Volume - I

Tender Notification for

RATE CONTRACT FOR SUPPLY OF NET METERS (1 PHASE,3 PHASE,LTCT & HT METERS)

CMC/BR/23-24/RB/PR/SN/2092

Date : 24.03.2023

Due Date for Submission of Bids : 14.04.2023

BSES RAJDHANI POWER LTD (BRPL)
BSES Bhawan, Nehru Place, New Delhi-110019
Corporate Identification Number:
U74899DL2001PLC111527
Telephone Number: +91 11 49207235
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Website: www.bsesdelhi.com

BSES
RAJDHANI POWER LIMITED

SECTION - I

REQUEST FOR QUOTATION

Tender Notification : CMC/BR/23-24/RB/PR/SN/2092

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

Date : 24.03.2023

BSES
RAJDHANI POWER LIMITED

INDEX

SECTION – I: REQUEST FOR QUOTATION

1.00 Event Information

BRPL invites Sealed tenders **RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)** . The bidder must qualify the technical requirements as specified in clause 2.0 stated below.The sealed envelopes shall be duly superscribed as — **"RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS) VIDE TENDER NOTICE CMC/BR/23-24/RB/PR/SN/2092 DUE FOR SUBMISSION ON DT. 14.04.2023", 1500 HRS.**

Sl. No.	Item Description	Specification	Requirement	Estimated Cost
			Total Qty. (Nos)	
BRPL,DELHI				
1	1-Ph Whole Current Net Meter (10A-60A, 240V, Cl-1.0)	SECTION V	600	***39 Lacs***
2	3-Ph Whole Current Net Meter (20A-60A, 240V. Cl-1.0)		800	
3	LT CT Net Meter (3P-4W, 240Volts, CL- 0.5s)		200	
4	HT Net Meter (3P-4W, 63.5V, 5A, CL-0.5s)		200	

Note:

- **Quantity may vary to any extent of +/- 30% of above mentioned total quantity.**
- **The rates quoted shall remain valid for one year from the date of LOI/RC.**

1.02 The schedule of specifications with detail terms & conditions can be obtained from address given below against demand draft/Pay Order of **Rs.1180/-**, drawn in favour of **BSES RAJDHANI POWER LTD,** payable at New Delhi. The tender documents can be downloaded from the website **"www.bsesdelhi.com"**.

In case tender papers are downloaded from the above website, then the bidder has to enclose a demand draft covering the cost of bid documents as stated above in a separate envelope with suitable superscription — "Cost of Bid Documents: Tender **Notice Ref: CMC/BR/23-24/RB/PR/SN/2092 ".**This envelope should accompany the Bid Documents.

1.00 Offers will be received upto **15:30 Hrs. on dt. 14.04.2023** as indicated earlier and will be opened at the address given below dt **14.04.2023 at 15:45 Hrs.** in the presence of authorized representatives of the bidders**.** The schedule of specifications with detail terms & conditions are enclosed. It is the sole responsibility of the bidder to ensure that the bid documents reach this office on or before the due date.

HEAD OF THE DEPARTMENT,
1st FLOOR, 'C' BLOCK,
CONTRACTS & MATERIALS DEPARTMENT,
BSES RAJDHANI POWER LTD,
BSES BHAWAN,
NEHRU PLACE, NEW DELHI-110019.

1.04 BRPL reserves the right to accept/reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:

(i). Earnest Money Deposit (EMD) @ 2% (Two percent) of the Tender value i.e **Rs 78,000/-** is not deposited in shape of Bank Draft in favour of BSES RAJDHANI POWER LTD, payable at New Delhi or Bank Guarantee executed on favour of BSES RAJDHANI POWER LTD.

(ii). The offer does not contain "FOR, NEW DELHI price indicating break-up towards all taxes & duties"

(iii). Complete Technical details are not enclosed.

(iv). Tender is received after due time due to any reason**.**

1.05 BRPL reserves the right to reject any or all bids or cancel/withdraw the invitation for bids without assigning any reason whatsoever and in such case no bidder/intending bidder shall have any claim arising out of such action.time of placing purchase orders.

2.0 Qualification Criteria:-

The prospective bidder must qualify all of the following requirements to be eligible to participate in the bidding. Bidders who meet following requirements will be considered as successful bidder and management has a right to disqualify those bidders who do not meet these requirements.

1. The bidder must be a meter manufacturer of static meter.
2. The bidder shall either themselves be manufacturers of the equipment offered or accredited representatives of such manufacturers in India or of their Principals abroad with whom they may be having collaboration **Such accreditation should be at least of one year preferably last year as on date of tender.** Authority letter from manufacturer shall be attached along with bid.
3. Relevant documents in support of the above must be furnished along with undertaking of the manufacturers. If these documents are not furnished along with the tenders the offer will be rejected summarily.
4. Bidder should have supplied minimum 1000 similar type of meters in last five years (From the date of technical bid opening) to Electricity Distribution Utility / Undertaking in India with electronic display and communication facility.
5. Offered meters should be in successful operation for minimum 2 years as on the date of opening of Bid.This should be supported by the copies of purchase orders and performance reports from the SEBs / Power utilities should be enclosed.
6. The bidder must possess valid ISO 9001:2000 certification for meter manufacturing and possess possess valid BIS Licence.
7. Firms who are debarred/blacklisted in other utilities in India will not be considered.
8. The Bidder should have average turnover of Rs.20 Crores in the last three financial years (i.e. 2019-20,2020-2021 & 2021-2022) **.** Bidder should submit report on financial standing such as profit and loss statement, balance sheets for the last three years as an supporting documents.
9. Bidder should have complete volume of type test reports as per IS 13779 (Including latest amendments if any) and magnet test as per CBIP-88 from any NABL accredited lab. The type test report should not be older than 5 years as on the date of opening of tender.
10. The manufacturer should have following facility to meet both quality and quantity requirement of supplies :

a) Computerized test bench: The manufacturer should have sufficient nos of Computerized test benches. The benches should have electronic supply, Isolated CT/ PT system and data should be directly stored in central server.

b) Seal tracking system: The manufacturer has to put both his own seal and BSES seal on the meter. He should have a seal tracking software to ensure tracking of seal and no duplication of seals and meter nos.

c) Meter Burn In system: In order to ensure the reliability of components and that there is no drift in meter accuracy with time ; the manufacturer should have burn in facility --- Running meter with load at elevated temperature.

d) Routine test data: During lot acceptance,all routine test data should be made available to inspector In fact as per BIS , STI all test data should be offered to inspector for verification.Routine test report should be packed with each meter.

e) Test benches : During the lot acceptance , BSES inspector can test up to 5% of offered quantity .The manufacturer should agree to provide all test facility to do so . Further he should allow BSES inspector to check shop floor process.The place of inspection should be clearly marked in tender and same should be well equipped .

f) Test equipments : Since the meters has lot of anti theft features , the manufacturer should have test set up too check the working of all anti theft features.Same should be available during lot inspection , otherwise inspector has a wright to withdraw inspection.

g) PCB assembly facility:- The PCB facility should have auto- pick n place machine, in- circuit testor, Protection against static charge/ dust etc. and process to ensure no corrosion of solden points/ tracks. Incase service is

taken from other vendor than bidder shall arrange inspection of facility. The bidder should be taking the service from the vendor since last two years and so far have procured & one million meter PCB from vendor.

The manufacturer should send the compliance of above mentioned parameters in technical offer and has to give an undertaking about ***No Objection*** to verify his manufacturing facility as a part of tender process. Further in relevance to above clauses vendor should submit details of facilities.

3.00 Bidding and Award Process

Bidders are requested to submit their questions regarding the RFQ or the bidding process after review of this RFQ. BSES RAJDHANI POWER LTD response to the questions raised by various bidders will be distributed to all participating bidders through an RFQ Update.

a.Time schedule of the bidding process

The bidders on this RFQ package should complete the following within the dates specified as under:

S. No.	Steps	Activity description	Due date
1	Technical Queries	▪ All Queries related to RFQ	On or before 14.04.2023
2	Technical Offer	• EMD of requisite amount • Non-refundable DD for Rs 1180/- in case tender documents downloaded from website • It include clause by clause commentary, GTP, Type test report from CPRI/NABL accredited independent test LAB (Not more than 5 year old), BIS report, Quality assurance plan, Deviation from the technical specifications,List of Plant and machinery, Testing facilities available at works and drawings, catalogues, manual etc. • Compliance of Qualification criterion (cl 2.0) and Documentary evidence in support of qualifying criterion as per format attached in Annexure V. • Acceptance of delivery, commercial terms and conditions. • Deviation from the General Conditions of the contract/commercial terms and condtions. • Original Tender documents duly stamped and signed on each page as token of acceptance	14.04.2023, At 1500 Hrs
3	Commercial Officer	• Price for Meter. • Break up regarding basic price and taxes as per format enclosed vide Annexure III A & B • Delivery commitment	14.04.2023, At 1500 Hrs
4	Samples (3 nos.of each type)	• **Submission of Sample with meter routine report as per bidder offer.** • **Samples will be submitted at BRPL Laboratory Near substation no .15 , sector – 7 , Pushpa Vihar , Saket ,New Delhi – 110017 on or before the due date.** • **Sample of optical cord to be submitted with meter – 2 nos.** • **Optical cord to be demonstrated for mechanical fixing & downloading.**	14.04.2023, At 1600 Hrs
5	Performance gaurantee quality system report	• As per RFQ	Only for successful bidders.
6	Opening of technical bid	• As per RFQ	14.04.2023, At 15:30 Hrs

This is a two part bid process.Bidders are to submit the bids a) Technical Bid b) Financial Bid. Both these parts should be furnished in separate sealed covers superscribing specification no. validity etc, with particulars as **Part-I Technical Particulars & Commercial Terms & Conditions** and **Part-II "Financial bid"** and these

sealed envelopes should again be placed in another sealed cover which shall be submitted before the due date & time specified.

Bidders are requested to submit the bid in one Original plus one copy in duplicate

The Part – I Eligibility and Technical Bid should not contain any cost information whatsoever. In case of Bids where the qualification requirements, technical suitability and other requirements are found to be inadequate, Part-II "Financial Bid' will be returned unopened.
b). Qualified bidders will be intimated after technical evaluation of all the bids is completed.

Part –II Financial Bid: This envelope will be opened after techno commercial evaluation and only of the qualified bidders. The date and time of same shall be intimated in due course to the qualified bidders.
Not withstanding anything stated above, the Purchaser reserves the right to assess biddrs capability to perfom the contrct, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

Part –III : E- Bidding and Reverse Auction through SAP-SRM Module

Purchase reserves the right to use the reverse auction through SAP-SRM tool as an integral part of the entire tendering process. All the bidders who are techno-commercial qualified on the basis of tender requirements shall participate in reverse auction.

Not withstanding anything stated above, the Purchaser reserves the right to assess bidders capability to perform the contract, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

4.00 Award Decision

Purchaser intends to award the business on a lowest bid basis, so suppliers are encouraged to bid competitively. The decision to place purchase order / letter of acceptance solely depends on purchaser on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that Purchaser may deem relevant.

The purchaser reserves all the rights to award the contract to one or more bidders so as to meet the delivery requirement or nullify the award decision without any reason.

BSES reserves the right to split the tender quantity amongst techno commercially qualified bidders on account of delivery requirement in tender,quantity under procurement etc.

Spilitting of tender quantity amongst more than one bidder shall be governed by below mentioned guidelines:

- If the quantity is to be split among 2 bidders, it will be done in the ratio of **70:30 on L1 price**.
- If the quantity is to be split among 3 bidders, it will be done in the ratio of **60:25:15 on L1 price**.
- In case quantity needs to be distributed and order splitting is required,distribution of quantity shall be maximum among three(3) bidders.

In the event of your bid being selected by purchaser (and / or its affiliates) and your subsequent DEFAULT on your bid; you will be required to pay purchaser (and / or its affiliates) an amount equal to the difference in your bid and the next lowest bid on the quantity declared in RFQ.

In case any supplier is found unsatisfactory during the delivery process, the award will be cancelled and BRPL reserves the right to award other suppliers who are found fit.

Qty Variation : The purchaser reserves the rights to vary the quantity by +/- 30% of the tender quantity.

Repeat Order : BRPL reserves the right to place repeat order at the same rates & terms and conditions as per this tender against additional requirement subject to mutual agreement between BRPL & supplier.

5.00 Market Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the Terms & Conditions. Bidders must agree to these rules prior to participating.In addition to other remedies available, we reserves the

right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the Terms & Condition. Bidders who violate the marketplace rules or engage in behavior that disrupts the fair execution of the marketplace restricts a bidder to length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace.
- Breach of the terms of the published in Request For Quotation.

6.00 Supplier Confidentiality

All information contained in this RFQ is confidential and may not be disclosed, published or advertised in any manner without written authorization from BSES RAJDHANI POWER LTD. This includes all bidding information submitted .All RFQ documents remain the property of BSES RAJDHANI POWER LTD and all suppliers are required to return these documents to BSES RAJDHANI POWER LTD upon request.

Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

7.0 Contact Information

All communication as regards this RFQ shall be made (i) in English, (ii) in writing and (iii) sent by mail, facsimile to

	Technical	Commercial
Contact Name	Mr. Manish Jain Copy to Mr. Gopal Nariya	Ms Sarveshwar Nautiyal Copy to Mr. Pankaj Goyal
Address	2nd Floor , E-Block, BSES Bhawan Nehru Place , New Delhi -111019	1st Floor , C-Block, BSES Bhawan Nehru Place , New Delhi -111019
Email Id	Manish.Jain@relianceada.com gopal.nariya@relianceada.com	Sarveshwar.Nautiyal@relianceada.com Pankaj.Goyal@relianceada.com,

Note: Those who are downloading tender notice from website. It is advisable to inform BRPL technical Deptt, so as they can be contacted in case of any amendment in tender.

SECTION – II

INSTRUCTION TO BIDDERS (ITB)

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

CMC/BR/23-24/RB/PR/SN/2092

Date : 24.03.2023

Due Date for Submission of Bids : 14.04.2023

A. GENERAL

1.0 BSES RAJDHANI POWER LTD, hereinafter referred to as the Purchaser"are desirous of implementing the various Systems Improvement/Repair & Maintenance works at their respective licensed area in Delhi The Purchaser has now floated this tender for procurement of different types of Meter's as notified earlier in this bid Document.

2.0 SCOPE OF WORK

The scope shall include Design, Manufacture,Testing at works conforming to the Technical Specifications enclosed along with Packing, Forwarding, Freight and Unloading and proper stacking at Purchaser's stores.

3.0 DISCLAIMER

3.01 This Document includes statements, which reflect various assumptions, which may or may not be correct. Each Bidder/Bidding Consortium should conduct its own estimation and analysis and should check the accuracy,reliability and completeness of the information in this Document and obtain independent advice from appropriate sources in their own interest.

3.02 Neither Purchaser nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with anything contained in this Document,any matter deemed to form part of this Document, provision of Services and any other information supplied by or on behalf of Purchaser or its employees, or otherwise a rising in anyway from the selection process for the Supply.

3.03 Though adequate care has been taken while issuing the Bid document,the Bidder should satisfy itself that Documents are complete in all respects. Intimation of any discrepancy shall be given to this office immediately.

3.04 This Document and the information contained herein are Strictly Confidential and are for the use of only the person(s) to whom it is issued. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient's professional advisors).

4 COST OF BIDDING

The Bidder shall bear all cost associated with the preparation and submission of its Bid and Purchaser will in no case be responsible or liable for those costs. **Further the Purchaser has a right to get Sample Meter's tested by any reputed independent lab like CPRI/ERDA/NABL (approved by BRPL) at the cost of bidder.**

B. BIDDING DOCUMENTS

5.0 BIDDING DOCUMENTS

5.01 The Scope of Work, Bidding Procedures and Contract Terms are described in the Bidding Documents. In addition to the covering letter accompanying Bidding Documents, the Bidding Documents include:

Volume -I

(a) Request for Quotation (RFQ) - Section - I
(b) Instructions to Bidders (ITB) - Section – II
(c) General Conditions of Contract - Section -III
(d) Quantity and delivery requirement - Section –IV
(e) Technical Specifications (TS) - Section –V

Volume - II

(a) Acceptance form for Reverse Auction - Annexure –A
(b) Bid Form - Annexure –I
(c) Bid Format - Annexure -II
(d) Price Schedule - Annexure –III
(e) Commercial Terms & Conditions - Annexure -IV
(f) No Deviation Sheet - Annexure –V
(g) Qualification Criterion - Annexure –VI

5.02 The Bidder is expected to examine the Bidding Documents, including all Instructions, Forms,Term and Specifications. Failure to furnish all information required by the Bidding documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect will may result in the rejection of the Bid.

6.00 **AMENDMENT OF BIDDING DOCUMENTS**

6.01 At any time prior to the deadline for submission of Bids,the Purchaser may for any reasons,whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by Amendment.

6.02 The Amendment shall be part of the Bidding Documents,pursuant to Clause 5.01,and it will be notified in writing by Fax/e-mail to all the Bidders who have received the Bidding Documents and confirmed their participation to Bid,and will be binding on them .

6.03 In order to afford prospective Bidders reasonable time in which to take the Amendment into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of Bids.

C. **PREPARATION OF BIDS**

7.0 **LANGUAGE OF BID**

The Bid prepared by the Bidder,and all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser,shall be written in the English Language.Any printed literature furnished by the Bidder may be written in another Language,provided that this literature is accompanied by an English translation, in which case,for purposes of interpretation of the Bid,the English translation shall govern.

8.0 **DOCUMENTS COMPRISING THE BID**

The Bid prepared and submitted by the Bidder shall comprise the following components:

(a) Bid Form ,Price & other Schedules (STRICTLY AS PER FORMAT)and Technical Data Sheets completed in accordance with Clause 9.0, 10.0, 11.0 and Technical Specification ;

(b) All the Bids must be accompanied with the required EMD as mentioned in the Section-I against each tender.

(c) Power of attorney indicating that the person signing the bid have the authority to sign the Bid and thus the Bid is binding upon the Bidder during the full period of its validity, in accordance with clause 12.0.

9.0 **BID FORM**

9.01 The Bidder shall complete an "Original' and another one "Copy'of the Bid Form and the appropriate Price & Other Schedules and Technical Data Sheets.

9.02 **EMD**

Pursuant to Clause 8.0(b) above,the bidder shall furnish,as part of its bid, a EMD amounting to 2% of the total bid value(FOR Destination) i.e **Rs 78,000/**. The EMD is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture.

The EMD shall be denominated in the currency of the bid,and shall be in the following form **:**

(a) A bank guarantee issued by any scheduled bank strictly as per the form at enclosed and shall be valid for a period of thirty (30)days beyond the validity of the bid

(b) Bank Draft in favour of BSES RAJDHANI POWER LTD,payable at Delhi.

Unsuccessful bidders' EMD will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity.

The successful bidder's EMD will be discharged upon furnishing the performance security.The EMD may be forfeited :

(a) If the Bidder:

(i) withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form ; or

(b) In the case of a successful Bidder, if the Bidder fails:

(i) to sign the Contract,or

(ii) to furnish the required performance security.

10.0 **BID PRICES**

10.01 Bidders shall quote for the entire Scope of Supply with a break-up of prices for individual items.The total Bid Price shall also cover all the Supplier's obligations mentioned in or reasonably to be inferred from the Bidding Documents in respect of Design, Supply,Transportation to site,all in accordance with the requirement of Bidding Documents The Bidder shall complete the appropriate Price Schedules included herein , stating the Unit Price for each item & total Price.

10.02 The prices offered shall be inclusive of all costs as well as Duties,Taxes and Levies paid or payable during execution of the supply work , breakup of price constituents, should be there.

Prices quoted by the Bidder shall be—Firm "and not subject to any price adjustment during the performance of the Contract. A Bid submitted with an adjustable price quotation will be treated as non -responsive and rejected.

11.0 **BID CURRENCIES**

Prices shall be quoted **in Indian Rupees (RS) Only.**

12.0 **PERIOD OF VALIDITY OF BIDS**

12.01 Bids shall remain valid for **120 days** post bid date.

12.02 Notwithstanding Clause12.01 above,the Purchaser may solicit the Bidder's consent to an extension of the Period of Bid Validity.The request and the responses thereto shall be made in writing by Fax/e-mail.

13.0 **ALERNATIVE BIDS**

Bidders shall submit Bids, which comply with the Bidding Documents. Alternative Bids will not be considered. The attention of Bidders is drawn to the provisions of Clause 22.03 & 22.04 regarding the rejection of Bids, which are not substantially responsive to the requirements of the Bidding Documents.

14.0 **FORMAT AND SIGNING OF BID**

14.01 The original Bid Form and accompanying documents(as specified in Clause9.0),clearly marked "Original Bid",plus one duplicate copy must be received by the Purchaser at the date, time and place specified pursuant to Clauses15.0 and 16.0. In the event of any discrepancy between the original and the copies,the original shall govern.

14.02 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to sign on behalf of the Bidder. Such authorization shall be indicated by written Power-of-Attorney accompanying the Bid.

14.03 The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D. SUBMISSION OF BIDS

15.0 **SEALING AND MARKING OF BIDS**

15.01 Bid submission: One original & one duplicate Copy (hard copies) of all the Bid Documents shall be sealed and

submitted to the Purchaser before the closing time for submission of the bid.

15.02 The Technical Documents and the EMD shall be enclosed in a sealed envelope and the said envelope shall be superscribed with —**Technical & EMD**". The Financial bid shall be inside another sealed envelope with superscription — **Financial Bid** ".Both these envelopes shall be sealed inside another big envelope.All the envelopes should bear the Name and Address of the Bidder and marking for the Original and Copy.The envelopes should be superscribed with —**"Tender Notice No, Due date of submission, Tender opening date**.

15.03 The Bidder has the option of sending the Bids in person.Bids submitted by Telex/Telegram /Fax will not be accepted.No request from any Bidder to the Purchaser to collect the proposals from Airlines/Cargo Agents etc shall be entertained by the Purchaser.

15.04 **The Bidder, along with the bid documents has to submit two samples along with detailed GTP & Drawings. The sample should clearly indicate (i) Name of the bidder (ii)TenderNo.,(iii) Group & Item Sr.N o.etc. Samples will be submitted at BRPL Laboratory Near substation no .15 , sector – 7 , Pushpa Vihar , Saket ,New Delhi – 110017 on or before the due date of tender submission. The samples shall not be returned back to the bidder.**

16.0 DEADLINE FOR SUBMISSION OF BIDS

16.01 The original Bid,together with the required copies, must be received by the Purchaser at the address specified at **15:30 Hrs on 14.04.2023**

16.02 The Purchaser may,at its discretion,extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with Clause9.0,in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

17.0 ONE BID PER BIDDER

Each Bidder shall submit only one Bid either by itself, or as a partner in a Joint Venture. A Bidder who submits or participates in more than one Bid will cause all those Bids to be rejected.

18.0 LATE BIDS

Any Bid received by the Purchaser after the deadline for submission of Bids prescribed by the Purchaser,pursuant to Clause 16.0, will be declared "Late" and rejected and returned unopened to the Bidder.

19.0 MODIFICATIONS AND WITHDRAWAL OF BIDS

19.01 The Bidder is not allowed to modify or withdraw its Bid after the Bid's submission.

E. EVALUATION OF BID

20.0 PROCESS TO BE CONFIDENTIAL

Information relating to the examination,clarification,evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the Purchaser's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

21.0 CLARIFICATION OF BIDS

To assist in the examination,evaluation and comparison of Bids,the Purchaser may,at its discretion,ask the bidder for a clarification of its Bid.All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought,offered or permitted.

22.0 PRELIMINARY EXAMINATION OF BIDS / RESPONSIVENESS

22.01 Purchaser will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order.

22.02 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity,the unit price shall prevail and the total price per item will be corrected.If there is a discrepancy between theTotal Amount and the sum of the total price per item , the sum of the total price per item shall prevail and the Total Amount will be corrected.

22.03 Prior to the detailed evaluation, Purchaser will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

22.04 Bid determined as not substantially responsive will be rejected by the Purchaser and/or the Purchaser and may not subsequently be made responsive by the Bidder by correction of the non -conformity.

