Advertisement No: PGD/PHY/HEP/ 644 Dated: 15/11/2019

DEPARTMENT OF PHYSICS
UNIVERSITY OF JAMMU, JAMMU – 180 006

BID DOCUMENT
(e - Procurement)

Project
Supply and Installation of Scientific Equipment
To the
Department of Physics, University of Jammu, Jammu

Issued On:
15.11.2019

BY
DEPARTMENT OF PHYSICS
UNIVERSITY OF JAMMU
JAMMU – 180 006

e- Procurement Notice

BIDDING DOCUMENT AND TECHNICAL SPECIFTCATIONS

NOTICE INVITING TENDER

Online tender/s invited under two bid systems (Technical and Financial) from the reputed manufacturers/ authorized representatives of manufacture / authorized distributors/ dealers for the supply and installation of **Scientific Equipment** as per the technical specification, terms and conditions and schedule of this tender document. Bidders can download complete set of bidding documents from e- procurement Platform http://jktenders.gov.inor from the university website www.jammuuniversity.in from 16.11.2019 onwards. Bidders need to submit the bids online by uploading all the required documents through http://jktenders.gov.in.Last Date/ Time for receipt of bids through e-procurement is: 06.12.2019 up to 05:00 PM (Server time). Late bids shall not be accepted. For further details regarding Tender Notification & Specifications please visit website: http://jktenders.gov.in and www.jammuuniversity.in.

CRITICAL DATES:

A.	Publishing Date	15.11.2019
B.	Bid Document Download Start Date	16.11.2019 11.00 AM
C.	Bid Submission Start Date	16.11.2019 03.00 PM
D.	Bid Submission End Date	06.12.2019 (05:00 PM)
E.	Online Technical Bid Opening Date	09.12.2019 (11:00 AM)
F.	Online financial e-Bid opening date & time (Only of the technical qualified bidders)	Will be communicated later to the technical qualified bidders
G.	Venue of opening of technical & financial e-Bids	Office of the H.O.D, Department of Physics, University of Jammu, Jammu
H.	Cost of the tender documents	Nil
I.	EMD amount	Rs.30,000/-

The interested bidders are requested to submit their offer along with terms & conditions, technical specifications and annexure forming part of this tender document.

1. The Bidders are advised to study the Bidding Document carefully. Submission of e-Bid against this NIT shall be deemed to have been done after careful study, site visit and examination of the procedures, terms and conditions of the Bidding Document with full understanding of its implications.
2. All the required documents excluding Price Schedule/BOQ should be uploaded by thee-Bidder electronically in the PDF format, whereas Price Schedule/ BOQ should be uploaded electronically in the same BOQ sheet provided with the NIT.
3. All the e-Bids must be accompanied by the scanned copy of EMD in the form of CDR only, pledged to the Registrar, University of Jammu, Jammu. No Interest would be payable on Earnest Money deposited.
4. Hard Copy of original instrument of EMD shall be submitted to the office of the Head, Department of Physics, University of Jammu, Jammu up to the last date and time of the online submission of e-Bid as given in the table.
5. The date and time of opening of Financial-Bids shall be notified on website http://jktenders.gov.in. This is conveyed to the qualified bidders automatically through an e-mail message on their registered e-mail

address. The Financial-bids shall be opened accordingly online on the same Web Site in the office of the Registrar University of Jammu, Jammu.

6. The tender document is available at website http://jktenders.gov.in. and www.jammuuniversity.in. Interested bidders may view, download the e-Bid document, seek clarification and submit their e-Bid online up to the date and time mentioned in the table above.
7. The e-Bids will be electronically opened in the presence of bidder's representatives, who choose to attend at the venue, date and time mentioned in the above table or any subsequent day to the convenience of the Tender Opening Committee. An authority letter of bidder's representative will be required to be produced.
8. The University of Jammu reserves the right to cancel any or all the e-Bids/ the e-Bid process without assigning any reason thereof. The decision of the university will be final and binding.
9. In the event of date specified for e-Bids opening being declared a holiday then the date for opening of e-Bids shall be the following working day at the appointed time and place.
10. To participate in e-bidding process, bidders have to get 'Digital Signature Certificate (DSC)'.
11. Hard copy of Technical and Commercial bid documents (complete) must be delivered to the office of Head, Department of Physics, University of Jammu, Jammu – 180 006 in two sealed covers up to 6th December,2019 ; 05.00 pm.

