

**DEPARTMENT OF PHYSICS
PANJAB UNIVERSITY, CHANDIGARH**

Phone 0172-2541741
Email: physics@pu.ac.in



**TENDER DOCUMENT FOR THE PURCHASE OF
N-type Coaxial Detector, Accessories and Electronic Modules**

TENDER NOTICE NO. : PHS/3885 dated 20.12.2019

LAST DATE FOR RECEIPT OF TENDER: 05-02-2020 4:00 P.M.

DATE & TIME OF OPENING TECHNICAL BID : 06-02-2020 3:00 P.M.

SECTION – I

PROCEDURE FOR SUBMISSION OF BIDS

1. There will be **Two bid system** for this Tender: *Techno-Commercial bid* and *Financial bid*.
2. Tender fee of Rs.1000/- is to be submitted along with the Tender in the form of demand draft of Rs.1000/- payable at Chandigarh in favour of ' The Registrar, Panjab University' Chandigarh.
3. **The two documents viz., Techno-Commercial bid and Financial bid covers prepared as above should be uploaded electronically on website <https://etenders.chd.nic.in/nicgep/app>**

Tender for the supply of: N-type Coaxial Detector, Accessories and Electronic Modules
(For specifications see page 9-13)

Due on 05-02-2020 4:00 p.m. (last date for submission).

Name & Address of the Tenderer: Chairperson, Department of Physics, Panjab University, Chandigarh - 160014

Note: Price should not be indicated in the Techno-Commercial bid otherwise the Tender will be rejected

4. Tenders received after the due date will not be accepted. If the last date for submission of Tender falls on any declared holiday in the University, the next working day will be considered as the last date for the same.
5. The bids prepared by the Tenderer and all correspondence and documents relating to the bids, shall be written in English language.
6. The contract for the supply of the items is non-transferable.
7. Each offer should be complete in all respects.
8. Telegraphic/electronic/conditional (other than mentioned in #3) offers will not be accepted.
9. The bidder is advised to quote the rates against the specifications given in the BoQ only.

SECTION – II

TERMS AND CONDITIONS

1. **Opening of bids:** Techno-Commercial bids will be opened by the Committee (Opening date is mentioned on front page of the Tender document) after the closing date and studied. The Tenderers will be invited for presentation and clarifications if needed. Financial bids of the Tenderers complying with the prescribed Techno-commercial specifications will be opened by the Committee. Tenderers or their authorized agents may be present if they so desire during opening of the Tenders.
2. **Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason.
3. **EMD:** The Tender bid should accompany EMD of Rs 2,00,000/-. The EMD should be made by means of an A/c payee DD in favour of the *Chairperson, Department of Physics, Panjab University, Chandigarh-160014* payable at Chandigarh. No interest is payable on EMD.
4. **Refund of EMD:** The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment.
5. **CIF value and comparison of Financial bids:** CIF value upto Department of Physics, Panjab University, Chandigarh (*shipment by air upto Delhi and insured up to the installation site*) should be quoted, and will be considered for comparison of bids. Bids quoted in foreign currency will be converted into Indian Currency at the exchange rate applicable on the day of opening of the financial bids for comparison purposes. In terms of the Government of India Notification No.47/2017-Integrated Tax (Rate) dated 14th November, 2017, the applicable Integrated Tax (Rate) under GST Act-2017 on goods procured for Scientific and Research purposes shall be 5%. Where ever applicable, this clause shall be taken into consideration.
6. **Warranty Period:** The warranty period should be *minimum One year (with spares)* from the date of installation with satisfactory performance as per specifications. The up time of instrument during warranty should not be less than 90% in one year. In case the fault persists for more than one week then Department of Physics, PU, has right to impose penalty. Further the period of warranty will be extended by the vendor accordingly.
7. **PBG:** Tenderer selected for supply of equipment, will have to provide Performance Bank Guarantee (PBG) on any *scheduled bank situated in India, equivalent to 10 percent of the cost of the equipment* which should be valid until the expiry of the Warranty period. The PBG will be provided by the Company along with the letter of acceptance of the order by the Principals. LC will be opened in favour of the Principals only after obtaining the PBG.