23.0 **EVALUATION AND COMPARISON OF BIDS**

23.01 The evaluation of Bids shall be done based on the delivered cost competitiveness basis.

23.02 The evaluation of the Bids shall be a stage-wise procedure. The following stages are identified for evaluation purposes: In the first stage, the Bids would be subjected to a responsiveness check.TheTechnical Proposals and the Conditional ties of the Bidders would be evaluated.

Subsequently, the Financial Proposals along with Supplementary Financial Proposals, if any, of Bidders with Techno-commercially Acceptable Bids shall be considered for final evaluation .

23.03 The Purchaser's evaluation of a Bid will take into account,in addition to the Bid price,the following factors, in the manner and to the extent indicated in this Clause:

(a) Supply Schedule

(b) Deviations from Bidding Documents

Bidders shall base their Bid price on the terms and conditions specified in the Bidding Documents. The cost of all quantifiable deviations and omissions from the specification , terms and conditions specified in Bidding Documents shall be evaluated.The Purchaser will make its own assessment of the cost of any deviation for the purpose of ensuring fair comparison of Bids.

23.04 Any adjustments in price,which result from the above procedures,shall be added for the purposes of comparative evaluation only to arrive at an "Evaluated Bid Price".Bid Prices quoted by Bidders shall remain unaltered.

F. AWARD OF CONTRACT

24.0 **CONTACTING THE PURCHASER**

24.01 From the time of Bid submission to the time of contract award, if any Bidder wishes to contact the Purchaser on any matter related to the Bid, it should do so in writing.

24.02 Any effort by a Bidder to influence the Purchaser and/or in the Purchaser‘s decisions in respect of Bid evaluation, Bid comparison or Contract Award, will result in the rejection of the Bidder‘s Bid.

25.0 **THE PURCHASER ’S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS**

The Purchaser reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at anytime prior toaward of Contract,without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Purchaser‘s action.

26.0 **AWARD OF CONTRACT**

The Purchaser will award the Contract to the successful Bidder whose Bid has been Determined to be the

lowest-evaluated responsive Bid, provided further that the Bidder has been determined to be qualified to satisfactorily perform the Contract. Purchaser reserves the right to award order other bidders in the tender, provided it is required for progress of project & provided he agrees to come to the lowest rate.

27.0 **THE PURCHASER 'S RIGHT TO VARY QUANTITIES**

The Purchaser reserves the right to vary the quantity i.e.increase or decrease the numbers/quantities without any change in tems and conditions during the execution of the Order.

28.0 **LETTER OF INTENT/ NOTIFICATION OF AWARD**

The letter of intent/ Notification of Award shall be issued to the successful Bidder whose bids have been considered responsive, techno-commercially acceptable and evaluated to be the lowest (L1). The successful B idder shall be required to furnish a letter of acceptance with in 7 days of issue of the letter of intent /Notification of Award by Purchaser.

29.0 **PERFORMANCE BANK GUARANTEE**

The successful Bidder shall furnish the Performance Bank Guarantee for an amount of **10%** (Ten percent) of the Contract Price in accordance with the format provided. The Performance Bond shall be valid for a period of Sixty months **(60)** from the date of the commissioning or Sixty six months **(66)** from the last date of receipt of material (last consignment) at site/stores which ever is earlier plus 3 months towards claim period. Upon submission of the performance security, the EMD shall be released.

30.0 **CORRUPT OR FRADULENT PRACTICES**

30.01 The Purchaser requires that the Bidders observe the highest standard of ethics during the procurement and execution of the Project. In pursuance of this policy, the Purchaser:

(a) Defines, for the purposes of this provision , the terms set forth below as follows:

(i) "Corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them ,or induce others to do so,by misusing the position in which they are placed, and it includes the offering, giving, receiving, orsoliciting of anything of value to influence the action of any such official in the procurement process or in contract execution;and

(ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or
the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Bidders(prior to or after Bid submission) designed to establish Bid prices at artificial non -competitive levels and to deprive the Purchaser of the benefits of free and open competition .

(b) Will reject a proposal foraward if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question ;

(c) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for,or in executing, a contract.

30.02 Furthermore, Bidders shall be aware of the provision stated in the General Conditions of Contract.

SECTION- III

GENERAL CONDITIONS OF CONTRACT (GCC)

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

CMC/BR/23-24/RB/PR/SN/2092

Date : 24.03.2023

GENERAL TERMS AND CONDITION

1.0 General Instructions

1.01 All the Bids shall be prepared and submitted in accordance with these instructions.

1.02 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Purchaser will in no case shall be responsible or liable for these costs.

1.03 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred/sold to the other party.

1.04 The Purchaser reserves the right to request for any additional information and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Purchaser, the data in support of RFQ requirement is incomplete.

1.05 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Purchaser's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Purchaser.

2.0 Definition Of Terms

2.01 "Purchaser" shall mean BSES RAJDHANI POWER LTD Limited, on whose behalf this bid enquiry is issued by its authorized representative / officers.

2.02 "Bidder" shall mean the firm who quotes against this bid enquiry issued by the Purchaser. "Supplier" or "Supplier" shall mean the successful Bidder and/or Bidders whose bid has been accepted by the Purchaser and on whom the "Letter of Acceptance" is placed by the Purchaser and shall include his heirs, legal representatives, successors and permitted assigns wherever the context so admits.

2.03 "Supply" and " shall mean the Scope of Contract as described.

2.04 "Specification" shall mean collectively all the terms and stipulations contained in those portions of this bid document known as RFQ, Commercial Terms & Condition, Instructions to Bidders, Technical Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.

2.05 "Letter of Acceptance" shall mean the official notice issued by the Purchaser notifying the Supplier that his proposal has been accepted and it shall include amendments thereto, if any, issued by the Purchaser. The "Letter of Acceptance" issued by the Purchaser shall be binding on the "Supplier" The date of Letter of Acceptance shall be taken as the effective date of the commencement of contract.

2.06 "Month" shall mean the calendar month and "Day" shall mean the calendar day.

2.07 "Codes and Standards" shall mean all the applicable codes and standards as indicated in the Specification.

2.08 "Offer Sheet" shall mean Bidder's firm offer submitted to BSES RAJDHANI POWER LTD in accordance with the specification.

2.09 "Contract" shall mean the "Letter of Acceptance" issued by the Purchaser.

2.10 "Contract Price" shall mean the price referred to in the "Letter of Acceptance".

2.11 "Contract Period" shall mean the period during which the "Contract" shall be executed as agreed between the Supplier and the Purchaser in the Contract inclusive of extended contract period for reason beyond the control of the Supplier and/or Purchaser due to force majeure.

2.12 "Acceptance" shall mean and deemed to include one or more of the following as will be stipulated in the specification:

a) The written acceptance of material by the inspector at suppliers works to ship the materials.

b) Acceptance of material at Purchaser site stores after its receipt and due inspection/ testing and release of material acceptance voucher.

c) Where the scope of the contract includes supplyg, acceptance shall mean issue of necessary equipment / material takeover receipt after installation & commissioning and final acceptance.

3.0 Contract Documents & Priority

3.01 Contract Documents: The terms and conditions of the contract shall consist solely of these RFQ conditions and the offer sheet.

3.02 Priority: Should there be any discrepancy between any term hereof and any term of the Offer Sheet, the terms of these RFQ shall prevail.

4.0 Scope Of Supply -General

4.01 The "Scope of Supply" shall be on the basis of Bidder's responsibility, completely covering the obligations, responsibility and supplies provided in this Bid enquiry whether implicit or explicit.

4.02 Bidder shall have to quote for the Bill of quantities as listed in Section – IV of this RFQ.

4.03 Quantity variation and additional requirement if any shall be communicated to successful bidder during project execution.

4.04 All relevant drawings, data and instruction manuals.

5.0 Quality Assurance and Inspection

5.01 Immediately on award of contract, the bidder shall prepare detailed quality assurance plan / test procedure identifying the various stages of manufacture, quality checks performed at each stage, raw material inspection and the Customer hold points. The document shall also furnish details of method of checking, inspection and acceptance standards / values and get the approval of Purchaser before proceeding with manufacturing. However, Purchaser shall have right to review the inspection reports, quality checks and results of suppliers in house inspection department which are not Customer hold points and the supplier shall comply with the remarks made by purchaser or his representative on such reviews with regards to further testing, rectification or rejection, etc.

5.02 Witness and Hold points are critical steps in manufacturing, inspection and testing where the supplier is obliged to notify the Purchaser in advance so that it may be witnessed by the Purchaser. Final inspection is a mandatory hold point. The supplier to proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from **BSES RAJDHANI POWER LTD.**

5.03 The performance of waiver of QA activity by Purchaser at any stage of manufacturing does not relieve the supplier of any obligation to perform in accordance with and meet all the requirements of the procurement documents and also all the codes & reference documents

mentioned in the procurement document nor shall it preclude subsequent rejection by the purchaser.

5.04 On completion of manufacturing the items can be dispatched only after issue of shipping release by the Purchaser.

5.05 All testing and inspection shall be done with out any extra cost.

5.06 Purchaser reserve the right to send any material out of the supply to any recognized laboratory for testing and the cost of testing shall be borne by the Purchaser. In case the material is found not in order with the technical requirement / specification, the charges along with any other penalty which may be levied is to be borne by the bidder. To avoid any complaint the supplier is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidders representative.

5.07 Bidder has to sign quality agreement before supply of the material.

6.0 Packing, Packing List & Marking

6.01 **Packing:** Supplier shall pack or shall cause to be packed all Commodities in boxes and containers and otherwise in such a manner as shall be reasonably suitable for shipment by road or rail to BSES RAJDHANI POWER LTD without undue risk of damage in transit.

6.02 **Packing List:** The contents of each package shall be itemized on a detailed list showing the exact weight and the extreme outside dimensions (length, width and eight) of each container or box. One copy of the packing list shall be enclosed in each package delivered. There shall also be enclosed in one package a master packing list identifying each individual package, which is part of the shipment. On any packaging where it is not feasible to place the packing list inside the container, all pertinent information shall be stenciled on the outside and will thus constitute a packing list.

7.01 **Prices basis for supply of materials**

Bidder to quote their prices on Landed Cost Basis .

For Supply to BSES RAJDHANI POWER LTD Delhi the price shall be inclusive of packing, forwarding, Freight & Godds and Service Tax (GST).

The above supply prices shall also **include unloading** at site stores.
Transit and storage insurance will be arranged by BSES RAJDHANI POWER LTD, however bidder to furnish required details in advance for arranging the same by BSES RAJDHANI POWER LTD.

8.0 **Variation in taxes, duties & levies**:

8.01 The total order value shall be adjusted on account of any variations in Statutory Levies imposed by Competent Authorities by way of fresh notification(s) within the stipulated delivery period only. However, incase of reduction in taxes, duties and levies, the benefits of the same shall be passed on to BUYER.

8.02 No other Taxes, Duties & Levies other than those specified above will be payable by BUYER except in case of new Levies, Taxes & Duties imposed by the Competent Authorities by way of fresh notification(s) subsequent to the issue of PURCHASE ORDER but within the stipulated delivery period.

8.03 Notwithstanding what is stated above, changes in Taxes, Duties & Levies shall apply only to that portion of PURCHASE ORDER not executed on the date of notification by Competent Authority. Further, changes in taxes, Duties & Levies after due date of Delivery shall not affect PURCHASE ORDER Terms and value.

8.04 PURCHASE ORDER value shall not be subject to any variation on account of variation in Exchange rate(s).

9.0 **Taxes & Duties on raw materials & bought out components**:

9.01 Taxes & Duties on raw materials & bought out components are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

9.02 Taxes & Duties on raw materials & bought out components procured indigenously are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

10.0 **Terms of payment and billing**

10.01 For Supply of Equipments:

- 100% payment shall be made within 45 days from the date of receipt of material at store/ site against submission of 10 % performance bank guarantee. (Refer 12.01)

10.02 Bidder to submit the following documents against dispatch of each consignment:

i. Consignee copy of LR
ii. Supplier detailed invoice showing commodity description , quantity, unit price, total price and basis of delivery.
iii. Original certificate issued by BSES RAJDHANI POWER LTD confirming receipt of material at site and acceptance of the same.
iv. Dispatch clearance / inspection report in original issued by the inspection authority
v. Packing List.
vi. Test Reports

vii. Guarantee Certificate.

11.0 Price Validity

11.01 All bids submitted shall remain valid, firm and subject to unconditional acceptance by BSES RAJDHANI POWER LTD Delhi for 120 days post bid-date. For awarded suppliers, the prices shall remain valid and firm till contract completion.

12.0 Performance Guarantee

12.01 Supplier shall establish a performance bond in favor of BSES RAJDHANI POWER LTD in an amount not less than Ten percent (10%) of the total price of the Contract (the "Performance Bond"). The Performance Bond shall be valid for a period of Sixty months (60) from the date of the commissioning or Sixty six months (66) from the last date of receipt of material (last consignment) at site/stores which ever is earlier plus 3 months towards claim period. It shall be in accordance with one of the following terms:

(a) Depositing pay order /demand draft of the relevant amount directly with BSES RAJDHANI POWER LTD at the address listed above or as otherwise specified by BSES RAJDHANI POWER LTD, either of which shall constitute the Performance Bond hereunder; or

(b) Bank guarantee from any nationalized bank in favour of BSES RAJDHANI POWER LTD. The performance Bank guarantee shall be in the format as specified by BSES RAJDHANI POWER LTD.

13.0 Forfeiture

13.01 Each Performance Bond established under Clause 10.0 shall contain a statement that it shall be automatically and unconditionally forfeited without recourse and payable against the presentation by BSES RAJDHANI POWER LTD of this Performance Bond to the ICICI Bank at Mumbai, or to the relevant company/ correspondent bank referred to above, as the case may be, together with a simple statement that supplier has failed to comply with any term or condition set forth in the Contract.

13.02 Each Performance Bond established under will be automatically and unconditionally forfeited without recourse if BSES RAJDHANI POWER LTD in its sole discretion determines that supplier has failed to comply with any term or condition set forth in the contract.

14.0 Release

All Performance Bonds will be released without interest within seven (7) days from the last date up to which the Performance Bond has to be kept valid (as defined in Clause 10.0) except for the case set forth in Clause 21.0.

15.0 Guarantee Period

15.01 The bidder to Guarantee the Meter with Box supplied against any defect of failure, which arise due to faulty materials, workmanship or design for the entire defects liability period. The Defect liability period shall be 60 months from the date of commissioning or 66 months from the last date of delivery whichever is earlier. If during the Guarantee period any materials / items are found to be defective, these shall be replaced with New Meter with Box free of cost by the bidder at his own cost within 30 days from the date of receipt of intimation.The analysis of defective meter within Guarantee period shall be provided by meter OEM's to BRPL. OEM shall ensure to establish a system where he will visit BRPL premises, in every 15 days or on accumulation of 250 defective meter (whichever comes first) and provide the detailed analysis report of faulty meters .

16.0 Return, Replacement or Substitution.

BSES RAJDHANI POWER LTD shall give Supplier notice of any defective Commodity promptly after becoming aware thereof. BSES RAJDHANI POWER LTD may in its discretion elect to return defective Commodities to Supplier for replacement, free of charge to BSES RAJDHANI POWER LTD, or may reject such Commodities and purchase the same or similar Commodities from any third party. In the latter case BSES RAJDHANI POWER LTD shall furnish proof to Supplier of the cost of such substitute purchase. In either case, all costs of any replacement, substitution, shipping, labour and other related expenses incurred in connection with the return and replacement or for the substitute purchase of a Commodity hereunder should be for the account of Supplier. BSES RAJDHANI POWER LTD may set off such costs against any amounts

payable by BSES RAJDHANI POWER LTD to Supplier. Supplier shall reimburse BSES RAJDHANI POWER LTD for the amount, if any, by which the price of a substitute Commodity exceeds the price for such Commodity as quoted in the Bid.

17.0 Effective Date of Commencement of Contract:

17.01 The date of the issue of the Letter of Acceptance shall be treated as the effective date of the commencement of Contract.

18.0 Time – The Essence Of Contract

18.01 The time and the date of completion of the "Supply"" as stipulated in the Letter Of Acceptance / Purchase order issued to the Supplier shall be deemed to be the essence of the "Contract". The Supply has to be completed not later than the aforesaid Schedule and date of completion of supply .

19.0 The Laws and Jurisdiction of Contract:

19.01 The laws applicable to this Contract shall be the Laws in force in India.

19.02 All disputes arising in connection with the present Contract shall be settled amicably by mutual consultation failing which shall be finally settled as per the rules of Arbitration and Conciliation Act, 1996 at the discretion of Purchaser. The venue of arbitration shall be at Mumbai in India

20.0 Events of Default

20.01 Events of Default. Each of the following events or occurrences shall constitute an event of default ("Event of Default") under the Contract:

(a) Supplier fails or refuses to pay any amounts due under the Contract;

(b) Supplier fails or refuses to deliver Commodities conforming to this RFQ/ specifications, or fails to deliver Commodities within the period specified in P.O. or any extension thereof

(c) Supplier becomes insolvent or unable to pay its debts when due, or commits any act of bankruptcy, such as filing any petition in any bankruptcy, winding-up or reorganization proceeding, or acknowledges in writing its insolvency or inability to pay its debts; or the Supplier's creditors file any petition relating to bankruptcy of Supplier;

(d) Supplier otherwise fails or refuses to perform or observe any term or condition of the Contract and such failure is not remediable or, if remediable, continues for a period of 30 days after receipt by the Supplier of notice of such failure from BSES RAJDHANI POWER LTD

21.0 Consequences of Default.

(a) If an Event of Default shall occur and be continuing, BSES RAJDHANI POWER LTD may forthwith terminate the Contract by written notice.

(b) In the event of an Event of Default, BSES RAJDHANI POWER LTD may, without prejudice to any other right granted to it by law, or the Contract, take any or all of the following actions;

(i) present for payment to the relevant bank the Performance Bond;

(ii) purchase the same or similar Commodities from any third party; and/or recover any losses and/or additional expenses BSES RAJDHANI POWER LTD may incur as a result of Supplier's default.

22.0 Penalty for Delay

22.01 If supply of items / equipments is delayed beyond the supply schedule as stipulated in purchase order then the Supplier shall be liable to pay to the Purchaser as penalty for delay, a sum of 1% (one percent) of the contract price (Ex- works) for every week delay or part thereof for individual mile stone deliveries.

22.02 The total amount of penalty for delay under the contract will be subject to a maximum of ten percent (10%) of the contract price (ex works value)

22.03 The Purchaser may, without prejudice to any method of recovery, deduct the amount for such damages from any amount due or which may become due to the Supplier or from the Performance Bond or file a claim against the supplier.

23.0 Force Majeure

23.01 General
An "Event of Force Majeure" shall mean any event or circumstance not within the reasonable control directly or indirectly, of the Party affected, but only if and to the extent that:

(i) Such event or circumstance materially and adversely affects the ability of the affected Party to perform its obligations under this Contract, and the affected Party has taken all reasonable precautions,due care and reasonable alternative measures in order to prevent or avoid the effect of such event on the affected party's ability to perform its obligations under this Contract and to mitigate the consequences thereof.

(ii) For the avoidance of doubt, if such event or circumstance would not have materially and adversely affected the performance of the affected party had such affected party followed good industry practice, such event or circumstance shall not constitute force majeure.

(iii) Such event is not the direct or indirect result of the failure of such Party to perform any of its obligations under this Contract.

(iv) Such Party has given the other Party prompt notice describing such events, the effect thereof and the actions being taken in order to comply with above clause.

23.02 Specific Events of Force Majeure subject to the provisions of above clause, Events of Force Majeure shall include only the following to the extent that they or their consequences satisfy the above requirements :

(i) The following events and circumstances :

a) Effect of any natural element or other acts of God, including but not limited to storm, flood, earthquake, lightning, cyclone, landslides or other natural disasters.

b) Explosions or fires

(ii) War declared by the Government of India, provided that the ports at Mumbai are declared as a war zone.

(iii) Dangers of navigation, perils of the sea.

23.03 Notice of Events of Force Majeure If a force majeure event prevents a party from performing any obligations under the Contract in part or in full, that party shall:

i) Immediately notify the other party in writing of the force majeure events within 7(seven) working days of the occurrence of the force majeure event

ii) Be entitled to suspend performance of the obligation under the Contract which is affected by force majeure event for the duration of the force majeure event.

iii) Use all reasonable efforts to resume full performance of the obligation as soon as practicable

iv) Keep the other party informed of all such efforts to resume full performance of the obligation on a regular basis.

v) Provide prompt notice of the resumption of full performance or obligation to the other party.

23.04 Mitigation of Events of Force Majeure Each Party shall:

(i) Make all reasonable efforts to prevent and reduce to a minimum and mitigate the effect of any delay occasioned by an Event of Force Majeure including recourse to alternate methods of satisfying its obligations under the Contract;

(ii) Use its best efforts to ensure resumption of normal performance after the termination of any Event of Force Majeure and shall perform its obligations to the maximum extent practicable as agreed between the Parties; and

(iii) Keep the other Party informed at regular intervals of the circumstances concerning the event of Force Majeure, with best estimates as to its likely continuation and what measures or contingency planning it is taking to mitigate and or terminate the Event of Force Majeure.

23.05 Burden of Proof In the event that the Parties are unable in good faith to agree that a Force Majeure event has occurred to an affected party, the parties shall resolve their dispute in accordance with the provisions of this Agreement. The burden of proof as to whether or not a force majeure event has occurred shall be upon the party claiming that the force majeure event has occurred and that it is the affected party.

23.06 Termination for Certain Events of Force Majeure. If any obligation of any Party under the Contract is or is reasonably expected to be delayed or prevented by a Force Majeure event for a continuous period of more than 3 months, the Parties shall promptly discuss in good faith how to proceed with a view to reaching a solution on mutually agreed basis. If a solution on mutually agreed basis cannot be arrived at within a period of 30 days after the expiry of the period of three months, the Contract shall be terminated after the said period of 30 days and neither Party shall be liable to the other for any consequences arising on account of such termination.

23.07 Limitation of Force Majeure event. The Supplier shall not be relieved of any obligation under the Contract solely because cost of performance is increased, whether as a consequence of adverse economic consequences or otherwise.

23.08 Extension of Contract Period due to Force Majeure event The Contract period may be extended by mutual agreement of Parties by way of an adjustment on account of any period during which an obligation of either Party is suspended due to a Force Majeure event.

23.09 Effect of Events of Force Majeure. Except as otherwise provided herein or may further be agreed between the Parties, either Party shall be excused from performance and neither Party shall be construed to be in default in respect of any obligations hereunder, for so long as failure to perform such obligations shall be due to and event of Force Majeure."

24.0 Transfer And Sub-Letting

24.01 The Supplier shall not sublet, transfer, assign or otherwise part with the Contract or any part thereof, either directly or indirectly, without prior written permission of the Purchaser.

25.0 Recoveries

25.01 When ever under this contract any money is recoverable from and payable by the bidder, the purchaser shall be entitled to recover such sum by appropriating in part or in whole by detecting any sum due to which any time thereafter may become due from the supplier in this or any other contract. Should the sum be not sufficient to cover the full amount recoverable the bidder shall pay to the purchaser on demand the remaining balance.

26.0 Waiver

26.01 Failure to enforce any condition herein contained shall not operate as a waiver of the condition itself or any subsequent breach thereof.

27.0 Indemnification

27.01 Notwithstanding contrary to anything contained in this RFQ, Supplier shall at his costs and risks make good any loss or damage to the property of the Purchaser and/or the other Supplier engaged by the Purchaser and/or the employees of the Purchaser and/or employees of the other Supplier engaged by the Purchaser whatsoever arising out of the negligence of the Supplier while performing the obligations under this contract.

SECTION – IV:

QUANTITY AND DELIVERY REQUIREMENT

Sl. No.	Item Description	Specification	Requirement	Estimated Cost
			Total Qty. (Nos)	
BRPL,DELHI				
1	1-Ph Whole Current Net Meter (10A-60A, 240V, Cl-1.0)	SECTION V	600	*39 Lacs*
2	3-Ph Whole Current Net Meter (20A-60A, 240V. Cl-1.0)		800	
3	LT CT Net Meter (3P-4W, 240Volts, CL- 0.5s)		200	
4	HT Net Meter (3P-4W, 63.5V, 5A, CL-0.5s)		200	

Note : Delivery as per our requirement.