    The first envelope (Marked as Technical Bid) shall contain all the documents mentioned below (a) to (i), and sealed.

    a) A copy of the last audited balance sheet of your firm
    b) Proof of manufacturing unit/ Authorized dealer letter from the Principal
    c) The names of the organizations and laboratories to which same equipment have been supplied preferably alongwith supply order in recent past;
    d) GST Registration No.:
    e) Undertaking duly signed by the bidder stating that the bidder has not ever been blacklisted/debarred;
    f) Technical specifications offered by the supplier;
    g) Technical compliance statement; and
    h) All related Catalogue/Brochure/Manual should be submitted

    The second envelope (Marked as Commercial/Financial Bid) shall contain the Schedule, in which the supplier shall register the rates of supply. The second envelope shall also be sealed. Each page of the tender shall be signed in full and stamped with the seal by the supplier. Both the envelopes then should be put together, and shall be sealed in a third envelope which should be marked as "Quotation for Scientific Equipment" alongwith enquiry number and date. It may be noted that the hard copy should be an exact replica of the uploaded offer documents. For evaluation purpose the uploaded offer documents will be treated as authentic and final. The hard copy shall be used only for the reference purpose. A documents submitted in hard copy but not uploaded on the website shall be treated as irrelevant.

Sd/-
Head
Department of Physics
University of Jammu
Jammu -180 006

Prof. Head Department of Physics
University of Jammu, Jammu

Checklist for Bid/Tender Submission

(The following check-list must be filled in and submitted with the bid documents)

Pre- Qualification Bid

Sr. No.	Particulars	Attached Yes/No
1.	Duly Filled Technical bid	
2.	A copy of the last audited balance sheet of your firm	
3.	Proof of manufacturing unit/ Authorized dealer letter from the Principal	
4.	The names of the organizations and laboratories to which same equipment have been supplied along with supply order in recent past	
5.	GST Registration No.	
6.	Undertaking duly signed by the tenderer stating that authorized distributors/manufacturers/dealers has not ever been blacklisted/debarred;	
7.	EMD as specified in Bid	
8.	The schedule of requirement indicating the make offered without indicating the pricing components along with the technical bid	
9.	Have you submitted the bids both techno commercial unpriced and priced bid separately for e3ch tender?	
10.	The statement of deviations from financial terms and conditions, if any?	
11.	**Duly signed Price Bid under a separate sealed cover**	
12.	Schedule of requirements duly priced?	

1. GENERAL INSTRUCTIONS **FOR ONLINE BID SUBMISSION THROUGH THE JAMMU & KASHMIR E-** PROCUREMENT PORTAL AT https://jktenders.gov.in.

a. 1. The interested bidder can download the bidding document from the websitehttp://jktenders.gov.in or www.jammuuniversity.in .
   2. Bidders are advised to download bid submission manual for the help of Bid Submission process from the "Downloads" option as well as from "Bidders Manual Kit" on website http://jktenders.gov.in.

b. Possession of valid Digital Signature Certificate (DSC) and enrollment/registration of the contractors/bidders on the e-Procurement/e-tender portal are prerequisite for e-tendering. The bidders have to submit their bids online in electronic format with digital Signature. The bids proposed without digital signature will not be accepted. No proposal will be accepted in physical form.

c. Bidder should register for the enrollment in the e-Procurement site using the "Online Bidder Enrollment" option available on the home page. Portal enrollment is generally free of charge. During enrollment/registration, the bidders should provide only valid and true information including valid email id. All the correspondence shall be made directly with the contractors/bidders through email id as registered. Bidder need to login to the site through their user ID/ password chosen during enrollment/registration.

d. Bids will be opened online as per time schedule mentioned in table above.

e. Before submission of online bids, bidders must ensure that scanned copy of all the necessary documents have been attached with bid. (note: Scan all the documents on 100 dpi with black and white option) ordinarily it shall be in PDF formats.

f. It is advisable that each document to be uploaded through online for the tenders should be less than 2 MB. The file size being less than 1 MB the transaction uploading time will be very fast.

g. It shall be deemed that the bidder has read and understood all the terms and conditions before submitting the offer. Bidder should go through the tender schedules carefully and upload the documents as asked. All the required information for bid must be filled and submitted online otherwise, the incomplete bid shall stand rejected.

h. The department will not be responsible for delay in online submission due to any reasons

i. Bidders besides other details will also upload the scanned copies of DD, CDR, or any other form as specified in the bidding document. The original instruments in respect of cost of tender document, EMD and relevant documents be submitted to the office of Head, Department of Physics, University of Jammu, Jammu-180006 by Registered post/courier/by hand and should reach within bid submission due date and time as indicated in the tender, otherwise quoted bid shall be rejected.

j. While submitting the bids online, the bidder shall read the terms and conditions and may accept the same to proceed further to submit the bid packets.

