



**(UNDER JURISDICTION OF DHANBAD/JHARKHAND COURT ONLY)**

**Bharat Coking Coal Limited**

**(A Subsidiary of Coal India Limited)**

**(A GOVT. OF INDIA UNDERTAKING)**

6, Lyons Range, 4<sup>th</sup> Floor, Purchase division,  
Kolkata-700001 (West Bengal)

**OFFICE OF THE CHIEF MANAGER (MM)**

Phone No. 033-22304975; Fax No. 033-22304928

Web-site No: www.bccl.gov.in

## **SUPPLY/PURCHASE ORDER**

**Under jurisdiction of Dhanbad Court  
and Jharkhand High Court only.**

Ref.No: KOL/72/Energy Meter/E&M/0159/2012/27

Dt. 31.10.2012

M/s.MODERN TRANSFORMERS PRIVATE LIMITED,  
C-137, BULANDSHAHAR ROAD INDUSTRIAL AREA,  
GHAZIABAD-201009 (U.P.).

**BY REGISTERED POST**

Contact Persons –Mr.S.K.GOEL, Director (Operation), 09350545285(M)

Fax No: 0120-4155204

(Old Vendor Code No: 229921)

(New Vendor Code No: 1/12/M/S/152)

Sub: Supply of Single phase Energy Meter.

Ref: BCCL E-Tender No: KOL/72/UB-RM/Energy Meter/E&M/0159/Advt/2011/50

Opened on 15.07.2011 against your offer No. MTPL/BCCL/2011 dtd.09. 07. 2011

and read along with subsequent correspondences and your last Letter No:

MTPL/BCCL/2012dtd.08.10.2012.

Dear Sirs,

With reference to the above, we, for and on behalf of BCCL, hereby place  
PURCHASE ORDER on you for supply of following items as per rate, terms and conditions  
indicated below :

### **1. SCOPE OF SUPPLY**

Item	Quantity	Rate/ No.	Value
Energy Meter 1φ220V-250V 10A-40A .Detailed technical specification shall be as per Annexure-'A' attached.	2138 nos.	Rs.856.00	Rs.1830128.00
Plus Excise Duty @12% , Education Cess @2% on ED			Rs. 226203.82
& Higher Edu Cess @1% on ED & Education cess -			Rs. 41126.64
Plus CST @2%extra against Form 'C' –			Rs. 40515.10
Plus Freight charges @Rs.18.95 each -			Rs. 17103.79
Inspection charges @0.8% on FOR Value -			Rs. 2114.03
Service charge @12.36% on Inspection charges –			Rs.2157191.38
Total Value:-			

(Rupees Twenty one lakh Fifty Seven thousand One hundred Ninety One & paise Thirty Eight )

**TERMS & CONDITIONS:**

1. **Payment Terms:** 100% within 21 days of receipt and acceptance of the materials by the consignee or from the date of receipt of Bills, whichever is later by the consignee.
2. **Prices:** FIRM and FOR destination basis except Govt. taxes & duties which shall be paid extra as applicable at the time of dispatch subject to documentary evidence, within the specified delivery period. Freight charges shall be paid extra at actual, subject to ceiling limit @Rs.18.95 each for 1ϕ 220V-250V 10A-40A Energy Meter against documentary evidence.
3. **Excise Duty:** E D extra as applicable at the time of supply. Presently @12%. Cenvatable Invoice is to be submitted by the firm in favour of BCCL as per details enclosed at Annx.B . Education Cess @2% on ED & Higher Edu Cess @1% on ED & Education cess shall be paid extra.
4. **Central Sales Tax:** CST extra as applicable at the time of supply against C Form. Presently @2%.
5. **DELIVERY SCHEDULE:** -- Delivery to be completed within 3(Three) months or earlier from the date of receipt of supply order.  
Delivery schedule shall be reckoned from the 10TH day from the date of order and the date of receipt of materials at our stores shall be treated as the date of delivery.  
Any increase in the rate of taxes & duties beyond delivery period will be to your account.
6. **Security Money:** - Exempted as registered with NSIC.
7. **Inspection** – Pre-despatch Inspection shall be carried out by CMPDIL, Ranchi at your Works premises. Inspection Fees @0.8% on FOR destination price and Service Tax @12.36% on inspection charges shall be paid initially by you along with your Inspection Call, which shall be subsequently reimbursed by BCCL along with your supply bills against documentary evidence e.g. money receipt etc. Final inspection shall be carried out at the consignee end after receipt of materials.
8. **PERFORMANCE BANK GUARANTEE:** You shall furnish a Performance Bank Guarantee as per **Appendix-II** enclosed on schedule/Nationalized Bank in India valid for three months beyond the expiry of Guarantee/Warranty period as at Annexure-'A' for 10 % value of the order i.e. Rs.215720.00 shall have to submitted to MM Division, BCCL, 6, Lyons Range, 4<sup>th</sup> Floor, Kolkata-700001 on commencement of supply. PBG may be submitted either for the entire order quantity at a time or each lot wise.
9. **Transit Insurance** – Shall be arranged and covered by you for safe arrival of materials to the consignee end at your cost and risk.
10. **PENALTY FOR FAILURE TO SUPPLY IN TIME:**  
The delivery of stores stipulated in Purchase order shall be deemed to be of the essence of the contract and delivery of the stores must be completed by the date specified. No materials should be supplied beyond the specified delivery period, unless specific approval has been obtained from the purchaser.  
In the event of failure to deliver the stores within the stipulated date/ period in accordance with the samples and/or specification mentioned in the supply order, and in the event of breach of any terms and conditions mentioned in the supply order. Bharat Coking Coal Limited reserves the right:  
a) To recover from successful tenderer, as agreed liquidated damages, a sum not less than 0.5% (half percentage) of the price of the stores which successful tenderer has not been able to supply (for this purpose part of a unit supplied will not be considered) as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10%. Where felt necessary the limit of 10% can be increased to 15% at the discretion of Head of the Materials Management Division.