SECTION – V:

TECHNICAL SPECIFICATION(TS)

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

CMC/BR/23-24/RB/PR/SN/2092

Date : 24.03.2023

BSES

Specification for

Single Phase Bidirectional Meter

Specification no: BSES-TS-112-SPWBM-R0

Rev		0
Date		20 July 2022
Prepared By	Shweta Dixit	
	Ashish Joshi	
Reviewed BY	Puneet Duggal	
	Vikas Srivastava	
	Lalit Mukhriya	
Approved BY	Gaurav Sharma	
	Manish Jain	

Index

Record of Revision

Clause No.	Change in Specification	Approved By	Rev

1.0 Scope of Supply

This specification covers the following for single phase 2 wire 10-60 Amps Static Watt hour and VA hour Bidirectional meters of accuracy class 1.0.

A. Design, manufacture, testing at manufacturer works before dispatch, packing, delivery and submission of all documentation.

B. Any accessories / hardware required for installation and operation for the meter.

C. Software (BCS and Hand Held Unit).

2.0 Codes & standards

Materials, equipment and methods used in the manufacturing of above mentioned equipment shall conform to the latest edition of following

S No.	Standard Number	Title
2.1	Indian Electricity Act	IE Act 2003
2.2	CEA Metering Regulations	With latest amendments
2.3	CBIP Manual (Pub no.-325)	Standardization of AC Static Electrical Energy Meters
2.4	IS- 11448	Application guide for AC Electricity meters
2.5	IS- 13779: 1999	AC Static Watt-hour Meters, Class 1 and 2 – Specification
2.6	IS- 15707	Testing, evaluation, installation and maintenance of ac electricity meters - Code of practice.
2.7	IEC 62056-21	Electricity metering - Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange
2.8	IEC 62058-11	Electricity metering equipment (AC) - Acceptance inspection - Part 11: General acceptance inspection methods
2.9	IEC 62058-31	Electricity metering equipment (AC) - Acceptance inspection - Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)
2.10	IEC 60736	Testing Equipment for electrical Energy meter
2.11	IS 15959 (Part 1): 2011	Data Exchange for Electricity Meter - Reading Tariff and Load Control - Companion Specification

2.12	IS 14772	General requirement for Enclosure for Electrical Requirement.

In the event of direct conflict between various order documents, the precedence of authority of documents shall be as follows-

i. Guaranteed Technical Particulars (GTP)

ii. Specification including applicable codes & standards

iii. Approved Vendor Drawings

iv. Other documents

3.0 System Data

3.1	Supply	Single Phase AC, 2 wire
3.2	Voltage	240 V ± 6% (415V Phase to phase)
3.3	Frequency	50 Hz ± 5%
3.4	System Neutral	Solidly Earthed

4.0 Electrical and Accuracy Requirement

4.1	Meter Type	Type 1: 1-ø, 2 wire Static Watt- hour and VA-hour Bidirectional Meter. Type 2:1-ø, 2 wire Static Watt- hour and VA-hour Bidirectional Meter with Meter Box Meter Type shall be offered as per purchaser's requirement.
4.1.1	Meter pre-fitted in box	For requirement of box please refer annexure "D'.
4.2	Connection	Direct / whole current
4.3	Rated Voltage	240V (phase to neutral) with variation of +30% & -40%. However meter should withstand the maximum system voltage i.e 415V± 6%.
4.4	Rated Current	Ib -10A and Imax- 60 A
4.5	Starting current	0.2 % of base current
4.6	Rated Frequency	50Hz +/- 5%
4.7	Power factor range	360 Degree Bidirectional (Import and Export Both)
4.8	Accuracy Class	1.0 For kWh, and kVAh. (IS13779 applies for accuracy requirements)

4.9	Power consumption in voltage circuit	Less than 1 watt & 8VA.
4.10	Power consumption in current circuit	Maximum 2VA.
4.11	Meter constant	Imp/ kWh, and Imp/ kVAh (Bidder to specify meter constant)
4.12	Calibration	Meter shall be software calibrated at factory and modification in calibration shall not be possible at site by any means or external influence.
4.13	Test Output Device	Separate kWh & kVAh Flashing LED visible from the front
4.14	Process Technology	Surface Mounting Technology or better
4.15	Insulation Level	Meter shall withstand an insulation test of 4 KV and impulse test at 8 KV.
4.16	Short time over current	The meter shall be able to carry short time over current of 30 Imax for half cycle at rated frequency.
4.17	Immunity to phase and earth fault	As per IS 13779
4.18	Influence of Heating & Self Heating	As per IS13779.
4.19	Electromagnetic compatibility	Meter shall remain immune to electrostatic discharge (upto and including 35KV), electromagnetic HF field and fast transient burst. The meter shall be designed in such a way that conducted or radiated electromagnetic disturbances as well as electrostatic discharge do not influence the meter. Meter shall be type tested for electromagnetic compatibility.
4.20	Limits of error due to influence quantities	Meter shall work within guaranteed accuracy as per IS 13779/ CBIP325 (most stringent standard to be followed) under and after influence of following :- a. Current Variation b. Ambient Temperature variation c. Voltage variation d. Frequency variation e. 10% third harmonic in current

		f. Reversed phase sequence g. Voltage unbalance h. Harmonic components in current and voltage circuit i. DC and even harmonics in AC current circuit j. Odd harmonics in AC current circuit k. Sub harmonics in AC current circuit l. Continuous (DC) “stray” magnetic induction of 67mT+/-5%. m. Continuous (DC) “abnormal” magnetic induction of 0.27T+/-5%. n. Alternating (AC) “stray’ magnetic induction of 0.5mT+/-5% o. Alternating (AC) “abnormal’ magnetic induction of 10mT. p. Alternating (AC) “abnormal’ magnetic induction of 0.2T+/-5%. q. External magnetic field 0.5 T r. Electromagnetic HF fields s. Radio frequency interference t. DC immunity test Note: BSES reserves the right to formulate any other test method to check magnetic immunity/ logging of meter. Meter with logging provision will be preferred.

5.0 Construction

5.1	Base Body	a. Material - Opaque and UV stabilized polycarbonate of grade LEXAN 142A/ 943AA or Equivalent with V0 inflammability level. b. A metal plate shall be provided at the base of meter body internally so that no tampering is possible from the rear side of meter even after cutting the base body.

5.2	Top Cover	a. Material - Transparent and UV stabilized polycarbonate of grade LEXAN 142A/ 943AA or Equivalent with V0 inflammability level. b. Top cover and base should be ultrasonically welded. c. It should so be designed so as the internal components should not be visible.
5.3	Terminal Block	a. Material - Flame retardant glass filled polycarbonate of grade 500 R or equivalent. b. Terminal block shall form Integral part of the meter base c. Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135C and pressure of 1.8MPa. The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
5.4	Terminal cover	a. Material - UV stabilized transparent polycarbonate cover LEXAN 143A/943AA or equivalent grade. b. Provision of sealing at two points through sealing screw. c. The terminal cover shall be extended type with baffle wall above the cable entry base wall so that access to the terminals is not possible (even with thin metallic wire) without breaking the seal. Terminal cover should have provision for cable entry from bottom. d. Diagram of external connections should be embossed on terminal cover. Sticker is not acceptable.
5.5	Terminals	a. Minimum 10mm diameter suitable for 25mm^2 aluminium cable with flat head screws and washers. b. Material of terminals, screws and washers should be brass or tinned copper. Two screws of appropriate size should be provided per terminal. c. Terminals shall be tested for continuous current of 150 % Imax. d. Terminals shall be clearly marked for phase / neutral /

		outgoing etc.
5.6	Ingress Protection	IP 51 or better, but without suction in the meter.
5.7	Output device	a. Meter should have flashing LED visible from the front to represent energy recording. b. Resolution shall be such that satisfactory accuracy test can be conducted at the lowest load in less than 5 minutes and starting current test in less than 10 minutes.
5.8	RTC	a. The meter shall have internal real time clock to set date and time. b. Uncertainty of setting initial time shall not be less than +/- 30 seconds from Indian standard Time as maintained by NPL New Delhi. c. The maximum drift permissible in the real time clock shall be +/-7 min/ year
5.9	Battery	a. Lithium ion battery with guaranteed storage life of 10 years and capacity life of 15 years. b. In case battery removal or total discharge same should not affect the working & memory of the meter even in case of single wire power condition. c. Bidder need to submit design life calculation for battery used in meter.
5.10	Memory	Non volatile memory independent of battery backup, memory should be retained for 10 years without any auxiliary power.
5.11	Self Diagnostic feature	Meter shall have self diagnostic for the following a. Date and RTC. b. Battery. c. Non volatile memory. d. Display
5.12	Meter Sealing Arrangement	a. Sealing should be in accordance with IS and CEA metering regulations with latest amendments. b. Approval shall be taken from purchaser for location of seals.

5.12.1	Manufacturer's Seals	One Polycarbonate seal to be provided on meter cover.
5.12.2	BSES Seals	a) Minimum one seal as Hologram type, numbered with hologram transfer on tamper proof paper seal. Seal should not be just Hologram sticker (100% hologram). Meter sides should not have sharp edges to avoid damage to hologram seals. b) One Hologram seal should be provided on each side of meter i.e two hologram seals should be provided. Meter sides should not have sharp edges to avoid damage to hologram seals. c) Polycarbonate seal should be provided on top cover. d) Seals will be issued to manufacturer free of cost.
5.12.3	Seal record	Record of all seals shall be forwarded to purchaser with each lot.
5.13	Name Plate and marking	Meter should have clearly visible, indelible and distinctly marked name plate in accordance with IS & clause no. 10.0 of this specification./
5.14	Environmental Condition	Meter shall be suitable for environmental conditions as mentioned below
5.14.1	Temperature Range	a. Operation range: -10 Deg C to 55 Deg C b. Limit range of operation: -25 to 60 Deg C c. Limit range of storage / transport : -25 to 70 Deg C
5.14.2	Relative Humidity	0 to 96 %
5.15	Resistance against heat and fire	a. The terminal block and Meter case shall have safety against the spread of fire. b. They shall not be ignited by thermal overload of live parts in contact with them as per IS 13779.
5.16	Guarantee/ Warranty	66 months from the date of dispatch or 60 months from date of commissioning, whichever is earlier

6.0 Functional Requirement

6.1	Meter category	C3 category of IS 15959 (Part 1).
6.2	Mode Of Metering	Bidirectional: Import and export both energies shall be measured and recorded.
6.3	KVAH Calculation	Lag only: KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh <

		KWh.
6.4	MD Registration	a. Meter shall store and display MD upto two decimal in every 30 min. period along with date & time. b. At the end of every 30 min, new MD shall be computed & compared with previous MD and store whichever is higher and the same shall be displayed. c. It is preferred that MD is computed using separate counter rather than by difference of initial and final energy counter. d. Block window with default demand integration period of 1800 s configurable to 900 s with proper security in field. e. Extended register shall be used for MD recording.
6.5	TOD Metering	a. Meter shall be capable of doing TOD metering in minimum 4 tariff rate registers programmable for minimum 8 time zones and 4 seasonal profiles. b. Meter shall be capable of doing TOD metering for kWh (Import, Export and NET), kVARh (Q1, Q2, Q3 an Q4), kVAh (While Active Import and While Active Export) and MD in kW, kVAR and kVA. c. TOD programmable on site through CMRI or AMR remotely. d. At Display as well as BCS end meter TOD values shall be shown as per cumulative values of TOD Zones of respective registers. e. TOD metering shall be implemented by the activity colander method of IS 15959 Part 1 clause 9/ DLMS UA-1000-1 f. Special Day table shall be defined as per IEC/ DLMS UA-1000-1

		g. Default TOD programming shall be as per latest DERC guidelines. Prior approval shall also be taken from BSES for the same. h. Tariff rate registers shall be as follow R1: Rate register for Peak R2: Rate register for Normal R3: Rate Register for Off Peak
6.6	Instantaneous Parameters	All the parameters mentioned in table '43' of IS 15959 (Part 1) along with following additional parameters shall be supported by meter: a. kWh (NET) b. KVAr (Signed) c. High Resolution (kWh) d. High Resolution (kVAh) e. Temperature in Deg C. f. Displacement Power Factor g. kWh (Import) h. kWh (Export) i. kVAH (While Active Import) j. kVAH (While Active Export) k. kVARH Q1 l. kVARH Q2 m. kVARH Q3 n. kVARH Q4 o. MD in kW, kVA and kVArh
6.7	Billing Profile Parameters	a. Billing parameters shall be generated at the end of each billing cycle and stored in memory as per provisions provided in clause no. 14 of IS 15959 (Part 1). b. 12 no's billing cycle parameters shall be remain in meter memory along with current cycle parameters and shall be available for reading as well as profile and or 'by entry' for selective access. c. All the parameters mentioned in table '46' of IS 15959 (Part

		1) along with following additional parameters shall be supported by meter: i. Cumulative kW (Import and Export) ii. Cumulative kVAh (While Active Import an Export) iii. kWh (NET) iv. Cumulative Energy, kWh (Import) for R1 to R8 v. Cumulative Energy, kWh (Export) for R1 to R8 vi. Cumulative Energy, kVAh (While Active Import) for R1 to R8 vii. Cumulative Energy, kVAh (While Active Export) for R1 to R8 viii. MD, KW for R1 to R8 ix. MD KVA for R1 to R8 x. Cumulative Energy, kVARh (Q1) xi. Cumulative Energy, kVARh (Q1 for R1 to R8 xii. Cumulative Energy, kVARh (Q2) xiii. Cumulative Energy, kVARh (Q2) for R1 to R8 xiv. Cumulative Energy, kVARh (Q3) xv. Cumulative Energy, kVARh (Q3) for R1 to R8 xvi. Cumulative Energy, kVARh (Q4) xvii. Cumulative Energy, kVARh (Q4) for R1 to R8 xviii. MD in kVAr xix. MD, kVAr for R1 to R8 xx. MD in kVAr xxi. MD, kVAr for R1 to R8
6.7.1	Billing period reset/ MD reset	00:00 Hrs of Ist of every month
6.8	Load survey Parameters	a. Load survey parameters shall be measured and recorded at the end of each profile capture period for last 60 Power ON days. b. All the parameters mentioned in table ‘44’ of IS 15959 (Part 1) along with following additional parameters shall be supported by meter.

		i. Average Neutral Current ii. Average Frequency iii. Average Temperature iv. Average PF v. Block kVArh-Q1 vi. Block kVArh- Q2 vii. Block kVArh-Q3 viii. Block kVArh- Q4 ix. Block Power Off x. Block kWh (Import and Export) xi. Block kVAH (While Active Import and Active Export)
6.8.1	Profile capture period	Default 1800 s programmable to 900 s.
6.9	Daily load profile	a. Daily load profile parameters shall be measured and recorded at each midnight i.e. 00:00 hrs for last 60 Power ON days. b. All the parameters mentioned in table '45' of IS 15959 (Part 1) shall be supported by meter as Daily load profile parameters along with following: i. Cumulative kVArh- Q1 ii. Cumulative kVArh- Q2 iii. Cumulative kVArh- Q3 iv. Cumulative kVArh- Q4 v. kWh (Import and Export) vi. kWh (While Active Import and Export)
6.10	General Purpose Parameters	Parameters as per clause E-10 of IS 15959 (Part 1) shall be provided in Non Volatile memory (NVM) of the meter
6.10.1	Name Plate Detail	As per Table '47' of IS 15959 (Part 1) with following additional parameters. a. Month of manufacturing.
6.10.2	Programmable parameters	a. These parameters can be programmed in field by CMRI via proper access rights.

		b. Every transaction shall be logged in non volatile memory of the meter with date and time stamp. c. Programming of any of the parameters shall increment the 'Cumulative programmable count' value. d. All the parameters mentioned in table Table '48' of IS 15959 (Part 1) shall be supported by meters.
6.11	Security	a. Reading and writing data into meter memory via optical and remote communication port shall be through DLMS security keys only. b. Bidder shall ensure to safeguard high security keys used for configuring parameters into meter. c. Once the meter memory is locked during manufacturing process, only parameters mentioned in IS 15959 shall be configurable even in factory. It should not be possible to configure any other parameters. d. Please note that there shall be no other mechanism/ method to interface with meter through optical and remote communication port except mentioned in IS 15959, even for manufacturer. e. It should not be possible to change data stored in meter memory even after accessing meter memory physically. In case of any change in memory data, a flag/alert shall be generated. Flag/Alert shall be indicated over display and in remote communication also.
6.12	OBIS code Detail	Bidders shall provide OBIS code details for all parameters additional from IS 15959.

7.0 Event and Tamper Monitoring

7.1	Low Voltage Logging	Event shall be logged in memory along with Occurrence and restoration event data. Threshold should be below 180 Volts.
7.2	Protection against HV spark	a. Meter shall continue to record energy or log the event, in case it is disturbed externally using a spark gun/ ignition coil. Upto 35 KV meter should remain immune. b. Communication port shall also be immune upto 35KV.

		c. Bidder should have valid test report from Sameer/ UL lab or any other NABL authorize Lab for the same.
7.3	Neutral disturbance	Meter shall log all events when AC/DC/ Pulsating voltage is injected in neutral circuit especially when same can disturb the recording of energy. Manufacturer should specify the method of testing of Neutral disturbance.
7.4	External Magnetic Interference	a. Meter should either be immune or should log the events of attempt of tampering by external magnetic field as per IS13779/ CBIP 325 with latest amendments. b. If the working of meter gets affected under the influence of external magnetic field, meter should record energy at Imax, Vref and UPF. c. Meter should not compute MD during this period. The meter shall record energy as per actual load once the magnetic field is removed.
7.5	Earth Tamper	a. Meter should detect and log earth tamper when phase and neutral current differ by a specified threshold. b. Continuous indication through LED flag or icon on display shall be provided for this tamper.
7.6	Top cover open	Meter shall have top cover open detection and same shall be logged. Detection and logging mechanism shall work even when the meter is de-energized. Logic shall be defined.
7.7	Power Off	a. Meter should detect power off when the voltage falls below the threshold value. b. Meter should log the power off event with occurrence and restoration date/time if meter remains in power off mode for 10 min. c. Cumulative Power off data should be recorded in separate register in the DD:HH:MM format with reading resolution of 01 min, i.e. if power is off for one min the register should increment. d. In case meter records power off for entire integration period, the load survey of all parameters should be void. Also, MD should not be calculated during power off.
7.8	Low PF	Meter should detect and log low PF tamper event if power factor of meter found below than a threshold value. Logic : Load > 10% of rated, pf range --- 0.2 to 0.5, duration 15 minutes
7.9	Connection Related Tamper Conditions	The meter shall not get affected by any remote control device & shall continue recording energy under any one or combinations of the following conditions:
7.9.1	Single wire power	Meter should log this tamper when incoming and outgoing neutral/ phase are disconnected and load connected to earth. Meter should record energy as per load, Vref and UPF. This event should also be regarded as the power off.
7.9.2	I/C & O/G Interchanged	Meter should record energy within limits of accuracy class 1.0.
7.9.3	Phase & Neutral Interchanged	Meter should record energy within limits of accuracy class 1.0.

7.9.4	I/C (Phase & Neutral) Interchanged, Load Connected To Earth.	Meter should record energy within limits of accuracy class 1.0
7.9.5	I/C Neutral Disconnected, O/G Neutral & Load Connected To Earth.	Meter should record energy
7.9.6	I/C Neutral Disconnected, O/G Neutral Connected To Earth Through Resistor & Load Connected To Earth.	Meter should record energy
7.9.7	I/C Neutral connected, O/G Neutral Connected To Earth Through Resistor & Load Connected To Earth.	Meter should record energy
7.9.8	Temperature logging	The meter should have capability to measure inside temperature and can log high temperature Events.
7.9.9	Abnormal Power Off	In case meter micro observes a power off even though AC supply is available, the event is called as “Abnormal power off”. Meter shall able to detect and log such event. The logic need to be discussed and agreed before hand.
7.10	Tamper Logging	a. Last 200 nos. tamper events shall be recorded in meter memory on FIFO basis except top cover open. b. First top cover open event should be non rollover and non resettable.
7.10.1	Parameter Snapshot	Snapshot of date, time, voltage, phase current, neutral current, power factor, active power, apparent power, cumulative kWh (Import and Export), cumulative kVAh (While Active import and Export) and kVARH (Q1, Q2, Q3, Q4) etc should be recorded for each tamper event
7.10.2	Tamper Indication	Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.
7.11	Tamper Logics	A logic sheet for tamper/ event detection and logging shall be submitted for purchaser’s approval. Following details should be provided for each tamper in tabular form a. Detailed Tamper logic b. Threshold values c. Persistence times d. Restoration time e. Snapshot details

Note - a) No defraud and deficiency metering in export mode.

b) Transactions:- Other than RTC and TOU zone timing, no other parameter should be programmable/ resettable in field. Regarding RTC and TOU, all transactions should be logged.

8.0 Meter Display

<table>
<tr><td>8.1</td><td>LCD Type</td><td>STN Liquid crystal, industrial grade with extended temperature range min 70 Deg C with backlit</td></tr>
<tr><td>8.2</td><td>Viewing angle</td><td>a. Minimum 160 DEG.
b. The display visibility should be sufficient to read the Meter mounted at height of 0.5 m as well as at the height of 2 m.</td></tr>
<tr><td>8.3</td><td>Size of LCD</td><td>Minimum 10X5mm</td></tr>
<tr><td>8.4</td><td>LCD Digits</td><td>Total 8 digits</td></tr>
<tr><td>8.5</td><td>LCD language</td><td>English</td></tr>
<tr><td>8.6</td><td>Display mode</td><td>Following parameters should be displayed in Auto scroll with programmable interval
<table>
<tr><th>Order</th><th>Parameter</th><th>Display time</th></tr>
<tr><td>1</td><td>LCD Test</td><td>5 Sec</td></tr>
<tr><td>2</td><td>Meter Sr. No.(8 digits)</td><td>5 Sec</td></tr>
<tr><td>3</td><td>Date</td><td>5 Sec</td></tr>
<tr><td>4</td><td>Time</td><td>5 Sec</td></tr>
<tr><td>5</td><td>Cumulative kWh Import</td><td>10 Sec</td></tr>
<tr><td></td><td>Cumulative kWh Export</td><td>10 Sec</td></tr>
<tr><td>6</td><td>Cumulative kVAh (While Active Import)</td><td>10 Sec</td></tr>
<tr><td></td><td>Cumulative kVAh (While Active Export)</td><td>10 Sec</td></tr>
<tr><td>7</td><td>Cumulative kVARh- Q1</td><td>10 Sec</td></tr>
<tr><td>8</td><td>Cumulative kVARh- Q2</td><td>10 Sec</td></tr>
<tr><td></td><td>Cumulative kVARh- Q3</td><td>10 Sec</td></tr>
<tr><td></td><td>Cumulative kVARh- Q4</td><td>10 Sec</td></tr>
<tr><td>9</td><td>Current MD in KW</td><td>5 Sec</td></tr>
<tr><td>10</td><td>Current MD (kW) Date and Time</td><td>5 Sec</td></tr>
<tr><td>11</td><td>Current MD in kVA</td><td>5 Sec</td></tr>
<tr><td>12</td><td>Current MD (kVA) date and time</td><td>5 Sec</td></tr>
<tr><td>13</td><td>Instantaneous Voltage</td><td>5 Sec</td></tr>
<tr><td>14</td><td>Instantaneous Phase Current</td><td>5 Sec</td></tr>
<tr><td>15</td><td>Instantaneous Neutral Current</td><td>5 Sec</td></tr>
<tr><td>16</td><td>Signed Power Factor</td><td>5 Sec</td></tr>
<tr><td>17</td><td>Instantaneous Load kW</td><td>5 Sec</td></tr>
<tr><td>18</td><td>Instantaneous Load kVA</td><td>5 Sec</td></tr>
</table></td></tr>
</table>

		<table><tr><td>19</td><td>Instantaneous Load kVAr</td><td></td></tr><tr><td>20</td><td>High resolution kWh</td><td>10 Sec</td></tr><tr><td>21</td><td>High resolution kVARh</td><td>10 Sec</td></tr></table> Meter with push button for manual display shall not be acceptable. However touch button can be allowed.
8.7	TOD Tariff Display	Appropriate indication for Current tariff.
8.8	Display indications	Appropriate indications/flags for all tampers and self diagnostic features should be provided.