k. The bidder has to select the payment option as offline to pay the Tender FEE/ EMD as applicable and enter details of the instruments.

l. The details of the DD/any other accepted instrument, physically delivered, should tally with the details available in the scanned copy and the data entered during bid submission time, otherwise submitted bid shall not be acceptable or liable for rejection.

m. Any clarifications may be sought online through the tender site, through the contact details or during pre-bid meeting if any. Bidder should take into account the corrigendum if any published before submitting the bids online.

n. The bidder has to digitally sign and upload the required bid documents one by one as indicated. Very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read, understood and agreed with all clauses of the bid document including General conditions of contract without any exception.

o. The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid may be rejected.

p. The price bid format is to be provided in a spread sheet file like BoQ_XXXX.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Priced-bid/BOQ template shall not be modified / replaced by the bidder; else the bid submitted is liable to be rejected for the tender.

q. The complete NIT document including Technical Specifications and Schedules duly signed be submitted along with Bid documents to the office of Head, Department of Physics, University of Jammu, Jammu-180006 by Registered post/courier/by hand and should reach within bid submission due date and time as indicated in the tender.

r. Price quoted should be firm.

s. Bidders are advised not to make any change in BOQ (Bill of Quantities) contents or its name. In no case they should attempt to create similar BOQ manually, otherwise the bid will be rejected automatically. The BOQ downloaded should be used for filling the net item rate as per columns mentioned in BOQ and it should be saved with the same name as it contains.

t. Bidders are advised to use "My Documents" area in their user on http://jktenders.gov.in e-Tendering portal to store important documents which are used in all NIT's like Income tax / sales tax Clearance Certificate, audited balance sheets/ annual reports etc. and attach these certificates as Non-Statutory documents while submitting their bids.

u. The guidelines regarding submission of bid online can be downloaded from website "http://jktenders.gov.in".

v. It may be noted that the hard copy should be an exact replica of the uploaded offer documents. For evaluation purposes the uploaded offer documents will be treated as authentic and final. The hard copy shall be used only for reference purpose. Any documents submitted in hard copy but not uploaded on website shall be treated as irrelevant.

2. INSTRUCTIONS TO BIDDERS

a. **Scope of Bid:** Supply and installation of Scientific Equipment as specified in the technical specification.

b. Eligibility :i. A Bidder may be a manufacturing firm/company or an authorized representative of the manufacturer/ authorized distributors/dealer.

ii. A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified.

iii. A foreign firm and individual may be ineligible if as a matter of law or regulations, India prohibits commercial relations with the country of bidder.

iv. The bidder must be able to provide evidences that they have installation of same model or similar model in India and other parts of globe.

v. The Bidder shall provide such evidence of eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

c. The bidder is expected to examine all instructions, forms, terms and specifications in the e-Bid document. Failing to furnish all information required as per the e-Bid document or submission of e-Bid not responsive to the e-Bid document in every respect will be at the bidder's risk and may result in rejection of the said e-Bid.

d. Clarification of Bidding Documents, Site Visit, Pre-Bid Meeting:

i. A Bidder requiring any clarification shall contact the Purchaser in writing at the Purchaser's address specified in the BDS or raise its enquiries during the pre-bid meeting if provided. The Purchaser will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids.

ii. If required, the Bidder is advised to visit and examine the project site and obtain for itself on its own responsibility all information that may be necessary for preparing the bid. The costs of visiting shall be at the Bidder's own expense.

iii. If specified in NIT, the Bidder's designated representative shall be invited to attend a pre-bid meeting.

e. Amendment of e-Bid Document:

i. At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by corrigendum. In case of e-procurement, corrigendum / amendment shall be published on http://jktenders.gov.in.

ii. It shall be the sole responsibility of the prospective bidders to check the web site http://jktenders.gov.in from time to time for any amendment in the e-tender document. In case of failure to get the amendments, if any, the Purchaser shall not be responsible for it.

3. Preparation of Bids:

a. **Cost of Bidding**: The Bidder shall bear all costs associated with the preparation and submission of its bid. The Purchaser shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

b. **Language of Bid** : English

c. Documents Comprising the Bid: The tender/Bid shall be submitted online in two part, viz.,Technical Bid and Commercial Bid.

I. TECHNICAL BID

The following documents are to be scanned and uploaded as part of the Technical Bid as per the tender document:

i. Scanned copy of proof for submission of Earnest Money Deposit.
ii. Proof of manufacturing unit/ Authorized dealer letter from the Principal
iii. The names of the organizations and laboratories to which same equipment have been supplied preferably alongwith supply order in recent past:
iv. GST Registration No.:
v. Undertaking duly signed by the bidder stating that authorized distributors/manufacturers/dealers has not ever been blacklisted/debarred;
vi. Technical specifications offered by the supplier along with Technical compliance statement; and
vii. All related Catalogue/Brochure/Manual
viii. Scanned copy of Tender Forms (Techno Commercial Un-Priced Bid) and Tender Acceptance Letter):

All the original documents as well as the original payment instrument like CDR of any scheduled bank against EMD as specified in this tender document have to be sent to the address of the Purchaser by registered post/speed post/courier/by hand on or before bid Submission closing date & time. Beyond that the tender shall be summarily rejected without assigning any reason.

II. COMMERCIAL BID

The commercial bid comprises of :

(i) Scanned copy of Tender Form (Price Bid)

(ii) Price bid in the form of BoQ_XXXX.xls.
(iii) Scanned copy of item wise breakup of price bid.

The Price bid format is provided as BoQ_XXXX.xls along with this Tender Document at http://jktenders.gov.in. Bidders are advised to download this BoQ_XXXX.xls and quote their offer/rates in the prescribed column. Bidders can quote Basic Price in INR or CURRENCY (for other than INR) but it is mandatory to quote taxes/levies in INR only, in the prescribed column and upload the same in the commercial bid.

4. General terms and conditions

a) Tenders should be submitted online on the website www.jktenders.gov.in and the hard copy of the same be addressed to, "Head, Department of Physics, New University Campus, University of Jammu, Jammu 180 006" .and must reach on this address by registered post/courier only on or before 06th December 2019.
b) Delivery of goods should be FOR Department of Physics, University of Jammu, Jammu.
c) Rate should be valid upto 6 months from the due date of opening of the tender.
d) General Sale tax/custom duty/excise/entry tax or any other tax, if any, should be clearly mentioned. Rates should be inclusive of custom clearance, insurance etc. It may kindly be noted that University of Jammu will not bear any cost/expenditure arising out of loss during transportation etc. Cost of equipment should include transportation charges and insurance charges up to FOR destination. University of Jammu is exempted from Custom Duty under DSIR registration. DSIR certificate shall be provided by the University of Jammu to the qualifier.
e) Firm shall be required to submit the End of Life of product. It shall be responsibility of the supplying firm/manufacturing firm to collect condemned instruments/its salvage whenever it is declared unserviceable/obsolete/end of life/beyond economic repair etc. Firm shall be required to submit EPR authorization issued by CPCB.
f) Concession to educational institutions, if any, should be clearly mentioned.
g) Products confirming to particular standards (ISO, ISI etc.) should be clearly mentioned.
h) In case any item is your proprietary product or if you are sole manufacturer / distributor of requisite item, **a latest certificate to this effect should be enclosed.**
i) In case company/firm is registered with GeM/any other Government organization/undertaking; should be clearly mentioned.
j) It is at discretion of the competent authority to reject one/all tenders/part of tender without assigning any reason, thereof.
k) In case seller fails to complete in full, all deliveries of product in accordance with supply order; the seller shall be responsible for the liquidity damages. Thereafter the buyer, will have right to terminate supply order in the case of such delay beyond period mentioned by seller in the offer and buyer will have total discretion to buy product from the market/other supplier at the lowest rate.
l) Detailed Catalogue/Brochure/Manual should be submitted along with the offer necessarily.
m) Debarment of the bidding firms shall be governed by Rule No. 151 of GFR 2017; Ministry of Finance, GOI, as mentioned below:
   (i) A bidder shall be debarred if he has been convicted of an offence—
      (a) under the Prevention of Corruption Act, 1988; or
      (b) the Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a public procurement contract.

(ii) A bidder debarred under sub-section (i) or any successor of the bidder shall not be eligible to participate in a procurement process of any procuring entity for a period not exceeding three years commencing from the date of debarment. Department of Commerce (DGS&D) will maintain such list which will also be displayed on the website of DGS&D as well as Central Public Procurement Portal.

(iii) A procuring entity may debar a bidder or any of its successors, from participating in any procurement process undertaken by it, for a period not exceeding two years, if it determines that the bidder has breached the code of integrity. The Ministry/Department will maintain such list which will also be displayed on their website.

