

# Mechanical Engineering Department, I.I.T. Delhi

## Notice Inviting Quotations (Retendering)

Date: 11 June 2012

1. Sealed Quotations are invited from original equipment manufacturers or their authorized representatives for supply and commissioning of Heat Flux Sensors. These sensors are to be used for measuring total heat flux in compartment fire experiments. The technical specifications, and terms & conditions are given below. Interested parties are required to submit their offer under two part bid system with TECHNICAL and FINANCIAL bids in separate sealed envelopes. The two envelopes should be clearly marked as "Technical Bid" and "Financial Bid". Both these sealed envelopes should be enclosed in a single sealed envelope, which should be clearly marked as "Quotations for Heat Flux Sensors". The Quotations should be addressed to: Prof. S R Kale and submitted in the office of Department of Mechanical Engineering, IIT Delhi, Hauz Khas, New Delhi – 110016 **latest by 5:00 PM on 26 June 2012.**

## 2. Technical requirements

Sensor cooling type	A. Air cooled	B. Water cooled
No. of sensor sets required	Three (3) nos.	Four (4) nos.
Heat flux range	Up to 500 kW/m <sup>2</sup> (all three heat transfer modes)	Up to 500 kW/m <sup>2</sup> (all three heat transfer modes)
Calibration	Calibration tests are required to NIST, or equivalent, traceability. Details to be provided.	Calibration tests are required to NIST, or equivalent, traceability. Details to be provided.
Sensitivity	Up to 10 $\mu$ V/(W/cm <sup>2</sup> )	Up to 200 $\mu$ V/(W/cm <sup>2</sup> )
Response time	Less than 200 ms	Less than 200 ms
Maximum temperature	Up to 800 °C (for short time measurement)	Up to 700 °C (for long time measurement)
Field of view (FOV)	180° (preferable)	180° (preferable)
Amplifier	(i) Amplifier and transmitter required to be used along with the sensor are also be provided. One amplifier is to be provided for each heat flux sensor. Distance between sensor and amplifier may be up to 10 m. (ii) After signal conditioning, output is required in the 4 - 20 mA range.	(i) Amplifier and transmitter required to be used along with the sensor are also be provided. One amplifier is to be provided for each heat flux sensor. Distance between sensor and amplifier may be up to 10 m. (ii) After signal conditioning, output is required in the 4 - 20 mA range.

<b>Cable length from amplifier to data acquisition system</b>	10 m (maximum)	10 m (maximum)
<b>Power supply</b>	220 V, 50 Hz	220 V, 50 Hz
<b>Warranty</b>	Comprehensive on-site warranty for three (03) years from the date of delivery is required.	Comprehensive on-site warranty for three (03) years from the date of delivery is required.
<b>Other</b>	(a) Sensors are to be integrated with data acquisition system (DAS) for providing the results directly in terms of heat flux. (b) Drawings of the sensor with mounting details should be attached with the technical bid.	(a) Sensors are to be integrated with data acquisition system (DAS) for providing the results directly in terms of heat flux. (b) Drawings of the sensor with mounting details should be attached with the technical bid.

3. (a) In case a bidder is quoting for both the air cooled and water cooled types of sensors, these offers should be submitted in separate sealed covers (each containing the separate Technical and Financial Bid covers); The type of sensor offered should be clearly stated on the cover.

(b) In case the bidder is quoting separate models for the same type of sensor, these should also be submitted in separate sealed covers clearly stating the sensor type and model/make on the cover.

#### 4. Information to be provided with the technical bid

4.1 Technical details is to be provided:

- (a) Heat flux range (maximum and minimum).
- (b) Resolution of the sensor.
- (c) Calibration accuracy of the sensor and calibration procedure adopted.
- (d) Calibration accuracy of the amplifier and calibration procedure adopted.
- (e) Time response.
- (f) Confirmation that the sensor can be exposed to a flame.
- (g) Technical information, brochures and catalogues of the amplifier and the sensor. Indicate whether the amplifier is battery or wall powered, and quote for both options if available.
- (h) Requirements for power supply and data transfer to a PC/laptop.
- (i) Details about the in-built temperature sensor.

- (j) For water-cooled sensors, indicate head (pressure), flow rate, inlet temperature and quality of water required for cooling the sensor. Indicate special requirements, if any, for air-cooled sensor.
  - (k) Details of testing and certification processes, including process for compliance to international standards, traceability to NIST or equivalent standards, periodic calibration requirements and procedure for the same.
- 4.2 Product brochure/catalog for the offered model(s).
  - 4.3 Details of interface and other hardware (including PC/laptop, if any) that are an integral part of the system should be provided.
  - 4.4 Compliance table indicating adherence to each item of the technical specification (see Annexure A for format).
  - 4.5 Assistance in installation and commissioning. Each sensor, amplifier and associated wiring/cabling is to be successfully demonstrated at IIT Delhi. Support during installation (by IIT Delhi) should also be provided. Details should be attached with the offer.
  - 4.6 List of customers to whom similar equipment/models have been supplied in the past five years. Please provide separate lists for supplies in India and in other countries. Copies of purchase order may also be attached.
  - 4.7 List of certified service centre(s) for the quoted model(s), in India, with supporting authorization document.
  - 4.8 In case the items are proprietary products of the company, a proprietary certificate stating the same should be provided.

## **5. Terms and Conditions**

- 5.1 Validity of the quotation should be at least 3 months from the date on which tenders are due.
- 5.2 The delivery schedule should be submitted.
- 5.3 Commissioning, demonstration and training sessions for IIT Delhi personnel at IIT Delhi for each type of sensor is mandatory and should be included in the offer.
- 5.4 If the bidder is an Indian agent, the agency certificate should be enclosed.
- 5.5 Each bidder must submit the NEFT mandate form for registering as a vendor at IIT Delhi.
- 5.6 The quotation should be for unit prices for each model of sensor. Prices should be FOB/CIF IIT Delhi, Hauz Khas, New Delhi, and inclusive of all installation charges. The currency of payment should be indicated.
- 5.7 Special discount/rebate wherever admissible keeping in view that the supplies are being made for educational purpose in respect of Public Institution of national importance may please be indicated.

- 5.8. All applicable taxes, terms and conditions should be clearly mentioned.
- 5.9. Generally no advance will be given.
- 5.10 In case of imported items, the payment shall be via irrevocable letter of credit.
- 5.11 The institute/committee has the right to accept or reject any bid or all quotations without assigning any reasons.

**Professor S. R. Kale**  
**Dept. of Mechanical Engineering**  
**IIT Delhi, Hauz Khas**  
**New Delhi 110016**

**Annexure A**

S.No.	Item	Specified technical requirement	Bidder's specification (To be filled by the bidder)

Date:

Authorized signature: