be 2mm.

The cover should be fitted with base of the meter box by two (2) numbers concealed hinges. Terminal cover of meter of both hinge type and detachable type acceptable but for hinge type the cover should rotate 120 (one hundred twenty) degree in mounted condition of the meter inside the Pilfer Proof meter box.

Suitable handle/knob is to be provided for opening of the cover of the meter box.

For mixing the meter box on wooden board, 4 nos. holes (two top side holes to be keyholes) of minimum 6mm dia should be provided at the four corners of the base of the meter box. 4nos self thread fixing screws of minimum size of 6mm dia & 25mm long should be provided with each meter box. For mounting of the meter inside the meter box, meter base support inside the meter box should be preferably raised by about 10mm.
Two (2) nos. latch/door closing clamp with sealing arrangement are to be provided with the meter box.
Two (2) nos. earthing bolt of dimension M8 x 20 mm are to be provided with the meter box.
The dimension of the pilfer proof meter box shall be such as to accommodate the meter with sufficient clearance from all sides of the meter after installation inside the box.
Name plate marking of the meter box shall be as follows:

i. Property of WBSEDCL & name of the manufacturer to be embossed on the meter box.

ii. P.O. No & date & sign of danger to be printed on the meter box.

28.0 TTB: One no.TTB is to be provided with each pilfer proof meter box and TTB is to be mounted at lower side of the meter box. Cover of TTB should be transparent polycarbonate material.

29.0 SCHEDULES:

The Bidder shall submit the following schedules (as per Standard Format), which is part and parcel of the Specification.

Schedule A Guaranteed Technical Particulars

Schedule B List of Raw Materials (as per enclosed Standard Format).

Schedule C Pre-qualification Conditions.

Schedule D List of Documents to be submitted during sample submission.

****

Schedule – A

GUARANTEED TECHNICAL PARTICULARS FOR 11KV STATIC TRIVECTOR METERS

Sl.No.	Description	Required Specification	Manufacturer's particulars
1	Maker's name and country	To be mentioned	
2	Type of meter/model	To be mentioned	
3	Accuracy class	0.5S	
4	Parameters displayed	To be mentioned	
5	P.F. Range	0 Lag-unity-0 Lead	
6	Basic Current (Ib)	-/lA,	
7	Maximum Current	200 % of Ib	
8	Minimum starting current	0.2% of Ib	
9	Rated Voltage	Ph-Ph : 110V	
10	Variation of voltage at which meter functions normally	-30% to + 20% of Vref	
11	Rated Frequency	50Hz	
12	Power Loss in Voltage & Current circuits	Potential Circuit Less than 1.5W/8VA, Current Circuit Less than 1VA. (Less VA/ Watt getting the preference)	
13	Dynamic range	To be mentioned	
14	MD reset Provisions	a) Through authenticated CMRI or Remote Communication Command b) Automatic resetting at preset date & time.	
15	No. of digits of display and height of character	Seven segment, minm. 7 digit Liquid Crystal Display (LCD) with backlit or LED, having minimum character height of 10 mm.	
16	Non volatile memory	To be mentioned	
17	Principle of operation	To be mentioned	
18	MD Integration period	15 Minutes	
19	Weight of meter	To be mentioned	
20	Dimensions	To be mentioned	
21	Warranty	5-1/2 years from the date of supply. Guarantee period shall be printed on the nameplate.	
22	Outline drawings & Leaflets	To be furnished	
23	a) Remote meter-readout facility	To be mentioned	
	b) Communication protocol used.	To be mentioned	
	c) Sealing provision for meter & optical port.	To be mentioned	
	d) Baud rate of data transmission	To be mentioned	
	e) Required software to be resident in CMRI and BCS.	To be mentioned	
	f) Ultrasonic welding of body	To be mentioned	

	g) Manufacturer's Seal provided	To be mentioned	
24	Base Computer Software	Windows XP based or suitable for latest version.	
25	Type Test Certificates	To be furnished	
26	Time of Day Zones (Selectable)	To be mentioned (Not mandatory)	
27	Whether meter measures both fundamental & Total Energy	Total Energy	
28	Real Time Clock Accuracy	Max.drift per annum +/-5 min for Class 0.5S.	
29	Anti Tamper Features	To be mentioned in details.	
30	Data retention by NVM without battery back up and un-powered condition	10 years	
31	Guarantee period of meter	5-1/2 years from the date of supply. Guarantee period shall be printed on the nameplate.	
32	BIS license	After publishing New IS	
32.1	BIS license No. & date with its validity for ISI certification mark on offered meter.	To be mentioned	
32.2	Details of meter design for which above BIS certification has been obtained: -	To be mentioned	
(i)	Ratio of Ib to Imax		
(ii)	Material of meter body		
(iii)	Grade of printed circuit Board material		
(iv)`	Type of assembly of component used (SMT)		
(v)	Meter constant (IMP / KWh)		
(vi)	Auxiliary power circuit (with PT or PT less)		
(vii)	Accuracy class		
33	ISO accreditation no. & date with its validity		
34	Other parameters / features not covered in the above GTP	Conform to specification of IS-14697 / 1999 & CBIP technical report No.88 (with its latest amendment).	
35	Past Experience	Copies of order executed in last three years along with GTP of the supplied meters to be enclosed. Past experience to be considered for manufacturing meter as per IS: 14697 & CBIP-88/304	

Schedule-B

LIST OF RAW MATERIALS & CRITICAL COMPONENTS

Sl. No.	Component Function / Feature	Make / origin
1	Current Element	
2	Measurement / Computing chips	
3	Memory chips	
4	Display modules	
5	Communication modules	
6	Optical port	
7	Power Supply	
8	Electronic components	
9	Mechanical parts	
10	Battery	
11	RTC / Micro controller	

Schedule-C

PRE-QUALIFICATION CONDITIONS FOR HT STATIC METERS

Sl. No.	Particulars	Remarks
1	Bidders must have valid BIS certification for the offered meter. If it has started to issue by appropriate authority	Yes / No
2	Bidder preferably posses ISO 9001 certification	Yes / No
3	Bidder should be manufacturers of static meters having supplied Static 11/33 KV H.T. Meters with memory and LCD display as per IS 14697 & CBIP 88/304 to Electricity Boards / Utilities in the past 3 years.	Yes / No
4	Bidders should have dust free, static protected environment for manufacture, assembly and Testing.	Yes / No
5	Bidder should have automatic computerized test bench for lot testing of meters.	Yes / No
6	Bidder has facilities of Oven for ageing test.	Yes / No

Schedule-D

Sl. No.	LIST OF DOCUMENTS TO BE SUBMITTED DURING SAMPLE SUBMISSION			
1	Attested copy of type test reports from NABL accredited laboratory as per new IS(If Published)			
2	Attested copy of BIS certificates of the same type of meter submitted as sample			
3	Attested certificates as regards material used for meter case, cover & terminal block.			
4	Annexure – B as per tender documents			
5	Annexure – C as per tender documents			
6	Operating manual & Tamper logic of the meter submitted			