9.0 Software and Communication

9.1	Base computer software	Licensed Software with the following features should be supplied for free
9.1.1	Operating System	BCS should be compatible for Windows XP, Vista, 7 and 8.
9.1.2	Security	System shall be password protected where user can login only if login ID is provided by administrator. BCS shall have rights management system so that access rights can be provided as per requirement to maintain security.
9.1.3	Data access	BCS shall be capable of accessing complete data stored in memory locally through CMRI, PDS, serial port of PC and remotely through modem (RF/NBIoT/4G/GPRS etc.) for connectivity to AMR. BCS should have polling feature with option of selecting parameters to be downloaded.
9.1.4	Database	BCS shall maintain master database according to desired area, location, and region etc.
9.1.5	Reporting	a. BCS shall have option of user defined report generation in format of Excel, Word and CSV, XML, PDF etc. b. BCS shall have capability to export data in ASCII, CSV and XML format at desired location so that the same could be integrated with our billing data for processing. c. All the data available in the meter shall be convertible to user defined ASCII, CSV and XML file format. d. BCS shall have option to export data in MIOS compliant format.
9.2	CMRI and PDS Software	a. The manufacturer has to provide software capable of downloading all the data stored in meter memory through CMRI (DOS operating System) and PDS (Linux Operating System). b. The software shall work both on SANDS & Analogic CMRI/ PDS. c. Meter reading protocols shall be shared with BSES. In the event of order, bidder shall work with BSES IT team to develop CMRI software for meter downloading and further uploading on computer.

		d. Software should have option for selection of parameters to be downloaded from meter. e. Parameters mentioned in annexure 'E' should be downloadable using CMRI and PDS in less than 30 minutes f. Software required for CMRI shall be supplied by the supplier for free of cost. Training in the use of software shall be provided by the manufacturer. The software shall be compatible to latest windows systems..
9.3	Training	Manufacture shall impart training to BSES personnel for usage of software
9.4	Communication Ports	Communication ports required in meter are as follows
9.4.1	Optical Port	Meter shall have one optical port. It should be compatible for data transfer over RS 232 standard. Communication shall not disturbed by external light.
9.4.2	RJ11 Port/ micro USB	One RJ11 (6P4C)/ micro USB port should be provided. Please refer annexure 'E' for pin out details. Port should be compatible for communication on RS232 standard. RJ11/ Micro USB port shall have cover with provision of sealing. It is preferable to have RJ11 port/ Micro USB outside the terminal cover subject to ESD immunity upto 35 KV.
9.4.3	Port protection	All ports shall be optically isolated from the power circuit.
9.4.4	Operation	All ports should work independently. Failure of one port (including display) should not affect the working of other port.
9.5	Data transfer rate	BCS and communication ports should support data transfer rate of 9600 bps (minimum).
9.6	Memory	Non volatile memory independent of battery backup, memory should be retained up-to 10 year in case of power failure.

10.0 Name Plate

10.1	Meter Serial number shall be of 8 digits. Serial number shall be printed in black colour. Embossing is not acceptable.
10.2	Size of the digit shall be minimum 5X3mm . Laser printing shall be preferred.
10.3	Bar code shall be printed along with serial number (below the meter serial number)
10.4	BIS registration mark (ISI mark)
10.5	'BSES' insignia shall be printed above LCD display with Property of BSES. Bidirectional Meter shall be printed on Name Plate.
10.6	BSES PO No. & date
10.7	Manufacturers name and country of origin
10.8	Model type / number of meter
10.9	Month & Year of manufacturing
10.10	Reference voltage / current rating
10.11	The number of phases and the number of wires for which the meter is suitable. Graphical symbol as per IS 12032 can be used.
10.12	Meter constant (Impulse/kWh, Impulse/ kVAh)
10.13	Class index of meter

10.14	Reference frequency
10.15	Warranty period

11.0 Component Specification

11.1	Shunt Element	Shunt beam should be braze or E-beam welded. Reputed make duly approved by purchaser.
11.2	Measurement or computing chips	Analog Devices, Cyrus Logic, Atmel, Phillips, Texas Instruments, SAMES, NEC
11.3	Memory chips	USA: Atmel, National Semiconductors, Texas Instruments, Phillips, ST,Microchip
		Japan: Hitachi or Oki
11.4	Display modules	Japan: Hitachi, Sony
		Holland / Korea: Phillips
		Truly Semiconductor
		Tianma/Hijing Electronics
11.5	Communication modules	USA: National Semiconductors, HP, Optonica,ST
		Holland / Korea: Phillips
		Japan: Hitachi
		Germany: Siemens
11.6	Optical port	USA: National Semiconductors ,HP
		Holland / Korea: Phillips
		Japan: Hitachi,
		Truly Semiconductor, Agillent, OSRAM, Everlight
11.7	Power supply unit	SMPS Type, reputed make
11.8	Active & passive components	USA: National Semiconductors, Atmel, Phillips, Texas Instruments, ST, Onsemi, Japan: Hitachi, Oki, AVX or Ricoh, Samsung, Everlight, Agillent
11.9	Battery	Varta, Texcell, SAFT
11.10	RTC	USA: Philips, Dallas Atmel, Motorola, Microchip , NEC or Oki
11.11	Current Transformers	The Meters should be with the current transformers as measuring elements.
11.12	Note	a. Manufacturer shall intimate deviation if any from make of components. Any deviation is subject to approval of BSES based on supporting documents and performance feedback of the components. b. Manufacturer should have complete tracking of material used in meter. BSES reserve the right to carry out audit of inventory/ manufacturing process at manufacturer's works and sub vendor's work. c. The components used by manufacturer shall

		have “Minimum Life” more than the 10 years. d. Even for existing/ par suppliers – fresh approval is needed for all deviations

12.0 Additional features

12.1	Temperature logging	The meter should have capability to measure inside temperature and can log high temperature Events.
12.2	Low Power factor logging	The meter shall have feature to record low power factor as a separate event. Tamper Indication/Icon shall be provided on the display.

13.0 Quality Assurance, Inspection and Testing

13.1	Vendor's Quality Plan (QP)	To be submitted for Purchaser's approval.
13.2	Sampling Method	Sampling Method for quality checks shall be as per relevant IS/ IEC/ CBIP guidelines and Purchaser's prior approval shall be taken for the same.
13.3	Inspection Hold-Points	To be mutually identified, agreed and approved in Quality Plan.
13.4	Type Tests	a. The meter shall be of type tested quality as per relevant IS/IEC/CBIP. Type test conducted at CPRI/ ERDA/ ERTL labs will be treated as valid. b. ESD test methodology and conformance criteria shall be as per CBIP publication no. 325. Bidder should have valid test report from CPRI/ ERDA/ Sameer/ UL lab for the same. c. The test report should not be more than 5 years old. In case any modification affecting only part of meter is made after type test, only specific type tests on the affected parts shall be repeated. d. Type test certificate should be submitted along with offer for scrutiny. e. For a manufacturer supplying meter for the first time, complete type tests will have to be carried out on

		sample randomly selected from the lot offered for inspection in event of order. 35kV ESD test will also be carried out on the sample at Sameer/UL lab. f. For regular suppliers, revalidation of meter design should be carried out by repeating the type tests on sample randomly selected from BSES lot at CPRI/ERDA every three years. g. Any other component supplied in addition to meter shall also be type tested as per IS /IEC if applicable.
13.5	Routine tests	All test marked “R” as per table 20 of IS
13.6	Acceptance Tests	a. All tests marked “A” as per table 20 of IS. b. All the routine and acceptance tests shall be carried out as per relevant standards. c. Following tests in addition to IS shall be conducted during lot inspection. i. Dimensional and drawing verification. ii. Display parameters/ sequence. iii. Data Downloading from CMRI and PC. iv. Tamper/ fraud detection/logging features as per approved documents. Tamper conditions will be simulated at varying load up to Imax. Accuracy will also be checked during tamper simulation. v. Burn in chamber test. vi. Component verifications. d. Purchaser reserves the right to formulate any other test method to verify guaranteed parameters of Meter.
13.7	ESD and Magnetic Interference test	ESD and magnetic interference test will be conducted at Samir lab, Chennai or CPRI.
13.8	Inspection	a. Purchaser reserves the right to inspect /witness all tests on the meters at Seller’s works at any time, prior to dispatch, to verify compliance with the specification/ standards. b. Manufacturer should have all the facilities/ equipments

		to conduct all the acceptance tests as per clause 14.3 relevant standards and tampers logics as per approved GTP. All the equipments including tamper logs kits/ jigs should be calibrated. c. In-process and / or final inspection call intimation shall be given in advance to purchaser.
13.9	General Requirements	**a)** Terminal cover should be fixed on the meter before dispatch. **b)** The bidder shall maintain a web site where routine test results of all meter supplied against these tender will be maintained and will be accessible to buyer/ buyer representative. **c)** Vendor shall ensure that patch required for HHU/CMRI shall be provided within 4 weeks. Vendor shall also ensure to deliver solution to meet DERC mandate within mutually agreed timeline. **d)** Delivery of software for reading through HHU/CMRI before meter delivery is required. **e)** For any false events recorded in meter, vendor shall depute their representative for field visit within one week and provide the root cause analysis in 4 weeks time.

14.0 Packing, Marking, Shipping, Handling and Storage

14.1	Packing	Every metes shall be properly sealed / packed in environmental friendly boxes/ cartons for protection against damage, vibration and ingress of dust and moisture.
14.2	Packing for accessories and spares	Robust wooden non returnable packing case with all the above protection & identification Label.
14.3	Marking	On each packing case, following details are required : a. Individual serial number b. Purchaser's name c. PO number (along with SAP item code, if any) & date d. Equipment Tag no. (if any) e. Destination

		f. Manufacturer / Supplier's name g. Address of Manufacturer / Supplier / it's agent h. Type , rating and other description of equipment i. Country of origin j. Month & year of Manufacturing k. Case measurements l. Gross and net weights in kilograms m. All necessary slinging and stacking instructions
14.4	Test reports	Routine test report to be provided with each meter
14.5	Shipping	The seller shall be responsible for all transit damage due to improper packing.
14.6	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet /manual to be furnished before commencement of supply.

15.0 Deviations

15.1	Deviations	Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, it will be assumed that the bidder complies fully with this specification.

16.0 Document Submission:

Drawing submission shall be as per the matrix given below. All documents/ drawing shall be provided on A4 sheet in soft copy with separators for each section. Language of the documents shall be English only. Deficient/ improper document/ drawing submission may liable for rejection

SL	Detail of Document	Bid	Approval	Pre Dispatch
1	Guaranteed Technical particulars (GTP)	Required	Required	
2	Deviation Sheet, if any	Required	Required	
3	Tamper Sheet	Required	Required	
4	Display Parameters	Required	Required	
5	GA / cross sectional drawing of Meter showing all	Required	Required	

	the views / sections			
6	Samples of each type and rating offered.	2 no's	4 no's	
8	Any software and accessories required for installation/ operation of meter	Required	Required	
9	Manufacturer's quality assurance plan and certification for quality standards	Required	Required	
10	Type Test reports of offered model/ type/ rating	Required		
11	BIS certificate	Required		
12	Complete product catalogue and user manual.	Required		
13	Customer Reference List	Required		
14	Recommended list of spare and accessories	Required		
15	Specification documents containing all parameters, Services, Methods in addition to companion specification of IS 15959 (part 2).		Required	
16	Program for production and testing (A)		Required	Required
18	Detailed installation and commissioning instructions		Required	Required
19	As Built Drawing		Required	Required
20	Operation and maintenance Instruction as well as trouble shooting charts/ manuals		Required	Required
21	Inspection and test reports, carried out in manufacturer's works			Required
22	Routine Test certificates			Required
23	Test certificates of all bought out items			Required
24	Meter Seal data			Required
25	Other documents: a. Completely filled-in Technical Parameters b. General arrangement drawing of the meter c. Rating plate d. Terminal Block dimensional drawing e. Mounting arrangement drawings f. Meter box drawing and dimensions g. Display parameter h. PIN configuration of Optical to RJ11 connector Manual and SOP/DWI for operation	Required	Required	

17.0 Delivery

17.1	Delivery	Despatch of Material: Vendor shall despatch the material, only after the Routine Tests/Final Acceptance Tests (FAT) of the material witnessed/waived by the Purchaser, and after receiving written Material Despatch Clearance (MDC) from the Purchaser.

Annexure - A- Guaranteed Technical Particulars (Data By Supplier)

Bidder shall furnish the GTP format with all details against each clause of this specification.
Bidder shall not change the format of GTP or clause description.
Bidder to submit duly filled GTP in hard copy format with company seal.

Clause No.	Clause Description	Manufacturer's Reply
1		
2		
3		
5		

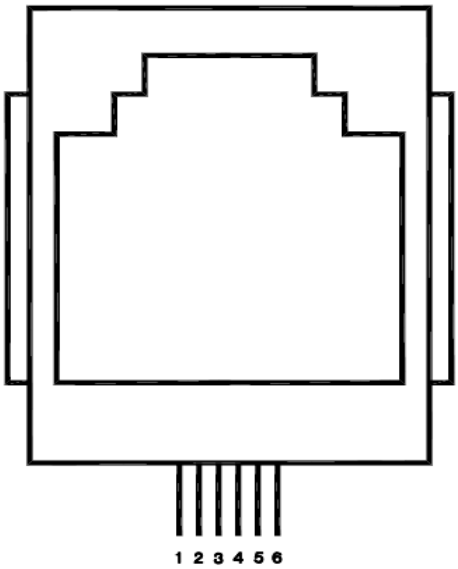
Bidder / Vendor seal / signature ----------

Name of the bidder	
Address of the bidder	
Name of contact person	
Telephone number and email id	

Annexure - B- Recommended Accessories / Spares (Data By Supplier)

SL	Description of spare part	Unit	Quantity
1		No	
2		No	
3			

Annexure - C- Pin out detail of RJ11 Port



RJ- 11 PORT

PIN OUT DETAIL		
PIN	SIGNAL	DISCRIPTION
1	NC	———
2	GND	GROUND
3	TXD	RS 232 TRANSMIT
4	GND	GROUND
5	RXD	RS 232 RECEIVE
6	NC	———

DRAWN	RAJESH	BSES Yamuna Power Limited	
CHECKED	ASHISH		
APPD.	D.S	TITLE: PIN OUT DETAILS– RJ 11 PORT SINGLE PHASE METER	
DATE	29–11–13		
SCALE	NTS	DRAWING No. CES/SCH/SPTWM/065	REV. 00

Annexure - D - Specification of Meter Box

Sl	Clause	Clause Description
1	Meter Box Type	Flush type with Completely transparent top cover and base with Incoming and Outgoing cable entry and data downloading arrangement.
2	Design	Meter box shall comply following requirement.
2.1	General Requirement	The meter box shall be designed in such a way that no access to the meter body, terminals and hardwired port of the meter shall be possible after installation and sealing of the box without breaking the box itself.
2.2	Theft Protection	a. Meter box shall be theft proof i.e. meter box cannot be opened without breaking the seals or meter itself. b. On breaking of the box, clear evident of the physical tempering shall be visual.
2.3	Parts of the box	a. The meter box shall be designed in 02 parts i.e. base and top cover. b. Meter shall be mounted inside the base on fixed moulded pillars by unidirectional screw. c. Cable glands and earthing bolt shall be provided at the base as per construction requirement. d. Proper stiffeners shall be provided in the body of the base and top cover to provide mechanical strength against transportation and installation vibrations.
2.4	Ingress protection	The meter box shall be completely dust and vermin proof. The meter box shall comply with the requirement of IP-55 & IS: 14772 & its latest version.
2.5	Collar of base and cover	a. 'U' shaped groove shall be provided in the collar of the base body, in which UV stabilized rubber 'O' shall be installed. The design of lining shall be such that it provides proper sealing between the cover & base of box to avoid penetration of dust and ingress of water. b. All around projection provided inside the cover periphery which keeps the 'O' ring pressed.

		c. The outside collar shall also be provide which cover outer surface of the collar.
2.6	Fixing of 'O' ring	a. Rubber 'O' Ring should be fixed with suitable adhesive so that the same does not get removed. b. Rubber 'O' ring shall be fixed in a single piece with out any gap between open ends. Open end of the 'O' ring shall be provided at the bottom side only.
3	Material	The material shall be as follow:
3.1	Box material	a. The material of meter box shall be flame retardant with inflammability level V0 having good dielectric and mechanical strength. b. The top Cover and Base of the box shall be made out of transparent polycarbonate with minimum 90% visibility so as to ease installation and monitoring of box against any tampering. c. The plastic shall be 'UV' stabilized to ensure that the moulded meter box should not change in colour, shape, size or should not get brittle after exposure to UV rays.
3.2	Hardware	All the metal hardware including hinges, U latches, mounting screws, downloading port ring etc shall be of rust proof stainless steel.
3.3	Cable glands	Polyamide Nylon-66
4	Construction	Meter box shall be constructed by moulding. Thickness of meter box shall be minimum 2.5 mm.
4.1	Moulding	The box shall be made through Injection Moulding or better method.
4.2	Base	Meter shall be factory fitted inside base body using unidirectional screws, on fixed mounting pillars, moulded in to the base of sufficient strength, so that removing of meter shall not possible without breaking the meter box or meter itself.
4.3	Top cover	Push Fit
5	Padlocking	The box shall also have padlocking facility.

6	Cable entry	a. 02 no's as incoming and outgoing at the 45 Deg Chamfer bottom corners suitable for 2CX25 Sqmm armoured aluminum cable. b. Cable entry must be at the bottom diagonal ends of the meter box. Appropriate clearance shall be provided between the cable entry and position of meter terminals for proper cable bending and connection. c. Minimum 60 mm vertical space shall be provided from the terminals of meter to centre of cable gland to provide sufficient bending radius and working space.
6.1	Cable Gland	a. Two nos. of Elbow shaped glands made out of Polyamide Nylon-66 suitable for 2CX10 / 2CX25 sqmm aluminium armoured cable shall be provided on both cable entries in the box. b. Glands shall be designed in such a manner that the same cannot be unscrewed / removed from the box from outside. Manufacturer may either supply two nos. of check nuts or any other alternate design to meet this requirement.
7	Earthing bolt	a. Earthing bolt of M6 with nut and washer shall be provided on left side of the body of meter box. b. The arrangement shall be such that one earth point shall be available for customer and external earthing provided by BSES can be terminated. c.Appropriate symbol shall be provided for earth terminal.
8	Mounting	
8.1	Meter mounting pillars	a. Fixed type, moulded in to the base body as per the requirement of meter mounting holes. b. Stiffeners shall be provided at the base of the mater mounting pillars.
8.2	Meter box mounting	a. Four (4) nos. fixing holes of 6 to 6.5 mm diameter at the back surface of box shall be provided to fix the same on flat wall. b. Mounting holes shall not be obstructing by Incoming or Outgoing cables.

8.3	Box Mounting spacers	04 no's, 25 mm minimum mounting spacer moulded at the mounting holes of back surface of the meter box in order to provide space between meter back surface and wall.
8.4	Box Mounting accessories	a. Long pan head self taping SS screws and washers shall be provided by the supplier with every box. b. 4 no's plastic fixing plugs suitable for self tapping screws shall also be provided.
9	Data Downloading arrangement	a. Slot for optical head with non removable metal ring shall be provided at the top cover of box to download meter. b. Meter shall be downloadable without opening of the box/ breaking of seals. c. This arrangement shall not de-rate the IP rating of meter box. d. A Top hinges and bottom sealable cover shall be provided on the data downloading slot. e. Data downloading shall not be affected by scratches on data downloading port or with ageing of box. Data downloading shall not be affected by visible light conditions.
10	Marking	Following marking shall be provided on both top cover and base by indiligible laser printing/ screen printing or embossed from inside of the box. a. BSES insignia shall be embossed on the base & cover of meter box. b. Meter serial no. c. purchaser's PO no. and date. d. Purchaser's Name. e. Name or trade mark of seller f. Any other detail required at the time of approval.

Annexure E:

S No	Parameters
1	Meter No.
2	Meter Current Time and Date (RTC)
3	Cumulative Active kWh Import- Current
	Cumulative Active kWh Export- Current
4	Cumulative Active kWh Import- History 1
	Cumulative Active kWh Export- History 1
5	Cumulative Active kWh Import- History 2
	Cumulative Active kWh Export- History 2
6	Maximum Demand kW Current
7	Maximum Demand kW History 1
8	Maximum Demand kW History 1
9	Maximum Demand kW History 1 Date
10	Maximum Demand kW History 1 Date
11	Cumulative kVAh (While Active Import- Current
	Cumulative kVAh (While Active Export- Current
12	Cumulative kVAh (While Active Import) History 1
	Cumulative kVAh (While Active Export) History 1
13	Cumulative kVAh History 2 While Active import)
	Cumulative kVAh History 2 While Active Export)
14	Maximum Demand kVA Current

15	Maximum Demand kVA History 1
16	Maximum Demand kVA History 1
17	TOD Rate Register R1
18	TOD Rate Register R2
19	TOD Rate Register R3
20	TOD Rate Register R4
21	TOD Rate Register R5
22	TOD Rate Register R6
23	TOD Rate Register R7
24	History 1 Power 'On Time' [days:HRS:MIN]
25	Maximum Demand kVA History 1 Date
26	Maximum Demand kVA History 2 Date
27	Top Cover Open Tamper Count
28	Top Cover Open Occurrence Date and Time
29	HV (35 kV) tamper count
30	HV (35 kV) Occurred date & time
31	High Temperature Event Counts
32	High Temperature Event Date
33	Low Voltage Event Count
34	Low Voltage Event Date
35	Abnormal Voltage Event Count
36	Abnormal Voltage Event Date
37	Single Wire Event Count
38	Single Wire Event Date
39	Abnormal Power On Off Event Count
40	Abnormal Power On Off Event Date
41	Earth Load Event Count
42	Earth Load Event Date
43	Magnet Tamper Event Count
44	Magnet Tamper Event Date

45	Low PF Event Count
46	Low PF Event Date
47	Neutral Disturbance Event Count
48	Neutral Disturbance Event Date
49	Reverse Current Event Count
50	Reverse Current Event Date
51	Power off event Count

Technical Specification for Three Phase Whole Current Bidirectional Meter

Specification no – BSES-TS-143-TPWBM-R0

Rev		**0**
Date		**April 13, 2023**
Prepared BY	Ashish Joshi	
Reviewed BY	Puneet Duggal	
	Vikas Srivastava	
	Lalit Mukhriya	
Approved BY	Gaurav Sharma	
	Manish Jain	

INDEX

RECORD OF REVISION

Revision No	Item / clause no.	Nature of Change	Approved By

1.0 SCOPE OF SUPPLY

This specification cover the following for Three Phase 4 wire 20-100 Amps Static Bidirectional meters (NET Meter) of accuracy class 1.0 with and without enclosure.

a. Design, manufacture, testing at manufacturer works before dispatch, packing, delivery and submission of all documentation.
b. Any accessories / hardware required for installation and operation for the meter.
c. Software (BCS and CMRI).

2.0 CODES & STANDARDS

Following codes and standards (with latest amendments) are applicable-

S No.	Code/Standard	Title
2.1	Indian Electricity Act	IE Act 2003
2.2	CEA Metering Regulations	With latest amendments
2.3	CBIP Manual (Pub no.-325)	Standardization of AC Static Electrical Energy Meters
2.4	IS- 11448	Application guide for AC Electricity meters
2.5	IS- 13779: 2020	AC Static Watt-hour Meters, Class 1 and 2 – Specification
2.6	IS- 15707	Testing, evaluation, installation and maintenance of ac electricity meters - Code of practice.
2.7	IEC 62056-21	Electricity metering - Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange
2.8	IEC 62058-11	Electricity metering equipment (AC) - Acceptance inspection - Part 11: General acceptance inspection methods
2.9	IEC 62058-31	Electricity metering equipment (AC) - Acceptance inspection - Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)
2.10	IEC 60736	Testing Equipment for electrical Energy meter
2.11	IS 15959 (Part 1): 2011	Data Exchange for Electricity Meter - Reading Tariff and Load Control - Companion Specification
2.12	IS 14772	General requirement for Enclosure for Electrical Requirement.

