

**TENDER
FOR
SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING OF 3-PHASE, 4 WIRE,
CT OPERATED MULTIFUNCTIONAL
ENERGYMETERS AT
NSIC HEAD OFFICE COMPLEX
OKHLA INDUSTRIAL ESTATE
NEW DELHI -110020**



ISO 9001:2008

**THE NATIONAL SMALL INDUSTRIES
CORPORATION LTD.**

***(A Government of India Enterprise)*
Okhla Industrial Estate
New Delhi-110020**

**Website: <http://www.nsic.co>.THE NATIONAL SMALL
INDUSTRIES CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISES)
Okhla Industrial Estate New Delhi-110020**

Ref:-SIC/HO/ADMN/STP/PROCU.METER/39/2003 Dt: 10-12-2012

M/s. _____

Sub: Supply, Installation, Testing and commissioning of Three phase, Four Wire, CT Operated Multifunctional Energy meter at NSIC Head Office Complex, Okhla Industrial Estate, New Delhi - 110020.

Sir,

Tender documents in respect of the above mentioned works containing 31 pages as detailed on page 6 (Index) are forwarded herewith. ***Please note that tender is to be issued in the office of the General Manager (S.G.) (Works/Estate) NSIC Ltd., NSIC Bhawan Okhla Industrial Estate New Delhi-110020 upto 20-12-2012, 3.00 P.M.***

The Tender should be signed on each page, dated and witnessed in all places provided for in the documents; all other papers should be initialed.

The tender should be accompanied by Earnest Money Deposit in the form of demand draft as mentioned in Appendix. Tenders without earnest money deposit shall be summarily rejected. The tenders will be opened at 4.00 P.M. on 21-12-2012.

The person, signing the tender on behalf of company/firm or on behalf of another person shall attach with tender a certified copy of proper authority/power of attorney on a non-judicial stamp paper of

requisite value duly executed in his favour by such person, company/firm and must state specifically that he has authority to sign such tenders for and on behalf of such person or company/firm as the case may be, and in all matters pertaining to the contract including arbitration clause.

This letter shall form part of the **“CONTRACT”** and must be signed and returned along with the tender documents.

Yours faithfully

**General Manager (S.G.)
(Works/Estate)**

Signature of the Contractor with stamp

Tender notice for Supply, Installation, Testing and commissioning of Three phase, Four Wire, CT Operated Multifunctional Energymeter at NSIC HO Complex, Okhla Industrial Estate, New Delhi -110020.

TENDER NOTICE NO- SIC/HO/ADMN/STP/PROCU.METER/39/2003

Date: 10-12-2012

Sealed item rate tenders are hereby invited on behalf of NSIC Ltd. from experienced Contractors/dealers/suppliers/manufactures

S. No	Name of the work	Estimated cost Rs. (Lacs)	EMD (Rs)	Comp-letion Time	Issue of Blank Tender Document	Last Date for submission of Tender
1	Supply, installation, Testing and commissioning of Three Phase, Four Wire, CT operated Multifunction Energy Meter at NSIC Head Office Complex, Okhla Industrial Estate, New Delhi -110020.	4.00 Lacs	8000/-	45 days	From 10-12-2012 to 20-12-2012	21-12-2012 Up to 3.00 PM

- Blank tender documents (non-transferable) for above work shall be issued from 10-12-2012 to 20-12-2012 on working days from the address given below on payment of required tender fee of Rs. 500/- (Rupees Five Hundred only) (non-refundable) in cash/DD/Bankers Cheque in favour of "NSIC Ltd.", payable at New Delhi. The bidders may also download the tender documents from the website www.nsic.co.in. However a separate demand draft/bankers cheque of Rs 500/- from any

nationalized bank in favour of NSIC Ltd. payable at New Delhi is to be enclosed along-with the tender towards the cost of tender documents.

2. The manufacturer/ supplier should have at least five years of experience of manufacturing and operation of the static type of meters offered.
3. The tenderers should have experience of similar nature of work. Photocopies of the completion certificates/award letters should be submitted along with the tender. Completion certificate issued by the reputed organization / MNC shall also be accepted. In case of certificates issued by the private party, copies of TDS should also be enclosed.
4. While applying for the tender document, the intending tenderers shall furnish proof of, experience certificates, works completed/awarded, valid work contract tax /sales tax/ VAT/TIN as applicable.
5. The tender issuing authority reserves the right to issue or refuse to issue the tender document to any party without assigning any reason.
6. Tenders not accompanied by Earnest Money Deposit and tender cost in the prescribed form shall be summarily rejected.
7. NSIC reserves the right to reject all or any tender wholly or partly without assigning any reason whatsoever.

