

INTER UNIVERSITY ACCELERATOR CENTRE

ARUNA ASAF ALI MARG

POST BOX NO: 10502

NEW DELHI-110067.

NOTICE INVITING TENDER NO. IUAC/NIT/08/AS/2018-19

Name of the work: - : Supply, Installation and Testing of Integrating Current Transformer (ICT) (03 pcs with dedicated electronics) to measure the electron beam current from an electron gun.

Estimated Value:- : 110,000 USD (~75 Lakhs INR)

Earnest Money Deposit (EMD)*: - : 2,200 USD (~1.48 Lakhs INR)

***Bidders registered with NSIC and Foreign Bidders quoting directly are exempted from paying EMD.**

Last Date and Time of Submission of Tender : 03/08/2018----- at 3.00 p.m.

Date & Time for opening of Tender : 03/08/2018----- at 3.30 p.m.

(Technical bid part-A)

Date & Time for opening of price bid (Part-B) : Will be intimated later on to technically qualified bidders.

Address for submission of tender : Administrative Officer(S&P),
Inter-University Accelerator Centre
Aruna Asaf Ali Marg
Post Box: 10 502
New Delhi - 110067

Place of Opening of the Tender : Inter-University Accelerator Centre

GENERAL CONDITIONS OF TENDER:

- 1. Submission of Tender:** Tenders should be submitted in sealed envelope in two Parts separately, i.e. "Technical bid" (Part-A) and "Price bid" (Part-B). Both the parts should be further sealed in an envelope super-scribing NIT No & name of work, due date for opening, bidders name & address. The tender duly filled in may be sent to above mentioned address either by post or hand delivered in the **tender box kept in the area near west side entrance, after ensuring that due entries are made in the register kept at the counter.** It should not be handed over to any employee of the Centre. **No tender shall be accepted later than the time schedule specified above.**

Any clarification/amendments/corrigenda etc. to NIT will only be available on website: www.iuac.res.in

- 2. Technical Bid (Part-A) :** In this, the bidder should submit his company profile, organizational setup, credentials, and copies of successfully executed work orders for reputed laboratories during the last five years. No deviations in respect of NIT conditions are acceptable. **The bidders are required to attach entire NIT (except for the price bid part) duly signed & stamped as a token of acceptance to the NIT conditions with this bid. The following specific conditions are essential for pre-qualification:-**

Entire NIT (except Price bid) duly signed & stamped by the bidder.

The bidder must be an internationally reputed firm/company/manufacturer or their representative of Beam current monitor devices, who has supplied similar type of system to the internationally reputed laboratories worldwide and in India and carried out similar work in the laboratories worldwide.

The company should supply the complete beam current measurement system along with electronics system for measurement of beam current for a light source based accelerator facility as listed in the scope of work. Partial quotation for the individual subsystems will not be accepted. The company should attach a brief justification note to ascertain their capability criteria to undertake the order.

The list of users who have used similar item and model/make along with their name, E-

mail address, Institute address & contact numbers should be submitted with the quotation. If the identical or similar equipment have been supplied to other Laboratory/Institute in India/Abroad, the details of such supplies for the preceding five years must be given together with the prices eventually or finally paid. Copies of work orders during the last five years should be included. No deviations from the technical specifications listed in the annexure A will ordinarily be permitted. However, the Centre reserves the right of final decision regarding acceptable technical specifications.

3. **Price Bid (Part-B) :** In this bid, the bidder is required to quote the FOB price of item along with the break up as provided in Annexure C for the works mentioned in the scope of work & technical specifications. The bidders should quote unconditional rates, neatly written without any overwriting and duly signed & stamped on all pages. The bidder may have to provide a certificate with the price bid mentioning that the price quoted by them is not higher than that the price quoted by them to other laboratories/institutes for similar product during last year.
4. **Scope Of work/supply:** Supply, Installation and testing of 03 pcs of Integrating Current Transformer to measure the electron beam current from an electron gun as per detailed technical specification and guidelines mentioned in NIT as **Annexure A**.
5. **Validity of Tender:** The prices must be valid for a period of **six months** from the date of opening of the quotation. No escalation of cost will be acceptable in any condition after opening of tender.
6. **Escalation:** No escalation over and above items rates quoted by the bidder shall be paid during the execution of contract.
7. **Pre installation requirements:**—Pre installation requirements like Power Supply, arrangement of rack, cooling requirement, temperature or humidity control or any other essential requirements which are to be kept ready/completed by IUAC before supply and installation of equipment, must be informed by the bidder clearly in their quotation to avoid any delay in Installation & Commissioning of equipment. Operating conditions and environment should clearly be mentioned.
8. **Inspection:-** The consignment shall be opened in presence of company's representative and inspection of the system will be done by IUAC technical

