

INVITATION FOR TENDER FOR SUPPLY OF EQUIPMENT

Sealed tender offers are invited in two separate sealed covers (Technical and Commercial offers) from eligible manufacturers/suppliers or their direct Indian agents for the supply of the following equipment.

ADVANCED THREE-PHASE POWER QUALITY AND ENERGY ANALYZER

Please send offers, ALONG WITH DESCRIPTIVE CATALOGUE/ BROCHURE. The validity of the bid should be at least four months (120 days) or more from the date of the opening of this tender. Please ensure that your quotation reaches not later than **19.01.2018 at 15:00 Hrs** at the following address:

Dr. Suman Maiti,
Assistant Professor, Dept. of Electrical Engineering,
Indian Institute of Technology Kharagpur – 721 302, West Bengal, India

Earnest money of **Rs. 5,000/-** is to be deposited in the form of Account payee Demand Draft in favour of IIT Kharagpur, payable at Kharagpur, India. Any bid which is not accompanied with an EMD shall be summarily rejected. Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

| | |
|---|---|
| Tender Reference | IIT/SRIC/EE / IHL / SM / 2017-18/EQ-7, Dated: 27.12.2017 |
| Price of Tender Document | NIL |
| Last Date and Time for submitting the tender document | 19.01.2018 at 15:00 Hrs (Indian time) |
| Time and Date of Opening of Technical Bids | 19.01.2018 at 16:00 Hrs (Indian time) |
| Place of Opening Tender | Electrical Engineering, Indian Institute of Technology Kharagpur – 721 302, West Bengal, India |
| Address of Communication | As stated above |
| Contact Telephone Numbers | +91- 3222 - 28 3090 |
| E-mail | Suman.maiti@ee.iitkgp.ernet.in |

DETAILED TECHNICAL SPECIFICATIONS FOR ADVANCED THREE-PHASE POWER QUALITY AND ENERGY ANALYZER

The three phase power quality analyzer should be of portable in nature and supplied with **4 Flexible clamp on current probes** with the following features.

The analyzer should measure the following:-

- Three phase and phase wise voltage, current, power, power factor, $\text{Cos}\phi$,
- Energy and Power
- Dips, Swells, interruptions, crest factor and unbalance
- Transient detection upto 6kV 200kHz on all phases simultaneously
- Inrush current
- Flicker
- Phaser diagram and waveforms
- Frequency
- Harmonics for voltage, current and power upto 50th order, Interharmonics
- Upto seven power quality parameter in one screen according to EN 50160
- Min, Max and Avg value for all RMS measurements.
- Power loss due to unbalance and Harmonics
- Inverter Efficiency

The instrument should have following features:-

- Graphical screen with display of measurement, waveform, trends and harmonic spectrum
- The instrument should comply to class A standard as per IEC 61000-4-30
- Minimum of 500 samples per cycle for RMS measurement
- Trend recording option with (i) Automatically records min, max and average values over time for all readings being displayed for the three phases and neutral simultaneously (ii) 5 readings/s continuous sampling per channel, 100/120 reading/s for 1/2 cycle values and Pinst (iii) Tabulated in event list, including 50/60 waveform cycles and 7.5s 1/2 cycle rms Voltage and Amps trend
- Power backup with Standard battery of 7 Hrs or more
- Energy loss calculator
- 8GB (Expandable to 32GB) Memory to store the data, event and waveform
- 99 Screen shots to be stored in the memory
- 4 Flexible current probes to measure all the three phases and also neutral current – 0.5A to 6000A
- The wiring configuration should be displayed in the meter for various configuration (1 phase, star, delta, etc)
- Optically isolated USB Communication port to connect to the PC to download and analyse measurement, waveform, trends and events. Direct access of data from the SD card.
- Software for data downloading and analysis.
- The instrument should have the programming capability for CT/PT ratio up to 10000/1.
- Should be supplied with 3 Nos of Small CT for CT secondary measurement of 10mA to 5A.

Technical specification:-

| Parameter | Range | Accuracy |
|--|---|----------------------------|
| Voltage | | |
| Number of inputs for voltage measurement | 4 (3 phase + neutral) dc-coupled | |
| Vrms (ac+dc) | 1 V to 1000 V phase to neutral with resolution 0.01V | ± 0.1 % of nominal voltage |
| Vpk | 1 Vpk to 1400 Vpk | 5% of nominal voltage |
| Vfund | 1 V to 1000 V phase to neutral with resolution 0.1V | ± 0.1 % of nominal voltage |
| Current, frequency and power factor | | |
| Number of inputs for current measurement | 4 (3 phase + neutral) dc- or ac-coupled Type: Clamp or current transformer with mV output or i430flex-TF | |

| | | |
|---------------------------|--|----------------------------------|
| Amps (ac +dc) | 5 A to 6000 A | ± 0.5% ± 5 counts |
| Frequency | 42 - 57 | ± 0.01 Hz |
| Power factor | 0-1 | ± 0.1% @ nominal load conditions |
| Harmonics | | |
| Harmonic order (n) | DC, 1 to 50 Grouping: Harmonic groups according to IEC 61000-4- 7 | |
| Interharmonic order (n) | OFF, 1 to 50 Grouping: Harmonic and Interharmonic subgroups according to IEC 61000-4-7 | |
| Flicker | | |
| Plt, Pst, Pst(1min) Pinst | 0.00 to 20.00 | ± 5 % |
| Unbalance | | |
| Volts | 0.0 % to 20.0 % | ± 0.1 % |
| Amps | 0.0 % to 20.0 % | ± 1 % |
| Sampling system | | |
| Resolution | 16 bit analog to digital converter on 8 channels | |
| Maximum sampling speed | 200 kS/s on each channel simultaneously | |
| RMS sampling | 5000 samples on 10/12 cycles according to IEC61000-4-30 | |
| PLL synchronization | 4096 samples on 10/12 cycles according to IEC61000-4-7 | |
| Transient | | |
| Transient | Upto 6kV PV Min time duration 5 micro sec | |
| Warranty | Minimum 3 years for main instruments, one year for supplied accessories | |
| Accessories | | |
| Accessories | Power Adapter | |
| | Test lead and Alligator clip set | |
| | color coding clips and regional decals | |
| | Flexible current probes/clamps (4 nos.) | |
| | Memory card, Software, maual and PC connection USB cable | |
| | Carrying case (soft) | |