- b) To purchase elsewhere, after due notice to the successful tenderer on the account and at the risk of the defaulting supplier the stores not supplied or others of a similar description without canceling the supply order in respect of consignment not yet due for supply or
- c) To cancel the supply order or a portion thereof, and if so desired to purchase the store at the risk and cost of the defaulting supplier and also
- d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed shall not be more than the agreed liquidated damages referred to in clause (a) above.
- e) To encash any Bank guarantee which is available for recovery of the penalty or
- f) To forfeit the security deposit full or in part.
- g) Whenever under the contract a sum of money is recoverable from and payable by the supplier, BCCL shall be entitled to recover such sum by appropriating, in part or whole by deducting any sum or which at any time thereafter may be due to the successful tenderer in this or any other contract with Bharat Coking Coal Ltd. or any subsidiary of Coal India Ltd. Should this sum be not sufficient to cover the full amount recoverable, the successful tenderer shall pay BCCL on demand the remaining amount. The supplier shall not be entitled to any gain under this clause.

#### 11. PRICE FALL CLAUSE.

- i) The prices charged for the stores supplied under the contract by the supplier shall in no event exceed the lowest price at which the supplier offer to sell the stores of identical description to any other organization from date of offer till completion of supply under the contract.
- ii) If at any time during the said period the supplier offers lower sale price of such stores to any other organization at a price lower than the price chargeable under this contract, the supplier shall forthwith notify such reduction or sale to the consignee concerned under intimation to CGM (MM), Bharat Coking Coal Limited, Commercial Block, Level –III, Koyla Bhavan, Koyla Nagar, Dhanbad and the price payable under the contract for the stores supplied after the date of coming into force of such reduction or sale, shall stand correspondingly reduced. The above stipulated will not, however apply to exports by the supplier.

12. **Submission of Bills**-100% value of bill duly stamped, signed & pre-receipted in quadruplicate as per terms of the order should be submitted for payment to the consignee, which shall be subsequently forwarded to the Paying Authority by the Consignee. Bill should be submitted along with delivery challan in original, Consignee note (if any), packing list if any, Guarantee/ Warranty certificate, Copy of valid BIS license and valid NSIC certificate, Test certificate required, proof of payment of freight charges if freight is claimed, documentary evidence of Excise duty payment i.e Excise Invoice if claimed, Price Certificate, Copy of Inspection Note of CMPDIL and other relevant documents, as per order.

#### 13. **Composite Guarantee /Warranty :**

- a) **Design Life:** The meter shall have a design life of at least 10 years.
- b) **Guarantee:** Materials supplied should be guaranteed for a period of 12 months from the date of commissioning or 18 months from the date of receipt and acceptance of materials at consignee end against any manufacturing defects/workmanship/inferior quality. Any defects observed on this account shall be attended within 07 days from the date of receipt of report and immediately replace the materials within 30 days free of cost.

14. **PRICE CERTIFICATE:** You should submit a certificate along with bill as stated below  
“The rates of the stores under this contract are the lowest at which we are selling to any other customer/Govt. Deptt. / Subsidiaries of CIL/ Other PSUs. If the materials are sold at any lower rate than that mentioned in this contract to any other agency, the same will automatically be applied to this contract from that date “

15. **Packing** – AS per Clause : 14 of **Annexure-‘A’** enclosed..

**16 Force Majeure Clauses –**

If the execution of the Contract / Supply Order is delayed beyond the period stipulated in the Contract / Supply Order as a result of hostilities, declaration of embargo or blockade or flood, acts of nature or any other contingency beyond the supplier's control due to act of God, then BCCL may allow such additional time by extending the delivery period as is considered justified by the circumstances of the case and its decision shall be final. In case additional time is granted by BCCL for execution of the Contract/ Supply Order, the Contract/Supply Order shall be read and understood as if it had contained from its inception the delivery date as extended.

a) The successful bidder will advise, in the event of his having to resort to this clause, by a registered letter, duly certified by the local chamber of commerce, or statutory authorities, the beginning and end of the causes of the delay, within 15 days of the occurrence and cession of such force majeure conditions. In the event of delay lasting out of force majeure, BCCL will reserve the right to cancel the contract, and provisions governing termination of contract as stated in the bid documents will apply.

b) For delay arising out of Force majeure, the bidder will not claim the extension in completion date for a period exceeding the period of delay attributable to the causes of force majeure and neither BCCL nor the bidder shall be liable to pay extra cost provided it is mutually established that the force majeure conditions did actually exist.

c) If any of the force majeure conditions exist in the place of operation of bidder even in the time of submission of bid, he will categorically specify them in his bid, and state whether they have been taken in to consideration in their quotation.

17. **Consignee** – Depot Officer, Ekra Central Stores. P.O: - Bansjora, Block-II Area, BCCL, Dhanbad, Jharkhand, India (Phone NO:-0326-2330350)

18. **Paying Authority**- Sr.Manager (F) I/C, BCCL, KOLKATA.

19. **ALL DISPUTES ARE SUBJECT TO DHANBAD COURT AND JHARKHAND HIGH COURT JURISDICTION ONLY.**

20. **Issue of Road Permit** - Road Permit if required may be obtained directly from the Consignee under intimation to this office.

ALL OTHER TERMS & CONDITIONS AND TECHNICAL SPECIFICATIONS ALONG WITH SCOPE OF SUPPLY WILL STRICTLY BE AS PER OUR NIT.

This contract is concluded with the issuance of this order. We are enclosing 2 copies of the Purchase order, one of which should be returned to us duly stamped and signed. This issues with the approval of the Competent Authority.

Yours faithfully,  
For & on behalf of Bharat Coking Coal Ltd.

Chief Manager (MM), Kol

**INDENT REFERENCE**

Sl No	Indent No. And Date	Budget Certification no. & Fund Certification no. & date	Indenting Authority
1	BCCL/CGM (E&M)/F.C.Indent/09-10/EM/01 dt.04.03.2010 . Inward Regn.No: 0159(10-11) dt.22.01.2011	1.BCCL/C&B/CAP/12-13/ P&M/ HQ/121/98/248 eBC dtd.27.09.2012 for Rs.2157191.38 2. e-FC No:106 dt.12.10.2012 for Rs.2157191.38	CGM(E&M),BCCL, Koyla Bhavan, Dhanbad.

**MATERIAL CODE NO:**

Material Code No:	94095300336
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Copy to:

1. GM (MM) PUR/GM (MM)(S), BCCL, Koyla Bhavan, Dhanbad.
2. CGM (E&M), BCCL, Koyla Bhavan, Dhanbad.
3. Sr.Manager (F)/I/C, BCCL, Kolkata.
4. Depot Officer, Central Store, Ekra, BCCL, Dhanbad.
5. MM (Tech Cell), MM Div, Koyla Bhavan. Dhanbad.
6. GM (E&M) Inspection, CMPDIL, GONDOWANA PLACE, KANKE ROAD, RANCHI-834008, JHARKHAND.
7. Master File/Office Copy.

**ANNEXURE-'B'**

Details in respect of both the supplier as well as the Consignee to be incorporated in the Invoice for getting input credit for VAT as well as CENVAT:

(A) CONSIGNEE DETAILS:

1. VAT TIN NO. - 20821500736
2. CST No. – KT-254(C)
3. Circle/Sub-circle where it is registered - Katras Circle, Katras.
4. S.S.I. Regd. No, if any
5. Service Tax Regd. No.,if any
6. Central Excise Duty Regd. No. - aaacb7934MEM007
7. Central Excise Range (code) - Dhanbad Code - 02
8. Central Excise Division (code) - Dhanbad Code - 02
9. Central Excise Commissionerate (code) – Ranchi Code - 87

5(Five) copies of Invoices are to be submitted by the supplier (Two copies for Area Finance to be retained by the Central Stores/Regional Stores and to be forwarded to AFM for Tax purposes, One copy for Central/Regional Stores, one for Fund Section and one Office Copy for MM-Finance).

The 1<sup>st</sup> copy of CENVAT Invoice must be affixed with "ORIGINAL FOR BUYER" meant for concerned Area Finance Manager for availing CENVAT Credit.

(B) VENDOR DETAILS: (TO BE FILLED IN BY VENDOR).

**TECHNICAL SPECIFICATIONS FOR WHOLE CURRENT A.C.SINGLE PHASE  
TWO WIRE STATIC ENERGY METER OF ACCURACY CLASS 1.0 (10-40A)  
WITH COMMUNICATION FACILITY**

Sl.no.	Description	Quantity
01.	Energy Meter 1 $\phi$ 220V-250V, 10A-40A	2138 Nos.

**1. SCOPE:**

The specification covers the design, manufacturing, testing, supply and delivery of AC whole current 1 phase 2 wire static watt hour meter for measurement of active energy (kWh) with initial and sustained accuracy of class 1.0 for solidly earthed system with balanced and unbalanced loads having power factor in the range of zero to unity(Lagging/Leading).

**2. APPLICABLE STANDARDS**

The meter shall comply with the latest version of IS-13779, IEC-61036 and CBIP TKI technical report 88/1998(latest amendments).

**3. CLIMATIC CONDITIONS**

The meter shall be suitably designed and treated for normal life and satisfactory operation under the hot and hazardous tropical climate conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish which provides suitable protection to them from any injurious effect of excessive humidity. The Static Energy Meter shall be suitable for satisfactorily working under the following climatic conditions:-

Sl. No.	Climatic Conditions	Value
1.	Max. ambient air temperature	60 <sup>0</sup> C
2.	Min. ambient air temperature	(-)5 <sup>0</sup> C
3.	Minimum Relative Humidity (% age)	26
4.	Max. Relative Humidity (% age)	95

**4. RATINGS:**

The rating of kWh meter should be as follows:-

Voltage Rating 220 -250 V AC

Current Rating (Basic Current) 10A

Maximum Continuous Current 600% of Basic Current

Starting current 0.2% of Basic Current at unity power factor

Current Rating 10-40 A

Class of Accuracy 1.0

Frequency 50 Hz +/-5%

Power loss As per ISS-13779

Resistance to surge voltage >6 kV peak As per ISS-13779 1.2/50Micro sec.

IEC-61036/CBIP-88

Test voltage of 50Hz for 1 Min. 2 kV rms

Clock time accuracy +/- 5 ppm at 25°C

Temperature rise As per ISS-13779

Power consumption by meter As per ISS-13779

## **5. SUPPLY SYSTEM:**

Supply Voltage 240V AC

Voltage variation range -40% to +20%

Frequency 50Hz +/- 5%

Power Factor +1 to -1

## **6. QUANTITY TO BE MEASURED / MONITORED**

The display order shall be:-

### **6.1 Default Display (Continuously on auto scroll).**

6.1.1 Cumulative Active Energy kWh.

6.1.2 Current **calendar month** MD in kW

6.1.3 Last **calendar** month **Cumulative** kWh.

6.1.4 Last **calendar** month MD in kW.

These parameters should be displayed on the LCD continuously for a period of 15 seconds on Auto scroll.

### **6.2 On Demand Display(with push button)**

6.2.1 Internal diagnostics

6.2.2 Cumulative kWh

6.2.3 Date

6.2.4 Real Time

#### **6.2.5 Voltage in V**

#### **6.2.6 Current I**

#### **6.2.7 Inst. Power kW**

6.2.8 Current **calendar month** MD in kW

6.2.9 Last **calendar** month cumulative kWh

6.2.10 Last **calendar** month MD in kW

6.2.11 Last **calendar** month MD in kW occurrence Date

6.2.12 Last **calendar** month MD in kW occurrence Time

6.2.13 Meter Serial Number

These parameters should be displayed on the LCD continuously for a period of 15 seconds on Auto scroll. The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds.

**7 Auto Display:** The meter shall have LED/LCD backlit type electronic display with minimum six digits with **additional provision for legend**. The decimal digit shall be clearly distinguished from integral digit. The registered parameters i.e. the data stored in meter shall not be lost/ affected in the event of power failure. The display shall also not be effected by electric and magnetic disturbances. The meter shall have non volatile memory (NVM) which does not need battery back up. The NVM shall have minimum retention period 10 years. The minimum character **dimensions** shall be 8.5mmx5mm. Impulse Counter & Stepper Motor shall not be provided in the meter.

The default MD integration period shall have facility for its programming **5-30 Minutes in steps of five** (preferably 30 minutes) at site with proper security.

7.1 Meter shall store MD integration period along with date and time at the end of every integration period, new MD shall be previous MD and store, whichever is higher

7.2 MD shall be reset automatically at the defined date (or period) or through CMRI manually as when required. The re-setting shall be automatic at the end of every month i.e. 24 hours of last day of month. Six last M.D. values shall be stored in the memory also with auto reset count in numbers. In addition to this the cumulative kWh **shall** also be stored in the memory at **same time** at the end of every month. The meter should be capable of storing last 6 month data with an option to retrieve the same.

7.3 Manual MD resetting **should be possible. Use of scalable push button or any other method is optional.**



**7.4 BILLING DATA:**

7.4.1 Meter serial number, Date and time, kWh, MD in kW, History of kWh & MD for last 6 months along with TOD readings.

7.4.2 All the above parameters (namely kWh, MD in kW) are meter readings.

7.4.3 All these data shall be accessible for reading, recording and spot billing by downloading through optical port on MRI or Laptop computers.

**8 STARTING CURRENT:**

The starting current of the meter shall be 0.2% of basic current at unity power factor.

**9 RUNNING AT NO LOAD:**

The meter should comply with the requirements of IEC 1036/IS-13779 and CBIP Technical Report 88/1998 (Latest amendment)

**10 ACCURACY & LIMITS OF ERRORS:**

The error of meters shall not exceed the permissible limits per standard IS 13779 (latest version) and CBIP Technical Report 88/1998 (with latest amendment).

**11 TEST OUTPUT DEVICE:**

The meter shall have a test output device in the form of a pulse indicator accessible from the front and capable of being monitored by suitable testing equipment.

**12 TESTS**

**12.1 TYPE TESTS & TEST CERTIFICATES:**

Meters shall be fully type tested as per IS: 13779 (latest version). The type test certificates shall be submitted along with the offer. Offer without Type Test Report shall be liable for rejection. The Type test certificates shall not be more than 3 years old. Test certificates of appropriate range shall be accepted.

**12.2 ROUTINE TESTS:**

The Acceptance and Routine tests shall be carried out as per latest version of IS- 13779.

**12.3 EFFECT OF MAGNETIC FIELD OF EXTERNAL ORIGIN:**

The meter shall be provided with adequate magnetic shielding so that any external magnetic field (AC electro-magnets/DC magnet) as per the value specify in CBIP technical report-88 (with latest amendment) application on the meter shall not effect the proper functioning and recoding of energy. However, the Meter should log the presence of abnormal magnetic induction With date and time in case the meter is affected.

**12.4 D.C IMMUNITY TEST:**

The meter should comply with the requirements of IEC 61036/IS-13779 and CBIP Technical Report 88/1998 (Latest amendment)

**12.5 INFLUENCE QUANTITIES:**

The meter shall work satisfactorily with guaranteed accuracy as per limit of IS 13779 and CBIP Technical Report 88/1988 (with latest amendments) under presence of the following quantities:

12.5.1 External Magnetic field 0.5 Tesla.

12.5.2 Electro Magnetic Field.

12.5.3 Radio Frequency interference.

12.5.4 Vibration.

12.5.5 Harmonic wave form.

12.5.6 Voltage fluctuation.

12.5.7 Electromagnetic high frequency field.

**12.6 ELECTROMAGNETIC COMPATIBILITY:**

The above shall conform to requirements listed in IS-13779 and IEC-61036 and CBIP Technical Report 88/1998 (Latest Amendments) and should be protected against radiated interference from either magnetic or radio frequency sources. The meter shall also withstand DC immunity test so as to ensure that the meter does not saturate on passage of direct current.

### **12.7 METER POWER SUPPLY:**

The meter should withstand the maximum system voltage i.e 440 volts continuously. In case of failure of power supply, the meter should display the measured quantities minimum for 24 hours. **This event will be logged in the history as power failure (Indicating time, date & duration).**

### **13. CONSTRUCTION:**

#### **13.1 METER CASE & COVER:**

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

##### **13.1.1 POLYCARBONATE PLASTIC:**

Self-insulating non-corroding polycarbonate material, which would ensure maximum strength against distortion and also injury to working part during normal use and rough handling during transportation. The material shall not soften/melt on heating. The meter casing material should be glass reinforced, flame retardant, unbreakable polycarbonate plastic material to ensure high reliability, long trouble free life, safety against electric shock, spread of fire and effect of excessive temperature. The material shall be corrosion resistant & inert to chemicals, oxidizing agents, petro chemical products, acids, salts and ultraviolet radiation. The meter chamber shall **conform to the degree of protection IP 51 of IS: 12063/ IEC: 529 for protection against ingress of dust and moisture.** The supplier should indicate hardness, melting temperature and tensile yield strength of the material and necessary test certificates of the same shall be furnished. The meter case and transparent cover should be sturdy enough to prevent damage during transportation and installation.

The polycarbonate plastic housing used may be provided with a key hole on the top for fixing which should not be accessible to the consumer after terminal cover is sealed. The meter shall withstand external magnetic influence as per latest amendments of CBIP 88.

The polycarbonate plastic used shall conform to IS: 11731 besides meeting the test requirement of heat reflection test as per ISO-75, **Glow wire test as per IS: 11000 (part 2/SEC-I) 1984 OR IEC PUB, 60695-2-12, Ball pressure test as per IEC-60695-2-12 and Flammability Test as per IS 11731 (Part-2) 1986.**

#### **13.2 TERMINAL BLOCK & COVER:**

The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block shall be made from best quality non-hygroscopic, flame retardant material (capable of passing the flammability tests given in IS-11731) with nickel-plated brass for connecting terminals. The clamping screw should be provided inside the terminal cover and should have metallic sleeve molded within the block to avoid damage during tightening of the screws.

The terminals in the terminal block shall be of adequate length in order to have proper grip of conductor with the help of two screws through **assembly** of a plate so as to **make** cage type arrangement. The screws shall have thread size not less than M4 and head having 4 -6 mm diameter. The screw shall not have pointed ends at the end of threads. All terminals and connecting screws and washers should be of tinned/nickel plated brass material.

The internal diameter of terminal hole shall be min. 8.5 mm and should comfortably accommodate the 25 mm<sup>2</sup> cable conductors. **Normally the cable used in such meters is 6 mm<sup>2</sup> & 10 mm<sup>2</sup> however at some places 25 mm<sup>2</sup> can be used.** The holes in the insulating material shall be of sufficient size to accommodate the insulation of conductor also.

The terminal cover shall be polycarbonate plastic with minimum thickness **2.0mm** mm and the terminal cover shall be of extended type completely covering the terminal block and fixing holes except for the provision of conductor entry at the bottom for incoming and outgoing leads. The terminal cover shall be so provided that it remains permanently connected with meter base. The supplier shall suitably design the cover, so that it opens or closes like a hinged door and the ends of hinged pins shall be flattened so that it does not come out. Provision for Minimum one number utility seal(s) as the terminal cover shall be made. Supply voltage circuit is to be connected solidly from inside.

**Plastic grade for Meter terminals should be LEXAN 500R and for meter terminal cover should be LAXAN 143R/940A.**

### **13.3 DESIGN:**

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-13779 (latest version). The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling. The construction of the meter shall ensure consistent performance under all conditions especially during dust storm/heavy rains/very hot weather. The insulating material used in the meter should be non-hygroscopic, non-aging and of tested quality. The meter should be sealed in such a way that internal parts of the meter are inaccessible. Further meter shall withstand an insulation test of 4 kV and impulse test at 8KV & the terminal block and meter case shall have safety against spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per the relevant IS-13779.

### **13.4 CIRCUITARY:**

The meter shall have an operational indication device such as blinking LED given type indication. The following indications are mandatory.

13.4.1 Meter Calibration.

13.4.2 Phase available indication

13.4.3 Load earthling .

13.4.4 Current reversal.

The operation indicator should be accessible from the front .The mounting of components on the PCB (Printed Circuit Board) shall preferably be SMT (Surface Mounted Technology) type. The Electronic Components used in the meter shall be of high quality and there shall be no drift in the accuracy of the meter at least up to 10 years. The circuitry in the meter shall be compatible with 2x8 bit (or better) processor and the meter shall be based on digital measuring and sampling technique.

### **13.5 CURRENT & PRESSURE COILS**

13.5.1 Current Circuit As per IS- 13779

13.5.2 Potential Circuit As per IS-13779. i.e Voltage Circuit

### **13.6 FIXING ARRANGEMENT:**

Every meter shall have three fixing holes one at the top and two at the bottom. The top hole shall be provided with a special clip at the back of the meter so that holding screw is not accessible to the consumer after the fixing of the meters. The lower fixing screws shall be provided under the sealed terminal cover. The requisite fixing screws shall be supplied with each meter.

### **13.7 SEALING:**

Minimum 2 No. unidirectional sealing screw with 2 holes each shall be provided for proper fixing of meter cover with 2 No. polycarbonate numbered seals, of good quality, on adjacent side (one by the meter manufacturer and the other by the Utility/ Nigam on both adjacent side.) so that meter internal parts are only accessible after breaking the seals, ultrasonic welding **and** push fit arrangement of case/cover of the meter.

### **13.8 SOFTWARE & COMMUNICATION COMPATIBILITY:**

13.8.1 Meter should be provided with optical communication port for error free data operation as per IEC-1107/ANSI / PACT, i.e. data down loading from meter. The optical port shall be compatible to RS232 **one additional RS 485 port**. The RS 232 port shall be capable to transfer the data locally i.e. through CMRI, Laptop etc. & transfer the data to the remote end through PSTN/Optical fiber/GSM/CDMA/RF/any other technology to the main computer/Laptop by using Modem. The meter shall have necessary facilities to transfer the data via the Communication port, the hand held data collection device (DCD) and to the computer at remote end to get complete details in alpha numeric form. The necessary software for this purpose shall be provided by the supplier. The data details of RS485 port (MODBUS Memory mapping) shall be submitted by the bidder along with the bid.

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

13.8.4 The data transfer (from meter to CMRI /AMR equipment) rate should be minimum 1200/9600 bps.

13.9.5 The supplier shall provide meter reading protocols / API.

### **14. PACKING:**

The meters shall be suitably packed for vertical/horizontal support to withstand handling during transport. The bidder shall be responsible for any damage during transit due to inadequate or improper packing. The meters shall preferably be supplied in thermocol packing of minimum 10 mm thickness.

### **15. DESIGN LIFE:**

The meter shall have a design life of at least 10 years.

### **16. QUALITY ASSURANCE PLAN:**

The design life of the meter shall be minimum 10 years and to prove the design life, the firm shall have at least the following Quality Assurance Plan:

16.1 The factory shall be completely dust proof.

16.2 The testing rooms shall be temperature and humidity controlled as per relevant standard.

16.3 The testing and calibrating equipment should be automatic and all test equipment shall Have their valid calibration certificates.

16.4 Power supply used in testing equipment shall be distortion free with sinusoidal wave Forms and maintaining constant voltage current and frequency as per the relevantstandards.

16.5 During the manufacturing of the meters the following checks shall be carried out:

16.5.1 Meter frame dimension tolerance shall be minimum.

16.5.2 The assembly of parts shall be done with the help of jigs and fixtures so that human Errors are eliminated.

16.5.3 The meters shall be batch tested on automatic, computerized test bench and the results shall be printed directly without any human errors.

### **17. ANTI TAMPER FEATURES:**

The meter shall not be affected by any remote control device and shall continue recording energy under any one or combinations of the following condition.

17.1 The meter shall be capable of recording energy correctly even if input and output terminals are interchanged. Also the meter shall record correctly even if phase and neutral are inter changed.

17.2 The meter shall register energy even the load is not terminated back to the meter and instead current is drawn through a local earth under **following** conditions.

17.2.1 When phase and neutral are connected correctly.

17.2.2 When phase and neutral wires connected are interchanged at input terminals.

17.3 Also when only phase is available either in neutral or phase terminal and earth loading has been done. In such circumstances only minimum starting current of **1 Amp**. Should be drawn and in other conditions as per relevant ISS.

17.4 The meter shall be factory calibrated through software and no modification of calibration shall be possible at site by any means what-so-ever. Trim pot method for calibration shall not be acceptable. No mechanical or potentiometer like devices shall be used for meter calibration that possibly can alter the meter accuracy either in case of change in climatic conditions or intentionally at site. Calibration Certificate/Routine test certificate should be supplied with the dispatch.

17.5 Meter shall record the energy accurately under the effect of radiation emitted by mobile phone. The test shall be carried out by bringing a mobile phone in the **close proximity almost touching the meter** of the meter for 10 minutes when there is an incoming call ( **ringing or being received** ) and shall be checked

17.6 The Meter shall immune to the external magnetic field upto 0.5 Tesla with permanent magnet of 75x75x35 mm and in case external magnetic field exceeding 0.5 Tesla(permanent magnet), the meter shall log the event of attempt of tampering by the external magnetic field, occurrences & restoration with date & time. The meter shall start record energy at maximum current I<sub>max</sub> under such influence of abnormal magnetic field irrespective of actual load. The meter shall record as per actual load once the external abnormal magnetic field is removed.

17.7 Meter shall immune of any abnormal frequency signal OR Meter shall log & display as tamper in the event abnormal frequency signal i.e. less than 47.5Hz OR more than 52.5 Hz is supplied to the meter.

17.8 Load survey-for all the billing parameters/anti tamper features shall be available for 75 days,

17.9 Minimum 100 numbers of events (occurrences & restoration with date & time of more than 10 minutes) shall be available in the meter memory on roll over facility. All the information shall be available in a standard simple format.

17.10 Meter should register energy correctly within its class of accuracy at 240V and UPF even with neutral disconnected and neutral available through by putting variable resistance/capacitor/diode.

17.11 The meter shall work satisfactorily under presence of various influencing conditions like External Magnetic Field, Electromagnetic Field, Radio Frequency Interference, Vibrations, harmonic Distortion, Voltage/ Frequency Fluctuations, and electromagnetic High Frequency Fields etc. The meter should be immune to electrostatic discharges (generated by High Voltage/Frequency Tamper device) of voltage up to 35 KV level (approx.) Meter should log the tamper event with date and time along with showing in display and start recording at I<sub>max</sub> if ESD voltage level is more than 35 KV (approx.)

To this effect a test certificate must submitted by the bidder from any Govt. approved NABL Lab/Power Utility as per following criteria. The accuracy of the meter should not be affected with the application of abnormal voltage /frequency generating device ( having spark discharge of approximately 35Kv) in any of the following manner for a total period of 10 minutes:

17.11.1 On phase or neutral terminals

17.11.2 On any connecting wires of the meter.

17.11.3 Voltage discharge with 0-10mm spark gap

17.11.4 Spark on meter body

17.11.5 At any place in load circuit

The accuracy of meter should be checked before, during & after the application of said devices.

17.12 **Meter Body Opening:** The meter shall have provision for detection and logging of opening of meter cover. Meter must detect/log with date and time meter body opening tamper, body opening must also be logged in absence of power supply. In case of meter body opening display of “Cover open” Must appear continuously even after the re-closing the cover so that at the time of meter reading it must come in notice. However cover open “date & time” should appear in push button mode.

**18. NAME PLATE AND MARKING:**

18.1 Every meter shall have a name plate clearly visible and indelible and distinctly marked in accordance with IS 13779 (latest version). The following information should appear on an external plate attached to the meter cover:

18.1.1 Manufacturer’s name or trade mark and place of manufacture.

18.1.2 Designation of type.

18.1.3 Number of phases and number of wires for which the meter is suitable.

18.2 In addition to above, the following information shall be marked on a name plate preferably placed with in the meter:

18.2.1 Sr. No. and year of manufacture

18.2.2 Principal unit in which the meter records.

18.2.3 Reference voltage.

18.2.4 Basic current and rated maximum current.

18.2.5 Reference frequency in Hz.

18.2.6 Meter constant.

18.2.7 Class index.

18.2.8 Reference temperature.

18.2.9 The words properties of ‘BCCL’

18.2.10 BIS Marking

**19. TESTING AND MANUFACTURING FACILITIES:**

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

19.1 Insulation resistance measurement.

19.2 Running at no load.

19.3 Starting current test.

19.4 Limits of error.

19.5 Range of adjustment.

19.6 Power loss in voltage and current coil.

19.7 Repeatability of error.

19.8 Transportation test.

19.9 Low load run test.

19.10 Heating test.

19.11 Protection against water, dust and moisture. The meter shall conform to the degree of protection IP-51 against ingress of dust, moisture and vermin’s

19.12 Effect of Magnetic field of external origin as per clause 5.6.2. of CBIP Report-88

**Following Documents will have to be submitted at the time of supply:**

**1.) An attested copy of currently valid BIS licence 13779**

**2.) Copy of Routine test certificates as per relevant IS.**

**20. Technical Data : -**

Sr. No.	DESCRIPTION	AS OFFERED BY FIRM
1.	Maker's Name	Modern Transformers Pvt.Ltd.
2.	Type of meter i) Basic current (A) ii) Maximum current	Single Phase 2 Wire Static Energy Meter. 10.0 A 40.0 A
3.	Standards to which the meter conform	IS: 13779,IEC-61036 & CBIP-88
4.	Overload capacity	60.0A
5.	Dynamic range	3000
6.	Power supply variation i) Specified operational range ii) Limit rage of operation iii) Frequency	220 to 250 V AC 144 to 288 V AC 47.5 to 52.5 Hz.
7.	Accuracy class	Class 1.0
8.	P.F. Range	Zero to Unity both Lag and Lead.
9.	Variation of voltage at which meter functions normally	144 to 288 V AC
10.	Power consumption per phase i) Voltage circuit ii) Current circuit	As per ISS:13779 As per ISS:13779
11.	Minimum starting current of the meter (% Ib)	0.2% of Ib
12.	Impulse voltage	As per ISS:13779
13.	Display (No. of digits and character height)	6 Digit, Min 8.5 mm x 5mm

Sr. No	DESCRIPTION	AS OFFERED BY FIRM
14.	Continuous display (Auto Display mode)	As per our Technical specifications.
15.	Operational indication-LED	Yes, Provided
16.	a) Material for base/terminal block b) Material for meter cover/terminal cover	FR Grade Polycarbonate, Black Colour Transparent Polycarbonate.
17.	a) Meter terminal block having sealable extended terminal cover. b) No of seals to be Provided. c) Connection diagram inside the terminal cover	a) Yes, Extended Terminal cover Provided. b) 2 nos on Meter Body & 1 no. on T-Cover. c) Yes, Provided.
18.	Communication port.	Optical port compatible to RS232 and RS485 Port.
19.	REAL Time clock with back up battery Life of battery	Yes, Provided. 10 Years.
20.	Non volatile memory retention time in absence of power.	10 Years.
21.	MD reset	MD shall be reset automatically at defined date or period or through CMRI manually as when required.
22.	Self diagnostic feature	Yes, Provided.
23.	Load survey	Billing parameters and Anti – Tamper Features for 75days.
24.	Snap shot facility	Yes , provided.
25.	No. of tamper events	100 Nos.
26.	Temper persistence time	10.0 Mins.
27.	Routine tests	Yes, Routine Test are conducted at your Plant.
28.	Acceptance tests	Yes, Acceptance Test are conducted at your Plant.
29.	Type tests	Type test report should be enclosed.
30.	Testing facilities	Yes, we have all the Testing Facilities for Routine and acceptance Test.
31.	BIS licence	CM/L-3101324 should be currently valid & to be submitted at the time of supply.



**APPENDIX-II**

**Format of Bank Guarantee for Security Deposit:/PBG**

*(RS.250 non-judicial stamp paper)*

Messers -----, a Company having its office ----- (hereinafter called the Contractor) has entered into a Contract No. ----- dated ----- ( hereinafter called the said Contract ) with Bharat Coking Coal Limited (hereinafter called BCCL, Buyer) to supply equipment on the terms and conditions contained in the said contract.

1. It has been agreed that hundred percent ( 100% ) payment of the value of the equipment will be made to the Contractor in terms of the said contract on the Contractor furnishing to the purchaser a Bank Guarantee for the sum of ----- equivalent to 10% of the value of order by the Contractor, as security for the due and faithful performance of the terms of the said contract and against any loss or damage caused to or would be caused to or suffered by Purchaser by reason of any breach by the said Seller of any of the terms and conditions contained in the said contract.

The ----- having its office at ----- has at the request of Seller agreed to give the guarantee hereinafter contained.

2. We, -----Bank Ltd. do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Purchaser stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Purchaser by reason of any breach by the said Seller or any of the terms and conditions contained in the said Contract or by reason of the Seller's failure to perform the said contract. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. We shall not withhold the payment on the ground that the Seller has disputed its liability to pay or has disputed the quantum of the amount or that any arbitration proceeding or legal proceeding is pending between purchaser and the Seller regarding the claim. However, our liability under this guarantee shall be restricted to an amount not exceeding -----.

3. We, -----, further agree that the guarantee herein contained shall come into force from the date hereof and shall remain in full force and effect during the period that would be taken for the performance of the said contract and that it shall continue to be enforceable till all the dues of the Purchaser under or by virtue of the said contract have been fully paid and its claims satisfied or purchaser certifies that the terms and conditions of the said contract have been fully and properly carried out by the said Seller and accordingly discharge the guarantee.

Unless a demand or claim under this guarantee is made on us in writing on or before the ----- (date to be given), we shall be discharged from all liability under this guarantee thereafter.

4. We ,-----Bank Ltd., further agree with the Purchaser, that the Purchaser, shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said -6-contract or to extend time of performance by the said seller (s) from time to time or to

postpone for any time or from time to time any of the powers exercisable by the Purchaser, against the said Seller and to forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our liability by reason or any such variation or extension being granted to the said Seller or for any forbearance act or omission on the part of the Purchaser, or any indulgence by the Purchaser, to the said Seller or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank further agrees that in case this guarantee is required for a longer period and it is not extended by the Bank beyond the period specified above, the Bank shall pay to the Purchaser the said sum of ----- (specify the amount) or such lesser sum as may then be due to the Purchaser and as the Purchaser may demand.

5. We, ----- Bank Ltd., further agree to renew the Bank Guarantee from time to time at the request of the BCCL.

6. We, ----- Bank Ltd., lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Purchaser, in writing.

7.. The Bank has under its constitution power to give this guarantee and ----- who have signed it on behalf of the Bank have authority to do so.

8. This Bank Guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

Dated : ..... Day of ..... 20.....  
for ..... Bank Limited.

**Signature of the authorised person  
for and on behalf of the Bank.**