**General Manager (S.G.)
(Works/Estate)**

**THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISES)
Okhla Industrial Estate New Delhi -110020**

Ref: - SIC/HO/ADMN/STP/PROCU.METER/39/2003

Dt: 05-12-2012

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THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.
(A GOVT OF INDIA ENTERPRISE)
NSIC BHAWAN, OKHLA INDUSTRIAL ESTATE,
NEW DELHI - 110020

INSTRUCTION TO THE TENDERERS

The Tender shall be submitted in accordance with these instructions and any tender not confirming to the instructions as under is liable to be rejected.

These instructions shall form part of the tender and contract.

1. The intending Tenderer shall be either Original Equipment Manufacturers/authorized dealer/distributor/contractors.
2. The intending Tenderer, in case of authorized Distributor / Dealer / contractor shall possess valid authorized Distributorship / Dealership license from manufacturers. He shall enclose the copy of the same alongwith the tender document.
3. The person signing the tender form or any other documents forming part of the contract on behalf of the Tenderer shall be deemed to warranty that he has authority to bind the Tenderer. If subsequently comes to light that the person so signed had no authority to do so, The General Manager (S.G.)(Works/Estate) may without prejudice to any other civil & criminal remedies cancel the contract or the tender and hold the Tenderer liable for all costs, charges and damages.
4. The tender must be placed in a properly sealed envelope addressed to General Manager (S.G.) (Works/Estate), NSIC-LTD, NSIC Bhawan, Okhla Industrial Estate, Ph-III, New Delhi.
5. The envelope must be super scribed "***Tender for Supply, Installation, Testing & Commissioning of Three Phase Four Wire CT Operated Multifunctional Energy Meters***". The tender should reach the office of General Manager (S.G.) (Works/Estate), NSIC-LTD, NSIC Bhawan, Okhla Industrial

Estate, Ph-III, New Delhi by 21st December 2012 up to 1500 hours.

6. The tenders will be opened at NSIC Bhawan on 21st December 2012 at 16:00 Hours (4.00 p.m). The Tenderer or their authorized representative (One person only) may be present at the time of opening of the tender.
7. The tender shall be completed in all respect and should be signed with date by the Authorized Signatory of Tenderer on all the pages of technical documents. Also the company stamp shall be placed under the signature of person on each and every page of tender document.
8. All the columns of the tender shall be duly, properly and exhaustively filled in. The rates and units shall not be overwritten. The rates shall always be both in figures and words.
9. General Manager (S.G.) (Works/Estate) reserves the right to reject any tender/ bid wholly or partly without assigning any reason.
10. Nothing extra shall be paid on account of any discrepancy in nomenclature of items. The Tenderer shall seek clarifications if any before submitting the tender.
11. While submitting the tender, any of the prescribed conditions are not fulfilled or are incomplete in any form, the tender are liable to be rejected. If any Tenderer stipulates any condition of his own, such conditional tender is liable to be rejected.
12. Any cutting/over writing etc. in the tender must be signed by the person who is signing the tender.
13. The Earnest Money deposit of Rs. 8,000 (Eight Thousand Only) by way of DD drawn in favor of "**National Small Industries Corporation Ltd.**" Payable at New Delhi" shall be submitted with tender document. No Cheque or cash towards Earnest Money deposit shall be accepted. The offers without Earnest Money Deposit will be rejected.

14. NSIC LTD has right to verify the particulars furnished by the bidder independently.
15. The Tenderer agrees that the rates submitted shall remain valid for acceptance for a period of 90 days from the date of opening of Technical Bid of tender.
16. Tenderer shall take into account the cost of labour, loading/unloading & cartage, taxes etc. for giving delivery of material at site i.e. NSIC-HO Complex, Okhla Industrial Estate, Ph-III, New Delhi while quoting the rates. In this regard no claim what so ever shall be entertained.
17. The material shall be inspected on receipt at destination, i.e. NSIC-HO Complex, Okhla Industrial Estate, Ph-III, New Delhi and supplier shall be responsible for any damage during the transit of goods.
18. Complete tender document available on our website www.nsic.co.in, any further corrigendum/addendum to this tender document shall be made available on aforesaid website. It is therefore, requested that the bidders may regularly visit the website for checking any corrigendum/addendum to this document.
19. All the communication with respect to the tender shall be addressed to:
**General Manager (S.G.) (Works/Estate),
NSIC- LTD, NSIC Bhawan,
Okhla Industrial Estate,
Phase-III, New Delhi-110020**
20. In the event of any dispute the legal matter shall be subjected to the jurisdiction of Delhi Court only.
We hereby confirm our acceptance to the instructions (S.No-1 to 19 above) as given above.