(iv) The bidder shall not be debarred unless such bidder has been given a reasonable opportunity to represent against such debarment

n) All the pages of hard copy of the offer should be endorsed along with the stamp/seal of the firm.

o) It may kindly be noted that in case a firm quotes NIL charges/consideration, the bid shall be treated as unresponsive and will not be considered.

p) Equipments/instruments must be quoted with at least one years of warranty from the date of installation. Warranty / Guarantee Clause needs to be mentioned necessarily wherever applicable.

q) Detailed AMC conditions with price details should be furnished for next three years after the warranty period.

r) Firm shall be required to submit the **EMD/Bid security amounting to Rs. 30,000/- pledged to Registrar, University of Jammu, Jammu. in the form of account payee DD, FDR,** Banker's cheque or bank any of the commercial banks which should remain **valid for 90 from the date of NIT.**

s) Firms which are exempted to submit the EMD/Bid security shall be required to submit certificate issued by the concerned Ministry/Department.

t) Successful bidders shall be required to submit performance security amounting 10% of the equipment cost pledged to the Registrar, University of Jammu in the form of account payee DD, FDR, Banker's cheque from any of the commercial banks which should remain valid for sixty days beyond the date of completion of all contractual obligations of the suppliers including warranty obligations.

u) The purchase will be made on credit basis and the payment will be made after supply and acceptance, by bank transfer.

x) Tenders are invited under two bid system

The supplier shall submit the tender in three envelopes. **The first envelope (Marked as Technical Bid)** shall contain all the documents mentioned below (a) to (i), and sealed.

a. A copy of the last audited balance sheet of your firm
b. Proof of manufacturing unit/ Authorized dealer letter from the Principal
c. The names of the organizations and laboratories to which same equipment have been supplied preferably alongwith supply order in recent past;
d. GST Registration No.;
e. Undertaking duly signed by the bidder stating that authorized distributors/manufacturers/dealers has not ever been blacklisted/debarred;
f. Technical specifications offered by the supplier;
g. Technical compliance statement; and
h. All related Catalogue/Brochure/Manual should be submitted

The second envelope (Marked as Commercial/Financial Bid) shall contain the Schedule, in which the supplier shall register the rates of supply. The second envelope shall also, likewise, be sealed. Each page of the tender shall be signed in full and stamped with the seal by the supplier. **Both the envelopes then should be put together, and shall be sealed in a third envelope** which should be marked as, **"Quotation for Scientific Equipment"** alongwith enquiry number and date. The Technical Bid shall be opened first in the presence of tenderers who would like to be present during tender opening session. **The Technical Documents shall be opened in the office of the H.O.D, Department of Physics, University of Jammu, at 11:00 am on 09.12.2019.** Financial bids of only technically qualified tenderers shall be opened. If the Technical Bids are not in order or are deficient in some respect, the commercial bids in respect of such tenders shall not be opened and shall be returned back to the bidder. The date and time of opening the Financial bids shall be announced immediately after opening all the Technical bids.

y) The firm should quote for the latest **Globally accepted and sold model. A certificate in this connection be given by the firm in the technical bid.**

z) The delivery, installation and operational training of the instruments/equipment should be completed within 2 months from placing of the order in case of the imported equipment and within 1 months if the instrument/equipment is made in India.

aa) Vendor shall ensure thorough installation, demonstration & relevant application training at the time of installation. Training for four persons for complete operation of the equipment should be provided on site.

bb) It may kindly be noted that late offers received after stipulated date and time will not be taken into consideration and shall be considered as rejected. University of Jammu shall not take into account the delay caused in submission of offer due to any of the reasons after last date of submission of bids.

cc) Any further changes in the details, like the date of opening or specification, will be posted on our web site only

dd) Technical specifications of the required instruments/equipments/articles are given below:

Technical Specifications of Scientific Equipment

	Name & Required Specification of the Item
A.	**Alpha Spectrometer**
i) Vacuum Chamber	The chamber should have single valve for pumping and venting. Microdot connector for Silicon surface barrier detector inside vacuum and BNC connector outside. There should be provision for changing the distance between detector and source.
ii) Ion implanted Si detector	Active Area: 50mm^2 Depletion Depth: 100µm Resolution: <14 KeV for Alpha Particle or better Mounting: Rear microdot connection
iii) Charge Sensitive Preamplifier	Low Noise less than 1.6KeV (Si) at 0pF detector capacity. Input capacitance 0-100pF. It should be compatible with the Si detector of alpha spectrometer. Accepts positive or negative charge input (normally from a semiconductor detector) from any type detector; BNC connector.
iv) NIM BIN	Wattage: 150W Output voltages: ±6 volts, ±12 volts, ±24 volts
v) Spectroscopy Amplifier for Alpha and Beta Spectroscopy using Si detector (NIM Module)	Input - Positive and Negative, Gain - Continuously adjustable from 5 to 1250. Output – Unipolar and Bipolar, Pulse Shape- Semi-Gaussian on all ranges with peaking time equal to 2.2τ, 50% pulse width equal to 3.3τ, and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5τ. Integral Nonlinearity: For 1.5-µs shaping time, <±0.05%. Noise : <5 µV rms Temperature Instability: Gain ≤±0.0075%/°C Overload Recovery Spectrum Broadening: <10% FWHM for a 60Co 1.33-MeV gamma line Pole-Zero Adjustment. Output for Preamplifier Power-supply.
vi) Detector (NIM Module) Bias Supply for Si detector	Bias Voltage 0-to ±1KV; of either polarity for two semiconductor detectors. Two individually adjustable outputs with 10 turn precision dials; SHV connectors output range 0- 1000V; positive or negative polarity for both detectors: impedance ~1.3M ohm; current monitoring capability
vii) Pulser (NIM Module)	Output-0-10V. Attenuated output with 1000:1, attenuated range. Positive or Negative polarity. Nonlinearity:<0.25%
viii) Cables/ Connectors	RG-62A/U 93-ohm Cable with two BNC male plugs, 4-ft length (two) RG-59A/U 75-ohm Cable with two SHV female plugs, 12-ft length (two) RG-62A/U 93-ohm Cable with two BNC male plugs, 0.5ft. length (one) RG-62A/U 93-ohm Cable with two BNC male plugs, 12-ft length (Two) BNC Tee Connector (one)
ix) Portable Vacuum pump	Vacuum pump with ultimate vacuum 1militorr and displacement 190 liters/min with manifold for alpha vacuum chamber.
x)Portable MultiChannel Analyser	Resolution : 8K Software: Windows Connection: USB
xi) Alpha Source Set	^{241}Am isotope of activity 0.1 µCi ^{228}Th isotope of activity 0.01 µCi ^{230}Th isotope of activity 0.01 µCi

xii) Digital Storage Oscilloscope	Bandwidth: 300 MHz Analog channels: 2 Real time sample rates on all channels: 2.5 GS/s Record length on all channles: 10k Display: Color
B.	**Pre-amplifier**, charge sensitive low noise amplifier
Noise	Increases with increasing input capacitance. Typical slope, 0 to 100 pF = 27 eV/pF; 100 pF to 1000 pF = 34 eV/pF. Typical performance values, based on silicon equivalent of ε = 3.6 ev at τ = 2 µs, are 1.9 keV at 0 pF; these become 4.6 keV at 100 pF and 35 keV at 1000 pF.
Rise Time	Based on a +0.5 V signal through either output into a 93-Ω circuit and measured from 10% to 90% of peak amplitude; <20 ns at 0 pF and <50 ns at 100 pF
Sensitivity	Nominal, measured through either output, 15 mV/MeV Si.
Energy Range	0 to 100 MeV Si.
Dynamic Input Capacitance	10,000 pF.
Integral Non- linerality	≤±0.05% for 0 to ±7 V open circuit or ±3.5 V terminated in 93 Ω
Temperature Instability	≤±100 ppm/°C, 0 to 50°C.
Detector Bias isolation	±3000 V.
Open Loop Gain	≥40,000.
C.	**Amplifier**, single width NIM module having low input noise, selectable shaping time constants and gain range, allows operation with semiconductor detectors, proportional counters, and scintillation detectors
Gain Range	Continuously adjustable from 5 to 1250.
Pulse Shape	Semi-Gaussian on all ranges with peaking time equal to 2.2τ, 50% pulse width equal to 3.3τ, and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5τ.
Integral Nonlinearity	For 1.5-µs shaping time, <±0.05%.
Noise	<5 µV rms referred to the input using 3-µs unipolar shaping; <7 µV using 1.5-µs shaping; both for a gain ≥100.
Temperature Instability	Gain ≤±0.0075%/°C, 0 to 50°C. Dc Level ≤±30 µV/°C, 0 to 50°C.
Bipolar Crossover Walk	≤±5 ns at 0.5-µs shaping for 50:1 dynamic range, including contribution of an ORTEC Model 552 Single-Channel Analyzer.
Overload Recovery	Recovers to within 2% of rated output from X300 overload in 2.5 non overloaded pulse widths using maximum gain for unipolar output. Same recovery from X500 overload for bipolar.
Restorer	Gated active baseline stabilizer with automatic threshold circuit to provide the threshold level as a function of signal noise to the baseline restorer discriminator.