8. **Terms of Payment:** LC will be opened for the 100% value of the equipment, 90% of the amount will be released after the shipment and remaining 10% after the installation of the equipment.
9. **Delivery period :** Delivery should be made within *120 days* of opening of the LC
10. **Delayed delivery:** If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty as under::
 - i First extension for one month or part thereof @ 2%.
 - ii Second extension for an additional month or part thereof @ 3%
11. **Non delivery beyond extended period:** If the Tenderer fails to execute the order within the second extension mentioned above or mutually agreed time frame, the order will be cancelled and EMD forfeited by the Department of Physics. He will also be liable for all damages imposed by Department of Physics, Panjab University, for non supply of equipment including the liability to pay the difference between the price accepted by him and those ultimately paid by the Department of Physics, Panjab University, for the equipment, Such damages will be assessed by the Committee for the purchase of N-type Coaxial Detector, Accessories and Electronic Modules.
12. Increased statutory levies and duties above the rate quoted in the offer will not be an excuse for the Tenderer to delay the supply beyond the date specified in the Tender.
13. **Validity of rates:** Rates quoted should be valid for at least *3 months* from the closing date of the tenders.
14. **Consistent pricing:** The rates quoted for the Equipments by the supplier shall in no case exceed the lowest price at which the supplier of this Equipments of identical description made to any other person/organization/Institution during the above said period and should attach an undertaking in this regard
15. **Installation requirements:** The Supplier will clearly mention installation requirements on our part in the *Techno-Commercial bid*.
16. **Installation time:** The Company must install the equipment *within a period of two months* of the date of delivery of the equipment at Department of Physics, Panjab University, Chandigarh.
17. **Free Installation:** The equipment and software should be installed and tested to the specifications *free of cost*.
18. **Supporting Equipment:** The Tenderer will provide all requisite supporting equipments like isolation transformer, step down transformer, vibration free platform if *needed*. We need the complete installed system.

19. **Licensed Software and its upgradation:** *Two user licences* for analysis software (if any) should be provided. The certified/licensed software and programs should be the part of the supplies. There should be *free upgradation of software upto 5 years*
20. **Factory Acceptance Data:** Proposed acceptance criteria for the equipment should be provided by the supplier. in order to compare the performance against the quoted specifications. *Manufacturer's test certificate along with test conditions and results* is to be supplied along with the equipment.
21. Tenderers are advised to study all technical aspects and terms & Conditions, of the Tender documents. Submission of Tender shall be deemed to have been done after careful study and examination of the Tender Document with understanding of its implications.
22. **Only Manufacturers or Authorized dealers to bid:** The offering firm should clearly mention whether they are the manufacturer or authorized agent/dealer of the manufacturer. In case of agent for overseas manufacturer, a letter of authorization from the manufacturer should be submitted along with the offer. The Tenderer can also enclose the rates on the letterhead of the manufacturer if he has been authorized to do so by the manufacturer.
23. **Descriptive literature:** The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance in .pdf format.
24. **User and Service Manuals:** A set of User's manuals and Service manuals of the main instrument, attachments and related equipment should be supplied with the equipment
25. **Equipment must be new:** The Tenderer must ensure that the equipment being offered is a new one and not refurbished or repaired one.
26. **Defective Equipment:** If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, unmerchantable or not in a accordance with the description /specification or otherwise faulty, the committee will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the Tenderer with 18% interest if such payments for such equipment has already been made to him.
27. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 45 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges.
28. **Furnishing of wrong/ambiguous information in the compliance**

statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.

29. **Damage during transit:** In case of any mishappening/damage to equipment and supplies during the carriage of supplies from the origin of equipment to the installation site, the supplier has to replace it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. The Department of Physics, Panjab University, will not be liable to any type of losses in any form.
30. **Legal jurisdiction:** Any dispute in this regard of any term of the offer and on the supply of equipment is subject to *Chandigarh jurisdiction* only.
31. **Training:** The equipment and software should be installed and training of persons should be provided free of charge at the premises of Department of Physics, Panjab University.
32. **Availability of Spares:** The Tenderer must assure the availability of spares for servicing of equipment *for at least 5 years*. Supplier should give an undertaking that spares parts will be supplied within the specified periods as and when ordered.
33. **Infrastructure:** The Department of Physics, Panjab University, will provide required *single phase power supply (220 V, 50 Hz)* with required electricity outlets.
34. **Clearance:** The Principals will do all types of clearance work to deliver the equipment at the site of installation. Department will provide all types of documentary support including Customs Duty Clearance. Principals will themselves have to procure any requisite permission from the Govt. of country of origin of equipment.
35. **Bank Charges:** Bank charges in India will be borne by the Panjab University and Bank charges abroad will be borne by the suppliers.
36. **Similar Models installed:** The Tenderer must mention in the *Techno-Commercial bid* the similar model of equipment installed in India and abroad *during the last two years* and the *addresses of contact persons at these places*.
37. **Application Specialist:** The Tenderer should mention in the *Techno-Commercial bid* the availability and *names* of *Application Specialist* and *Service Engineers* in the nearest regional office.
38. **Response Time:** The Tenderer should mention in the *Techno-Commercial bid* the response time for attending to a complaint about the equipment.
39. **Change of Indian Representatives:** The original manufacturer/Principals should give an undertaking that the aforementioned warranty and availability of spares clauses will be valid even in the case of change of their representatives in India.