In the event of direct conflict between various order documents, the precedence of authority of documents shall be as follows -

i. Guaranteed Technical Particulars (GTP)
ii. Specification including applicable codes & standards
iii. Approved Vendor Drawings
iv. Other documents

3.0 SERVICE CONDITIONS

3.1	Temperature Range	Operation range: -10 Deg C to 55 Deg C Limit range of operation: -25 to 60 Deg C Limit range of storage / transport : -25 to 70 Deg C

3.2	Relative Humidity	0 to 96 %

4.0 DISTRIBUTION SYSTEM DATA

4.1	Supply	3 phase 4 wire system
4.2	Voltage	11KV
4.3	Frequency	50 Hz ± 5%
4.4	System neutral	Solidly Earthed

5.0 ELECTRICAL AND ACCURACY REQUIREMENTS

5.1	Meter Type	Type 1. 3 phase 4 wire static bidirectional energy meter (NET Meter) with 50 mm extended type terminal cover. Type 2: 3 phase 4 Wire static bidirectional energy meter along with short type terminal cover fitted in polycarbonate enclosure as per annexure 'E'.
5.2	Accuracy Class	1.0 as per IS13779 (accuracy class for reactive energy should be same as that for active energy)
5.3	Connection	Direct / whole current
5.4	Rated Voltage	240V (P-N), 415V (P-P) with variation of +30% & -40%. However meter should withstand the maximum system voltage across terminals.
5.5	Rated basic current	20A
5.6	Rated maximum Current	100A
5.7	Rated Frequency	50Hz +/- 5%
5.8	Power factor range	Zero Lag – unity – Zero lead
5.9	Power Consumption in Voltage circuit	Less than 1 Watt & 4 VA per phase
5.10	Power consumption in Current circuit	1 VA per phase
5.11	Starting current	0.2% of Ib
5.12	Meter constant	To be specified by bidder
5.13	Process Technology	Surface Mounting Technology or better
5.14	Insulation Level	Meter shall withstand an insulation test of 4 KV and impulse test at 8 KV
5.15	Accuracy	Meter shall comply as per IS 13779.
5.16	Repeatability of error test	As per IS 13779
5.17	Starting and Running with No-Load	Meter shall be fully functional within 5 seconds of applying rated voltage to meter terminals. Meter shall not produce more than one output pulse count when voltage is applied with no current flowing in the current circuit. Meter shall pass test for No-load condition.
5.18	Voltage dips and interruptions	Voltage dips and interruptions shall not produce a change in the register of more than 0.001KWH and test output shall not produce a signal more than 0.001KWH as per IS 13779.
5.19	Short time over current	Meter shall not get damaged due to short time over currents. Meter shall perform correctly when back to its initial working conditions and the variation in error shall not exceed 0.1% @ I_b and unity power factor. Meter shall be able to carry a short time over current of 20 times the maximum current for a

		period of 0.5 second as per IS 13779.
5.20	Influence of heating and self-heating	As per IS 13779
5.21	Immunity to earth/phase fault	As per IS 13779
5.22	Limits of error due to Current variation	As per IS 13779
5.23	Limits of error due to influence quantities	Meter shall work within guaranteed accuracy as per IS 13779/ CBIP325 (most stringent standard to be followed) under and after influence of following :- a. Voltage variation b. Frequency variation c. 10% third harmonic in current d. Reversed phase sequence e. Voltage unbalance f. Harmonic components in current and voltage circuit g. DC and even harmonics in AC current circuit h. Odd harmonics in AC current circuit i. Sub harmonics in AC current circuit j. Continuous (DC) “stray” magnetic induction of 67mT+/-5%. k. Continuous (DC) “abnormal” magnetic induction of 0.27T+/-5%. l. Alternating (AC) “stray’ magnetic induction of 0.5mT+/-5% m. Alternating (AC) “abnormal’ magnetic induction of 10mT. n. Alternating (AC) “abnormal’ magnetic induction of 0.2T+/-5%. o. External magnetic field 0.5 T p. Electromagnetic HF fields q. Radio frequency interference r. DC immunity test
5.24	Limits of error due to ambient temperature variation	As per IS 13779
5.25	Electromagnetic compatibility	Meter shall remain immune to electrostatic discharge, electromagnetic HF field and fast transient burst as per IS 137 79
5.26	Radio Interference	Meter shall not generate conducted or radiated noise which interferes with other equipment

6.0 CONSTRUCTION REQUIREMENTS

6.1	General	Construction should be in accordance with IS13779.
6.2	Base Body	Opaque, UV stabilized polycarbonate of grade LEXAN 142A/ 943AA or Equivalent with FV0 flammability level as per IS 11731 Part 2.
6.3	Top Cover	Transparent, UV stabilized polycarbonate of grade LEXAN 142A/ 943AA or Equivalent with FV0 flammability level as per IS 11731 Part 2.

		It should so be designed so as the internal components should not be visible.
6.4	Assembly of base body and top cover	By ultrasonic welding
6.5	Terminal block	a. Material - Flame retardant glass filled polycarbonate of grade 500 R or equivalent with flammability level FV0 as per IS 11731 Part 2. b. Terminal block shall form Integral part of the meter base c. Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135C and pressure of 1.8MPa. The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
6.6	Terminal Cover	a. Type 1: 50 mm extended type terminal cover with U cut suitable for 50 mm^2 Cable. b. Type 2: Short type terminal cover suitable for 50 mm^2 Cable. c. Material - UV stabilized transparent polycarbonate cover. LEXAN 143A/943AA with flammability level FV0 as per IS 11731 Part 2 or equivalent grade d. Provision of sealing at two points through sealing screw. e. The terminal cover shall be extended type with baffle wall above the cable entry base wall so that access to the terminals is not possible (even with thin metallic wire) without breaking the seal. Terminal cover should have provision for cable entry from bottom. f. Diagram of external connections should be embossed on terminal cover. Sticker is not acceptable. g. T Cover should be easy to use.
6.7	Terminals	a. Suitable for 50mm^2 aluminium cable. b. Material of terminals, screws and washers should be brass or tinned copper. Two flat head screws of appropriate size should be provided per terminal. c. Terminals shall be tested for continuous current of 150 % Imax. d. Terminals shall be clearly marked for phase/neutral/incoming/outgoing etc.
6.8	Ingress Protection	IP 51 or better, but without suction in the meter.
6.9	Meter Enclosure	Meter shall be factory fitted using unidirectional screw in a polycarbonate enclosure confirming specifications provided in annexure 'E' for Meter 'Type 1' only.
6.10	Output device	Meter should have flashing LED visible from the front as output device to represent energy recording. LED shall be configurable for KWH, KVAh and KVArh. The resolution shall be such that satisfactory accuracy test can be conducted at the lowest load in less than 5 minutes and

		starting current test in less than 10 minutes.
6.11	RTC	Meter shall have internal real time clock to set date and time. Time accuracy should be as per relevant IS/IEC. Meter should have facility for time synchronization locally through CMRI. It is preferable to have facility for remote synchronization through AMR. Clock correction events shall be registered in meter's memory.
6.12	Battery	Lithium ion battery with guaranteed shelf life of 10 years and capacity life of 15 years. Battery removal or total discharge should not affect the working of the meter.
6.13	Memory	a. Non volatile memory independent of battery backup to store complete meter data. Data should be retained in the memory up to 10 year without any auxiliary power. b. Memory chip of a meter shall not work in circuit of another meter. Hardware/ firmware level security in microcontroller of meter shall be provided in this regard.
6.14	Self Diagnostic feature	Meter shall have self diagnostic for the following a. Date and RTC b. Battery c. Non volatile memory d. Display
6.15	Clearance and Creepage distance	As per IS 13779
6.16	Mounting	Surface / Flush mounted
6.17	Resistance against heat and fire	The terminal block and Meter case shall have safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per IS 13779.
6.18	Electronic components	All active & passive components should be surface mounting type and shall be assembled by state of the art assembly processes.
6.19	Power Supply	The power supply should comply with the relevant standards. Power supply unit of the meter should not be affected in case maximum voltage of the system appears across the terminals due to faults or due to wrong connections.
6.20	Measurement/ computing chips	Measurement/computing ASICs should be surface mounting type.
6.21	Protection against Corrosion	a. Internal electrical components should be of electrolytic copper & should be protected from corrosion, rust etc. b. Mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods.
6.22	Meter Sealing Arrangement	Sealing should be in accordance with IS and CEA metering regulations with latest amendments. Approval shall be taken from purchaser for location of seals.
6.22.1	Manufacturer's Seals	One Polycarbonate seal to be provided on meter cover.
6.22.2	BSES Seals	a. One Hologram seal should be provided **on each side** of meter i.e two hologram seals should be

		provided. Meter sides should not have sharp edges to avoid damage to hologram seals. b. Polycarbonate seal should be provided on top cover. c. Seals will be issued to manufacturer free of cost.
6.22.3	Seal record	Record of all seals shall be forwarded to purchaser with each lot.
6.23	Guarantee/ Warranty	66 months from the date of dispatch or 60 months from date of commissioning, whichever is earlier

7.0 FUNCTIONAL REQUIREMENTS

7.1	Meter category	Meter shall comply C2 category as per IS 15959 part 1 with additional parameters specified in this specification. Metering Mode of Meter shall be Bidirectional (NET Meter).
7.2	Tariff Basis	Lag only: KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh < KWh.
7.3	MD Registration	Meter shall store and display MD upto two decimal in every 30 min. period along with date & time. At the end of every 30 min, new MD shall be computed & compared with previous MD and store whichever is higher and the same shall be displayed. It is preferred that MD is computed using separate counter rather than by difference of initial and final energy counter.
7.4	Auto Reset of MD	Auto resetting shall be 1st of every month at 00:00hrs.
7.5	TOD Metering	a. Meter shall be capable of doing TOD metering in minimum 4 tariff rate registers programmable for minimum 8 time zones and 4 seasonal profiles. b. Meter shall be capable of doing TOD metering for kWh (Import and Export) , kVARh (While active import and while active export), kVAh (All four quadrants) and MD in kW (Import and export), kVAR (Quadrant Wise) and kVA (Import and Export) . Reactive parameter should be recorded separately for quadrant wise (Q1 to Q4) c. TOD programmable on site through CMRI or AMR remotely. d. At Display as well as BCS end meter TOD values shall be shown as per cumulative values of TOD Zones of respective registers. e. TOD metering shall be implemented by the activity colander method of IS 15959 Part 1 clause 9/ DLMS UA-1000-1

		f. Special Day table shall be defined as per IEC/ DLMS UA-1000-1 g. Default TOD programming shall be as per latest DERC guidelines. Prior approval shall also be taken from BSES for the same. h. Tariff rate registers shall be as follow R1: Rate register for Peak R2: Rate register for Normal R3: Rate Register for Off Peak
7.6	Security	a. Reading and writing data into meter memory via optical and remote communication port shall be through DLMS security keys only. b. Bidder shall ensure to safeguard high security keys used for configuring parameters into meter. c. Once the meter memory is locked during manufacturing process, only parameters mentioned in IS 15959 shall be configurable even in factory. It should not be possible to configure any other parameters. d. Please note that there shall be no other mechanism/ method to interface with meter through optical and remote communication port except mentioned in IS 15959, even for manufacturer. e. It should not be possible to change data stored in meter memory even after accessing meter memory physically. In case of any change in memory data, a flag/alert shall be generated. Flag/Alert shall be indicated over display and in remote communication also.
7.7	Parameters profiles	Meter shall support all the parameters profile as per IS 15959 part 1 with additional parameters specified in this specification:
7.7.1	Instantaneous parameters	All the parameters as per table 27 of IS 15959 Part 1 shall be continuously updated by the meter hardware/software as per internal sampling and computation time and last updated value shall be available for downloading as and

		when required along with following additional parameters: i. Neutral Current ii. Import and Export kWh iii. kVAh in Active import and Active export iv. kVARh (Q1 to Q4) Quadrant Wise. (Please refer IS 14697 for quadrant definitions. v. MD in kWh (Import and Export) vi. MD in kVAh (while active Import and Export) vii. MD in kVARh (Q1 to Q4) viii. Defraud and deficiency energies ix. % THD in R Phase Voltage x. % THD in Y Phase Voltage xi. % THD in B Phase Voltage xii. % THD in R Phase Current xiii. % THD in Y Phase Current xiv. % THD in B Phase Current xv. Displacement PF xvi. Maximum Demand in kVAR xvii. Voltage angles all phases with respect to R phase. xviii. High resolution kWh xix. High resolution kVArh xx. High resolution kVAh All the energies shall be measured and recorded with and without harmonics.
7.7.2	Billing Parameters	All the parameters mentioned in Table 29 of IS 15959 part along-with following additional parameters: i. Import and export cumulative kWh (R1 to R8) ii. Cumulative kVArh (While Active Import and Export) iii. Cumulative Energy, kVArh (Q1 to Q4) for R1 to R8 iv. MD in kWh Import and Export for R1 to R8 v. MD in kVAh (Import and Export) for R1 to R8 vi. MD in kVAr (Q1 to Q4) for R1 to R8 vii. Cumulative Power interruption counts in all billing history data viii. Monthly power on/off duration All the energies shall be measured and recorded with and

		without harmonics. 12 no's billing cycle parameters shall be remain in meter memory along with current cycle parameters and shall be available for reading as well as profile
7.7.3	Block load survey parameters	a. All the parameters as per Table 28 of IS 15959 part 1 for 60 power ON days. b. Default profile capture period shall be 1800 sec. c. Following additional parameters shall be provided: i. Current- Neutral I_N ii. Active Current- R phase iii. Active Current -Y Phase iv. Active Current -B Phase v. Reactive Current- R Phase vi. Reactive Current- Y Phase vii. Reactive Current- B Phase viii. Three Phase Power Factor ix. R phase Active Power x. Y phase Active Power xi. B phase Active Power xii. R Phase Apparent Power xiii. Y Phase Apparent Power xiv. B Phase Apparent Power xv. Power Off time in integration period All the energies shall be measured and recorded with and without harmonics. 30 min integration period, load profile of phase voltage (R, Y, B) with instant and average value and line, active and reactive current (R, Y, B) with instant and average value, and all three phase active, reactive (all four quadrant) and apparent power and energy, PF (import and Export), THD in both current and voltage, phase-wise demand, power-off time integration period for 60 days
7.7.4	Daily Load Profile	a. All the parameters as per table 57 of IS 15959 Part 1 shall be measured and recorded at each midnight

		i.e. 00:00 hrs for last 60 power ON days. b. All the energies shall be measured and recorded with and without harmonics. c. Mid night data: The meter should record midnight Cumulative kWh & kVAh, kVARh lag and kVARh lead reading for last min 60 days load survey data.
7.7.5	General Purpose Parameters	Following parameters shall be provided in Non Volatile memory (NVM) of the meter.
7.7.5.1	Name plate details	Provided As per table 30 of IS 15959 Part 1.
7.7.5.2	Programmable parameters	a. Parameters mentioned in table 31 of IS 15959 part 1 shall be provided. b. These parameters can be programmed by BCS or CMRI via proper security. Every transaction shall be logged in non volatile memory of the meter with date and time stamp.
7.7.6	Transaction events	All transaction shall be logged in memory of meter as per table 35 of IS 15959 part 1.

8.0 EVENT AND TAMPER MONITORING

8.1	Top Cover Open	Meter shall have top cover open detection and same shall be logged. Detection and logging mechanism shall work even when the meter is de-energized. Top cover open event should not get reset.
8.2	External Magnetic tamper	1. Meter should either be immune or should log the events of attempt of tampering by external magnetic field as per relevant IS13779/ CBIP 325 with latest amendments. 2. If the working of the meter gets affected under the influence of external magnetic field, meter should record energy at Imax and UPF. Meter should not compute MD during this period. Counter for reactive energy should not increase in this case. The meter shall record energy as per actual load once the magnetic field is removed.
8.3	Protection against HV spark/ESD	If the meter is subjected to HV spark/ ESD, meter shall continue to record energy or log the event. Upto 35 KV meter should remain immune. Communication port shall also be immune upto 35KV. Bidder should have valid test report from Sameer/ UL lab or any other NABL accredited Lab for the same.
8.4	Neutral disturbance	Meter should log the event when AC/DC/ Pulsating voltage is injected in neutral circuit.
8.5	Phase sequence reversal	Meter should work accurately irrespective of the phase sequence of the supply. Meter should log the event.
8.6	Detection of missing potential	Absence of potential on any phase should be logged. Restoration of normal supply shall also be recorded. The threshold value of voltage should be programmable at factory end.

8.7	Low Voltage	Meter should log low voltage event if average voltage is below 75% of Vref.
8.8	High Voltage	Meter should log high voltage event if average voltage is above 115% of Vref.
8.9	Voltage Imbalance	Meter should log voltage imbalance event when the difference between minimum and maximum phase voltage is more than 10% of Vref.
8.10	Abnormal/Invalid Voltage	Meter should log invalid voltage if phase angle between voltages deviates from the standard values by more than +/-10 degrees i.e. 120 +/- 10 degrees.
8.11	Reversal of Current Coil Polarity	Meter should log the event of reversal of C.C polarity. Meter should register energy consumed correctly with any one, two or all three current coils reversed.
8.12	Current Circuit Shorting / Bypass	Meter should log the event of current coil shorting/bypass. Threshold value of current should be programmable at factory end.
8.13	Current Circuit Open	Meter should log the event of current coil open. Threshold value of current should be programmable at factory end.
8.14	Over current	If the current in any phase exceeds the rated current, meter should log overcurrent event.
8.15	Current Imbalance	Meter should log current imbalance event when the difference between minimum and maximum phase current is more than 30% of I average.
8.16	Invalid Phase Association	Meter should log invalid phase association event if the voltage sequence does not match with the current sequence.
8.17	High neutral Current	Meter should log high neutral current when neutral current is greater than 50% of I basic.
8.18	Power On/Off	Meter shall detect power OFF (minimum power off period 5 mins) if all phase voltages are absent. This event shall be recorded at the time of each power OFF. At the same time power ON event shall be recorded. . Meter should have provision to record last 30 such events.
	Abnormal Power Off	In case meter micro observes a power off even though AC supply is available, the event is called as “Abnormal power off”. Meter shall able to detect and log such event. The logic need to be discussed and agreed before-hand.
	Low Power factor	The meter shall have feature to record low power factor as a separate event when Load > 10% of of rated, pf range --- 0.2 to 0.5, duration 15 minutes.
	2Phase connection	Meter shall have feature to log an event in case only two phase are connected i.e. remaining one phase & Neutral are absent.
	Transactions	Other than RTC and TOU zone timing, no other parameter should be programmable/ resetable in field. Regarding RTC and TOU, all transactions should be logged.
	High Temperature	The meter should have capability to measure inside temperature and can log high temperature Events.
8.19	Harmonic events	Meter shall log high harmonic events if meter detect %THD

		in phase voltage or current more than 5%. Threshold value and occurrence/ restoration time should be factory programmable. Meter shall capture detailed harmonic profile while logging of this event.
8.20	Tamper Logging	Last 200 nos. tamper events shall be recorded in meter memory on FIFO basis excluding top cover open. Last 20 events of top cover open tamper should be recorded in the memory including the first occurrence.
8.20.1	Parameter Snapshot	a. Snapshot of Date, time, voltages, Phase currents (Line, Active and Reactive), neutral current, power factor, active power, apparent power, signed reactive power, cumulative kWh, cumulative kVAh, cumulative kVArh (lag and lead) etc should be recorded for each tamper event b. Detailed harmonic profile shall be captured at occurrence of High harmonic events.
8.20.2	Tamper Indication	For each tamper event, appropriate Indication/Icon should appear on the meter display either continuously or in auto display mode. Icons appearing continuously are preferable.
8.21	Tamper Logics	Logic sheet for tamper/ event detection and logging should be submitted for purchaser's approval. Following details should be provided for each tamper in tabular form a. Detailed Tamper logic b. Threshold values c. Persistence time d. Restoration time e. Snapshot details

9.0 DISPLAY

9.1	Type	STN Liquid crystal, Pin type with backlight
9.2	Viewing angle	Minimum 160 degrees
9.3	UV Protection	The display modules should be well protected from the external UV radiations
9.4	Size	Minimum 10X5mm
9.5	Digits	Minimum 8 digits
9.6	Language	English
9.7	Display Parameters	Parameters to be displayed are given below
9.7.1	Auto scroll mode	a. LCD test b. Meter SL no. c. Date d. Time e. Cumulative Active Energy Import f. Cumulative Active Energy Export g. Cumulative Active Energy NET (With +ve sign for Import and –ve sign for Export) h. Cumulative Apparent Energy (Import) i. Cumulative Apparent Energy (Export) j. Instantaneous load in kW, kVAr & kVA k. Phase wise voltage and current (R, Y, B phases) l. Instantaneous average power factor with sign m. Cumulative Reactive Energy (Q1) n. Cumulative Reactive Energy (Q2)

		o. Cumulative Reactive Energy (Q3) p. Cumulative Reactive Energy (Q4) q. Active Import Maximum demand in KW with date and time r. Active Export Maximum demand in KW with date and time s. Apparent (While Active Import) Maximum Demand in KVA with date and time t. Apparent (While Active Export) Maximum demand in KVA with date and time u. Current TOD registers- Active Energy (Import) v. Current TOD registers- Active Energy (Export) w. Current TOD registers- Apparent (While Active Import) x. Current TOD registers- Apparent (While active Export) y. Present tamper status Scroll time should be 10 Sec
9.7.2	Manual Display mode (using push button)	Following parameters should be displayed in addition to parameters displayed in Auto display mode - a. Cumulative power on hours b. Cumulative power off hours c. Number of power failures (Power OFF Events) d. R phase voltage e. Y phase voltage f. B phase voltage g. R phase current (line) h. Y phase current (line) i. B phase current (line) j. Neutral Current (Actual) k. Frequency l. Instantaneous Active load With sign for import and Export m. Instantaneous Reactive load With sign for import and Export n. Instantaneous Apparent load With sign for Quadrant (Q1, Q2, Q3, Q4) o. Cumulative Billing counts p. Cumulative programming count q. Billing date r. Last month billing cumulative Active Import Energy s. Last month billing cumulative Active Export Energy t. Last month billing Cumulative Apparent Energy (While Active Import) u. Last month billing Cumulative Apparent Energy (While Active Export) v. Last month billing Cumulative Reactive Energy (Q1) w. Last month billing Cumulative Reactive Energy (Q2) x. Last month billing Cumulative Reactive Energy (Q3) y. Last month billing Cumulative Reactive Energy (Q4) z. Last month billing Active Import Maximum demand with date and time aa. Last month billing Active Export Maximum demand

		with date and time bb. Last month billing Apparent (While Active Import) Maximum Demand with date and time cc. Last month billing Apparent (While Active Export) Maximum demand with date and time z. Last Month billing TOD registers- Active Energy (Import) aa. Last Month billing TOD registers- Active Energy (Export) dd. Last month billing TOD registers- Apparent (While Active Import) ee. Last month billing TOD registers- Apparent (While Active Export) ff. High resolution Cumulative Active Energy Import gg. High Resolution Cumulative Active Energy Export hh. High Résolution Cumulative Active Energy NET (With +ve sign for Import and –ve sign for Export) ii. High resolution Cumulative Apparent Energy (While Active Import) jj. High resolution Cumulative Apparent Energy (While Active Export) kk. High resolution Cumulative Reactive Energy (Q1) ll. High resolution Cumulative Reactive Energy (Q2) mm. High resolution Cumulative Reactive Energy (Q3) nn. High resolution Cumulative Reactive Energy (Q4) oo. Last occurred and restored tamper with date and time pp. Cumulative tamper count qq. Tamper status displays rr. Connection check The meter display should return to Default Display mode (mentioned above) if the 'push button' is not operated for more than 5 seconds. Scroll lock facility should be provided by pressing scroll push button for long duration (10-15 sec). Lock should be released by repeat action.
9.7.3	Tamper indications	As per clause 8.20.2.
9.7.4	Self Diagnostic Indications	Appropriate indication for each self diagnostic feature should be displayed continuously irrespective of display mode (auto/manual).
9.7.5	Connection check	Appropriate indication to be displayed continuously in case of current/voltage connection error

10.0 SOFTWARE AND COMMUNICATION

10.1	Base computer software	The BCS shall ensure that data downloaded / displayed cannot be tampered. BCS shall be able to display data in tabular (text) as well as graphical format. Software shall have polling feature with optional selection of parameters to be downloaded through AMR in daily / weekly / monthly / annual format. Any software upgrade shall also be provided free in future by the bidder. Licensed Software with the following features should be

		supplied for free
10.1.1	Operating System	BCS should be compatible for latest Windows OS with backward compatibility.
10.1.2	Security	System shall be password protected where user can login only if login ID is provided by administrator. BCS shall have rights management system so that access rights can be provided as per requirement to maintain security.
10.1.3	Data access	BCS shall be capable of accessing complete data stored in meter memory locally through PC and remotely through modem (RF/GPRS/NBIoT/4G etc.) for connectivity to AMR.
10.1.4	Database	BCS shall maintain master database according to desired area, location, and region etc.
10.1.5	Reporting	a. BCS shall have option of user defined report generation in format of Excel, Word and CSV etc. b. BCS shall have capability to export data in ASCII format at desired location so that the same could be integrated with our billing data for processing. c. All the data available in the meter shall be convertible to user defined ASCII file format. d. BCS shall have option of user defined report generation in format of Excel, Word and CSV, XML, PDF etc. e. BCS shall have capability to export data in ASCII, CSV and XML format at desired location so that the same could be integrated with our billing data for processing. f. All the data available in the meter shall be convertible to user defined ASCII, CSV and XML file format.
10.2	CMRI Software	Manufacturer has to provide software capable of downloading data through CMRI. Software required for CMRI shall be supplied by the supplier for free of cost. Training in the use of software shall be provided by the manufacturer. The software shall be compatible to latest windows systems.
10.2.1	Integration	In the event of order, bidder shall work with BSES IT team to integrate CMRI software with BSES AMR and billing system i.e meter downloading, uploading data on computer etc. Meter reading protocols shall be shared with BSES.
10.2.2	Data access	CMRI software should be capable of downloading complete data stored in the meter memory. Software should have option for selection of parameters to be downloaded from meter i.e billing data, event/tamper logging data etc. Billing data should be downloadable using CMRI within 1 minute.
10.2.3	Suitability	CMRI software shall work both on SANDS & Analogic make CMRI.
10.3	Training	Manufacturer shall impart training to BSES personnel for usage of software
10.4	Communication Ports	Communication ports required in meter are as follows
10.4.1	RJ11 Port	RS232 compatible RJ11 6P4C shall be provided. PIN configuration shall be as per annexure 'A'
10.4.1	Optical Port	Meter shall have optical port in the front for data download. Portable hand held device shall also be provided along with

		meter for meter reading.
10.4.2	Port protection	All ports shall be galvanically isolated from the power circuit.
10.4.3	Operation	Both ports should work independently. Failure of one port (including display) should not affect the working of other port.
10.5	Communication protocol	a. IS 15959 part 1. b. Integration of meters with BSES system will be supplier's responsibility.
10.6	Data transfer rate	BCS and communication ports should support data transfer rate of 9600 bps (minimum).