experts/scientists. In case company's representative is not available, the inspection will be done by IUAC team and discrepancy will be intimated to the supplier accordingly. All short supplies will be arranged by the supplier at its own cost. In case of receipt of the material in damaged or defective condition, the supplier will have to arrange the replacement of goods free of cost.

- 9. Installation/commissioning:-** The equipment should be installed/commissioned and demonstrated by the supplier at IUAC's site within a suitable time period on a mutually agreed basis after the delivery of goods at IUAC and the same will be put under operation. It is expected that during the initial performance test of the equipment, the vendor should help IUAC personnel, if required. The vendor should clearly mention their charges in the quotation in case their personnel need to visit IUAC to assist the initial performance test.
- 10. Correspondence:** All the correspondence in respect of tender/contractual obligation shall be made to the Admin. Officer (S&P), Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067 E-mail: joseph@iuac.res.in, Ph. +91-11-24126018, 24126022.
- 11. Terms of Payment:** L/C will be opened for 100 % of FOB value after receipt of acceptance of order from successful bidder. 70% of payment will be released against presentation of complete shipping documents. Balance 20% of order value shall be released after satisfactory installation, commissioning and testing of the equipment. Remaining 10% will be released after the warranty period OR against a Performance Bank Guarantee equivalent to 10% value and valid for the warranty period plus two months.
- 12. Post Warranty Period:** Extended warranty for a period of five years of post-warranty with required spares should be offered. During the warranty period, it should be specified that who will be the authorized personnel for servicing/maintenance etc. The response time for attending a fault should be within 3 days in case of Indian agent and 2 weeks in case of foreign workers. In such cases the supplier will pay the travel, lodging, transportation of faulty parts etc. charges.
- 13. Manpower Training:** IUAC Scientist/Engineers will be trained at supplier's site or at IUAC site during installation and testing. The personnel will witness and participate in

the complete process of assembly, system integration and testing of various sub system up to the final acceptance test. The detailed schedule time schedule needs to be conveyed by the supplier well in advance. The cost of training of the IUAC personnel at the site of the company including their travel by economy class, accommodation etc. will be taken care by IUAC.

14. Spares: Supplier should quote separately as option for spares required for trouble free operation of the beam current monitoring system round the clock for 5 years. Some of the major spares should be listed along with financial quote. All the additional spare item cost will not be included for comparative purpose.

15. Documents and Manual:

- i. Upon delivery of the beam current measurement system to IUAC, two sets of as built, signed, final prints of Electrical assembly and testing of systems shall be supplied by the vendor. These prints shall be made to the highest professional standards. All drawings shall also be delivered on CD/pen drive.
- ii. Upon delivery of the beam current measurement system to IUAC, two copies of the final parts list shall be supplied by the vendor.
- iii. Upon delivery the vendor should provide the guarantee documents mentioning all the terms and conditions in details.
- iv. All the information along with all the test results, technical descriptions, data sheets shall be supplied in a bound design and operations manual.
- v. Set of documents must include operating manuals, safety manuals, periodic maintenance, troubleshooting manuals and maintenance procedure.
- vi. Any other documentation necessary for safe and reliable operation of the equipment should also be supplied. Two sets of the manual should be provided without additional cost.

16. Software and application:

All the software installations required for measurement and operation of the beam current monitors will be done at IUAC. All the application and development software including OS, drivers etc. with required license with installable media (if applicable) should be supplied.

17. Final Acceptance: The final acceptance of the system is defined as successful completion of shipment, installation and acceptance tests at IUAC to substantiate compliance with the specification mentioned in annexure A. Complete system with all the accessories and spare parts should reach to IUAC safely with all the mentioned warranty intact.