Tenderer's Name & Signature with seal

**THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.
(A GOVT OF INDIA ENTERPRISE)
NSIC BHAWAN, OKHLA INDUSTRIAL ESTATE,
NEW DELHI - 110020**

COMMERCIAL AND GENERAL TERMS & CONDITIONS

Name of work: Supply, Installation, Testing & Commissioning of
Three Phase, Four Wire, CT Operated Multifunctional
Digital Display Energy Meter.

1. Scope of Supply:

- a) The tenders shall be submitted as per the technical specification enclosed in Annexure-A.
- b) Sealed tenders should be submitted in the prescribed form and should be addressed to the **General Manager (S.G.) (Works/Estate), NSIC-LTD, NSIC Bhawan, Okhla Industrial Estate, Phase-III, New Delhi**. The envelope should be super - scribed as **“Tender for Supply, Installation, Testing & Commissioning of Three Phase, Four Wire CT Operated Multifunctional Energy Meter”**. The authorized person of the Tenderer should sign the tender documents.
- c) The quantity indicated in the Annexure- A is only approximate and liable for upward/downward revision. If additional quantity is required, the qualified Tenderer is bound to supply such quantity at the accepted rates.
- d) The Tenderer are free to inspect the installation location in the premises of NSIC, Okhla Industrial Estate, Phase-III, New Delhi before submitting the quotes.
- e) The rates quoted against this tender shall be valid for a period of 90 days from the date of opening of tender.

- f) Submission of the tender implies that these conditions of Contract have been read by the Tenderer and is aware of the scope of the work and the quality of the material to be supplied. The final acceptance of the tender rests with the General Manager (S.G.) (Works/Estate) of NSIC-LTD, who reserves the right to accept or reject any or all tenders without assigning any reason therefore.

2. Submission of tender:

- a) The tender received within the stipulated date and time will be opened at the office of General Manager (S.G.) (Works/Estate), NSIC-LTD, NSIC Bhawan, Okhla Industrial Estate, Phase-III, New Delhi, in the presence of intending tenderers, on the date and time mentioned in the Notice Inviting Tender.
- b) Tenders received in open covers / letters / fax / telegram / email will not be entertained.
- c) The tenders received after the stipulated date and time or received without the requisite EMD or received with conditions will not be accepted. Tenders not submitted in the prescribed form will be rejected. Tenders which propose any alternations in the conditions specified will be rejected.

3. Validity of tender:

- a) The tender shall be valid for a period of 90 days from the date of opening of tender. If any Tenderer withdraws his tender before the said period or makes any modifications in the terms and the conditions of the tender which are not acceptable to the NSIC, then the NSIC shall, without prejudice to any other rights or remedy, be at liberty to forfeit his EMD.
- b) Should the Tenderer for any reason withdraw the tender after it is accepted or fails to execute the orders within stipulated period, the NSIC shall be at liberty to cancel the order forthwith. The EMD of the tenderers in such a case

will be forfeited by the Corporation. Further the NSIC shall have the right to procure such or similar Multifunctional Energy Meters from the open market at the tenderer's risk and cost.

- c) No representation for the enhancement of the prices of the accepted tender or alteration of the terms and conditions will be entertained.

4. Offers ready stock/ Subject to prior sale:

- a) Offers from ready stock are preferred. In case the offers are subject to prior orders, the Tenderer shall indicate the period within which the ordered quantity will be executed. The Tenderer shall please note that in case he fails to execute within the stipulated period indicated in said tender, penalty at the rate of 1% of value of the order, per week of delay subject to a maximum of 10% of the order value will be levied.
- b) The successful Tenderer shall, within a week from the date of receipt of communication of acceptance of tender, intimate his acceptance of the order. The successful Tenderer shall complete the work strictly as per the stipulated time.

5. Guarantee of Quality:

The equipments offered shall confirm to the specifications as given in tender/order and shall have guarantee/warranty against defective design, defective quality material supplied, manufacturing defects etc. for a minimum period of 12 months or as per manufacturer specifications whichever is more from the date of supply and installation of Multifunctional Energy Meter and provide onsite guarantee/warranty **for the** period as mentioned above. Onsite warranty of minimum 12 months or as per manufacturer's specifications whichever is more covers free service and free spare parts excluding cost of consumables.

