Institute of Physics

(An autonomous Research Institute of Dept. of Atomic Energy, Govt. of India)

P.O: Sainik School,
Bhubaneswar, Orissa-
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GLOBAL TENDER NOTICE NO.: **01/2010-2011**

Last date of receipt of the sealed quotations: Upto 3 P.M. of 21.05.2010

Sealed quotations are invited from leading manufacturers and / or their accredited associates for supply, installation, testing & commissioning of

1. **5-Axes Sample Manipulator (with variable temperature stage) – 01 Unit**
2. **X-Ray Detector (Si-Li)/ Pettier cool) with Amplifier & power supply & electronic cables**
3. **Water Chiller for SQUID VSM**

Detailed technical specifications and other terms & conditions for supply of the above items/ equipments can be obtained by downloading the same from the Institute's official website: www.iopb.res.in . All quotations should be submitted in sealed envelopes in two parts separately, i.e. "Technical bid" (Part- A) & "Financial bid" (Part-B). Both the parts should be further sealed in an envelope super scribing the name of the Item. The technical bid will be opened on **24.05.2010**. The price Bid of the only technically qualified bidders will be opened at a later date with prior intimation to the respective bidders.

The Institute reserves the right to accept or reject any or all quotations either in full or in part without assigning any reasons thereof.

DIRECTOR

TECHNICAL SPECIFICATION

Sl. No.- 1 Sample manipulator, chamber, and accessories

Scattering chamber

Scattering chamber made of stainless steel (14 in. i.d. and 18 in. height) and equipped with connecting flanges in HV standard or better. Guaranteed base pressure of ~10^{-8} mbar should be achievable after 24 h of pumping. Complete set of blank flanges. The chamber should be electro polished, leak checked and certified leak free. It should be equipped with flanges for:

- 5-axes manipulator (DN 160CF),
- Fluorescence screen (DN 100CF),
- Pumping (DN 160CF) and pressure measurement ports,
- Spare ports (2 nos.),
- 3 Viewports (one DN 100CF and 2 DN 40CF): 0, 45, and 90° with respect to the ion beam direction: UV and X-ray resistant
- 2 Ports for electrical feedthrough, 2xBNC, 2xLEMO
- 2 Ports for electrical feedthrough BNC and SHV connectors
- 1 feedthrough based shutter assembly (Molybdenum) and suitable current meter (1 to 500 nA), It should be placed close to the entrance port (other side of detectors)

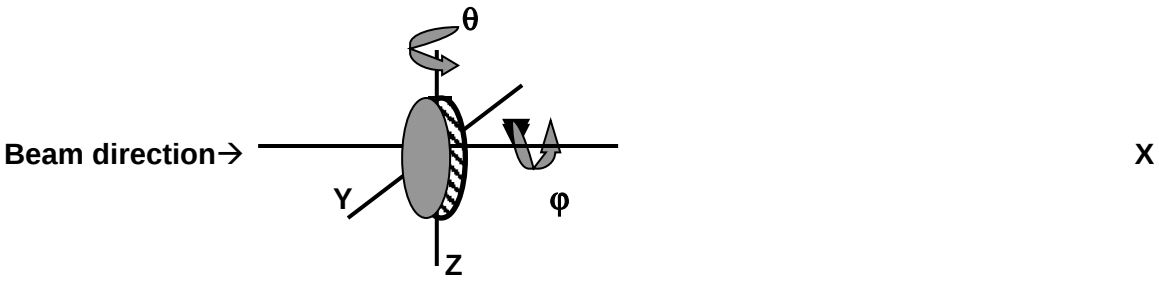
• Quick access vacuum door DN 160 CF along with venting valve with provision of gas connect
The chamber should be electrically isolated and possible to be used as a Faraday cup to monitor ion beam current. Height of the centre of the chamber from the ground level should be considered as 42 in.

5-axes Manipulator

XY-Motion Module – motorized (stepper motor with encoder, should include controller)
DN 160CF mounting flange, XY-motion module with +/- 12.5 mm stroke
Large barrel type micrometers with 5 µm graduations for manual operation should be possible.
XY-Motion specification >> Resolution: 5 µm manual, 1 µm motorized.
Z-Motion Module – motorized (stepper motor with encoder, should include controller)
Travel length of Z-Motion Module is 50 mm.
Large barrel type micrometer with 5 µm graduation for manual operation should be available.
Z-Motion specification: Resolution: 0.1 mm manual, 0.01 mm motorized.

Primary rotation module R1, ±180° (around Z-axis) – motorized (stepper motor with encoder, should include controller)
R1 (or θ)-Motion (as shown in figure) specification: Resolution: 0.01° motorized.

Primary rotation module R2, 360° continuous (around X-axis) – motorized (stepper motor with encoder, should include controller)
R2 (or φ)-Motion (as shown in figure) specification: Resolution: 0.02° or better motorized.



