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## INDIAN INSTITUTE OF ASTROPHYSICS

2<sup>ND</sup> BLOCK, KORAMANGALA, BANGALORE - 560034

Ref No : PUR/IMP/PFO/ADITYA/SK/011/2014-15.

April 30, 2014.

Dear Sir/s,

The Director, Indian Institute of Astrophysics, Bangalore, invites Sealed Tenders Two bid system (price bid & technical bid) for the Import of **“Particle Fall out Photometer with Accessories as per the Technical Specifications Annexed”**. The terms and conditions may be noted from IIA Website and if you are in a position to quote for the supply in accordance with the requirements, please submit your quotation. The Tender documents and other details are available on IIA web site [www.iiap.res.in/tenders.htm](http://www.iiap.res.in/tenders.htm)

**The Tender bids must be in foreign currency only.** Your completed Tender bid both Technical bid and Commercial bid must reach our office on or before 23/05/2014 by 15 00 hrs. The bid/s must be in a separate Sealed envelopes duly super-scribed with the name of the supply, the Due Date and both envelopes kept in a big Envelopes mentioning the supply, must reach this Office within the Due Date and time. The Technical bid will be opened in the presence of the bidder/s or their authorized representative of the Company by 15.30 hrs on 23/05/2014. The Commercial bids will be opened only those vendors quotes qualify in Technical Evaluation. The opening of commercial bids, the date will be intimated later. Incomplete Bid/s are liable for rejection.

For Technical clarifications you may contact during office hours Shri S.Kathiravan (Phone No.2254 1403) and for Commercial clarifications can be had from Shri Y.K.Raja Iyengar, Purchase Officer (Phone No.2254 1244).

Thanking you,

Yours faithfully,

Y.K.Raja Iyengar  
Purchase Officer

**GLOBAL TENDER DOCUMENT No : PUR/IMP/PFO/ADITYA/SK/011/2014-2015.  
DT : 30/04/2014.**

**TENDER FORM**

FROM:

TO

THE DIRECTOR  
Indian Institute of Astrophysics,  
Bangalore - 560 034.

Sir,

I/We hereby offer to supply the Items/Equipment indicated below at the price hereunder quoted and agree to hold this office open till . I/We shall be bound to supply the items/Equipment hereby offered upon the issue of the Purchase Order communicating to the acceptance thereof on or before the expiry of the last mentioned date. You are at liberty to accept any one or more of the items such Items/Equipment. I/We not withstanding that the offer in this tender has not been accepted in whole, shall be bound to supply such items and such portion or portions of one or more of the items as may be specified in the said Purchase order communicating the acceptance.

S No.	Description of the item(s)	Qty.	Unit	Rate	Dely. Period
1.	Particle Fall out Photometer with Accessories as per the Technical Specifications Annexed".	1	No.		

(Tender bid should be submitted in Foreign currency only)

Place at which the Delivery is required : Indian Institute of Astrophysics  
Bangalore - 560 034.

Date by which the supplies are required : 4 weeks from the date of order.

2 I/We have understood the items of the tender annexed to the invitation to the Tender and have thoroughly examined the specifications/drawing and / or pattern quoted or referred to herein and / are fully aware of the nature of the items/ Equipment required and my / our offer is to supply the items/ Equipment strictly in accordance with the requirements subject to the terms and conditions contained in the Purchase order communicating the acceptance of this tender either in whole or in part.

Date :

Signature and Seal of Supplier

## **Annexure - A**

### **INSTRUCTIONS TO SUPPLIERS**

1. Tenders should be sent in a sealed and super-scribed envelopes with mention of Tender No. date and date of opening. Only one Tender should be sent in each envelope.
2. Late and Delayed tender will not considered at all.
3. Duties, Taxes where legally leviable and intended to be claimed should distinctly shown separately in the Tender.
4. a) Your quotation should be valid for 90-120 days from the date of opening of Tender.  
b) Prices are required to be quoted according to the units indicated in the annexed tender form. When quotations are given in terms of units other than those specified in the Tender from, relationship between the two sets of units must be furnished.
5. a) All available Technical Literature(s), Catalogue(s) and other data in support of the specifications and details of the item(s) should be furnished along with the offer.  
b) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensional details are available the same should indicated in your offer.  
c) Air freight/sea freight charges up to Bangalore Airport may be sent along with the offer.