18. Guarantee/ Quality Assurance

1. The Vendor shall furnish a manufacturing plan and acceptance test procedures to be approved by IUAC. Approval by IUAC shall not release the Vendor from his responsibility for conceptual design, manufacturing, or any other mistakes committed in the fabrication of the Beam Current Monitor system.
2. All purchased articles from subcontractors or manufacturers released for inclusion in this Beam Current Monitor system shall be clearly identified to indicate conformance to Vendor's receiving inspection.
3. The bidder should guarantee for the works/items executed/supplied by him from the manufacturing/engineering defect and bad material/workmanship for a period of at least one year from the date of successful installation at the IUAC. During this period if any replacement of items and/or repairs/rectification is needed, he shall make the same free of cost.
4. Only calibrated test equipment shall be used. Copies of the test data sheets shall include lists of the instruments used to perform the tests and the calibration due date of each instrument.
5. The Vendor shall establish those controls and processes necessary to ensure uniformity of all deliverable articles. All controls, inspections, tests and quality provisions established during development and pre-production tests shall be indicated on the applicable drawing and shall be performed on each deliverable article.
6. All units and parts of the equipment shall be properly packaged and delivered in an undamaged condition to IUAC.

19. Force Majeure: IUAC may grant an extension of time limit set for the completion of the work in case timely completion of the work is delayed by force majeure beyond the supplier's control. Force majeure is defined an event of effect that cannot reasonably be

anticipated such as acts of God (like earthquakes, floods, tsunami etc.), the direct and indirect consequences of wars (declared or undeclared), national emergencies, civil commotions and strikes (only those which exceeds a duration of ten continuous days) at successful Tenderer's factory. Apart from the extension of the time limit, force majeure does not entitle the successful Tenderer to any relaxation or to any compensation of damage or loss suffered.

- 20. Liquidated damages:** In case the delivery of the listed items is delayed beyond the specified delivery period for reasons attributable to the supplier, deductions on account of liquidated damages @ **0.5 %** per week of the total order value will be deducted subject to maximum 5% of the total order.
- 21. IUAC reserves the right** to reject any or all the tenders in full or in part without assigning any reasons whatsoever, and the decision of the Centre in this regard will be binding on all the bidders. Tenders not complying with any of the provisions stated in this tender document are liable to be rejected. **Director, IUAC reserves the right to accept or reject any tender without assigning any reason and does not bind himself to accept the lowest tender.**
- 22. This contract shall be governed by the Indian laws. Any dispute arising out of this contract will be subjected to jurisdiction of New Delhi/Delhi.**

Accepted
(Signature of bidder)

Annexure A

Specification of Integrating Current Transformer (ICT) and its support electronics (3 Pcs) for beam current measurement of electron gun at IUAC

Sl. No.	Features	Specification	Qty.
1	<p>Integrating Current Transformer (ICT) based System with following features:</p> <ul style="list-style-type: none">• Pulsed mode of operation as per Annexure B.• Crate based acquisition/signal processing electronics system.• Should be able to measure at least 1 pC charge in a micro pulse as per Annexure B.• Should be able to separately measure charge of micro pulses spaced 200 ns apart i.e. micro pulse repetition rate ~5 MHz.• Should be able to measure macro pulse charge in excess of 4500 pC with a repetition rates up to 10 Hz (typ ~ 6.25 Hz).• UHV compatible.	As per Table 1, Table 2 and Table 3	3 No. s
2	Details of Beam Structure, micro/macro pulse concept of DLS	As per Annexure B	

Complete assembly to be of following modules:

ICT Hardware

Table-1. Required major specification of ICT Hardware

Sl.	Parameter	Desired Value	Offered Value
1	Flange Type and dimension	CF 4.5"	
2	Output Connector type	SMA	
3	Pipe Diameter	DN 40 (ID = 38 mm)	
4	Calibration and Testing kit	As per compatibility	
5	Input Bias	As per specification	
6	Leak Rate Temperature level	Less than 5.0×10^{-11} mbar L/s Temperature of baking to get good vacuum is under 100°C	

ICT Hardware must be supplied with:

- Proper, well shielded connecting RF cables Shielded RF cables between ICT and Acquisition Electronics system.

