Institute of Physics

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

P.O: Sainik School, Bhubaneswar, Orissa- 751 005, India

GLOBAL TENDER NOTICE NO.: **04/2010-2011**

Last date of receipt of the sealed quotations: Upto 3 P.M. of 25.10.2010

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

1. **High Resolution Steady State Fluorescence Spectrometer: – 01 Unit**
2. **Turbo Molecular Pump with Accessories (550ltrs./Sec.):- 01 Unit**
3. **Turbo Molecular Pump with Accessories (55/60 ltrs./Sec.):- 01 Unit**

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 **29.10.2010**. 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

GLOBAL TENDER No. 04/2010-11

DETAILED TECHNICAL SPECIFICATION

Item No.- 1.

A: High Resolution Steady State Fluorescence Spectrometer.

Signal to noise ratio:	better than 4000:1 (should be 6000:1) (Water Raman spectrum)
1. Source:	a) 450W Ozone free Xe lamp b) He-Cd laser of suitable power (325 nm, ~20 mW) to be quoted as an optional item (item '**C**' as given separately)
2. Excitation monochromator:	Double grating type, preferably with two entrance ports
a) Focal length :	min 200 mm
b) Wavelength range:	200 – 900 nm (and zero order)
c) Stray light rejection:	50000:1 or better (should be 100000:1)
d) Grating:	1200 g/mm (1800 g/mm will be better) (optimized for UV)
e) Aperture (F-number):	f/4.1 or better
f) Dispersion:	2.64 nm/mm or better
3. Emission Monochromator: a) Focal length :	With two detector ports min 300 mm
b) Wavelength range:	200-900 nm
c) Stray light rejection:	50000:1 or better (should be 100000:1)
d) Grating :	1200 g/mm (1800 g/mm will be better) (Optimized for visible) should have a software controlled grating turret
4. Detectors:	a) Red-sensitive PMT suitable for photon counting. Must cover 200-850 nm. Reference detector for spectrum correction if required.

5. Software and hardware:	a) for full system control and data acquisition b) For full data analysis (with multiple user license).

Data should be available in standard formats for ease of presentation and off line analysis

7. Other components:	**As may be required for coupling of laser (B) and low temperature cryostat (C) .**

Software should take care of temp control and readout with proper interfacing of the cryostat.

8. Sample chamber/holder:	To handle reflective solid targets, films and liquids at low temperature **in reflection geometry** Standard holders may be provided for carrying out measurements at room temperature (optional) without the cryostat.
9. Set of filters:	For second harmonic cutoff (beyond 600 nm) and intensity filter to be used with laser option, if required.
10. Optional:	Suitable vibration isolated optical table.
IMP:	System should run with 220 V AC at 50 Hz

B. Flow type low temperature cryostat with control for the Fluorescence spectrometer as above (A)

Temperature range:	around 4 K - 300 K
Sample holder :	Suitable for holding 10 mm x 10 mm or slightly larger samples.
Temperature stability:	+/- 0.1 K or better
Cool down time to lowest Temp:	about 10 minutes or better
He consumption for cool down :	<1.5 litres
He consumption at the lowest temp:	< 0.5 l/h

System should be quoted with all attachments necessary (**pressure gauge, pump, flow line, He container, heater, temperature sensor** etc) to function without any problem under the same control software as the spectrometer (A).

IMP: System should run at AC 220 V at 50 Hz

C. CW He-Cd laser with power supply and controls required for the Fluorescence spectrometer as above (A)

Wavelength :	325 nm
Power :	~ 20 mW
Polarization:	Vertical, > 100:1
Beam diameter:	1.5 mm or less
Beam divergence:	1.5 mrad or less
Mode:	TEM_{00} or TEM_{MM}

The complete system should have suitable power supply and cooling unit to run at AC 220 V at 50 Hz. Should be quoted with two years warrantee.

Important

- It will be preferable to go for all items from a single vendor. In such a case vendors must provide price breakup for individual items (A, B and C as above).
- Depending upon price and service constraints IOP may go for items B and C (as above) from other vendors.
- In the above case the spectrometer vendor must agree to provide the necessary couplings with software control wherever necessary for their integration. The price for the extra items required must also be indicated in the quote.
- Interested vendors may quote for individual items B or C only to be considered separately for coupling to A as above.
- Recommended spares for each item may be quoted for five years of trouble free operation.