6. Packing :

- a) The supplier shall provide such packing of the goods, as is required to prevent their damages or deterioration during the transit to their final destination as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit.
- b) The Energy Meters shall be securely boxed, crated and protected from mechanical damage, moisture etc. suitable for both storage and transit according to the nature of the material and mode of transport.

7. Price:

- a) The price shall be firm and shall include all applicable taxes. Any variation in the taxes duties, levies etc. during the period of contract shall be to the Tenderer account. The rates quoted shall be all inclusive on FOR destination. Destination means NSIC-Head Office Complex, Okhla Industrial Estate, Phase-III, New Delhi. The Corporation will not issue Forms C and or D. The tenderer should note this while quoting the rates. The price shall be quoted both in figures and words.
- b) The successful tenderer shall produce PAN Number, TIN Number registration details alongwith the tender document. Applicable taxes, if any, will be recovered from the bills.

8. Delivery:

- a) The successful tenderer shall complete supplies strictly within the accepted delivery period. Material ordered by the NSIC shall be delivered FOR destination securely packed as may be necessary.
- b) Energy Meters shall have to be delivered and installed at NSIC-HO Complex, Okhla Industrial Estate, Phase-III, New Delhi and to be operationalized to the satisfaction of tender accepting authority or his authorized representative of NSIC.

- c) Installation & demonstration with operation of Energy Meters shall have to be carried out free of cost at NSIC-HO Complex, Okhla Industrial Estate, Phase-III, New Delhi.

9. Payment:

The payment will be made by the Corporation by crossed account payee cheque for works executed at site as certified by the Engineer-in-charge against the production of bills with giving the reference number of the purchase order along with warranty card and proper installation certificates duly acknowledged by the tender accepting authority or his authorized representative of NSIC. All statutory deductions as applicable like TDS, Sales tax/VAT shall be made from the due payment of the contractor.

10. Earnest Money Deposit:

- a) An EMD of Rs 8,000/- shall be paid along with the tender either by way of DD/Pay order drawn in favour of the **“National Small Industries Corporation Ltd” payable at New Delhi.**
- b) Non furnishing of EMD at prescribed rate alongwith the tender or by claiming exemption will attract to rejection of the tender.
- c) NSIC shall not be liable for payment of any interest on EMD or any depreciation thereof.
- d) Any request by the bidders to consider their EMD furnished by them to NSIC for any other contract/tender cannot be considered as EMD for this tender. Hence the bidders have to invariably furnish the required EMD for this tender.
- e) The EMD will be returned to the unsuccessful bidders soon after the orders are placed on the successful bidder/s.

- f) In case of successful bidder, the EMD will be converted as part of Security Deposit (SD) for due performance of the contract.
- g) The EMD/SD will be forfeited in the following cases:
- I. If the bidder fails to accept the order based on his offer (bid) and/or fails to agree to enter into contract within the prescribed time.
 - II. If the bidder fails to execute the work of supply, installation, testing and commissioning of Three Phase Multifunctional Energy Meters on issuance of dispatch instruction by the NSIC at the agreed contract rate.
 - III. If the bidder delays supplies beyond a reasonable time resulting in disruption of NSIC works.

11. Security Deposit:

Total security deposit shall be 10 % of the accepted tender cost and shall be deposited/deducted by/from the contractor as following: -

a). Initial Security Deposit:

The earnest money deposited shall be converted into initial security deposit.

b). Balance Security Deposit

Balance security deposit will be deducted from the final bill after adjustment of EMD upto 10% of total accepted tender cost.

- 11.1 All compensation or other sums of money payable by the contractor under the terms of this Contract or any other Contract or any other account whatsoever may be deducted from the security deposit.

11.2 Refund **of Security deposit**. Security deposit refundable to the Contractor worked out on the basis of the value of work completed shall be refunded to the Contractor on the Engineer-In-Charge certifying in writing that the work has been completed satisfactorily after defect liability period of 12 months.

11.3 No interest shall be payable to the contractor on the Security Deposit furnished/ recovered from the contractor, by the Corporation.

12. Duration & Termination of contract:

a) The time of completion of work is 45 days from the date of acceptance of work order.

b) Service Facility: In order to ensure proper and timely after sales service manufacturer or authorized agency shall have an office in New Delhi with well equipped service centers with technically qualified people across Delhi or shall be able to deploy Service Personnel at short notice and attend the maintenance within 24 hours.