Spectrum Broadening	Typically <10% FWHM for a ^{60}Co 1.33-MeV gamma line at 85% of full scale for an incoming count rate of 1,000 to 50,000 counts/s (Unipolar output, 1.5-μs shaping).
Spectrum Shift	Peak position shifts typically <0.02% for a ^{60}Co 1.33-MeV gamma line at 85% of full scale (measured at the unipolar output, 1.5 μs shaping, 1,000 to 50,000 counts/s).
D.	**High Voltage Power Supply**, NIM module with noise-free, well-regulated, very stable high voltage necessary for proper operation of photomultipliers, ionization chambers, semiconductor detectors, electron multipliers
Output Polarity	Positive or negative, selected by switch on rear panel.
Output Range	50 to 3000 V; minimum usable voltage 10 V.
Output Load Capacity	0 to 10 mA.
Regulation	≤0.0025% variation in output voltage for combined line and load variations within operating range at constant ambient temperature.
Temperature Instability	<±50 ppm/°C after 30-minute warmup; operating range 0 to 50°C.
Long Term Drift	<0.01%/hour and <0.03%/24-hour variation in output voltage at constant input line voltage, load, and ambient temperature after 30-minute warm up.
Output Ripple	<15 mV peak-to-peak, 20 Hz to 20 MHz.
Overload Protection	Internal circuitry protects against overloads including short circuits.
Resettability	Output voltage can be reset to within 0.1%.
E.	**Multichannel Analyser,** compact standalone 8k MCA
ADC	The ADC includes sliding scale linearization and <2 μs dead time including memory transfer.
Integral Nonlinearity	≤±0.025% over the top 99% of the dynamic range.
Differential Nonlinearity	<±1% over the top 99% of the dynamic range.
Gain Instability	≤±50 ppm/°C.
USB Interface	The USB 2.0 to PC as data transfer speeds up to a maximum of 480 Mbps.
F.	**NIM (Nuclear Instrumentation Module) BIN**
Wattage	150 watt
Output voltages	±6 volts, ±12 volts, ±24 volts

TECHNICAL COMPLIANCE REPORT

	Name & Required Specification of the Item	Qty	Make & Model	Complied Yes/No	Deviation if any
A.	**Alpha Spectrometer**	1			
i) Vacuum Chamber	The chamber should have single valve for pumping and venting. Microdot connector for Silicon surface barrier detector inside vacuum and BNC connector outside. There should be provision for changing the distance between detector and source.				
ii) Ion implanted Si detector	Active Area: 50mm^2 Depletion Depth: 100µm Resolution: <14 KeV for Alpha Particle or better Mounting: Rear microdot connection				
iii) Charge Sensitive Preamplifier	Low Noise less than 1.6KeV (Si) at 0pF detector capacity. Input capacitance 0-100pF. It should be compatible with the Si detector of alpha spectrometer. Accepts positive or negative charge input (normally from a semiconductor detector) from any type detector: BNC connector.				
iv) NIM BIN	Wattage: 150W Output voltages: ±6 volts. ±12 volts. ±24 volts				
v) Spectroscopy Amplifier (NIM Module)	Input - Positive and Negative. Gain - Continuously adjustable from 5 to 1250. Output – Unipolar and Bipolar. Pulse Shape- Semi-Gaussian on all ranges with peaking time equal to 2.2τ. 50% pulse width equal to 3.3τ. and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5τ. Integral Nonlinearity: For 1.5-µs shaping time. <±0.05%. Noise : <5 µV rms Temperature Instability: Gain ≤±0.0075%/°C Overload Recovery Spectrum Broadening: <10% FWHM for a 60Co 1.33-MeV gamma line Pole-Zero Adjustment. Output for Preamplifier Power-supply.				
vi) Detector (NIM Module) Bias Supply for Si detector	Bias Voltage 0-to ±1KV: of either polarity for two semiconductor detectors. Two individually adjustable outputs with 10 turn precision dials: SHV connectors output range 0-1000V: positive or negative polarity for both detectors: impedance -1.3M ohm: current monitoring capability				
vii) Pulser (NIM Module)	Output-0-10V. Attenuated output with 1000:1. attenuated range. Positive or Negative polarity. Nonlinearity:<0.25%				
viii) Cables/ Connectors	RG-62A/U 93-ohm Cable with two BNC male plugs. 4-ft length RG-59A/U 75-ohm Cable with two SHV female				