Item No. 2

Turbo Molecular Pump with Accessories (550ltrs./Sec.):- 01 Unit

Inlet flange: DN 160 CF F

Fore vacuum connection flange: DN 25 ISO KF

I) Pumping speed for: Nitrogen: 510l/s

Helium: 520 l/s
Argon: 500 l/s or better
Hydrogen: 500 l/s or better

II) Compression ratio for: Nitrogen: > $1.\ 10^{11}$

Helium: $3\text{-}6.10^{7}$

Maximum for vacuum pressure required: 11-13 mbar (for N_2)

lll) Gas throughput for: Nitrogen: 4-6 mbar l/s
Helium: 8-10 mbar l/s

Ultimate pressure with rotary vane backing pump: < 5.10^{-10} mbar as per DIN 28428 standards. Display and Control unit of the pump must provide the following parameters:

- Rotation speed of the pump in terms of r.p.s. as well as r.p.m.
- Current drawn by the pump
- Operating hours
- Temperature of bearing
- Temperature of motor
- Temperature of electronics

Accessories:

- Air cooling kit, cleaning kit, auto vent valve, splinter shield, heating jacket, connecting components with metal hose, copper seals, nuts and bolts, required cables and other essential accessories to be quoted under main offer. Facility should be there to operate the pump at various speeds by using the controller itself without any extra accessories.

The turbo pump should have maintenance free, permanent magnetic bearing at the high vacuum side and oil lubricated ceramic bearing.

B) **Backing pump: Double stage rotary vane vacuum pump with magnetic coupling, with 20 m^3/hr pumping speed;** Qty: 1 No.

- Pumping speed: - 20 m^3/h.
- Flange connection: - DN 25 ISO-KF
- Ultimate pressure: - 0.005 mbar without gas ballast.
- Noise level: - < 55 dB(A)
- Motor to pump coupling: - Magnetic coupling.
- Leak rate of the pump: - 1 x 10^{-5} mbar l/s
- Integrated with high speed hydraulically controlled high vacuum safety valve.

Accessories: Oil mist filter with oil return device and connecting components to Turbo pump

C) Vacuum measurement system:

(i) Pirani/Capacitance gauge with DN 16 CF (meas. range: 1500 to 0.0005 mbar) – Qty 01
Should have accuracy of ±2.5% (in the range of 950-1050 mbar), ±5% (in the range of 50 to 950 mbar), and ±15% (in the range of 50 mar to 10^{-3} mbar)

(ii) Penning gauge with DN 40 CF (meas. Range: 0.01 mbar to 2x10^{-9} mbar) – Qty 01
Accuracy: ±30% (in the range of 10^{-3} to 10^{-8} mbar)
repeatability: ±5% (in the range of 10^{-3} to 10^{-8} mbar)

The vendor must mention the output signal, bake out temperature etc. in a clear manner. Proper connection flange should be provided.

(iii) Dual gauge control unit; Qty: 1 no.

No. of sensor connections: 2 (to accommodate the above two gauges)

Measurement range: 55000 mbar to 5.10^{-11} mbar (depends on the type of gauge head connected)

Supply: 220 V AC, 50 Hz, 1 phase.

Interface: RS 232 C

Measurement signal output, analog: 0 – 10 V DC

Operating temperature: + 5 to + 50^{0}C.

Measurement rate: 50 l/s

Display rate: 10 l/s.

Set point: potential free changeover contact: 4 pieces

Sensor Cables (6 m long – 2 nos.), Main cables (for dual gauge controller: 3 m long), centering rings and clamps to be quoted under the main offer.

D) Installation and commissioning of the offered system to be done at our site for free of cost.

E) After sales service: In case of break down, complete repairs of the Turbo Pump, viz. bearing replacement, motor part replacement, complete cleaning of pump etc. should be possible at site.
The vendor should have Service Centre/Facility and complete infrastructure within India to handle complete repairs of the turbo pump, such as, changing of stator / rotor assembly, repairs of electronics, etc and availability of critical spares off the shelf, from Indian office.

In addition, there has to be a written commitment from the company that in case of a state of urgency (as identified by the concerned Scientist of IOP), the vendor should send the replacement pump within 15 days at the IOP site. In absence of this commitment, the quotation will be considered as invalid.

E) The vendor must submit an item-wise compliance statement, along with the offer comparing with tender specifications. In absence of the compliance statement, the quotation will be considered as invalid.

Item No. 3

55-60 lps turbo pumping system & accessories:

A) Turbo molecular pumping system with integrated drive – Qty. 1

Inlet flange: - DN 63 CF-F,

Pumping speed for: Nitrogen: 55-60 lps, Helium: - 50 lps, Hydrogen: - 42 lps
Compression ratio for: Nitrogen: >1x 10^{11}, Helium: >6x10^{6}, Hydrogen: >1x10^{5}

Ultimate pressure with double stage rotary vane backing pump: <5 X 10^{-10} mbar as per DIN 28428 standard.