13. Claims:

a) If the materials supplied are found to be of size and shape different than those contracted and of specifications lower than those stipulated in this contract, NSIC shall have right to totally reject the goods and/or to prefer a claim for compensation for the part of goods, which is rejected. The tenderer shall reimburse to NSIC, the actual expenditure on such goods by way of cost, within 15 (fifteen) days of its demand. The tenderer shall be responsible for arranging the rejected goods to be removed at his cost from NSIC premises, if so desired by NSIC.

b) The tenderer shall also compensate for losses, if any, sustained by Corporation due to defective packing and/or marking of the goods not in accordance with the terms of the Contract.

14. Breach of Contract:

- a) In case of failure of the tenderer to perform the contract as per the terms and conditions and to the satisfaction of NSIC. NSIC reserves the right to terminate the contract without assigning any reason. NSIC shall have a right to execute the work through any other agency on the risk and cost of the Tenderer.
- b) Following actions on the part of tenderer will constitute breach of contract:
 - 1. Non supply of Energy Meters up to stipulated time, the quantity as per specifications ordered by the Corporation.
 - 2. Supply of poor quality/sub standard Energymeters and other materials.
 - 3. Inordinate delay on supply of equipments
 - 4. Failure to replace/provide alternate materials in place of faulty/damaged, seconds or sub standard materials

In case the tenderer commits any of the above acts the Corporation reserves the right to repudiate the contract without assigning any reasons besides taking appropriate action against the tenderer including forfeiture of security deposit.

15. Liquidated Damages for Delay

Time is essence of the contract. In case the CONTRACTOR fails to complete the whole work within the stipulated period, and clear the site he shall be liable to pay liquidated damages @ 0.5% (One Half of one percent only) of the value of contract per week and or part thereof of the delay subject to a maximum of 10% (ten percent only) of the value of the contract. The amount of Compensation may be adjusted or set-off against

any sum payable to the Contractor under this or any other contract with the Corporation.

16. Guarantee:

The tenderer shall extend unconditionally guarantee that the Material supplied shall:-

- a. Be in satisfactory condition and free from all defects including defects arising out of inferior materials faulty and inferior workmanship.
- b. Be of highest quality and fit for the purpose for which they are intended.
- c. Strictly comply with Technical Specifications.
- d. Wherever defects are found in goods within a period of 12 months from the date of supply, the supplier shall bear all costs including freight and the replacement of the defective goods, without any cost to NSIC.

17. Warranty:

It shall be ensured that the supplier shall give complete warranty for the goods to be supplied against tender and proposal reflects the period of warranty in the price bid.

We confirm with our acceptance to the Commercial & General Terms & Conditions (S.No-1 to 17) as given above.

Signature of the Tenderer

Undertaking from the Tenderer

To

General Manager (S.G.) (Works/Estate)
NSIC Ltd., NSIC Bhawan
Okhla Industrial Estate,
New Delhi-110020

I/We have read and examined the following documents relating to supply, installation, testing and commissioning of three phase, CT Operated Multifunctional Energymeters at NSIC HO Complex, Okhla Phase-III, New Delhi-110020.

- a). Notice inviting tender.
- b). Instructions to Tenderers
- c). Technical Specifications
- d). General Conditions of Contract including Contractors, Labour Regulations, Model Rules for Labour Welfare and Safety Code appended to these conditions together with the amendments thereto if any.
- e). Special Conditions of contracts if any.
- f). Bill of Quantities

I/We hereby tender for execution of the works referred to in the aforesaid documents upon the terms and conditions contained or referred to therein and in accordance in all respects with the specifications, designs, drawings and other relevant details at the rates contained in Schedule and within the period(s) of completion as stipulated in Appendix.

In consideration of I/We being invited to tender, I/We agree to keep the tender open for acceptance for 120 days from the due date of submission thereof and not to make any modifications in its terms and conditions which are not acceptable to the Corporation.

A sum of Rs 8,000/- is hereby forwarded as Earnest Money Deposit in the form of Demand Draft/Pay order in favour of NSIC Ltd. payable at New Delhi . If I/We fail to keep the tender open as aforesaid or make any modifications in the terms and conditions of the tender which are not acceptable to the Corporation, I/We agree that the Corporation shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Should this tender be accepted, I /We agree to abide by & fulfill all the terms conditions of aforesaid document.

If after the tender is accepted, I/we fail to commence the execution of the work as provided in the conditions. I/We agree that Corporation shall without prejudice to any other right or remedy is at liberty to forfeit the said earnest money absolutely.

Signature of contractor.....

Duly authorized to sign the tender on behalf of the (in block capitals).....

.....

Dated.....

Witness.....

Address.....

.....