#### **d) Specifications:**

Items / Equipment offered should strictly conform to our specifications. Deviation, if any should be clearly indicated by the Supplier in their quotation. The supplier should also indicate the Make / type No. of the stores offered and provide catalogue(s), Technical literature(s) and sample(s), wherever necessary along with the quotations. Test certificates wherever necessary should be forwarded along with the supplies. Whenever options are called for in our specifications, the Supplier should address all such options. Wherever specifically mentioned by us, the Supplier could suggest changes to specifications with appropriate response for the same.

1. Corrections, if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.
2. The supplier should supply along with the tender, the Banking information for payment or any other purpose.
3. A complete set of instruction and operation manual should be supplied.
4. Final performance should be guaranteed.

## **TERMS AND CONDITONS OF CONTRACT**

### **1. DEFINITIONS:**

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- a) The terms ‘Purchaser’ shall mean the Director, Indian Institute of Astrophysics, Bangalore - 560 034.
- b) The term ‘Supplier’ shall mean, the person, firm or company with whom or with which the order for the supply of Items / Equipment is placed.
- c) The terms ‘Purchase Order’ shall mean the communication signed on behalf of the Purchaser by an officer duly authorized intimating the acceptance on behalf the Purchaser on the terms and conditions mentioned or referred to in the said communications accepting the tender or offer of the supplier for supply of Items/Equipment.

### **2. PRICES:**

The price may please be indicated on unit basis only.

#### **Duty Exemption:**

Please note that we may issue “Customs duty Exemption Certificate”, if acceptable under the Govt. of India notification No.51/96 valid till 2016.

### **3. GUARANTEE AND REPLACEMENT:**

The Supplier shall guarantee that the Items/Equipment supplied shall comply fully with the specifications laid down, for material workmanship and performance. The Guarantee should be for a period of one year minimum from the date of supply.

### **4. PACKING, FORWARDING AND INSURANCE:**

The Contractor will be held responsible for the stores being sufficiently and properly packed for transport by air / Sea to withstand transit hazards ensure safe arrival at the destination. The packing and marking of packing shall be done by and at the expenses of the contractor. The Purchaser will not pay separately for transit insurance, all risks in transit being exclusively of the supplier and the Purchase shall pay only for such Items/Equipment as are actually received in good condition, in accordance with contract.

### **5. TEST CERTIFICATE:**

Wherever required Test Certificate should be sent before dispatch of the items.

### **6. ACCEPTANCE OF ITEMS / EQUIPMENT:**

a)It is expressly agreed that the acceptance of Items/Equipment, is subject to final approval by the Purchase, whose decision shall be final.

7. **DELIVERY PERIOD:**

Delivery is the essence of the contract. The supplier should adhere to delivery schedule as indicated in the Purchase order.

8. **EXTENSION OF DELIVERY TIME:**

As soon as it is apparent that Supplier dates cannot be adhered to, an application shall be sent by the Supplier to the Purchaser. If failure, on the part of the Supplier to deliver the Items/Equipment in proper time shall have arisen from any cause which the Purchaser may admit as reasonable ground for an extension of the time ( and his decision shall be final he may allow such additional time as he considers it to be justified by the circumstances of the case). In case of Letter of Credit the banking charge for the LOC amendment will be on suppliers account.

9. **PAYMENT:**

Preference will be given to the supplier whose payment terms is on Site Draft.

10. **SECURITY FOR PAYMENT:**

Successful Supplier will have to furnish in the form of a Bank Guarantee or any other form as called for by the Purchase towards any payments before supply of items/equipment. In case of payment through Letter of Credit the Banking charges outside India and inside India will be on suppliers account.

11. IIA reserves the right to reject any or all the Tenders without assigning any reason.

**Purchase Officer  
For Director**

## **TECHNICAL SPECIFICATIONS OF PARTICLE FALL OUT (PFO) METER**

**PLACE:** DETAILS OF REQUIREMENT OF PARTICLE FALL OUT (PFO) METER FOR VELC PROJECT ON ADITYA-1. THE INSTRUMENT WILL BE USED AT PROF. M.G.K.MENON SPACE SCIENCE LABORATORY AT **CREST** CAMPUS OF INDIAN INSTITUTE OF ASTROPHYSICS (IIAP).

**USE:** THE PROPOSED PARTICLE FALL OUT PHOTO METER WILL BE USED IN PROF.MGK MENON LAB FOR PARTICULATE CONTAMINATION MEASUREMENT.