	plugs. 12-ft length RG-62A/U 93-ohm Cable with two BNC male plugs. 0.5ft. length RG-62A/U 93-ohm Cable with two BNC male plugs. 12-ft length BNC Tee Connector				
ix) Portable Vacuum pump	Vacuum pump with ultimate vacuum 1militorr and displacement 190 liters/min with manifold for alpha vacuum chamber.				
x) Portable Multi Channel Analyser	Resolution : 8K Software: Windows Connection: USB				
xi) Alpha Source Set	^{241}Am isotope of activity 0.1 μCi ^{228}Th isotope of activity 0.01 μCi ^{230}Th isotope of activity 0.01 μCi				
xii) Digital Storage Oscilloscope	Bandwidth: 300 MHz Analog channels: 2 Real time sample rates on all channels: 2.5 GS/s Record length on all channles: 10k Display: Color				
B.	**Pre-amplifier**, charge sensitive low noise amplifier	1			
Noise	Increases with increasing input capacitance. Typical slope. 0 to 100 pF = 27 eV/pF; 100 pF to 1000 pF = 34 eV/pF. Typical performance values, based on silicon equivalent of ε = 3.6 ev at τ = 2 μs, are 1.9 keV at 0 pF; these become 4.6 keV at 100 pF and 35 keV at 1000 pF.				
Rise Time	Based on a +0.5 V signal through either output into a 93-Ω circuit and measured from 10% to 90% of peak amplitude: <20 ns at 0 pF and <50 ns at 100 pF				
Sensitivity	Nominal, measured through either output, 15 mV/MeV Si.				
Energy Range	0 to 100 MeV Si.				
Dynamic Input Capacitance	10,000 pF.				
Integral Non- linerality	≤±0.05% for 0 to ±7 V open circuit or ±3.5 V terminated in 93 Ω				
Temperature Instability	≤±100 ppm/°C, 0 to 50°C.				
Detector Bias isolation	±3000 V.				
Open Loop Gain	≥40,000.				
C.	**Amplifier**, single width NIM module having low input noise, selectable shaping time constants and gain range, allows operation with semiconductor detectors, proportional counters, and scintillation detectors	1			

Gain Range	Continuously adjustable from 5 to 1250.				
Pulse Shape	Semi-Gaussian on all ranges with peaking time equal to 2.2τ. 50% pulse width equal to 3.3τ. and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5τ.				
Integral Nonlinearity	For 1.5-μs shaping time, <±0.05%.				
Noise	<5 μV rms referred to the input using 3-μs unipolar shaping: <7 μV using 1.5-μs shaping: both for a gain >100.				
Temperature Instability	Gain ≤±0.0075%/°C. 0 to 50°C. Dc Level ≤±30 μV/°C. 0 to 50°C.				
Bipolar Crossover Walk	≤±5 ns at 0.5-μs shaping for 50:1 dynamic range, including contribution of an ORTEC Model 552 Single-Channel Analyzer.				
Overload Recovery	Recovers to within 2% of rated output from X300 overload in 2.5 non overloaded pulse widths using maximum gain for unipolar output. Same recovery from X500 overload for bipolar.				
Restorer	Gated active baseline stabilizer with automatic threshold circuit to provide the threshold level as a function of signal noise to the baseline restorer discriminator.				
Spectrum Broadening	Typically <10% FWHM for a ^{60}Co 1.33-MeV gamma line at 85% of full scale for an incoming count rate of 1.000 to 50.000 counts/s (Unipolar output, 1.5-μs shaping).				
Spectrum Shift	Peak position shifts typically <0.02% for a ^{60}Co 1.33-MeV gamma line at 85% of full scale (measured at the unipolar output, 1.5 μs shaping, 1.000 to 50.000 counts/s).				
D.	**High Voltage Power Supply**, NIM module with noise-free, well-regulated, very stable high voltage necessary for proper operation of photomultipliers, ionization chambers, semiconductor detectors, electron multipliers	1			
Output Polarity	Positive or negative, selected by switch on rear panel.				
Output Range	50 to 3000 V; minimum usable voltage 10 V.				
Output Load Capacity	0 to 10 mA.				
Regulation	≤0.0025% variation in output voltage for combined line and load variations within operating range at constant ambient temperature.				
Temperature Instability	<±50 ppm/°C after 30-minute warmup; operating range 0 to 50°C.				
Long Term Drift	<0.01%/hour and <0.03%/24-hour variation in output voltage at constant input line voltage, load, and ambient temperature after 30-minute warm up.				
Output Ripple	<15 mV peak-to-peak, 20 Hz to 20 MHz.				

Overload Protection	Internal circuitry protects against overloads including short circuits.				
Resettability	Output voltage can be reset to within 0.1%.				
E.	**Multichannel Analyser,** compact standalone 8k MCA	1			
ADC	The ADC includes sliding scale linearization and <2 µs dead time including memory transfer.				
Integral Nonlinearity	≤±0.025% over the top 99% of the dynamic range.				
Differential Nonlinearity	<±1% over the top 99% of the dynamic range.				
Gain Instability	≤±50 ppm/°C.				
USB Interface	The USB 2.0 to PC as data transfer speeds up to a maximum of 480 Mbps.				
F.	**NIM (Nuclear Instrumentation Module) BIN**	1			
Wattage	150 watt				
Output voltages	±6 volts. ±12 volts. ±24 volts				