11.0 NAME PLATE

11.1	Meter Serial number shall be of 8 digits. Serial number shall be printed in black colour. Embossing is not acceptable**.** (Should also be stored in meter memory and should be downloadable). Name plate shall be printed preferably by laser.
11.2	Size of the digit shall be minimum 5X3mm
11.3	Bar code shall be printed below serial number
11.4	BIS registration mark (ISI mark)
11.5	'BSES' logo should be printed above LCD display. With property of BSES
11.6	BSES PO No. & date
11.7	Manufacturers name and country of origin
11.8	Model type / number of meter
11.9	Month and Year of manufacturing (Should also be stored in meter memory and should be downloadable)
11.10	Reference voltage and current rating
11.11	The number of phases and the number of wires for which the meter is suitable. Graphical symbol as per IS 12032 can be used.
11.12	Principal units in which meter reads
11.13	Meter constant Impulse/kWh, Impulse/kVAh
11.14	Class index of meter
11.15	Reference frequency
11.16	Warranty period
11.17	Reference temperature if different from 27 Deg C
11.18	Connections, diagrams and terminals shall be marked / provided in accordance with Indian Standard.

12.0 APPROVED MAKES OF COMPONENTS

12.1	Measurement or computing chips	The measurement or computing chips used in the Meter should be with the Surface mount type along with the ASICs	Analog Devices, Cyrus Logic, Atmel, Phillips, Texas Instruments, SAMES, NEC
12.2	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel, National Semiconductors, Texas Instruments, Phillips, ST,Microchip Japan: Hitachi or Oki

12.3	Display modules	a) The display modules should be well protected from the external UV radiations. b) The display visibility should be sufficient to read the Meter mounted at height of 0.5 meter as well as at the height of 2 meters (refer 3.2.d for Viewing angle). c) The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). d) It should be trans-reflective HTN or STN type industrial grade with extended temperature range minimum 70	Japan: Hitachi, Sony Holland / Korea: Phillips Truly Semiconductor Tianma/Hijing Electronics
12.4	Communication modules		USA: National Semiconductors, HP, Optonica,ST, Holland / Korea: Phillips Japan: Hitachi Germany: Siemens
12.5	Optical port	a) Optical port should be used to transfer the meter data to meter reading instrument. b) The mechanical construction of the port should be such to facilitate the data transfer easily. 9 pin connector of optical port shall be FCI copper type.	USA: National Semiconductors ,HP Holland / Korea: Phillips Japan: Hitachi, Truly Semiconductor, Agillent, OSRAM, Everlight
12.6	Power supply unit	The power supply should be with the capabilities as per the relevant standards. The power supply unit of the meter should not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	SMPS Type, reputed make
12.7	Active & passive components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly	USA: National Semiconductors, Atmel, Phillips, Texas Instruments, ST, Onsemi, Japan: Hitachi, Oki, AVX or Ricoh, Samsung, Everlight, Agillent

		processes. The PTH components should be positioned such a way that the leads of components should not be under stress and not touching the internal wires. LED	
12.8	Battery	Lithium with guaranteed life of 15 years.	Varta, Texcell, SAFT
12.9	RTC	The accuracy of RTC shall be as per relevant IEC / IS standards	USA: Philips, Dallas Atmel, Motorola, Microchip , NEC or Oki
12.10	Note		a. Manufacturer shall intimate deviation if any from make of components. Any deviation is subject to approval of BSES based on supporting documents and performance feedback of the components. b. Manufacturer should have complete tracking of material used in meter. BSES reserve the right to carry out audit of inventory/ manufacturing process at manufacturer's works and sub vendor's work. c. The components used by manufacturer shall have "Minimum Life" more than the 10 years. d. Even for existing/ par suppliers – fresh approval is needed for all deviations

13.0 QUALITY ASSURANCE, INSPECTION AND TESTING

13.1	Quality Assurance Plan (QAP)	To be submitted for Purchaser's approval.
13.1.1	Inspection Hold-Points	To be mutually identified, agreed and approved in QAP.
13.1.2	Sampling Method	Sampling Method for quality checks shall be as per relevant IS/ IEC/ CBIP guidelines and Purchaser's prior approval shall be taken for the same.
13.2	Type Tests	a. The meter shall be of type tested quality as per relevant IS/IEC/CBIP. Type test conducted at CPRI/ ERDA labs will be treated as valid. b. The test report should not be more than 5 years old. In case any modification affecting only part of meter is made after type test, only specific type tests on the

		affected parts shall be repeated. c. Type test certificate should be submitted along with offer for scrutiny. d. For a manufacturer supplying meter for the first time, complete type tests will have to be carried out on sample randomly selected from the lot offered for inspection in event of order. 35kV ESD test will also be carried out on the sample at Sameer/UL lab. e. For regular suppliers, revalidation of meter design should be carried out by repeating the type tests on sample randomly selected from BSES lot at CPRI/ERDA every three years f. Any other component supplied in addition to meter shall also be type tested as per IS /IEC if applicable. g. Conformance test report of IS15959 part 1 shall be submitted.
13.3	Routine tests	All test marked “R” as per IS13779
13.4	Acceptance Tests	a. All tests marked “A” as per IS13779. b. Dimensional and drawing verification. c. Display parameters/ sequence. d. Data Downloading from CMRI and PC. e. Tamper detection/logging features as per approved documents. Tamper conditions will be simulated at varying load up to Imax. Accuracy will also be checked during tamper simulation. f. Burn in chamber test. g. Component verification. h. Testing of Profile parameters and communication protocol. i. Purchaser reserves the right to formulate any other test method to verify guaranteed parameters of Meter.
13.5	Inspection	a. Purchaser reserves the right to inspect /witness all tests on the meters at Seller’s works at any time, prior to dispatch, to verify compliance with the specification/ standards. b. Manufacturer should have all the facilities/ equipments to conduct all the acceptance tests as per IS during inspection. All the testing equipment should be calibrated. c. In-process and / or final inspection call intimation shall be given at least 15 days in advance to the purchaser.
13.6	General Requirements	a. The internal potential links should be in closed position or link less meters will be preferred and there shall not be any external link. b. Terminal cover should be fixed on the meter before dispatch. c. The bidder shall maintain a web site where routine test results of all meter supplied against these tender will be maintained and will be accessible to buyer/ buyer representative.

		d. For any false events recorded in meter, vendor shall depute their representative for field visit within one week and provide the root cause analysis in 4 weeks time.

14.0 SHIPPING, HANDLING AND SITE SUPPORT

14.1	Packing	Every meter shall be properly sealed / packed in environmental friendly boxes/ cartons for protection against damage, vibration and ingress of dust and moisture.
14.2	Packing for accessories and spares	Robust non returnable packing case with all the above protection & identification Label.
14.3	Marking	Following details are required on each packing case: a. Individual serial number b. Purchaser's name c. PO number (along with SAP item code, if any) & date d. Equipment Tag no. (if any) e. Destination f. Manufacturer / Supplier's name g. Address of Manufacturer / Supplier / it's agent h. Type , rating and other description of equipment i. Country of origin j. Month & year of Manufacturing k. Case measurements l. Gross and net weights in kilograms m. All necessary slinging and stacking instructions
14.4	Test reports	Routine test report to be provided with each meter
14.5	Shipping	The seller shall be responsible for all transit damage due to improper packing.
14.6	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet /manual to be furnished before commencement of supply.

15.0 DEVIATIONS

15.1	Deviation	Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, it will be assumed that the bidder complies fully with this specification.

16.0 DOCUMENT AND DRAWING SUBMISSION

Drawing submission shall be as per the matrix given below. All documents/ drawing shall be provided on A4 sheet in soft copy with separators for each section. Language of the documents shall be English only. Deficient/ improper document/ drawing submission may liable for rejection

SL	Detail of Document	Bid	Approval	Pre Dispatch
1	Guaranteed Technical particulars (GTP)	Required	Required	
2	Deviation Sheet, if any	Required	Required	
3	Tamper Sheet	Required	Required	

4	Display Parameters	Required	Required	
5	GA / cross sectional drawing of Meter showing all the views / sections (eg: Terminal Block dimensional drawing, Mounting arrangement drawings, Meter box drawing and dimensions)	Required	Required	
6	Samples of each type and rating offered.	2 no's	4 no's	
8	Any software and accessories required for installation/ operation of meter	Required	Required	
9	Manufacturer's quality assurance plan and certification for quality standards	Required	Required	
10	Type Test reports of offered model/ type/ rating	Required		
11	BIS certificate	Required		
12	Complete product catalogue and user manual.	Required		
13	Customer Reference List	Required		
14	Recommended list of spare and accessories	Required		
15	Specification documents containing all parameters, Services, Methods in addition to companion specification of IS 15959 (part 1).		Required	
16	Program for production and testing (A)		Required	Required
18	Detailed installation and commissioning instructions		Required	Required
19	As Built Drawing		Required	Required
20	Operation and maintenance Instruction as well as trouble shooting charts/ manuals		Required	Required
21	Inspection and test reports, carried out in manufacturer's works			Required
22	Routine Test certificates			Required
23	Test certificates of all bought out items			Required
24	Meter Seal data			Required

ANNEXURE – A GUARANTEED TECHNICAL PARTICULARS (DATA BY SUPPLIER)

Bidder shall furnish the GTP as per format provided below. All the clauses of the specification shall be covered in GTP. Any deviation or comments shall be specifically mentioned against each clause. No comments or deviation will be treated as acceptance.

Complete GA drawing, technical literature, operation and maintenance manual of hardware/ software shall be provided with technical bid.

Incomplete technical bids are liable to be rejected without any intimation.

Clause no	Description	Compliance of the clause YES / NO	Deviation / Remarks
1			
2			
3			
4			

5			
6			

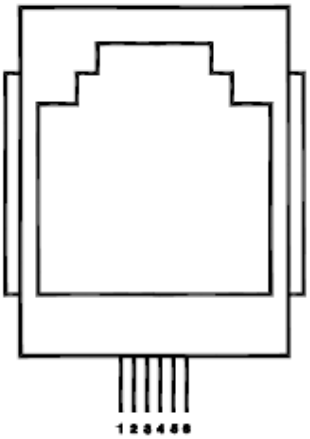
Bidder / Vendor seal / signature ----------

Name of the bidder	
Address of bidder	
Name of contact person	
Telephone no & email id	

ANNEXURE – B RECOMMENDED ACCESSORIES / SPARES (DATA BY SUPPLIER)

S No	Description of spare part	Unit	Quantity
1			
2			
3			
4			
5			
6			

ANNEXURE – C – RJ11 PORT DETAILS

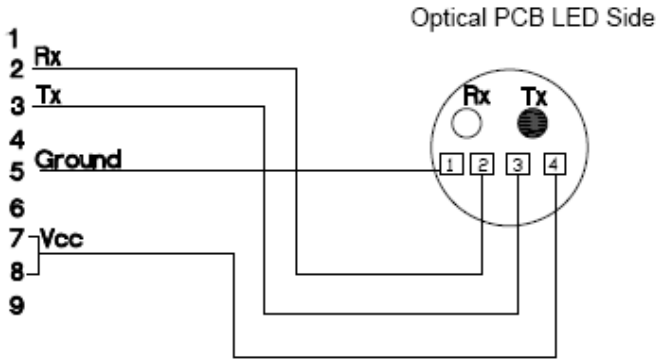


RJ– 11 PORT

PIN OUT DETAIL		
PIN	SIGNAL	DISCRIPTION
1	NC	——
2	GND	GROUND
3	TXD	RS 232 TRANSMIT
4	GND	GROUND
5	RXD	RS 232 RECEIVE
6	NC	——

ANNEXURE- D- CONFIGURATION OF OPTICAL CABLE

9 PIN D Type male Connector



ANNEXURE – E- SPECIFICATION OF METER ENCLOSURE:

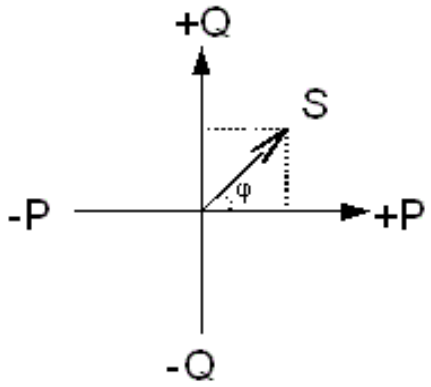
Sl	Clause	Clause Description
1	Meter Box Type	Flush type with Completely transparent top cover and base with Incoming and Outgoing cable entry and data downloading arrangement.
2	Codes and Standards	
2.1	IS 14772	General Requirements For Enclosures For Accessories For Household And Similar
2.2	IS 4249	Classification And Methods Of Tests For Non-Ignitable And Self-Extinguishing Properties Of Solid Electrical Insulating Materials
2.3	IS 8623	Specification For Low Voltage Switchgear And Control gear Assemblies
3	Design	Meter box shall comply following requirement.
3.1	General Requirement	The meter box shall be designed in such a way that no access to the meter body, terminals and hardwired port of the meter shall be possible after installation and sealing of the box without breaking the box itself.
3.2	Theft Protection	a. Meter box shall be theft proof i.e. meter box cannot be opened without breaking the seals or meter itself. b. On breaking of the box, clear evident of the physical tempering shall be visual.
3.3	Parts of the box	a. The meter box shall be designed in 02 parts i.e. base and top cover. b. Meter shall be mounted inside the base on fixed moulded pillars by unidirectional screw. c. Meter top cover should be hinge type. d. Cable glands and earthing bolt shall be provided at the base as per construction requirement. e. Proper stiffeners shall be provided in the body of the base and top cover to provide mechanical strength against transportation and installation vibrations.
3.4	Ingress protection	The meter box shall be completely dust and vermin proof.. The meter box shall comply with the requirement of IP-55 & IS: 14772 & its latest version.
3.5	Collar of base and cover	a. 'U' shaped groove shall be provided in the collar of the base body, in which UV stabilized rubber 'O' shall be installed. The design of lining shall be such that it provides proper sealing between the cover & base of box to avoid penetration of dust and ingress of water. b. All around projection provided inside the cover periphery which keeps the 'O' ring pressed. c. The outside collar shall also be provide which cover outer surface of the collar.
3.6	Fixing of 'O' ring	a. Rubber 'O' Ring should be fixed with suitable adhesive so that the same does not get removed. b. Rubber 'O' ring shall be fixed in a single piece with out any gap between open ends. Open end of the 'O' ring shall be provided at the bottom side only.
4	Material	The material shall be as follow:

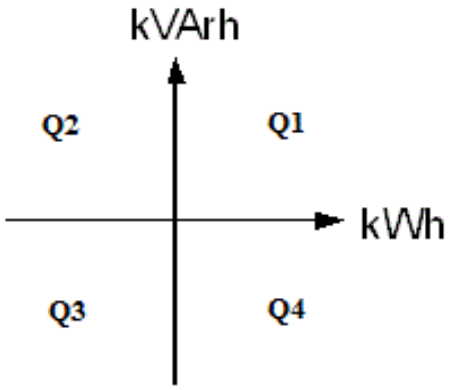
4.1	Box material	The material of meter box shall be flame retardant with inflammability level V0 having good dielectric and mechanical strength. The top Cover and Base of the box shall be made out of transparent polycarbonate with minimum 90% visibility so as to ease installation and monitoring of box against any tampering. The plastic shall be 'UV' stabilized to ensure that the moulded meter box should not change in colour, shape, size or should not get brittle after exposure to UV rays.
4.2	Hardware	All the metal hardware including hinges, U latches, mounting screws, downloading port ring etc shall be of rust proof stainless steel.
4.3	Cable glands	Polyamide Nylon-66 with flammability level V0.
5	Construction	Meter box shall be constructed by moulding of polycarbonate material as specified in clause no. 3.1. Thickness of meter box shall be minimum 3.0 mm.
5.1	Moulding	The box shall be made through Injection Moulding or better method.
5.2	Base	Meter shall be factory fitted inside base body using unidirectional screws, on fixed mounting pillars, moulded in to the base of sufficient strength, so that removing of meter shall not possible without breaking the meter box or meter itself.
5.3	Top cover	Hinge type
5.3.1	Hinge type	a. Minimum 02 no's concealed / internal hinges, not visible or accessible from outside the box without breaking the box itself. b. Minimum 02 no's U latches shall be provided to closed the box with sealing arrangement at each U latch. c. After closing the U latches no play/ gap shall exist between base and top cover.
6	Padlocking	The box shall also have padlocking facility.
7	Cable entry	At bottom suitable for 4CX50 Sqmm cable through cable glands
7.1	Cable Gland	a. Two nos. of Elbow shaped glands made out of Polyamide Nylon-66 suitable upto 4CX50 sqmm aluminium armoured cable shall be provided on both cable entries in the box. b. Glands shall be designed in such a manner that the same cannot be unscrewed / removed from the box from outside. Manufacturer may either supply two nos. of check nuts or any other alternate design to meet this requirement.
8	Earthing bolt	Earthing bolt of M8 with nut and washer shall be provided on left side of the body of meter box. The arrangement shall be such that one earth point shall be available for customer and external earthing provided by BSES can be terminated. Necessary symbol shall be provided for earth terminal.
9	Gland Plate	MS gland plate of minimum thickness 3.0 mm shall be provided at the bottom of the box.
10	Termination Height	Height of the meter terminals from gland plate shall be 150 mm minimum.
11	Mounting	As follow

11.1	Meter mounting pillars	a. Fixed type, moulded in to the base body as per the requirement of meter mounting holes. b. Stiffeners shall be provided at the base of the mater mounting pillars.
11.2	Meter box mounting	Four (4) nos. fixing holes of 6 to 6.5 mm diameter at the back surface of box shall be provided to fix the same on flat wall. Mounting holes shall not be obstructing by Incoming or Outgoing cables.
11.3	Box Mounting accessories	Long pan head self taping SS screws and washers shall be provided by the supplier with every box. 4 no's plastic fixing plugs suitable for self tapping screws shall also be provided.
12	Data Downloading arrangement	a. DB9 RS232 connector shall be provided at the top cover of box to download meter. b. Meter shall be downloadable without opening of the box/ breaking of seals. c. This arrangement shall not de-rate the IP rating of meter box. A Top hinges and bottom sealable cover shall be provided on the data downloading slot. d. Data downloading shall not be affected by scratches on data downloading port or with ageing of box. Data downloading shall not be affected by visible light conditions.
12.1	Optical to RS232 cable.	Optical reader with 9 pin D-type female connector cable shall be provided in each meter box.The optical meter reader with 9 pin D-type male connector cable of the entire meter boxes (100%) shall be tested for meter downloading before dispatch.
13	Marking	Following marking shall be provided on both top cover and base by indiligible laser printing/ screen printing or embossed from inside of the box. a. BSES insignia shall be embossed on the base & cover of meter box. b. Meter serial no. c. purchaser's PO no. and date. d. Purchaser's Name. e. Name or trade mark of seller f. Any other detail required at the time of approval.
14	Type Tests and Acceptance tests	a. All the below mentioned tests shall be carried out on 01 no randomly selected sample by BYPL representative from the lot offered for inspection at CPRI/ ERDA/ CIPHET. b. Following tests shall be carried out on sampled meter enclosure from the offered lot for inspection as per QAP approved by BYPL as acceptance tests. c. 01 no's box sealed by BYPL representative from the lot offered for inspection shall be tested for mentioned tests at CPRI/ ERDA/ CIPHET.
14.1	Visual examination	As Per GTP/ approved drawing
14.2	Verification of dimensions & Marking	As Per Spec/GTP/approved drawing

13.3	Protection against electric Shock	IS:14772
14.4	Resistance to ingress of solid object & to harmful ingress of water (IP-55)	IS:14772
14.5	Test of Mechanical Strength / Impact Resistance Test	IS:14772
14.6	Resistance to heat	IS:14772
14.7	Resistance to Rusting	IS:14772
14.8	Glow Wire Test at 950 degree Centigrade	IS:14772/ IEC 695-2-1
14.9	Verification of Dielectric Properties at 5 KV	IS:8623
14.10	Heat Deflection Test at 125 degree Centigrade at 0.45 Mpa	
14.11	Test for Self Extinguishing Properties	IS:4249
14.12	Flammability Test	IS:11731 II
14.13	U V Resistance Test	DIN 53387

Quadrant Definitions:





Specification

Three Phase LT.CT. NET Meter

CONTENTS

1.0 SCOPE

This Specification covers the design, engineering, manufacture, assembly, inspection and testing before dispatch and supply of 3 phase 4 wire, Class 0.5 accuracy, 3 X 240V and -/5 Amps static meter for outdoor use.

2.0 APPLICABLE STANDARDS

IS: 14697 for Class 0.5, IEC: 687 and CBIP Technical report no.325 and its latest amendments CBIP Guide on Static Energy Meters- Specifications and Testing, along-with BRPL specifications.