APPENDIX

- | | |
|--|--|
| 1. Competent Authority | C.M.D. NSIC or his
Authorized executives |
| 2. Earnest money/Security deposit | |
| a) Estimated cost of the Works | Rs. 4.00 Lacs |
| b) Earnest money | Rs 8,000/- in the form of
DD /Pay order in favour
of NSIC Ltd.,New Delhi |
| c) Security Deposit | 10% of the contract value |
| 1. Deviation limit for items of work
Deviation limit beyond which clauses 10.2
shall apply for the building / Development work | 30% |
| 4. Time allowed for execution of work | 45 Days |
| 5. Authority competent to grant extension of time for
or his any cause of delay which is beyond Authorized
representative Contractor's control | GM-SG (Works/Estate) |
| 6. Liquidated Damaged | 0.5% per week subject
to a Maximum 10% value
of the contract |
| 7. Approving Authority for releasing the payment
up to the accepted tender cost. | GM-SG (Works/Estate)
New Delhi |
| 8. Defect Liability Period | 12 months from the date
of Completion of work. |
| 9. Authority competent to reduce
Compensation | GM-SG (Works) NSIC Ltd.
New Delhi |

(Signature of the Contractor)

SPECIAL CONDITIONS

1. Any facility not mentioned in this scope, but which is vital to erection and commissioning of Multifunctional Energy meter is assumed to be included in the scope of work.
2. Electricity for erection at site will be provided free of cost at NSIC substation. However, cable, T &P etc will have to be managed by the contractor.
3. Contractor has to ensure safety and provide adequate supervision/precautions.
4. During working at site, some restrictions may be imposed by Engineer-in-Charge/Security staff of Corporation or Local Authorities regarding safety and security etc., the contractor shall be bound to follow all such restrictions/instruction & nothing extra shall be payable on this account & no claim for delay on this account shall be entertained.
5. No compensation shall be payable to the contractor for any damage caused by rains lightning, wind, storm, floods Tornado, earth quakes or other natural calamities during the execution of work. He shall make good all such damages at his own cost; and no claim on this account will be entertained.
6. The tender shall be based on Conditions of Contract and tenderers are required to quote their own rates against each item in schedule of quantities, which is enclosed. All rates shall remain firm for the contract period/extended contract period.
7. If the contractor fails to proceed with the work within the stipulated time as specified from the date of issue of letter of intent/letter to proceed with the work, the Corporation shall forfeit the earnest money deposited by him along with the tender.

8. All the works to be carried out in accordance with latest CPWD/BIS Specifications and as per the directions of Engineer-in-charge.

**General Manager (S.G.)
(Works/Estate)**

SIGNATURE OF THE CONTRACTOR

Schedule of Work

S. No.	Description	Qty.	Rate Rs.	Amount Rs.
1.	Supply, Installation, Testing & Commissioning of 3-Phase, 4 Wire, CT Operated, Digital Display Multifunctional Energy Meter. make: L&T/HPL	34 Nos		
2.	Supply, Installation, testing & commissioning of Current Transformers of capacity 100/5A, 200/5A, 300/5A, Make: AE/L&T/Equivalent with accuracy 1.0 & ISI mark.	34 set		
3.	Supply, Installation, testing & Commissioning of 3-nos HRC Fuse with base of 16 amps make: L&T/Siemens/AE or equivalent	34 set		
4.	Modification work of existing panel including de-installation of old meter, panel cutting, connection of CTs, 63 amps Connector if required with wiring of 1.5 sqmm cu wire make: Havells and making cut out in existing LT Panel complete work in all respects as specified and directed by engineer in charge.	34 Job		
	Total Rs.			

Total in words -----

Signature of bidder with stamp

TECHNICAL SPECIFICATION FOR THREE PHASE FOUR WIRE CT OPERATED MULTIFUNCTIONAL ENERGY METER:

SCOPE :

This specification covers 3-Phase, 4 Wire, CT operated Digital Display multifunctional energy Meters of accuracy class 0.5 for the measurement of alternating current electrical active energy with a reference frequency of 50Hz in three phase for balanced and unbalanced loads in three phase four wire system.

STANDARD APPLICABLE :

While drawing these specifications, the relevant Indian/ International standard shall be applicable.

SUPPLY SYSTEM :

System : 3-Phase, 4 wire system(CT operated meters)
Standard voltage : 3x240V - 415 Volts
Standard basic current : 5 Amp.(through current transformer)
Max. rated current : (CT operated 100/5,200/5, 300/5)
Standard frequency : 50 Hz

SYSTEM VARIATION :

The meters should be suitable for working satisfactorily and accurately with following variations in the supply system parameters and ambient temperature and humidity.