ICT Signal Processing/Acquisition Electronics

Table-2. Required major specification of Digital Board

Sl.	Parameter	Desired Value	Offered Value
1	Input Sensitivity	Should be able to measure minimum 1pC and maximum 300 pC (typ. 240 pC) charge within ~10 ps to be repeated in every 200 ns. The Current integrator should be able to resolve the charges measured within < 200 ns so that it can distinguish the fresh charges appearing in every 200 ns. (Annexure B)	
2	Supply Voltage	5 to 24 V DC	
3	TRIGGER In	On-board or External source, synchronized to ICT signal.	
4	Maximum Accepted Jitter in Trigger	100 pico seconds	
5	Calibration Mode	Yes	
6	Remote Control	USB/RS-232/LAN	
7	Driver Software for Control	Yes (control GUI)	

Electronics system must be supplied with:

- FPGA/Microcontroller based system with provision for user programmability
- Proper signal conditioning outputs available.
- Standalone Crate based system compatible to 19” Standard Rack.
- TCP/USB/RS232/RS485 connection interface should be located in the front panel.

Table-3.Power Supply Considerations

Sl.	Parameter	Desired Value	Offered Value
1	Power Supply	230 V AC±10%, 15 A (Max),	
2	Power Consumption	As per design	
3	Operating Environment	Temperature: 20 °C – 25 °C Relative Humidity: < 80 %	

Important notes about the system:

1. Complete system assembly must be compatible to 19 inch rack mount and modular in nature.
2. Appropriate test points and proper test mechanism/manual must be provided.
3. Standard interfaces like USB/LAN/RS232/RS485 should be available.
4. Operation Manual for control and operation of equipment should be provided.
5. Factory based Calibration and Test Report must be provided.
6. Hardware Warranty and life cycle with warranty options, terms and conditions must be clearly mentioned.

Annexure B:

The Delhi Light Source (DLS) is a pulsed electron machine based on pre-bunched free electron laser. The beam structure for DLS is shown in figure-1.

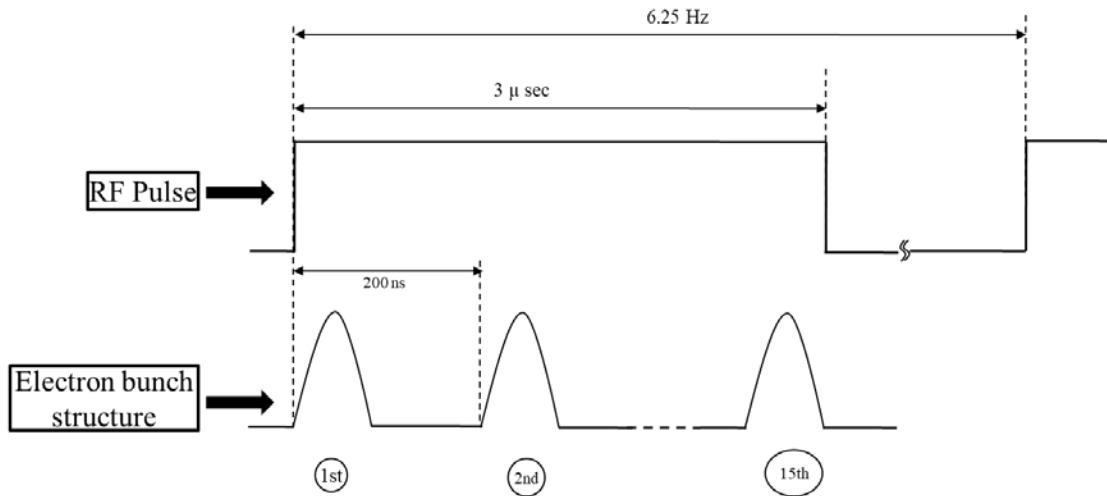


Figure-1: schematic of electron beam structure for DLS.

Beam Parameter:

Beam Specification	Min	Max	Typical
Beam Energy	2 MeV	10 MeV	7 MeV
Total charge per electron pulse	1 pC	300pC	240pC
Total charge in one RF cycle (15 electron pulse train)	15 pC	4.5 nC	3.6nC
Transverse Beam size	2 mm	10 mm	3mm

Annexure C:

Price Bid for Beam Current Measurement System and its support electronics for Delhi Light Source (DLS) at IUAC

Sl. No.	Items	FOB Price in USD/Euro
1.	Complete Beam current measurement System consisting of ICT based current transformer with Electronics system, calibration unit and cable (Break-up should be provided)	
2.	Charge of Commissioning and Testing of the equipment at IUAC. Charge of manpower training at vendor's site	
3.	Extended warranty (Up to 5 Years beyond the period of normal warranty)	
5.	Cost of Spare parts (Separate sheet with details may be attached)	
	Total	