3.0 TECHNICAL SPECIFICATIONS

Sr. No.	Parameters	Technical Requirements
3.1	Voltage	240 volt (P-N), 415 volt (P-P) +20% to –40% Vref.
3.2	Current	-/5 Amps, Max. continuous current 10 Amps
3.3	Power Factor Range	Zero lag – Unity – Zero lead
3.4	Display	a) LCD (Seven digits) b) Height: 10 mm X 6 mm min. c) Pin Type d) Viewing angle min. 160 degrees
3.5	Display Parameters	Display order shall be as per Annexure-1
3.6	Power Consumption	As per Relevant IS
3.7	Starting Current	0.1% Ib
3.8	Running with no load	Meter shall not record any energy under no-load condition.
3.9	Frequency	50 Hz with +/- 5% variation
3.10	Process Technology	Surface Mounting Technology or better.
3.11	Test Output Device	Separate KWH & KVAh Flashing LED visible from the front
3.12	Billing Data	a) Display parameters: LCD test, date & time, cumulative KWH (import and export), cumulative KVAH & RKVAH (import and export), MD in KW & KVA (import and export), PF, V, I. b) Display order shall be as per Annexure-1
3.13	MD Registration	a) Meter shall store MD in every 30 min. period along with date & time with sliding window (5-15 min interval) programmable. At the end of every 30 min, new MD shall be previous MD and store whichever is higher and the same shall be displayed. b) It should be possible to reset MD automatically at the defined date (or period) or through MRI
3.14	Auto Reset of MD	Default auto reset date : 00:00 hrs on 1st day of the month however provision shall be made to change MD reset date through MRI even after installation of meter on site.

<table>
<tr><th>Sr. No.</th><th>Parameters</th><th>Technical Requirements</th></tr>
<tr><td>3.15</td><td>TOD metering</td><td>Meter shall be capable of doing TOD metering for KWH, KVARH, KVAH and MD in KW and KVA with 6 time zones (programmable on site through CMRI)- for both import and export mode. Following are the default TODs:-
<table>
<tr><th>Tariff</th><th>Timings</th><th>1st April-30 st Sep</th><th>1st Oct-31 March</th></tr>
<tr><td>1</td><td>00:00 to 3:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>2</td><td>03:00 to 09:00</td><td>Tnp</td><td>Tnp</td></tr>
<tr><td>3</td><td>09:00 to 13:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>4</td><td>13:00 to 17:00</td><td>Tp</td><td>Tp</td></tr>
<tr><td>5</td><td>17:00 to 21:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>6</td><td>21:00 to 24:00</td><td>Tp</td><td>Tp</td></tr>
</table>
Note: Tnp – TOD zone for non peak
Tn – TOD zone for normal
Tp - TOD zone for peak</td></tr>
<tr><td>3.16</td><td>Load Survey</td><td>30 min integration period, load profile of phase voltage (R,Y,B) and line current(R,Y,B), and all three phase active, reactive and apparent power – both import and export of 90 days (MD integration should be 30 min.)</td></tr>
<tr><td>3.17</td><td>Time required for data reading from meter and downloading on desktop PC</td><td>a) Meter data consisting of all parameters and 90 days load survey for above parameters shall be read by CMRI and downloaded on desktop PC in minimum possible time and it shall be indicated at the time of finalizing GTP. (The meter reading time should not be more than 3 minutes for complete set of data).
b) The software should have capability to transfer data from single CMRI to PC and the multiple CMRI data download to PC with a loader charger.</td></tr>
<tr><td>3.18</td><td>Diagnostic Feature</td><td>Self-diagnostic for time, calendar, RTC battery all display segments and NVM.</td></tr>
<tr><td>3.19</td><td>Security Feature</td><td>Programmable facility to restrict the access to the information recorded at different security level such as read communication, communication write etc.</td></tr>
<tr><td>3.20</td><td>Software & communication compatibility</td><td>a) Optical port with RS 232 compatible to transfer the data locally through CMRI & remote through PSTN / Optical fiber / GSM / CDMA / RF / any other technology to the main computer. The optical communication should not be affected by the normal day light or any other light source surrounding the installed meter.

b) The Supplier shall supply Software required for CMRI & for the connectivity to AMR modules. The supplier shall also provide training for the use of software. The software should be compatible to Microsoft Windows systems (Windows 98 system). The software should have polling feature with optional selection of parameters to be downloaded for AMR application.

c) Necessary provision shall be made in the software for converting all the parameters available for new and old meters if supplied earlier. Copy of operation manual shall be supplied. The software should have selection of meters by date, serial number, data file name or groups of files for data conversion to text file process.

d) The Supplier shall provide meter reading protocols.
* Same need to be confirmed and mutually agreed before supply *.
Vendor to jointly work with BSES IT team to develop CMRI software for meter downloading and further uploading on computer</td></tr>
</table>

Sr. No.	Parameters	Technical Requirements
3.21	Additional communication port	An additional RS 232 hardwired port to be provided in sealable area for AMR PSTN/Optical fiber/GSM/CDMA to the main computer.
3.22	Memory	Non-volatile memory independent of battery backup, memory should be retained upto 10 years in case of power failure.
3.23	Climatic Conditions	The meter should function satisfactorily in India with temperature ranging from -10 ºC - 60ºC and humidity upto 96%.
3.24	Calibration	Meters shall be software calibrated at factory and modification in calibration shall not be possible at site by any means.
3.25	Battery	In case battery removal or total discharge same should not effect the working & memory of the meter.
3.26	KVAh definition	KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh < KWh
3.27	CT and voltage terminals	Meter height, pitch for CT and voltage terminals should align with the LT CT meter box used in BRPL. Following are the dimensions:- • Pitch for CT and voltage terminals- 11.5 mm • PIN height – 28 mm, PIN diameter -4.5 mm, distance of center from base of meter - 31 mm (tolerance- 0.5 mm) Note- Sample of box can be seen at BRPL office

4.0 CONSTRUCTIONAL FEATURES

Sr. No.	Parameters	Technical Requirements
4.1	Meter Body	a) Top transparent and base opaque material polycarbonate of LEXAN 143A/943AA or equivalent grade. b) Front cover & base should be ultrasonically welded. c) Top cover should be designed so as the internal components should not be visible.
4.2	Terminal Block	Made of polycarbonate of grade 500 R or equivalent grade and shall form Integral part of the meter base, brass or copper duly plated current terminals with flat-head brass screws.
4.3	Terminal Cover	Transparent terminal cover with provision of sealing through sealing screw.
4.4	Diagram of connections	Diagram of external connections to be shown on terminal cover
4.5	Marking on name plates	Meter should have clearly visible, indelible and distinctly name plate marked in accordance with IS & BSES' logo should be printed above LCD display. With property of BSES(Cl No 7.0)
4.6	Meter Sealing	Supplier shall affix one Buyer seal on side of Meter body as advised and record should be forwarded to Buyer.
4.7	Warrantee	05 years.
4.8	Insulation	A meter shall withstand an insulation test of 4 KV and impulse test at 8 KV
4.9	Resistance of heat and fire	The terminal block and Meter case shall have safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per the relevant IS 14697.

5.0 TAMPER AND ANTI-FRAUD DETECTION/EVIDENCE FEATURES

Total no of tamper events logged by meter shall be at least 200 nos., compartment wise division of each event and their persistence time shall be indicated at the time of finalizing GTP.

The meter shall not get affected by any remote control devices and shall continue recording energy under any one or combinations of the following conditions**.** Meter shall log all three-phase voltage, current, power factor, **neutral current** etc. at the time of tamper attempt for all such occurrences:

1.1 **Phase sequence reversal**: The meters shall work accurately irrespective of the phase sequence of the supply.

1.2 **Detection of missing potential**: In case someone intentionally takes out a potential lead, the meter shall record the date and time of such occurrence. The last restoration of normal supply shall also be similarly recorded. The threshold value of voltage should be agreed before delivery.

1.3 **Reversal of C.C. Polarity**: Meter shall record the reversal of C.C. polarity with time and date, and also the time of restoration. Meter shall, however, register the energy consumed correctly with any one, two or all three - phase C.C. reversal.

1.4 **C.C. Shorting/ Bypass**: Meter shall record C.C. terminal shorting/ bypass with time and date and time of restoration. The threshold value of currents should be programmable. Logging of neural current is most important.

1.5 **Unbalance voltage:** Meter shall record all events when the difference between two phase voltage is more than 20V.

1.6 **Low voltage:** Meter shall record all events, if all the three voltages are beyond 20% of Vref.

1.7 Power On/Off: Meter shall detect power OFF (minimum power off period 5 mins) if any of phase voltages are not present. This event shall be recorded at the time of each power OFF. At the same time power ON event shall be recorded. **Meter should have provision to record last 30 such events.**

1.8 **Snap Shots:** Meter shall log all three-phase voltage, current, power factor, neutral current etc. at the time of tamper attempt for all such occurrences.

1.9 **Neutral Disturbance**: Meter shall record correctly in case of any AC, DC high frequency signal injected in the neutral circuit of meter. Meter should log the event. Meter shall record correctly in case of missing neutral connection.

1.10 **External Magnetic tampers:** Meter should log on the events of attempt of tampering by external magnetic field as mentioned in the relevant IS. The Meter shall record as per actual load once the external abnormal magnetic field is removed. In such conditions the Meter shall log the event for presence of abnormal external magnetic field and its restoration.

1.11 **Protection against HV spark/ ESD:** Meter shall continue to record energy or log the event, incase it is disturbed externally using a spark gun/ ignition coil. Upto 35 KV meter should be immune.

1.12 **Over Load:** Meter shall record Over Load as an event, incase the current in any phase persist for more than rated current that is 5Amp.

1.13 **Abnormal power off :** Meter shall record case of abnormal power off with date and time. In general meter should not get off, if AC supply is available.

1.14 **Abnormal voltage/ load:** meter shall record abnormal voltage and / or abnormal current if either the angle between two phases is beyond 120 +/- 20deg or angle between two current is less than 30deg.

1.15 **Top cover open:** The meter shall have top cover opening detection mechanism. The top cover opening event shall be indicated display continuously in auto scroll mode with kWh or through additional LED and shall be logged in memory. The detection and logging mechanism shall work even when meter is not energized. In case of indication of display, meter display shall get reset in 150 days.

1.16 **Manufacturing Detail in memory** :- Meter shall have manufacturing month and year in the memory and should come in data downloading

1.17 **Wiring connection Display:** Incase of abnormal wiring like sequence error. Phase association error, CT reversal, Phase- CT mismatch, one/two phase no voltage- An indication, clearly indicating type of fault should appear and get logged in meter.

Note:

- No defraud and deficiency metering in export mode
- Vendor has to define Tamper Logic, Occurrence and restoration time before supply.
- Tamper and fraud protection test shall be part of acceptance test.

5.1 Influence Quantities

The meter shall work satisfactorily with guaranteed accuracy limit under the presence of the following influence quantities as per IEC-1036 and CBIP Technical Report no.88 with latest amendment.

The influence quantities are:

- External Magnetic field – 0.2 tesla (with log on feature)
- Electromagnetic field induction,
- Radio frequency interference,
- Unbalanced load,
- Vibration etc,
- Wave form 10% of 3rd harmonics,
- Phase sequence,
- Voltage unbalance,
- Electro Magnetic H.F. Field, and

6.0 COMPONENT SPECIFICATIONS

Ser No	Component Function	Requirement	Makes and Origin
6.1	Current Transformers	The Meters should be with the current transformers as measuring elements. The current transformer should withstand for the clauses under 5.2.h	The current transformer should withstand for the clauses under 5.2.h
6.2	Measurement or computing chips	The Measurement or computing chips used in the Meter should be with the Surface mount type along with the ASICs.	USA: Anolog Devices, Cyrus Logic, Atmel, Phillips,Texas Instruments. South Africa: SAMES Japan: NEC
6.3	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel, National Semiconductors, Texas Instruments, Phillips, ST,Microchip Japan: Hitachi or Oki
6.4	Display modules	a) The display modules should be well protected from the external UV radiations. b) The display visibility should be sufficient to read the Meter mounted at height of 0.5 meter as well as at the height of 2 meters (refer 3.2.d for Viewing angle). c) The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). d) It should be trans-reflective HTN or STN type industrial grade with extended temperature	Hongkong: Genda Singapore: Bonafied Technologies Korea: Advantek China: Sucess Japan: Hitachi, Sony Holland / Korea: Phillips

Ser No	Component Function	Requirement	Makes and Origin
		range.	
6.5	Communication modules	Communication modules should be compatible for the two RS 232 ports (one for optical port for communication with Meter reading instruments & the other - for the hardwired RS 232 port to communicate with various modems for AMR)	USA: National Semiconductors, HP, Optonica,ST, Holland / Korea: Phillips Japan: Hitachi Taiwan: Ligitek Germany: Siemens
6.6	Optical port	Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	USA: National Semiconductors ,HP Holland / Korea: Phillips Japan: Hitachi, Taiwan: Ligitek
6.7	Power Supply	The power supply should be with the capabilities as per the relevant standards. The power supply unit of the meter should not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections. Should work upto -50% vref with only one phase	SMPS Type (It should take care of clause 3.1 and 3.5)
6.8	Electronic components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Phillips, Texas Instruments,ST,Onsemi Japan: Hitachi, Oki, AVX or Ricoh Korea: Samsung
6.9	Mechanical parts	a) The internal electrical components should be of electrolytic copper & should be protected from corrosion, rust etc. b) The other mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods.	
6.10	Battery	Lithium with guaranteed life of 15 years (manufacture guarantee card)	Varta, Tedirun, Sanyo or National
6.11	RTC & Micro controller	The accuracy of RTC shall be as per relevant CBIP -88 standards	USA: Philips, Dallas Atmel, Motorola, Microchip Japan: NEC or Oki
6.12	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm	

Note:1) The components used by manufacturer shall have "Minimum Life" more than the 10 years.
2) Incase vendor want to use other make components; same shall be approved by BSES before use. Deviation of component make is not allowed without prior approval.
3) Even for existing/ par suppliers – fresh approval is needed for all deviations.

7.0 GENERAL REQUIREMENTS

7.18 On the meter name-plate:

a) meter serial number should be of 8 digits

b) size of the digit of the meter serial number should be minimum 5mm X 3mm.

c) bar code should be printed next to / below / above the meter serial number

d) BIS registration mark (ISI mark)

Identification on rating plate for Net Meter: - NET METER

7.19 Meter Sr. Nos. to be printed in black on the name plate, instead of embossing.

7.20 Buyer's Serial Number sticker should be fixed on window glass from inside or on Meter front cover of minimum digit size 6 mm X 3 mm.

7.21 The supplier should seal meters on both sides. The Buyer shall approve the method of sealing.

7.22 The internal potential links should be in closed position or link less Meters will be preferred and there shall not be any external link.

7.23 Deliverable with Meters.

1. Individual meter accuracy test report.
2. Terminal cover
3. Consolidated report of routine test report & seal & initial reading record. (soft copy as per BRPL format)

7.24 Box number, Meter serial number, type, rating should be mentioned on cases / cartons.

7.25 Meters shall be suitably packed with environmental friendly material in order to avoid damage or disturbance during transit or handling and to prevent in grace of moisture and dust. Also refer CEA Metering Regulation 2006.

7.10 In case battery removal/ total discharge same should not effect the working & memory of the meter

8.0 ANNEXURE 1: DISPLAY SEQUENCE FOR THE PARAMETERS

8.1 Default Display: (Auto scroll mode, Scroll time 6 Sec.)

a. LCD test
b. Date
c. Time
aa. Cumulative Active import energy
bb. Cumulative Active export energy cc.
Cumulative Active net energy
dd. Cumulative Apparent import Energy
ee. Cumulative Apparent export Energy
ff. Maximum demand in Active import
gg. Maximum demand in Active export
hh. Cumulative Reactive import while active import energy
ii. Cumulative Reactive import while active export energy
jj. Cumulative Reactive export while active import energy kk.
Cumulative Reactive export while active export energy ll.
Instantaneous Power Factor
mm. Maximum Demand in Apparent import while Active import nn.
Maximum Demand in Apparent import while Active export oo.
TOD Active energy import (Reg.1 to Reg.3)
pp. TOD Active energy export (Reg.1 to Reg.3)
qq. Self Diagnostics Flags
rr. Connection Check
ss. Last Cover open date
tt. Last Cover open time

8.2 On-demand Display:

After using pushbutton the following parameters should be displayed.

- LCD test
- Date
- Time
- R phase voltage
- Y phase voltage
- B phase voltage
- R phase current (line)
- Y phase current (line)
- B phase current (line)
- Last month billing Date & Time
- Last month billing Active import energy
- Last month billing Active export energy
- Last month billing Reactive import while active import energy
- Last month billing Reactive import while active export energy
- Last month billing Reactive export while active import energy
- Last month billing Reactive export while active export energy
- Last month billing Apparent import energy
- Last month billing Apparent export energy
- Last month billing Maximum Demand in Active import
- Last month billing Maximum Demand in Active import occurrence Date and Time
- Last month billing Maximum Demand in Active export
- Last month billing Maximum Demand in Active export occurrence Date and Time
- Last month billing Maximum Demand in Apparent while Active import
- Last month billing Maximum Demand in Apparent occurrence Date
- Last month billing Maximum Demand in Apparent occurrence Time
- Last month billing Maximum Demand in Apparent while Active export
- Last month billing Maximum Demand in Apparent occurrence Date

- Last month billing Maximum Demand in Apparent occurrence Time
- Present PT Status
- Present CT Status
- Present Others Status
- Last Occurrence Tamper ID
- Date of Last Tamper Occurrence
- Time of Last Tamper Occurrence
- Last Restoration Tamper ID
- Date of Last Tamper Restoration
- Time of Last Tamper Restoration
- Cumulative Tamper Count
- Front Cover Open Count
- Last Cover open date
- Last Cover open time
- Neutral Current
- Present Sequence
- Instantaneous Load Active
- Instantaneous Load Reactive
- Instantaneous Load Apparent
- Cumulative Active import energy
- Cumulative Active export energy
- Cumulative Active net energy
- Cumulative Apparent import Energy
- Cumulative Apparent export Energy
- Cumulative Reactive import while active import energy
- Cumulative Reactive import while active export energy
- Cumulative Reactive export while active import energy
- Cumulative Reactive export while active export energy
- Self Diagnostic Flags
- Connection check.

Note: The meter display should return to Default Display mode (mentioned above) if the 'push button' is not operated approx. more than 10 seconds.

Note: The meter display should return to Default Display mode (mentioned above) if the 'push button' is not operated for more than 6 seconds. . Provision for scroll lock by pressing for 15 sec and sent to normal after 5 min.

Specification

Three Phase HT 3p4w NET Meter

CONTENTS

1.0 Scope

This specification shall cover design, engineering, manufacture, assembly, inspection, testing at manufacturers' works before dispatch, supply of 3 phase 4 wire ,Class 0.5 accuracy, lag only HT CT-PT operated NET energy meter. The meter shall be suitable for measurement of energy and power, demand requirement in an A.C. balanced/unbalanced system over a power factor range of zero lag to zero lead. These meters should have communication ports to interface standard modems for remote meter reading on PSTN lines / optic fiber / CDMA / GSM/ GPRS.

A related base computer & analysis software (BCS), as per the details given in this specification, shall also be supplied along with the meters.

2.0 Applicable Standards

IS 14697: 1999 for Class 0.5 and IS :13779:1999 for class 1.0 , IS 9000, IEC 687 for Class 0.5 and IEC 61036for Class 1.0 with latest amendments and CBIP Technical Report No. 325 with latest amendments, CBIP Guide on Static Energy Meter – Specifications and Testing along with the BRPL Specifications.

3.0 Technical Specification

Sr.No	Parameters	Technical Requirements
3.1	Voltage	63.5 V (P-N) with +20% to -30% Vref.
3.2	Rated secondary current	-/5 Amps. Balanced & unbalanced load
3.3	Display	LCD, scrolling, 5 sec for each parameter
3.4	Display parameters	a) LCD (Seven digits) b) Height: 10 mm X 6 mm min. c) Pin Type d) Viewing angle min. 120 degrees *Phasor diagram/ wiring error*: Meter should indicate/ display wiring error with fault type. Fault related to phase association error should be clearly tagged.
3.5	Power Consumption	As per relevant IS.
3.6	Starting current	0.1 % of I_b For Class). 5 and 0.2 % Ib for Class 1.0
3.7	Frequency	50 Hz with + / - 5% variation
3.8	Process technology	SMT or better
3.9	Test Output Device	Flashing LED visible from the front for KWh, KVAH, RKVAH
3.10	Billing data	a) Display parameters: LCD test, date & time, cumulative KWH, cumulative KVAH & RKVAH, MD in KW & KVA, PF, V, I (cumulative KWH continuous and other parameter with pushbutton. Display parameters in Normal Display as well as On demand Display mode shall be finalized at the time of actual order. b) Display order shall be as per Annexure-1
3.11	MD Registration	a) Meter shall store MD in every 15/30 min. period along with date & time with sliding window (5-15/30 min interval) programmable. At the end of every 15/30 min, new MD shall be previous MD and store whichever is higher and the same shall be displayed. **on a later date both MD and load survey can be programmed for 15/30 minutes** b) It should be possible to reset MD automatically at the defined date (or period) or through MRI c) MD reset knob should be sealable.
3.12	Auto Reset of MD	Auto reset date for MD shall be indicated at the time of finalizing GTP and provision shall be made to change MD reset date through MRI even after installation of meter on site.
3.13	TOD metering	Meter shall be capable of doing TOD metering for KWH, KVARH, KVAH and MD in KW and KVA with 6 time zones (programmable on site through CMRI) **for both import and export mode**. Following are the default TODs:-

<table>
<tr><th>Sr.No</th><th>Parameters</th><th>Technical Requirements</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Tariff</th><th>Timings</th><th>1st April- 30 st Sep</th><th>1st Oct- 31 March</th></tr>
<tr><td>1</td><td>00:00 to 3:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>2</td><td>03:00 to 09:00</td><td>Tnp</td><td>Tnp</td></tr>
<tr><td>3</td><td>09:00 to 13:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>4</td><td>13:00 to 17:00</td><td>Tp</td><td>Tp</td></tr>
<tr><td>5</td><td>17:00 to 21:00</td><td>Tn</td><td>Tn</td></tr>
<tr><td>6</td><td>21:00 to 24:00</td><td>Tp</td><td>Tp</td></tr>
</table>
Note: Tnp – TOD zone for non peak
Tn – TOD zone for normal
Tp - TOD zone for peak
</td></tr>
<tr><td>3.14</td><td>Load survey</td><td>30 min integration period, load profile of phase wise voltage and current, KW, RKVA and KVA for min- for both import and export - 60 days (with 30 minutes integration period).</td></tr>
<tr><td>3.15</td><td>Time required for data reading from meter and downloading on desktop PC</td><td>a) Meter data consisting of all parameters and 60 days load survey for above parameters shall be read by CMRI and downloaded on desktop PC in minimum possible time and it shall be indicated at the time of finalizing GTP. (The meter reading time should not be more than 3 minutes for complete set of data).

b) The software should have capability to transfer data from single CMRI to PC and the multiple CMRI data download to PC with a loader charger.</td></tr>
<tr><td>3.16</td><td>Diagnostic feature</td><td>Self-diagnostic for time, calendar, RTC battery all display segments and NVM.</td></tr>
<tr><td>3.17</td><td>Security feature</td><td>Programmable facility to restrict the access to the information recorded at different security level such as read communication, communication write etc.</td></tr>
<tr><td>3.18</td><td>Additional communication port</td><td>An additional RS 232 hardwired port to be provided in terminal block for AMR PSTN/Optical fibre/GSM/CDMA to the main computer.</td></tr>
<tr><td>3.19</td><td>Software & communication compatibility</td><td>a) Optical port with RS 232 compatible to transfer the data locally through CMRI & remote through PSTN / Optical fiber / GSM / CDMA / RF / any other technology to the main computer.

b) The Supplier shall supply Software required for CMRI & for the connectivity to AMR modules. The supplier shall also provide training for the use of software. The software should be compatible to Microsoft Windows systems (Windows 98 system). The software should have polling feature with optional selection of parameters to be downloaded for AMR application.

c) Necessary provision shall be made in the software for converting all the parameters available for new and old meters if supplied earlier. Copy of operation manual shall be supplied.

d) The data transfer (from meter to CMRI / AMR equipment) rate should be minimum 2400 bps.

e) The Supplier shall provide meter-reading protocols. Meters with open protocols will be preferred . Vendor to jointly work with BSES IT team to develop CMRI software for meter downloading and further uploading on</td></tr>
</table>

Sr.No	Parameters	Technical Requirements
		computer
3.20	Memory	Non volatile memory independent of battery backup, memory should be retained up-to 10 year in case of power failure
3.21	Climatic Conditions	a) The meter should function satisfactorily in India with temperature ranging from 0 - 60ºC and humidity upto 96%. b) Also refer IS: 13779 for climatic conditions.
3.22	Calibration	Meters shall be software calibrated at factory and modification in calibration shall not be possible at site by any means.
3.23	Computation of KVAh	KVA shall be computed as Modulus of Active and reactive energy. How ever incase of capacitive Reactive energy, the KVA will same as KW. The polarity of KVA is same as KW. At no given instant, the KVAH should be less than KWH. Meter should have calibration LED to check meter accuracy in field condition both for Active and Apparent Energy.