Electrical Quantities :

- a) Rated voltage : +10% to-30% of V ref. 440v
- b) Rated frequency : 50Hz +5% to -5% of Freq.
- c) Range of temp. variation : 0 deg to 45 deg centigrade Ambient.
- d) Average working temperature: 27 degree centigrade+/- 10 degree
- e) Reference temp : 27 degree centigrade
- f) Humidity : As per IS 14697 (1999)

CONSTRUCTION OF THE METER

Meter shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions. However, the following shall be ensured.

- Personal safety against electric shock
- Personal safety against effects of excessive temperature
- Protection against spread of fire
- Protection against penetration of solid objects, dust and water
- All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.
- The meter shall be designed and manufactured using SMT (Surface Mount Technology) components.
- All insulating material used in the construction of meter shall be Non hygroscopic, Non ageing and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.
- The meter shall have an operation indication device such as a blinking LED. The operation indicator shall be visible from the front window and capable of being monitored conveniently with suitable testing equipment.
- The meter shall conform to the degree of protection IP 51 of IS:12063/IEC:529 for protection against ingress of dust, moisture and vermin's.
- The terminal block shall be of high grade non-hygroscopic, fire retardant, low tracking, fire resistant, reinforced poly-carbonate or equivalent high grade engineering plastic which shall form an extension of the meter case and shall have terminal holes and shall be of sufficient size to accommodate the insulated conductors.
- The meter cover shall be fully transparent. However, in case of non transparent cover the window shall be of fully transparent Polycarbonate material for easy reading of all the displayed values/ parameters, name plate details and observation of operation indicator. The meter cover and base shall be suitably

shielded with metallic material so as to protect the meter from adverse effect of AC/DC Abnormal external magnetic field.

The terminal block, the ETBC meter cover & meter base shall ensure reasonable safety against the spread of fire. They shall not be ignited by thermic overload of live parts in contact with them.

The terminals shall have suitable construction with barriers and cover to provide firm and safe connection of current and voltage leads of stranded copper conductors or copper reducer type terminal ends (thimbles). The manner of fixing the conductors to the terminal block shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixing which may be loosened and tightened several times during the life of the meter shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.

The meter shall be compact in design. The entire design and construction shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation. The meter shall be convenient to transport and immune to shock and vibration during transportation and handling. All parts that are likely to develop corrosion shall be effectively protected against corrosion.

The construction of the meter shall be such as to be sealed independently and prevent unauthorized tampering.

ELECTRICAL REQUIREMENT:

- i) **Power consumption in Voltage Circuit:** The power consumption in each voltage circuit of meters at reference voltage, reference temperature and ref. frequency shall not exceed 1.0 watt and 6.0 VA
- ii) **Power consumption in Current Circuit:** Power consumption in each current circuit for CT operated meter at basic current, reference frequency and ref. Temperature should not exceed 0.75 VA.

- iii) **Short time over current:** The meter should be able to carry a short time over current of 20 I max. for 0.5 second (One half cycle) for meters connected through current transformer.
- iv) **Initial start of meter:** The meter should be fully functional within five seconds after rated voltage is applied to the meter terminal.
- v) **Running with no load:** When the voltage is applied with no current flowing in the current circuit, the test output of the meter shall not produce more than one output/ count.
- vi) **Starting:** The meter shall start and continue to register at 0.2% of basic current at unity P.F.
- vii) **Meter constant:** Relation between the test output and indication in the display shall comply with the marking on the name plate.

OUT PUT DEVICE:

The meter shall have a test output accessible from the front and be capable of being monitored with suitable testing equipment. The operation indicator, must be visible from the front. Test output device shall be homogenous and be provided in the form of LED output device for kWh and kVAh measurement.

The relation between test output shall comply with the marking on the name plate or with the indication on display if so provided in addition to details on name plate i.e. pulse per kWh / KVAh OR kWh/KVAh per pulse.

QUANTITIES TO BE MEASURED AND DISPLAYED:

The measured value(s) shall be displayed on seven segment, seven digit Liquid crystal Display LED / (LCD) display with backlit unit, having minimum character height of 8 mm.

Good quality display shall be used to enable correct reading even from distance.

The information is to be shown on electronic display in a cyclic mode LED/LCD type.

- ii) Internal diagnostics
- iii) All electrical parameters shall be displayed continuously on Auto Scroll.
 - 1. Active energy (kWH).
 - 2. Reactive Energy (kVARH)
 - 3. Apparent Energy (kVAH)
 - 4. Maximum demand (kW)
 - 5. Cumulative maximum Demand
 - 6. Instant Power Factor (Lead/ Lag)
 - 7. Instantaneous phase wise voltage
 - 8. Instantaneous phase wise current.
 - 9. Instantaneous kW/kVA
 - 10. Frequency

POWER SUPPLY:

The meter shall be self powered and thus shall draw it's power from all three phases and neutral and shall function accurately in the event of loss of neutral, loss of any two phases and loss of any one phase and neutral.