Maximum backing vacuum pressure for N_2: >20 mbar

Gas throughput for full rotational speed: N_2: 1.3 l/s, He: 2.7 l/s, Hydrogen: 1.4 l/s
Cooling: - Air cooling

Degree of protection should be as per IP 54 standard

Display and Control unit of the pump must provide the following parameters:

- Rotation speed of the pump in terms of r.p.s. as well as r.p.m.
- Current drawn by the pump
- Operating hours
- Temperature of bearing
- Temperature of motor
- Temperature of electronics

Accessories: Heating jacket, vent valve, metal hose, clamps, O-rings, splinter shield, cleaning kit, and other essential accessories to be quoted.

The turbo pump should have maintenance free, permanent magnetic bearing at High Vacuum Side, and oil lubricated ceramic bearing at bottom side, and the magnetic bearing should have a dry emergency bearing embedded in to it. It should be suitable to be mounted for any orientation.

B) <u>Backing pump: -</u> Double stage rotary vane vacuum pump - **Qty. 1**

- Pumping speed: 5 m^3 /hr
- Ultimate pressure: 5X10^{-3} mbar without gas ballast
- Flange in & out: DN 16 ISO-KF
- Rated power: 0.15 kW
- Water vapor tolerance at 50 Hz: 15 mbar
- Water vapor capacity at 50 Hz: 30 grams/hr
- Noise level: <55 dB
- Pump fluid filling: 0.4 lit
- Motor to pump coupling: Magnetic
- Leak rate of the pump: 1X10^{-5} mbar l/s

Accessories: Oil mist filter with oil return device and connecting components to the turbo pump.

C) <u>Vacuum Measurement system</u> – 1 Set
Pirani/capacitance Gauge: Qty. 1
- Connecting flange: DN 16 CF-F
- Measuring range: 1500 to 5 X 10^{-4} mbar
- Bake out temp.: 80^0C
- Seal: metal
- Accuracy: <u>+</u> 2.5% (in the range of 1500 to 0.0005 mbar), <u>+</u>5% (in the range of 50-950 mbar), <u>+</u>15% (in the range of 50 mbar to 10^{-3} mbar)

Penning Gauge: Qty. 1

- Connecting flange: DN 40 CF-F
- Measurement range: 0.01 mbar to 2 X 10^{-9} mbar or better

- Accuracy: ± 30% (in the range of 10^{-3} to 10^{-8} mbar)

- Repeatability: ± 5 % (in the range of 10^{-3} to 10^{-8} mbar)
- Operating temp.: 5 to 60 ^{0}C
- Volume: 1.5 cc

- Connecting cable length: 3 mtrs

Dual Gauge Controller: Qty. 1

- To accommodate both the above gauges
- Display rate: 10/sec
- Error signal working contact, potential free.: 1 piece
- Measuring range should be clearly mentioned

- Power consumption: Should be clearly mentioned
- Mains: 250 V, 50 to 60 Hz
- Interface: Should be mentioned

- Sensor cable length should be 6 m (2 nos.)

- mains cable length for dual gauge controller should be at least 3 m (1 no.)

D) Installation and commissioning of the offered system to be done at our site for free of cost.

E) After sales service: In case of break down, complete repairs of the Turbo Pump, viz. bearing replacement, motor part replacement, complete cleaning of pump etc. should be possible at site.
The vendor should have Service Centre/Facility and complete infrastructure within India to handle complete repairs of the turbo pump, such as, changing of stator / rotor assembly, repairs of electronics, etc and availability of critical spares off the shelf, from Indian office.

In addition, there has to be a written commitment from the company that in case of a state of urgency (as identified by the concerned Scientist of IOP), the vendor should send the replacement pump within 15 days at the IOP site. In absence of this commitment, the quotation will be considered as invalid.

The vendor must submit an item-wise compliance statement, along with the offer comparing with tender specifications. In absence of the compliance statement, the quotation will be considered as invalid.

Commercial Terms & Conditions:

1. **Price**: - The price mentioned above is Ex-Works/ FCA separately including export packing (Air worthy) charges (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. If The LC confirmation is required by the supplier, the total confirmation charges will be borne by the beneficiary (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. One month additional validity required to be available for claim lodgment.
7. ****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.
8. **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.
9. **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.
10. **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.

11. **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.
12. **Operational Manual**: - You are required to supply the operational manual of the equipment, circuitry diagrams etc. written in English only along with the consignment.
13. **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.
14. **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.
15. **Shipment**: - Partial will not be strictly allowed.
16. **Agency Commission**: - No agency commission will be paid to any body / organization for this purchase.
17. **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.
18. **Training**: -
19. **Service support: -**
20. **Preventive Maintenance**: -
21. **Pre Delivery Inspection:**
22. **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