BID PARTICULARS

1. Name of the Supplier :

2. Address of the Supplier :

3. Availability of demonstration of equipment : Yes / No

4. Tender cost enclosed: : Yes/No if yes

D.D. No. _____ Bank _____ Amount _____

5. EMD enclosed : Yes / No if Yes

D.D. No. _____ Bank _____

6. Name and address of the Officer/contact person to whom all references shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No :

e-Mail :

Web :

< Organization Letter Head >>

DECLARATION SHEET

We, _____ hereby certify that all the Information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification. This is certified that our organization has been authorized (Copy attached) by the OEM to participate in Tender. We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document. Moreover, OEM has agreed to support on regular basis with technology / product updates and extend support for the warranty.

We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS OF THE Vendor/ Manufacturer / Agent
1 Phone	
2 Fax	
3 E - mail	
4 Contact Person Name	
5 Mobile Number	
6 TIN/GST Number	
7 PAN Number	
8 Kindly provide bank details of the bidder in the following format: a) Name of the Bank	
b) Account Number	
c) Kindly attach scanned copy of one Cheque book page to enable us to return the EMD to unsuccessful bidder	

Specifications of N-type Coaxial detector, Accessories and Electronics modules

Expected number of complete sets (N-type Coaxial detector, Accessories and Electronics modules) to be procured - TWO SETS.

Available Input power for all modules: 220 V, 50 Hz AC

1. Germanium Detector :

Coaxial Germanium (n-type) Detector in horizontal (Streamline) configuration, End cap Diameter - 70 mm (Tolerance ~ 0.3 mm), Liquid nitrogen cooled (Dewar: 30 L), Relative Efficiency: 30% at 1332 keV, Energy Range: 4 keV - 10 MeV, Energy resolution values better than or equal to - 750 eV FWHM at 5.9 keV, 1.90 keV FWHM at 1332 keV, Peak to Compton ratio better than or equal to 52:1, Low background Carbon Fibre window (Thickness ~ 35 mil, diam 51 mm) for >90 % transmission of 5.9 keV X-ray, Ratio of 22 keV Ag-K X-rays and 88 keV gamma ray lines of ¹⁰⁹Cd source better than 20:1, Neutron damage resistant.

Engineering drawings have to be approved by Panjab University prior to fabrication so as to be compatible with the Compton-shield, with which the Ge detector is to be used (Figure on Page 13). Technical bid must contain the necessary configuration and drawings.

Preamplifier & detector bias input unit : Preamplifier mounted close to the detector with energy signal output from preamplifier, test pulse input for preamplifier, Preamplifier power supply, Detector bias supply input and HV filter, High voltage shut down option on detector warm up.

The Ge detector will be used with NaI(Tl)-BGO Compton-suppression Shield – **Drawings of the Compton-suppression shield are given in Figure on Page 13.**

The Ge detector capsule front (Carbon window) must be at the closest possible safe distance (~ 1 mm) from the end-face of BGO cylindrical well of depth-dimension $L \sim 170$ mm. The detector electronics shroud should be just outside the BGO cylindrical well. The length of detector neck, i.e., distance between Detector-Electronics shroud end face and center of the LN₂ Dewar should be sufficient that the LN₂ dewar does not hinder the Photomultiplier part of the BGO shield (**Figure on Page 13**). Also see e-Tender for specifications of the Anti-Compton shield with which HpGe to be used. e-Tender is published simultaneously by Panjab University.