There should not be any backlash in any rotational motion. Inner surface of the manipulator base flange (facing the chamber) should have 8 blind threaded holes

Movable Detector Holders

Flange mounted movable detector holders - motorized (stepper motor with encoder, should include controller)

• DN 160CF,
• First detector R1=(10-70) deg with rotational precision of 0.5-1° - according to drawing,
• Second detector R2=(110-170) deg with rotational precision of 0.5-1° - according to drawing,
• 2 ports DN 16 CF

The detectors should be placed within horizontally made cylinders (5 mm thick, 12.5 mm long, and 20 mm i.d.) and both sides open. However, in the front face (facing the manipulator side), we need an arrangement to fix up a small SS disk of 1 mm thickness (with a central hole of 2 mm diameter and 5 mm x 2 mm rectangular slot) by screws. Two discs each with a hole and a rectangular slot need to be supplied. These aperture plates in front of the detectors are an absolute necessity and hence the arrangement to fix the plate on the detector holder, by screws, should be there. These two cylindrical detector holders should have 4 threaded holes (through holes) of 2 mm dia across the diameter which should be located at a distance of 5-6 mm away from the front aperture plate. Screws put across these through holes should hold the detectors within the cylindrical holders. In fact, the holes should be made at such a distance such that the detector surface appears at a distance of 6-8 mm away from the aperture plate. The detector holders should be identical and kept at a distance of 100 mm away from the centre of the chamber. Each detector holder (cylindrical detector housing described above) should be sitting on a support mechanism whose height should be made such that the center of the detector (sitting within the holder) coincides with the center of the manipulator.

Sample receiving station with water cooling

Sample receiving station with heating and thermal measurement, complete with all electrical and mechanical feedthroughs and connections

Sample holder

Two nos. of sample holding platens should be supplied for performing experiments in the temperature range 100-773 K or higher, resistive indirect heating, for sample diameter 50 mm. Should be accompanied by suitable heating power supply, thermocouples, and Eurotherm temperature controller. Minimum step by which temperature can be lowered/raised and stability in the final temperature (with respect to the set temperature) should be mentioned clearly. Reference point of the recorded temperature should be clearly mentioned.

The metallic holder should have preferably holes and clips to accommodate multiple samples (ten or more) having typical dimension of 1×1 cm^2 area and 0.5–1 mm thick. Its actual dimension and the best sample mounting possibility should be clearly mentioned in the quote along with detail drawing of the sample holding platen. Material for the sample holder should be mentioned. It should be nonmagnetic and highly conducting material (both electrically and thermally). Its compatibility with the load lock system for easy sample transfer should be clearly mentioned in the quotation.

During the low- and high-temperature irradiation experiments, target current measurement should be possible. There should be a written commitment from the supplier.

Gate valves

DN 63CF gate valve – manual with compensation bellow (for the beam line connection)
DN 63CF gate valve – manual (for connecting the load lock chamber to the scattering chamber)

The load lock chamber

SS304 made standard load lock chamber with CF flanges. DN 100CF main pumping port and two DN 40CF ports. Viton sealed quick access door. There will be a gate valve (DN63 CF) (as mentioned above) between the load lock chamber and the scattering chamber.
The chamber should be electro polished in compliance with normal UHV standards, leak
checked and certified leak free.

Linear transfer for load lock and the scattering chamber

The linear transfer system to transport sample holders with sample from Load Lock to the scattering chamber. It should be fully mechanical one without any magnetic part. All ball bearings should be ceramic balls. No magnetic fields. The linear transfer should have forward movement and continuous rotation around the movement axis.

Accessories

1. **Main Frame**

Adjustable rigid steel frames for the system, comprising mounting plate sandwich design (stainless steel, isolating plate and stainless steel mounting plate), large wheel for easy displacement of the system.

It should be able to accommodate all the stepper motor controllers, vacuum pump/gauge controllers (3-4 nos.), temperature controller, etc.

2. **Chamber lighting system**

LED based illumination system should allow observation of the sample transfer in the scattering chamber.

2. X-Ray Detector (Si-Li)/ Pettier cool) with Amplifier & power supply & electronic cables

1. X-ray Detector (Lithium-drifted Silicon Si(Li) and Peltier Cool)

(i) Type: Lithium-drifted Silicon Si(Li) and / Peltier Cool
(ii) Energy Range: About 1-30 KeV
(iii) Energy Resolution: Around 130-160 eV (FWHM at 5.9 KeV)
(iv) Sensitive area : Around ≤ 30 sq. mm
(v) Window : Be-window
(vi) Background Counts: Low
(vii) Electronic cables and connectors
(* A test report of the Detector with clamed parameters is REQUIRED)

2. Amplifier

A spectroscopic Amplifier suitable for the above Detector to obtain the highest-resolution is required. Preferably, the amplifier used in test purpose while writing the test

report claming the parameter value (above test report). Recommended spare parts should be quoted separately.