### **Particle Fall Out Photometer**

The Particle Fall Out Photometer is a photometric measuring instrument, that is able to detect small particles present near the working areas in clean room environments to monitor the surface contamination.

The instrument is for measuring the particulate contamination on test surfaces. It shall be based on light scattering method by settled particles when subjected to a stabilized light beam nearly parallel to a non reflective sampling surface. Measuring range shall be from 0 to 5000 PPM

During the measurement the precipitating particles shall be collected on numbered sample-plates allocated to the areas which have to be monitored. After exposure, they will be collected and the degree of contamination of the sample-plates will be measured with the PFO-Photometer. The read-out of the PFO-Photometer shall be an indication of the contamination in ppm. This is a vital condition in order to protect the products is to have the possibility of measuring the particle fall out during the process of integration.

The method used by the PFO-Photometer shall determine the surface contamination of the product and shall differ the way from airborne particle measurements, which are normally applied for control of the cleanliness level.

## **Required Features**

The reliability of the PFO shall be improved by the use of an integrated self check, which checks the vital functions of the instrument and perform a reference measurement, between every measured sample plate. Messages generated by the self check shall be presented on the display of the instrument.

The read-out of the measurements shall be on the display. The instrument shall have the automatic sample plate indication, serial communication with a PC and a possibility to inspect the particles on the sample plate visually via a video output.

The necessary data processing software shall be provided to organize the measurements in a table, where measured values are connected to the right sample plate. From this table the results may be presented in different ways, like graphical and numerical, particle fall out between two measurements or cumulative fallout etc.

For the PC-communication and the visual inspection, the PFO-meter shall have the provision for PC connection with suitable video-entry.

## **Measurement principle**

PFO-Photometer shall measure the sedimentation on sample (witness) plates which are exposed to the particle fall out in proximity to the critical areas. The sample plates will be collected after a specific time and then will be placed in the PFO-Photometer. The PFO shall measure the obscuration i.e. the ratio of area covered by the particles to the total measuring area. The measurement method shall be based

on the scattering of light beams caused by particles on the sample plate. The light beams shall be parallel to the surface of the sample plate, which itself doesn't disperse these beams. The scattered light shall be measured and digitally displayed in PFO-units.

The PFO-Photometer shall have a possibility to observe the structure and composition of the fall out by a video connection. The video output can also be used for documentation and filing our measurements in a log.

## **The Sample or Witness plate**

The Sample Plate used in the PFO-Photometer shall be smooth, nonreflecting glass plate, protected from unintentional particle fall out by a plate holder. This plate holder shall automatically removed from the sample plate, when the this is inserted into the PFO-Photometer.

New Sample Plates shall be delivered together with a check sheet, on which critical points of the sample plate will be registered.

The PFO-Photometer shall be delivered with 12 sample plates, user manual and a package of sample plate cleaning tissue. Every sample plate shall have a unique serial number and every sample plate shall have a check-sheet on which all characteristic points are filled in.

## **Calibration**

The PFO-Photometer shall have internal reference to check if calibration is necessary. The PFO shall check after every measurement if the instrument is running within its specifications. If the limits of the specifications are approached, the PFO shall warn the user that calibration will be necessary in the near future.



The minimum detectable obscuration and maximum detectable obscuration shall be specified.

Calibrated sample (PFO) plate with known value of obscuration factor may be provided for in house calibration.

## **Back panel**

- Connections to mains and external equipment shall be made on the back panel.
- The Monitor/Video Switch and Video Output shall be available on the back panel.
- Necessary electrical Fuses, Inlet mains switch shall be available.
- RS 232 serial communication shall be available

## **Specifications:**

- Light source : LED
- Detector: PIN diode type with Electronic amplifier and digital display.
- PC-Communication: RS-232
- Visual inspection: examination of the settled particles by a built-in video display, or separate video-monitor. Connection of a video-recorder is preferred.
- Primary calibration: Calibration report shall be available
- Sample plates: 12 Nos

- Power input: 230 VAC 50 Hz
- Measuring range: 0-5000 ppm
- Operating temperature range : 5 deg C to 40 Deg C
- Accuracy - : better than 5% in the operating temperature range.
- offset +/- 2 ppm

### **Accessories:**

Necessary interface cables, spare fuses, standard accessories & data processing software shall be provided.

Optional accessories list may be provided with technical and budgetary information.

### **After sales service & Guarantee/Warranty:**

After sales, the service support for any repair & for regular calibration shall be mentioned.

Guarantee/Warranty details of the product shall be mentioned.