2. ELECTRONICS MODULES FOR DETECTOR BIASING AND DATA ACQUISITION IN COMPTON-SUPPRESSION MODE:

A. POWER SUPPLY ELECTRONIC MODULES

- (i) HpGe detector Preamplifier Power Supply (**In-built or Separate Units**)
- (ii) HpGe Detector Power Supply (**In-built or Separate Units**): High voltage separate/in-built module for biasing the Ge detector (0.5–4.0 kV or higher (polarity positive and negative) at 0–100 μ A) with display for HV. Remote shutdown feature compatible with outputs from warmup sensor on germanium detector. Automatic overload protection and overload indicator. External control of output voltage. Available input power 230 V ac, 50 Hz.
- (iii) BGO Power Supply (Separate Module) - High voltage module (0 to ± 2 kV or higher; Current 0-10 mA or higher) for biasing (noise-free, well-regulated, very stable high voltage necessary for proper operation of photomultipliers) the **8 Photomultiplier tubes of the BGO Shield detector segments** (Similar to the Anti-Compton Shield used in Gamma Detector Array at Inter-University Accelerator

Centre, New Delhi, <https://www.ias.ac.in/article/fulltext/pram/082/04/0769-0778>) through voltage distribution junction. Digital meter reads output voltage or current, Overload and short-circuited protected, External control of output voltage, Available input power 230 V ac, 50 Hz.

B. HIGH PERFORMANCE DIGITAL SIGNAL PROCESSOR MODULE

Digital signal processing of Preamplifier output signal (PHA and LIST modes) for quality Gamma-ray and X-ray spectroscopic performance and including features to optimize coincidence timing applications for Compton Suppression.

- (i) Processing of the Preamplifier output signal from Ge detector in PHA mode for Gamma-ray and X-ray Spectroscopy
- (ii) Processing of the BGO shield signal and rejection of the Ge detector signal if detected in coincidence with BGO shield signal.

Digital Spectrum Stabilizer, Automatic Pole Zero Adjust, Baseline Restorer.

PHA mode, LIST Mode data Acquisition

ADC conversion gain up to 16k Channels or higher; ADC Gate options (off, Coincidence and Anti-Coincidence); concurrent acquisition of data from HpGe detector in Coincidence and Anti-coincidence with signal from PMTs of the Compton-suppression NaI(Tl)-BGO shield.

Gain stability of the system ~ 50 ppm/ $^{\circ}$ C.

Coincidence gate : The Coincidence gate should be configurable

Coincidence Logic: gate TTL pulse compared to internal fast channel with adjustable offset and window (25 ns increments up to ± 5 μ s or higher)

Gate Window: defined by delay after coincidence detection and gate width to cover peak detection (25 ns increments up to 200 μ s or higher)

Data Acquisition System and MCA Emulation Software: PC (Windows operating system Microsoft 10.0 and above) - based data acquisition system with necessary windows-based software. This PC should be easily serviceable in India in case of any fault. The software should also be compatible with Windows based PCs available in India.

MCA Emulation Software, Full computer control of various functions, Variable Digital Filter Shaping-Time Constants 1-10 μ s, Dead-Time Correction, Pulse Pile-Up Rejecter, Automatic Digital Pole-Zero Adjustment, Digital Gated Baseline Restorer, Universal serial bus for PC communications. System Conversion Gain: Software controllable from 512 to 16k channels or higher. Nuclear identification and analysis software.

The Nuclear identification and analysis software should also be available on second Microsoft Windows 10.0 based PC available in our laboratory, so that analysis can be performed on a separate system other than data acquisition PC system.

The system must be complete in itself including all necessary cables. The HpGe detector and Electronic modules must be complete in itself to work with BGO-NaI(Tl) anti-Compton Shield being procured by the Physics department, Panjab University with given specifications (See e-Tender for specifications of the Anti-Compton shield with which HpGe to be used – e-Tender is published simultaneously by Panjab University)

The option for use of the detector and preamplifier output with conventional analog electronic modules, i.e., Spectroscopy amplifier, Multichannel Analyser, High voltage detector supply, be available.

C. DOCUMENTS

A complete set of operational manuals. All required hardware and software documents, manuals installation CDs/DVDs etc. to be provided. All manuals (service and operational) should be provided as Hard copies as well as soft copies (on CDs).

OPTIONAL:

Extended warranty per year for next two years.

