POSTED UNDER POSTAL CERTIFICATE

BUREAU OF INDIAN STANDARDS

Phone : 23721442, 28394955, 28394956, 28396324
FAX : 28398841

BIS BANGALORE LABORATORY
Peenya Industrial Area
1st Stage, Tumkur Road
Bangalore – 560 058

Ref : BNBL / 13:3(SFPC)

Date : 01 02 2007

Subject: **Supply of Precision Pyranometer, Secondary Standard, High Quality and Shadow Ring.**

M/s Dynalab,
G3/G2, Brahma Memories
Bhonsale Nagar
Pune-411 007

Dear Sir(s),

Technical & Commercial Bids are invited for the supply of **Supply of Precision Pyranometer, Secondary Standard, High Quality and Shadow Ring.** required for testing of Soar Flat Plate Collector in separate SEALED covers, which should reach the undersigned latest by **17 00 hours** on **16 February 2007** at the above address.

1. The terms and conditions for submitting quotations and supply of the equipment are given in **Annexure – I.**

2. The detailed specification(s) of the above mentioned equipments(s)/items are given in **Annexure – II & III.**

3. The Technical Bids shall be opened in the Conference Hall of BIS Office, Bangalore at the address mentioned above at **15 00 hours** on **20 February 2007** in the presence of such tenderers or their duly authorized representatives who may like to attend.

4. Please note that the envelopes containing Technical & Commercial Bids are sealed properly i.e. either wax sealed or with adhesive cello tape on both ends. Unsealed and stapled envelopes shall not be accepted.
5. Unless stated otherwise, quotation(s) shall be deemed to be for delivery at BIS Bangalore Branch Office Laboratory.

6. The specification and terms & Conditions can also be downloaded from BIS Website – www.bis.org.in

Thanking you,

Yours faithfully,

(B.R. Narayanappa)
Director & Head BNBOL

Encl. : 1) Annexure - I
2) Annexure – II
3) Annexure – III

TERMS & CONDITIONS

1 The **BUREAU** gives **FIRST PREFERENCE** in its purchase to goods bearing ISI Certification Mark and second preference to those which conform to the relevant Indian Standard Specification as applicable.

2 The delivery of stores is required within 30 days of receipt of order. If however, it is not possible for you to effect delivery during working hours by that date, you are requested to specify the date by which you can guarantee delivery of stores.

The quotation(s) shall be submitted in Two Parts- Technical Bid & Commercial Bid. The Technical & Commercial Bids should be sealed by the bidder in separate cover duly super scribed and both these sealed covers are to be put in a bigger cover which should also sealed and duly super scribed **"Quotations for Supply of Supply of Precision Pyranometer, Secondary Standard, High Quality and Shadow Ring."** for testing of Solar Flat Plate Collector as per IS 12933 (Part 1): 2003. Such Bids shall remain valid for a period of 90 days from the date of opening of quotation(s). The commercial Bid will be opened after technical evaluation of technical bid. The date of opening of commercial Bid will be informed to the bidders found suitable in technical evaluation.

3 The offer/quotation must be strictly as per required specifications and the tender terms and conditions. The technical bid shall contain the technical leaflets/literature and complete specification of the quoted model(s) of the item. Deviations, if any from the specifications shall be clearly brought out along with justification.

4 Quotation(s)/Bids qualified by indefinite expressions as "subject to immediate acceptance", "subject to prior sale", etc. and incomplete quotation(s) is/are liable to be summarily rejected.

5 The financial bid should clearly give break-up of cost of each equipment as per specifications. The rates quoted should separately indicate Basic Cost, Excise Duty, Sales Tax, Packing and Forwarding Charges, Freight, Insurance, VAT, etc. In the absence of any such stipulation, it will be presumed that the prices include all such charges and no claim for the same shall be entertained.

6 Each tender document shall be accompanied with an **Earnest Money Deposit (EMD) of 3 % of the cost of the equipment**. The demand draft for the EMD amount shall be drawn in favour of **"Bureau of Indian Standards"**, payable at **Bangalore**. The sealed envelope containing EMD shall be super scribed **"EMD"** and stapled separately with the envelope containing Commercial Bid. This will be returned to the unsuccessful bidders within 30 days of the award of the contract.

7 The equipment should be installed/commissioned and demonstrated by the supplier at BIS Bangalore Laboratory immediately, but in any case within one month after receipt of the item in the lab, and the same will be put under operation to the satisfaction of BIS technical personnel who will test the performance of the equipment. **No separate charges for installation, etc. will be paid to the party beyond the quoted prices**.