Safety rating – 600V Cat IV / 1000V CAT III for both meter and clamp

IP Protection – IP 51 or better

Display resolution – 320 X 240 pixels or better with user adjustable contrast and brightness

Built in Real time clock to facilitate time stamped trending and events.

Operating temp - 0 °C to + 50 °C battery only, 0 °C to +40 °C with adapter

Important Note:

The instrument should be upgradable in nature. The following hardware and software upgrade options must be available for upgrade at a later date.

1. Bandwidth Upgrade,
2. 16 Digital Channel Logic Analyser,
3. Spectrum Analyser,
4. Arbitrary Function Generator,
5. Protocol Analyser,
6. Limit/Mask testing application,
7. Power Analysis application, etc

Warranty

Minimum 3 Years or higher from the date of supply. Manufacturer must have their own dedicated Service Center available in India and details of Service Center must be provided while submitting their Quotations

General

Quotations should be submitted either by an OEM or their Authorised Distributors only. Valid Authorisation Certificate from OEM is must incase of Quotations are submitted by Distributors.

GENERAL TERMS & CONDITIONS

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDERS ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPS CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPS SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOP.

THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:

1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE INDIAN AGENT.

1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.

1.3 PLEASE ENCLOSE THE DOCUMENT(S) RELATED TO THE ENLISTMENT OF THE INDIAN AGENT WITH DIRECTOR GENERAL OF SUPPLIES & DISPOSALS (DGS & R) UNDER THE COMPULSORY REGISTRATION SCHEME OF MINISTRY OF FINANCE.

2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. **PRICE BIDS FOR FOREIGN FIRMS:** PRICES ARE TO BE QUOTED ON 'EX-WORKS' DULY PACKED OR ON "FCA/FOB" INTERNATIONAL PORT" BASIS AND ALSO INCLUDING AGENCY COMMISSION PAYABLE TO YOUR INDIAN AGENTS, IF ANY SHOWING CLEARLY THE FOLLOWING BREAK UP:-

- I) EX-WORKS PRICE
- II) PACKING & FORWARDING
- III) FREIGHT
- IV) ANY OTHER RELEVANT EXPENSES.
- V) TAXES PAYABLE BY THE INSTITUTE

INSURANCE WILL BE PAID BY OUR INSTITUTE SEPARATELY AND SHOULD NOT FORM PART OF THE QUOTED PRICE.

PRICE BIDS FOR INDIAN FIRMS: PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS CLEARLY SHOWING THE BREAK UP.

5. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.
6. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN **FE**). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO WITH YOUR

PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.

7. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).
8. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND COMMISSIONING
9. **PAYMENT TERMS FOR FOREIGN FIRMS**

- A) 100% PAYMENT THROUGH SIGHTDRAFT/FORIGN DEMAND DRAFT/LC (EXCEPTIONAL CASES)/SWIFT TELE TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION.
- B) BANK CHARGES ON LC/SD (WITHIN INDIA APPLICANT ACCOUNT AND OUTSIDE INDIA TO BENEFICIARY ACCOUNT).

PAYMENT TERMS FOR INDIAN FIRMS

- A) 100% PAYMENT THROUGH CROSSED ACCOUNT PAYEE CHEQUE / ELECTRONIC TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION.
- B) ENSURE MENTIONING
 - i) BANK DETAILS OF THE BENEFICIARY, VAT NO., SERVICE TAX NO. AND PAN NUMBER
 - ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM ORDER HAS TO BE PLACED

10. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.
11. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
12. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXEMPTION IN TERMS OF GOVT. NOTIFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
13. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IF THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.
14. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.
15. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
16. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.

17. CONDITIONAL OFFER WILL NOT BE ACCEPTED.

18. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.

19. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-

A) CURRENT INCOME TAX AND SALES TAX CLEARANCE CERTIFICATES (VAT No.), SERVICE TAX NO. AND PAN NO.

C) BANKER'S SOLVENCY CERTIFICATE

C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

| DESCRIPTION | JAN. TO MARCH | APRIL TO JUNE | JULY TO SEPT. |
|--------------------|---------------|---------------|---------------|
| GROSS REVENUE | | | |
| PROFIT BEFORE TAX | | | |
| PROFIT AFTER TAX | | | |
| RETURN ON INVESTED | | | |
| CAPITAL (ROIC) | | | |

D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.

E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.

20. **WARRANTY / GUARANTEE:** THIS COMPREHENSIVE WARRANTY / GUARANTEE SHALL REMAIN VALID FOR **36 MONTHS** AFTER THE GOODS (OR ANY PORTION THEREOF AS THE CASE MAY BE) HAVE BEEN DELIVERED AND COMMISSIONED TO THE FINAL DESTINATION.

21. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

22. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **DR. Suman Maiti, Department of Electrical Engineering, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR - 721 302** AND ACKNOWLEDGEMENT TO BE OBTAINED.

IMPORTANT

1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.
3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Dr. Suman Maiti**, at the address mentioned above.

LAST DATE FOR SUBMISSION OF SEALED BIDS: 19.01.2018

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
 - 2) Fax, e-mail Tender will not be accepted.
 - 3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
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