2. Power supply & Electronic cables

A power supply unit suitable for the above Detector to obtain the highest-resolution is required. Preferably, the amplifier used in test purpose while writing the test report claming the parameter value (above test report). Recommended spare parts should be quoted separately.

3. **Water Chiller for SQUID VSM**

PT410 Cryorefrigeratror Technical Manual

06-01-06 10 Manual PT410 CP2880

2.1.2 Cooling water specifications:

Parameter	Value	
Cooling Water: minimum flow @ maximum temperature See Figure 3 for details.	2.3 GPM @ 80 F	8.8 LPM @ 27 C
Maximum Inlet Pressure	110 PSIG	7.6 bar
Alkalinity	5.8 < pH < 8.0	5.8 < pH < 8.0
Calcium Carbonate	Concentration < 80 PPM	Concentration < 80 PPM

Commercial Terms & Conditions: -

1. **Price**: - The price mentioned above is Ex-Works/ FCA/ FOB separately including export packing, (this does not include the appropriate taxes)
2. **Destination**: - The consignment should be sent to **"**The Director, Institute of Physics, P.O. Sainik School, Bhubaneswar-751005, INDIA**"** on freight to pay (payable in Indian Currency) basis.
3. **Delivery**: - Delivery of the consignment should be made within ----------weeks from the date of issue of Letter of credit (L/C) either revocable or irrevocable.
4. **Payment**: - ***The payment will be released against irrevocable Letter of Credit (LC). You are required to issue an order confirmation letter in order to establish the L/C. 90% of the L/C value will be released on delivery of the consignment & balance 10% will be released after successful installation & commissioning of the equipment against submission of Performance Bank***

Guaranty (PBG) of equivalent amount (10%) valid for the warranty period and acceptance protocol signed by both the parties (supplier / it's authourised representative & buyer (IOP)). All Bank Charges towards Confirmation of the LC, if required, will be borne by the supplier.

5. ***Bank Charges:- All bank charges(except confirmation charges) inside India will be borne by the Institute & outside India will be borne by the supplier.***
6. **Bank Guaranty**: - You are required to submit a Performance Bank Guaranty equivalent to 10% of the equipment cost, valid for the entire warranty period issued by a nationalized Bank in favour of "Director, Institute of Physics, Bhubaneswar. The Bank
7. Guaranty is required to be submitted at the time of order confirmation.
8. **Details of the Consignment**: - You are required to submit the details of the consignment such as weight of the equipment, dimension of the packing & number of packets etc. at the time of order confirmation.
9. **Freight forwarder**: - The Institute will appoint the freight forwarder for forwarding & custom clearing of the consignment at the customs. The name of the freight forwarder will be intimated to the supplier at the time of opening of the L/C.
10. **Insurance**: - The transit Insurance of the consignment covering all risks and damages will be arranged by the Institute of Physics or its freight forwarder, duly authorized by the Institute.
11. **Warranty**: - The equipment should be warranted for a period of --------- months from the date of successful delivery / commissioning at Institute's site. The necessary warranty certificate in this effect should be furnished along with the supply/ commissioning of the equipment. Spare parts in warranty period are required to be replaced on DDP (Destination Duty Paid) basis.
12. **Documents**: - The despatch documents along with the signed invoice copy & the copy of the airway bill (2 copies each) should be despatched through courier / faxed to the Institute immediately after the equipment is handed over to the freight forwarder.
13. **Operational Manual**: - You are required to supply the operational manual of the equipment, circuitry diagrams etc. written in English only along with the consignment.

14. **Spare parts Manual**: - You are required to supply the operational manual of the equipment; circuitry diagrams etc. written in English only along with the consignment.
15. **Essential Spares/ consumables: -** Essential spares & Consumables along with the price list applicable for a period of 3/5/10 years are required to be supplied with the equipment & to be quoted separately.
16. **Shipment**: - Partial will not be strictly allowed.
17. **Agency Commission**: - No agency commission will be paid to any body / organization for this purchase.
18. **Banker**: - Our banker is Indian Overseas Bank, 121, New Station Square, Unit III, Bhubaneswar- 751001, INDIA. You are required to specify the Banking details such as A/c No, SWIFT code, Branch Code, name of the Bank etc. in order to release the payments.
19. **Training**: -
20. **Service support: -**
21. **Preventive Maintenance**: -
22. **Pre-Delivery Inspection:**
23. **Acceptance**: - If the terms & conditions mentioned above are acceptable to you, you are required to send the order confirmation letter along with a copy of this purchase order & details of consignment to the Institute within 02 weeks from the date of issue of the P.O. as a token of your acceptance.

DIRECTOR