8 BIS shall pay 90% of the cost after satisfactory installation and commissioning and training, and the balance of 10% as **contract performance security** would be paid after expiry of warranty period. However other terms of payment for contract performance security can also be considered, if so stated clearly.

9 Documents in support of experience, past performance, technical capability, manufacturing facilities, and financial position of the supplier as well as client-list should be furnished along with the technical bid.

10 The warranty period of the equipment shall be clearly stated in the Technical Bid. The warranty period of an item/equipment shall commence from the date of receipt of the item/equipment in good working condition and satisfactory installation / commissioning / demonstration at BIS Bangalore Laboratory. The warranty period and validity of contract performance security shall be extended for the period of delay in satisfactory installation.

11 **The bidders shall mention in the quotation, the rate/amount of annual maintenance charges**, if BIS opts for maintenance contract after expiry of the warranty period. This is mandatory to mention.

12 **Please mention clearly in the technical bid regarding address of arrangements for service/repair of the equipment is available.** Suppliers having the required infrastructure in or around Bangalore for providing timely and efficient service of the equipment will be preferred.

13 All goods received would be subjected to inspection by BIS before or after receipt or commissioning (as applicable). The decision of BIS shall be binding. Rejected items/goods/stores shall be removed by the supplier at his own cost and risk, within 30 days of receipt of notice for the removal of such goods, and no liability, whatsoever, on the Bureau shall be attached for the rejected/disapproved goods/items/stores.

14 The Bureau reserves the right to accept or reject summarily any or all quotation(s) in whole or in part without assigning any reason whatsoever.

15 The Bureau takes no responsibility for delay, loss or non-receipt of quotation(s) after dispatch.

16 In case of non-compliance with the terms and conditions of the contract, the Bureau reserves its right to :

a) Cancel/rescind/revoke the order if supply is not made in time and is not conforming to the required specifications.
b) impose penalty up to 1% of the total value of the order for a delay of every seven days after the scheduled date subject to the ceiling of a maximum of 10% of the total value of the order.

17 Successful tenderer shall be required to provide training to BIS personnel at BIS Bangalore Laboratory in the use of the equipment at the supplier’s cost.

18 All questions, disputes or differences arising under, out of or in connection with this tender enquiry shall be subject to the exclusive jurisdiction of Bangalore Courts.

BUREAU OF INDIAN STANDARDS
(BANGALORE BRANCH OFFICE LABORATORY)
EQUIPMENT SPECIFICATION

EQUIPMENT SPEC. CODE	:	**SFPC 024**
NAME OF THE EQUIPMENT	:	**PRECISION PYRANOMETER**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**One No.**

1.0 Scope

Prescribes the requirements for a precision thermoelectric pyranometer for measuring the irradiance on a plane surface which results fro direct solar radiation and from the diffuse radiation from the hemisphere.

This instrument is required for carrying out the following tests:

- Outdoor No-flow exposure test as per Cl. 5.2 of IS 12933 (Pt.5).
- External thermal shock test as per Cl. 5.4 of IS 12933 (Pt.5).
- Internal thermal shock test as per Cl. 5.5 of IS 12933 (Pt.5).
- Thermal performance test as per Cl. 6.4 of IS 12933 (Pt.5).

2.0 Material

2.1 The entire instrument shall be made of brass and shall be resistant to the corrosive dampness.

2.2 The sensitive element shall be made of constantan copper thermocouple combined in a star shape and temperature balanced.

2.3 The protection domes shall be made of special optical clear flint glass of exceptional clarity, uniform optical transmission characteristics and refractive index.

2.4 The sensitive element shall be of copper constantan junctions formed on an insulating disc, approximately 20 mm in diameter and 8 mm thick. The thermopile should be made from 0.19 mm thick constantan wire.

2.5 The active junctions of the thermopile shall lie in an even horizontal plane and painted black with special optical black lacquer.

2.6 The absorptivity of the black lacquer shall not less than 98 percent and uniform over a wide range of wave lengths.

2.7 The entire instrument except for the two glass domes shall be protected from dust radiation by mounting it in the centre of a circular guard plate painted white.

2.8 The top surface of the guard plate shall be exactly level with the blackened surface of the thermopile for a distance of 25 mm from the inner edge and shall slope down from there at an angle of about 10^{o}.

2.9 The electrical leads from the thermopile shall be mounted in an air tight inside the tubes through which they emerge and screw cap closing the bottom lid of the cylindrical chamber shall be threaded over a rubber ring washer.