The offered meter shall continue to work in case of loss of any two phases or loss of any one phase and neutral.

The potential link shall be internal (inside the meter case) and no external links shall be acceptable.

CALIBRATION:

The meter shall only be factory calibrated and no modification of Calibration shall be possible at site by any means whatsoever.

However, it shall be possible to check the accuracy of the meter in the field by means of LED output using suitable testing equipment.

GENERAL AND CONSTRUCTIONAL REQUIREMENT: -

METER CASE: -

The meter case & cover will either be ultrasonically welded or shall have push fit type arrangement with two No. Aluminium seals, one each on either side, so that Meter's internal parts are only accessible after breaking seals, ultrasonic welding, push fit arrangement or case / cover of the meter and it should become unserviceable.

The material for base and transparent cover of the meter shall be of thermoplastic / engineering plastic respectively.

The meter shall be factory calibrated and shall have unidirectional screws fully embedded so that these cannot be unscrewed by means of pliers etc. for sealing.

TERMINALS AND TERMINAL BLOCK: -

The meter shall have brass terminals suitable for termination of aluminum service cable. The terminal block which shall be of high grade nonhygroscopic, low tracking property insulating material (not Bakelite) which should form and extension of the meter case and have terminal holes of sufficient size to accommodate the insulation of the conductors.

The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixing which may be loosened and tightened several times during the life of the meter shall screw into a metal nut.

All parts of each terminal shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Two screws shall be provided in each current terminal for effectively clamping the external leads of thimbles. Each clamping screw shall engage at least 3 threads in the terminal. The ends of screws shall be such as not to pierce the conductor.

Electrical connections shall be so designed that the contact pressure is not transmitted through insulating material. For current circuits, the voltage is considered to be the same as for the related voltage circuit.

TAMPER FEATURES:

The meter should have the following special features to prevent/detect different ways of tamper and fraud.

- a) Phase sequence reversal: - The meter shall keep working accurately irrespective of reversal of any phase sequence of supply.
- b) Polarity reversal :- The Meter should register correct energy even though polarities are reversed.
- c) CT polarity reversal :- The meter should keep registering correct energy even though all the CT polarities are reversed.
- d) Meter must work in absence of neutral.
- e) The meter should record in event of voltage unbalance between any of the three phases.

CONNECTION DIAGRAM & TERMINAL MARKING:

The connection diagram of the meter shall be clearly shown in inside portion of the terminal cover & shall be of permanent nature. Meter terminals shall also be marked & these markings should appear in above diagram.

GUARANTEE

The meter shall have a design life of at least 10 years and be guaranteed for a period of at least 5 years against manufacturing /Design defect. The meter found defective within the above guarantee period shall be replaced/ repaired by the supplier free of cost within one month of the receipt of intimation.

RESISTANCE TO HEAT AND FIRE: -

The terminal block, the terminal cover and the meter case shall ensure reasonable safety against the spread of fire. They should not be ignited by thermic over-load of live parts in contact with them.

PROTECION AGAINST PENETRATION OF DUST & WATER: -

The meter shall conform to the degree of protection IP 51 against ingress of dust, moisture and vermin's.

ELECTRONIC COMPONENTS:

The meter shall be made from high accuracy and reliable Surface Mount Technology (SMT) Components.

ELECTROMAGNETIC COMPATIBILITY: -

The above shall conform to requirement listed in IS: 13779 (1993) and IEC: 1036 and should be protected against radiated interference from either magnetic or radio-frequency sources. The meter shall also withstand D.C. Immunity test so as to ensure that the meter does not Saturate on passage of Direct Current.

TEST REPORT: -

The meters shall be inspected and tested at manufacturer's works before dispatch. The manufacturer test reports shall be furnished at the time of installation. The purchaser has the right to have the tests carried out at the cost of the supplier by an independent agency wherever there is a dispute regarding the quality of the material supplied.

Wiring of Meter:

All the wiring of CT and PT shall be of standard make and colour code of switch board type consisting of single tinned annealed copper conductor insulated with polyvinyl chloride of size 1.5 mm Square suitable for 440 volts service.

Ferules engraved with some number and letters shall be provided on the terminal ends of all wired for easy identification of circuits for inspection and maintenance.