4.0 Constructional Features

Sr.NO	Parameters	Technical Requirements
4.1	Body of Meter	a) Top transparent and base opaque material polycarbonate of LEXAN 143A/943AA or equivalent grade. b) Front cover & base should be ultrasonically welded. c) Top cover should be designed so as the internal components should not be visible.
4.2	Terminal Block	Made of polycarbonate of grade 500 R or equivalent grade and shall form Integral part of the meter base, brass or copper current terminals with flat-head brass screws.
4.3	Terminal cover	Transparent terminal cover with provision of sealing through sealing screw.
4.4	Diagram of connections	Diagram of external connections to be shown on terminal cover from inside.
4.5	Marking on name plates	Meter should have clearly visible, indelible and distinctly name plate marked in accordance with IS & BSES' logo should be printed above LCD display. With property of BSES.
4.6	Meter Sealing	Supplier shall affix one Buyer seal on side of Meter body as advised and record should be forwarded to Buyer.
4.7	Warrantee	66 months.
4.8	Insulation	A meter shall withstand an insulation test of 4 KV and impulse test at 6 KV
4.9	Resistance to heat and fire	The terminal block and Meter case shall have safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per the relevant IS 13779.

5.0 Tamper & ANTI-Fraud detection/evidence features

Total no of tamper events logged by meter shall be at least 200 nos., compartment wise division of each event and their persistence time shall be indicated at the time of finalizing GTP

The meter shall not get affected by any remote control devices and shall continue recording energy under any one or combinations of the following conditions:

5.1 Phase sequence reversal: The meters shall work accurately irrespective of the phase sequence of the supply.

5.2 Detection of missing potential: In case someone intentionally takes out a potential lead, the date and time of such occurrence shall be recorded by the meter. The last restoration of normal supply shall also be similarly recorded. The threshold of the voltages should be programmable.

5.3 Reversal of C.C. Polarity: Meter shall record the reversal of C.C. polarity with time and date, and also the time of restoration. Meter shall however register the energy consumed correctly with any one, or all two phase c.c. reversal.

5.4 Power On / Off:- Meter shall detect power OFF (minimum power off period 5 minutes) if any of phase voltages are not present. This event shall be recorded at the time of each power OFF. At the same time power ' ON ' event shall be recorded. This logging shall be available in Tamper details along with cumulative time of failure.

5.6 Snap shots: Meter shall log all three phase voltage, current, power factor etc. at the time of tamper attempt for all such occurrences.

5.7 External Magnetic tamper: Meter should log on the events of attempt of tampering by external magnetic field & should function as mentioned in the CBIP Technical report no. 88 with latest amendments.

5.8 Over Load/Low Load: Meter shall record Over Load/Low load as an event, in terms of defined % threshold value of load(Programmable at factory)

5.9 Voltage High/Voltage Low: Meter shall record case of High Voltage/Low Voltage in terms of defined value Voltage Threshold (Vref.)

* *Vendor has to define Tamper Logic, Occurrence and restoration time before supply and take approval before supply. Further when ever meter switch to Imax mode due to tamper the event should be logged and no MD should be computed for that period.*

5.10 Influence Quantities: The meter shall work satisfactorily with guaranteed accuracy limit under the presence of the following influence quantities as per IEC-1036, and CBIP Technical Report No.88 with latest amendment.

The influence quantities are:

a) External Magnetic field – 0.2 tesla (with log on feature)
b) Electromagnetic field induction,
c) Radio frequency interference,
d) Unbalanced load,
e) Vibration etc,
f) Wave form 10% of 3rd harmonics,
g) Phase sequence,
h) Voltage unbalance,
i) Electro Magnetic H.F. Field

5.11 RTC Drift:

In case of TOD tariff the proper RTC functioning will be of prime importance. In view of this a software to adjust the RTC drift to be provided along with.

5.12 Protection against HV spark: Meter shall continue to record energy or log the event, incase it is disturbed externally using a spark gun/ ignition coil. Upto 35 KV meter should be immune.

5.13 Recording of Neutral disturbance: - Meter shall log all events when AC/DC/ Pulsating voltage is injected in neutral circuit especially when same can disturb the recording of energy.

5.14 Abnormal power off : Meter shall record case of abnormal power off with date and time. In general meter should not get off, if AC supply is available.

5.15 Abnormal voltage/ load: meter shall record abnormal voltage and / or abnormal current if either the angle between two phases is beyond 120 +/- 20deg or angle between two current is less than 30deg.

5.16 Top cover open: The meter shall have top cover opening detection mechanism. The top cover opening event shall be indicated display continuously in auto scroll mode with kWh or through additional LED and shall be logged in memory. The detection and logging mechanism shall work even when meter is not energized. In case of indication of display, meter display shall get reset in 150 days.

5.17 Wiring connection Display: Incase of abnormal wiring like sequence error. Phase association error, CT reversal, Phase- CT mismatch, one/two phase no voltage- An indication, clearly indicating type of fault should appear and get logged in meter.

Note-
No defraud and deficiency metering in export mode
Tamper and fraud protection test shall be part of acceptance test.

6.0 COMPONENT SPECIFICATIONS

Ser No	Component Function	Requirement	Makes and Origin
6.1	Current Transformers	The Meters should be with the current transformers as measuring elements. The current transformer should withstand for the clauses under 5.2.h	The current transformer should withstand for the clauses under 5.2.h
6.2	Measurement or computing chips	The Measurement or computing chips used in the Meter should be with the Surface mount type along with the ASICs.	USA: Anolog Devices, Cyrus Logic, Atmel, Phillips,Texas Instruments. South Africa: SAMES Japan: NEC
6.3	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel, National Semiconductors, Texas Instruments, Phillips, ST,Microchip Japan: Hitachi or Oki
6.4	Display modules	a) The display modules should be well protected from the external UV radiations. b) The display visibility should be sufficient to read the Meter mounted at height of 0.5 meter as well as at the height of 2 meters (refer 3.2.d for Viewing angle). c) The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). d) It should be trans-reflective HTN or STN type industrial grade with extended temperature range.	Hongkong: Genda Singapore: Bonafied Technologies Korea: Advantek China: Sucess Japan: Hitachi, Sony Holland / Korea: Phillips
6.5	Communication modules	Communication modules should be compatible for the two RS 232 ports (one for optical port for communication with Meter reading instruments & the other - for the hardwired RS 232 port to communicate with various modems for AMR)	USA: National Semiconductors, HP, Optonica,ST, Holland / Korea: Phillips Japan: Hitachi Taiwan: Ligitek Germany: Siemens
6.6	Optical port	Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	USA: National Semiconductors ,HP Holland / Korea: Phillips Japan: Hitachi, Taiwan: Ligitek
6.7	Power Supply	The power supply should be with the capabilities as per the relevant standards. The power supply unit of the meter should not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	SMPS Type (It should take care of clause 3.1 and 3.5)
6.8	Electronic components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly	USA: National Semiconductors, Atmel, Phillips, Texas

Ser No	Component Function	Requirement	Makes and Origin
		processes.	Instruments,ST,Onsemi Japan: Hitachi, Oki, AVX or Ricoh Korea: Samsung
6.9	Mechanical parts	a) The internal electrical components should be of electrolytic copper & should be protected from corrosion, rust etc. b) The other mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods.	
6.10	Battery	Lithium with guaranteed life of 15 years	Varta, Tedirun, Sanyo or National
6.11	RTC & Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	USA: Philips, Dallas Atmel, Motorola, Microchip Japan: NEC or Oki
6.12	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm	

7.0 GENERAL REQUIREMENTS

7.1 On the meter nameplate:

a) meter serial number should be of 8 digits

b) size of the digit of the meter serial number should be minimum 5mm X 3mm.

c) bar code should be printed next to / below / above the meter serial number .

d) BIS registration mark (ISI mark)

Identification on rating plate for Net Meter: - NET METER

7.26 Supplier shall supply software suitable for energy measurement & energy spot billing through CMRI.

7.27 Buyer's Serial Number sticker should be fixed on window glass from inside or on Meter front cover of minimum digit size 6 mm X 3 mm.

7.28 The supplier should seal meters on both sides. The Buyer shall approve the method of sealing.

7.29 The internal potential links should be in closed position or link less Meters will be preferred and there shall not be any external link.

7.30 Terminal cover should be fixed on Meter before dispatch.

7.31 Meter Sr. Nos. to be printed in black on the name plate, instead of embossing.

7.32 Box number, Meter serial number, type, rating should be mentioned on cases / cartons.

7.33 Meters shall be suitably packed with environmental friendly material in order to avoid damage or disturbance during transit or handling and to prevent in grace of moisture and dust.

8.0 ANNEXURE 1: DISPLAY SEQUENCE FOR THE PARAMETERS

8.1 Default Display: (Auto scroll mode, Scroll time 10 Sec.)

uu. All Segment on display
vv. Date
ww. Real Time
xx. Cumulative Active import energy
yy. Cumulative Active export energy
zz. Cumulative Apparent import Energy
aaa. Cumulative Apparent export Energy
bbb. Maximum demand in Active import
ccc. Maximum demand in Active export
ddd. Cumulative Reactive import while active import energy
eee. Cumulative Reactive import while active export energy
fff. Cumulative Reactive export while active import energy ggg.
Cumulative Reactive export while active export energy hhh.
Instantaneous Average Power Factor
iii. Maximum Apparent Demand while active import jjj.
Maximum Apparent Demand while active export kkk.
TOD Active energy import (Reg.1 to Reg.3)
lll. TOD Active energy export (Reg.1 to Reg.3)
mmm. TOD Apparent energy while Active import (Reg.1 to Reg.3)
nnn. TOD Apparent energy while Active export (Reg.1 to Reg.3)
ooo. TOD Reactive import while active import energy (Reg.1 to Reg.3)
ppp. TOD Reactive import while active export energy (Reg.1 to Reg.3) qqq.
TOD Reactive export while active import energy (Reg.1 to Reg.3) rrr. TOD
Reactive export while active export energy (Reg.1 to Reg.3) sss. Phase
To Neutral Voltage R
ttt. Phase To Neutral Voltage Y
uuu. Phase To Neutral Voltage B
vvv. R Phase Line Current
www. Y Phase Line Current
xxx. B Phase Line Current

8.2 On-demand Display:

After using pushbutton the following parameters should be displayed.

a. All Segment on display
b. Date
c. Real Time
d. Cumulative Active import energy
e. Cumulative Active export energy
f. Cumulative Active net energy
g. Cumulative Apparent import Energy
h. Cumulative Apparent export Energy
i. Maximum demand in Active import
j. Maximum demand in Active export
k. Cumulative Reactive import while active import energy
l. Cumulative Reactive import while active export energy
m. Cumulative Reactive export while active import energy
n. Cumulative Reactive export while active export energy
o. Instantaneous Average Power Factor
p. Maximum Demand in Apparent while Active import
q. Maximum Demand in Apparent while Active export
r. TOD Active energy import (Reg.1 to Reg.3)
s. TOD Active energy export (Reg.1 to Reg.3)
t. TOD Apparent energy while Active import (Reg.1 to Reg.3)
u. TOD Apparent energy while Active export (Reg.1 to Reg.3)
v. TOD Reactive import while active import energy (Reg.1 to Reg.3)
w. TOD Reactive import while active export energy (Reg.1 to Reg.3)
x. TOD Reactive export while active import energy (Reg.1 to Reg.3)

y. TOD Reactive export while active export energy (Reg.1 to Reg.3)
z. Phase To Neutral Voltage R
aa. Phase To Neutral Voltage Y
bb. Phase To Neutral Voltage B
cc. R Phase Line Current
dd. Y Phase Line Current
ee. B Phase Line Current
ff. History 1 Active import energy
gg. History 1 Active export energy
yyy. History 1 Reactive import while active import energy
zzz. History 1 Reactive import while active export energy
aaaa. History 1 Reactive export while active import energy
bbbb. History 1 Reactive export while active export energy hh.
History 1 Apparent import Energy
ii. History 1 Apparent export Energy
jj. History 1 Maximum demand in Active import
kk. History 1 Maximum demand in Active import Occurrence Time and Date
ll. History 1 Maximum demand in Active export
mm. History 1 Maximum demand in Active export Occurrence Time and Date
nn. History 1 Maximum Demand in Apparent while Active import
oo. History 1 Maximum demand in Apparent while Active import Occurrence Time and Date
pp. History 1 Maximum Demand in Apparent while Active export
qq. History 1 Maximum demand in Apparent while Active export Occurrence Time and Date
rr. Cumulative Tamper Count
ss. Present PT Status
tt. Present CT Status
uu. Phase Sequence
vv. Battery Status
ww. Self Diagnostic Flags
xx. Connection Check

Note: The meter display should return to Default Display mode (mentioned above) if the 'push button' is not operated approx. more than 6 seconds.

BSES
RAJDHANI POWER LIMITED

Volume - II

FORMATS

Tender Notification for

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

CMC/BR/23-24/RB/PR/SN/2092

Date : 24.03.2023

BSES
RAJDHANI POWER LIMITED

Annexure - A

ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed & stamped by the bidder along-with bid)

BSES Rajdhani Power Ltd (BRPL) intends to use reverse auction through SAP-SRM tool as an integral part of entire tendering process. All bidders who are techno-commercially qualified on the basis of tender requirements shall participate in the reverse auction.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid:-

1. In case of bidding through Internet medium, bidders are advised to ensure availability of all associated infrastructure as required to participate in the reverse auction event. Inability to bid due to telephone glitch, internet response issues, software & hardware hangs/failures, power failures or any other reason shall not be the responsibility of BRPL.

2. In case bidder fails to participate in the reverse auction event due to any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid submitted by them as a part of tender shall be considered as bidder's Final No Regret offer. Any off-line price bids received from a bidder in lieu of non-participation in the reverse auction event shall be rejected by BRPL.

3. The bidder is advised to understand the auto bid process t safeguard themselves against any possibility of non-participation in the reverse auction event.

4. The bidder shall be prepared with competitive price quotes during the day of reverse auction event.

5. The prices quoted by bidder in reverse auction event shall be on FOR Landed cost BRPL Store/site basis inclusive of all relevant taxes, duties, levies, transportation charges etc.

6. The prices submitted by the bidder during reverse auction event shall be binding on the bidder.

7. The bidder agrees to non-disclosure of trade information regarding bid details e.g. purchase, identity, bid process/technology, bid documentation etc.

8. BRPL will make every effort to make the bid process transparent. However award decision of BRPL will be final and binding on the bidder.

9. The prices submitted during reverse auction event shall be binding on the bidder.

10. No request for Time extension of the reverse auction event shall be considered by BRPL.

Annexure -I

BID FORM

RATE CONTRACT FOR SUPPLY OF NET METERS(1 PHASE,3 PHASE,LTCT & HT METERS)

To

Head of the Department
Contracts & Materials
BSES Rajdhani Power Ltd
BSES Bhawan, Nehru Place
New Delhi– 110019
Sir,

1 We understand that BSES RAJDHANI POWER LTD is desirous of procuring different types of 'Meter's ' in it's licensed distribution network area in Delhi.

2 Having examined the Bidding Documents for the above named works, we the undersigned, offer to deliver the goods in full conformity with the Drawings, Conditions of Contract and specifications for the sum of AS PER PRICE BID ENCLOSED or such other sums as may be determined in accordance with the terms and conditions of the contract .The above Amounts are in accordance with the Price Schedules attached herewith and are made part of this bid.

3 If our Bid is accepted, we under take to deliver the entire goods as per delivery schedule given by you from the date of award of purchase order/letter of intent

4 If our Bid is accepted, we will furnish a performance bank guarantee for an amount of 10% (Ten) percent of the total contract value for due performance of the Contract in accordance with the General Conditions of Contract.

5 We agree to abide by this Bid for a period of 120 days from the date fixed for bid opening under clause 9.0 of GCC , and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

6 We declare that we have studied the provision of Indian Income Tax Law and other Indian Laws for supply of equipments/materials and the prices have been quoted accordingly.

7 Unless and until Letter of Intent isissued, this Bid, together with your written acceptance there of, shall constitute a binding contract between us.

8 We understand that you are not bound to accept the lowest, or any bid you may receive.

9 There is provision for Resolution of Disputes under this Contract, in accordance with the Laws and Jurisdiction of Contract, Clause 19 of GCC .

Dated this..... day of..... 20 .....

Signature..... In the capacity of ……

.....duly authorized to sign for and on behalf of

(IN BLOCK CAPITALS) .....

Annexure -II

FORMAT FOR BID SECURITY BANK GUARANTEE

(To be issued in a Non Judicial Stamp Paper of Rs.50/-purchased in the name of the bank)

Whereas [name of the Bidder](hereinafter called the Bidder") has submitted its bid dated [date of submission of bid] for the supply of [name and/or description of the goods] (hereafter called ''the Bid").

KNOW ALL PEOPLE by these presents that WE [name of bank]at[Branch Name and address],having our registered office at[address of the registered office of the bank](herein after called —the Bank"),are bound unto BSES Rajdhani Power Ltd., with it's Corporate Office at BSES Bhawan Nehru Place, New Delhi -110019 ,(herein after called —the Purchaser")in the sum of Rs._____ for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this_____ day of_____ 20____.

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form ;or

2. If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:

(a) fails or refuses to execute the Contract Form ,if required; or
(b) fails or refuses to furnish the performance security, In accordance with the Instructions to Bidders/GENERAL CONDITIONS.;

We undertake to pay to the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that is its demand the purchaser will note that amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or condition s.

This guarantee will remain in force up to and including thirty (30) days after the period of bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the bank)

Signature of the witness

BSES
RAJDHANI POWER LIMITED

Annexure –III

PRICE FORMAT

ENQUIRY NO & DATE: CMC/BR/23-24/RB/PR/SN/2092 DT : 24.03.2023

S.NO	HSN Code	Material Dispatch Location (GSTN no.)	Item Description	UOM	QTY (Nos.)	EX-WORKS RATE/No.	C GST (%)	C GST (Amt)	S GST (%)	S GST (Amt)	I GST (%)	I GST (Am)	FREIGHT	LANDED COST/No.	TOTAL LANDED COST
1			1-Ph Whole Current Net Meter	Nos	600										
2			3-Ph Whole Current Net Meter	Nos	800										
3			LT CT Net Meter	Nos	200										
4			HT Net Meter	Nos	200										

Pls attach the covering letter head alongwith the price format.

NAME OF THE BIDDER WITH STAMP

Annexure - IV

COMMERCIAL TERMS AND CONDITIONS

ENQUIRY NO & DATE : CMC/BR/23-24/RB/PR/SN/2092, DT:24.03.2023

S/NO	ITEM DESCRIPTION	AS PER BRPL	CONFIRMATION OF BIDDER
1	Validity of prices	120 days from the date of offer	
2	Price basis	a) Firm, FOR Delhi store basis. Prices shall be inclusive of all taxes & duties, freight upto Delhi stores. b) Unloading at stores shall be in vendor's scope c) Transit insurance in BRPL scope for Indian portion only	
3	Payment terms	100% payment within 45 days after receipt of material at stores	
4	Delivery schedule	As per our requirement	
5	Defect Liability period	60 months after commissioning or 66 months from the last date of supply,whichever is earlier	
6	Penalty for delay	1%(Ex works value) per week of delay of undelivered units or part thereof subject to maximum of 10% of total PO value(Ex works) of undelivered units	
7	Performance Bank Guarantee	10% of total PO value valid for 60 months after commissioning or 66 months from the last date of supply,whichever is earlier plus 3 months towards claim period	

ANNEXURE V

ENQUIRY NO & DATE : CMC/BR/23-24/RB/PR/SN/2092 DT: 24.03.2023

NO DEVIATION SHEET

SL NO	SL NO OF TECHNICAL SPECIFICATION	DEVIATIONS,IF ANY

SIGNATURE & SEAL OF BIDDER

NAME OF BIDDER

BSES
RAJDHANI POWER LIMITED

Annexure – VI

S.No	Qualification Criteria	Declaration by bidder with qualifying the fulfillment	Documentary Evidence attached page no. details
1	The bidder must be a meter manufacturer of static meter.		
2	The bidder shall either themselves be manufacturers of the equipment offered or accredited representatives of such manufacturers in India or of their Principals abroad with whom they may be having collaboration Such accreditation should be at least of one year preferably last year as on date of tender. Authority letter from manufacturer shall be attached along with bid.		
3	Relevant documents in support of the above must be furnished along with undertaking of the manufacturers. If these documents are not furnished along with the tenders the offer will be rejected summarily.		
4	Bidder should have supplied minimum 1000 similar type of meters in last five years (From the date of technical bid opening) to Electricity Distribution Utility / Undertaking in India with electronic display and communication facility.	Order copies /completion certificates to be submitted	
5	Offered meters should be in successful operation for minimum 2 years as on the date of opening of Bid.This should be supported by the copies of purchase orders and performance reports from the SEBs / Power utilities should be enclosed.	Copy of completion certificates to be submitted in this regard	
6	The bidder must possess valid ISO 9001:2000 certification for meter manufacturing and possess possess valid BIS Licence.	ISO or equivalent Certification copy	
7	Firms who are debarred/blacklisted in other utilities in India will not be considered.	Self certification	
8	The Bidder should have average turnover of Rs.20 Crores in the last three financial years (i.e. 2019-20,2020-2021 & 2021-2022) . Bidder should submit report on financial standing such as profit and loss statement, balance sheets for the last three years as an supporting documents.	Copy of audited Balance Sheet and P&L Account to be submitted in this regard	
9	Bidder should have complete volume of type test reports as per IS 13779 (Including latest amendments if any) and magnet test as per CBIP-88 from any NABL accredited lab. The type test report should not be older than 5 years as on the date of opening of tender.		
10	The bidder must be a meter manufacturer of static meter.		
10.1	Computerized test bench: The manufacturer should have sufficient Nos of Computerized test benches. The benches should have electronic supply, Isolated CT/ PT system and data should be directly stored in central server.		
10.2	Seal tracking system: The manufacturer has to put both his own seal and BSES seal on the meter. He should have a seal tracking software to ensure tracking of seal and no duplication of seals and meter nos,.		
10.3	Meter Burn In system: In order to ensure the reliability of components and that there is no drift in meter accuracy with time; the manufacturer should have burn in facility --- Running meter with load at elevated temperature		
10.4	Routine test data: During lot acceptance, all routine test data should be made available to inspector. In fact as per BIS, STI all test data should be offered to inspector for verification. Routine test report should be packed with each meter.		
10.5	Test benches: During the lot acceptance, BSES inspector can test up to 5% of offered quantity. The manufacturer should agree to provide all test facility to do so. Further he should allow BSES inspector to check shop floor process.		
10.6	Test equipments: Since the meters has lot of anti theft features, the manufacturer should have test set up too check the working of all anti theft features.		
10.7	PCB assembly facility:- The PCB facility should have auto- pick n place machine, in- circuit testor, Protection against static charge/ dust etc.; and process to ensure no corrosion of solder points/ tracks. Incase service is taken from other vendor than bidder shall arrange inspection of facility. The bidder should be taking the service from the vendor since last two years and so far have procured & one million 50,000 3ph meter PCB from vendor.		

CHECK LIST

Sl No	Item Description	YES/NO
1	INDEX	YES/NO
2	COVERING LETTER	YES/NO
3	BID FORM (UNPRICED) DULY SIGNED	YES/NO
4	BILL OF MATERIAL (UNPRICED)	YES/NO
5	TECHNICAL BID	YES/NO
6	ACCEPTANCE TO COMMERCIAL TERMS AND CONDITIONS	YES/NO
7	FINANCIAL BID (IN SEALED ENVELOPE)	YES/NO
8	EMD IN PRESCRIBED FORMAT	YES/NO
9	DEMAND DRAFT OF RS 1180/- DRAWN IN FAVOUR OF	BSES.....POWER LTD
10	POWER OF ATTORNEY/AUTHORISATION LETTER FOR SIGNING THE BID	YES/NO