2.10 The interior of the cylindrical chamber shall be made air tight and dry all times.

2.11 The entire instrument shall be mounted on a mounting plate for facilitating ease of installation and correct alignment.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	U.SURENDRA	U.SURENDRA	B.R.NARYANAPPA
DESIGNATION	Director (Mech)	Director (Mech)	Head BNBOL
DATE	14 08 06	14 08 06	14 08 06

EQUIPMENT SPEC. CODE	:	**SFPC 024**
NAME OF THE EQUIPMENT	:	**PRECISION PYRANOMETER**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**One No.**

3.0 Requirements

3.1 Response time (95%) : less than 5 s
3.2 Zero offset temperature change : ± 1W/m^2
3.3 Zero offset thermal radiation : ± 3W/m^2
3.4 Non stability (change/year): ± 0.5 %
3.5 Non linearity of response : ± 0.2 %
3.6 Directional error(at 1000 W/m^2) : ± 10 W/m^2
3.7 Temperature dependence of sensitivity : ± 1 % (-20 to +50º C)
3.8 Tilt response (at 1000 W/m^2): ± 0.2 %
3.9 Sensitivity: 7 – 17 micro V/W/ m^2
3.10 Impedance: 40 – 100 Ohms
3.11 Level accuracy : 0.1°
3.12 Operating Temperature : - 40 to + 80°C
3.13 Spectral range (50% points): 305 – 2800 nm
3.14 Typical signal output for atmospheric applications: 0 – 25 mV
3.15 Maximum irradiance : 4000 W/ m^2
3.17 Expected daily accuracy: ± 2 %

4.0 Calibration :

Calibration certificate with calibration traceability to World Radiation Reference (WRR) shall be furnished along with the equipment.

5.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation.

6.0 Specification

-

7.0 Accessories

Signal cable 20 m
Integrator with provision for two channels

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	U.SURENDRA	U.SURENDRA	B.R.NARYANAPPA
DESIGNATION	Director (Mech)	Director (Mech)	Head BNBOL
DATE	14 08 06	14 08 06	14 08 06

Bureau of Indian Standards
Bangalore Branch Office Laboratory
Equipment Specification

EQUIPMENT SPEC.CODE	**:**	**SFPC 025**
NAME OF THE EQUIPMENT	**:**	**SHADOW RING FOR USE PYRANOMETER**
PROPOSED FOR BIS LABS	**:**	**BNBOL**
TOTAL QUANTITY REQUIRED	**:**	**One No.**

1.0 Scope

Prescribes the requirements for a shadow ring use with pyranometer This instrument is required for carrying out the following tests:

- Outdoor No-floe exposure test as per Cl. 5.2 of IS 12933 (Pt.5).
- External thermal shock test as per Cl. 5.4 of IS 12933 (Pt.5).
- Internal thermal shock test as per Cl. 5.5 of IS 12933 (Pt.5).
- Thermal performance test as per Cl. 6.4 of IS 12933 (Pt.5).

2.0 Principles

The objective of the shadow ring is to intercept the direct radiation from coming to the pyranometer from the sun during the whole day without readjustment. The shadow ring must satisfy the following requirements:

- The axis of the shadow ring must always be parallel to the polar axis. In consequence the angle between shadow ring axis and horizontal should be equal to the latitude of the observation site.
- The shadow ring must able to shift along the shadow ring axix relative to the pyranometer and in this way be adjusted to the suns changes in declination during the year.
- Within the shadow ring construction the pyranometer must be positioned with its sensor on shadow ring axis.

3.0 Specification

Material : Anodized aluminium of sea water proof quality/ stainless steel
Outer Ring Diameter : 620 mm
Ring width : 55 mm
Ring width/ring radius ratio: 0.185
View angle (The apparent width of the ring as seen from the pyranometer) 10.6º

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	U.SURENDRA	U.SURENDRA	B.R.NARYANAPPA
DESIGNATION	Director (Mech)	Director (Mech)	Head BNBOL
DATE	14 08 2006	14 08 2006	14 08 2006

REF : BNBL/13:3/12933 01 02 2007

LIST OF SUPPLIERS
OF
PRECISION PYRANOMETER & SHADOW RING

1	**M/s Weather Technologies (India) Pvt. Ltd.** **Vidya Apartment, 3rd Floor,** **Above Vidya Sahakari Bank** **Next to Hotel Saraja** **Aundh, Pune-411 007**
2	**M/s Swarg Systems & Instruments Trade** **Plot No. 841/2, Sector-2C** **Gandhnagar-382007** **Gujarat**
3	**M/s SGS Weather & Environmental Systems Pvt. Ltd.** **29, Ground Floor, South Extension Plaza II** **South Extension Part II** **New Delhi-110 049**
4	**M/s Swarg Systems & Instruments Trade** **Plot No. 841/2, Sector-2C** **Gandhnagar-382007** **Gujarat**