

**Indian Institute of Technology, Delhi**  
**Centre for Energy Studies**

**NOTICE: INVITING QUOTATION**

Date: 6.01.2012

Due date: 27.01.2012

Sealed quotations are invited for the item “**Exhaust Gas Analyzer for Internal Combustion Engines (CO, CO<sub>2</sub>, HC, NO<sub>x</sub>, O<sub>2</sub>, Lambda)**” and the specifications of the item are given below. The quotations should be submitted in a sealed cover (separate bids: technical and commercial) to Dr. K. A. Subramanian, Assistant Professor, Room No. 414, Block V, Centre for Energy Studies, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016 on or before **27.01.2012 (Friday)**. The late submission will not be entertained.

**Item name: “Exhaust Gas Analyzer for Internal Combustion Engines (CO, CO<sub>2</sub>, HC, NO<sub>x</sub>, O<sub>2</sub>, Lambda)”**

The Specifications of the item are given below:

- |       |                        |   |
|-------|------------------------|---|
| (i)   | Measurement Parameters | : Exhaust gases HC, CO, CO <sub>2</sub> , O <sub>2</sub> and NO <sub>x</sub> , and Lambda   |
| (ii)  | Measurement Range      | : HC = 0 .....20,000 ppm Vol.<br>CO = 0 .....10 % Vol.<br>CO <sub>2</sub> = 0 ..... 20 % vol.<br>O <sub>2</sub> = 0 ..... 25 % Vol.<br>NO <sub>x</sub> = 0 ..... 5000 ppm Vol.<br>Oil Temp. = 0 °C ..... 150 °C<br>Lambda = 0.....9.999 |
| (iii) | Resolution             | : HC ≤ 1 ppm<br>CO ≤ 0.01 % Vol.<br>CO <sub>2</sub> ≤ 0.1 % vol.<br>O <sub>2</sub> ≤ 0.01 % Vol.<br>NO <sub>x</sub> ≤ 1 ppm Vol.<br>Oil Temp. ≤ 1 °C<br>Lambda ≤ 0.001  |
| (iv)  | Repeatability          | : +/- 0.5% FS at constant temperature   |

- (v) Linearity : +- 1 % FS
- (vi) Display : High resolution LCD
- (vii) Interface and additional monitoring : RS 232 with cable and necessary software (online emission data logger system with time interval of 1 second, data exporting facility for generating the graphs, printer, keyboard connecting facility)
- (viii) Operating voltage : 100.... 300 V AC, 50-60 Hz (or) 11...12 V DC
- (ix) Operating temperature range : 5 °C to 45 °C
- (x) Sampling gas temperature : 200 °C to 500 °C
- (xi) Sampling handling system : Probe, Gas hose (10 m length)
- (xii) Extra accessories : Power supply adaptor, Line Filters (20 No.s), Probe (1 No.).
- (xiii) Operating Conditions : The analyzer should be compatible with both automotive diesel and gasoline engines with various power rating. As the typical engine exhaust gas contains CO, CO<sub>2</sub>, O<sub>2</sub>, HC, NO<sub>x</sub>, N<sub>2</sub>, H<sub>2</sub>O, SO<sub>x</sub>, the analyzer should be able to measure the above mentioned measuring parameters accurately from the engine.
- (xiv) The analyzer should be certified by the National and International agency.

#### **Terms and conditions covering submission of quotations**

1. Please submit the TECHNICAL and FINANCIAL bids in two separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and "Financial Bid". Both the sealed envelopes should be sent in a single sealed envelope, with clearly marked as "Quotation for **Exhaust Gas Analyzer for Internal Combustion Engines (CO, CO<sub>2</sub>, HC, NO<sub>x</sub>, O<sub>2</sub>, Lambda)**". The quote should reach the following address on or before (date: **27.01.2012**) up to 5.30 P.M.  
**Name:** Dr. K. A. Subramanian  
**Address:** Room No. 414, Block V, Centre for Energy Studies, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016
2. Price quoted: The rates quoted must be FOB-IIT Delhi, inclusive of Installation charges.
3. Quote should be in Indian Rupees as well as US Dollars and to be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India.
5. If the quote is being submitted by the representative of the principals/manufacturers themselves, a valid Agency ship/Dealership Certificate authorizing the agent to quote to IIT Delhi on behalf of the Principals should be enclosed.

6. Complete set of manuals for the operation and servicing of equipment should be given. All circuit diagrams, other mechanical and electrical schematics must be provided to main unit, sub systems and accessories.
7. Spare set: - A complete set of necessary spares and consumables should be supplied for at least three years of trouble free operation.
8. Clearly specify the installation requirement – such as space, power, frequency, environment (Temperature and humidity), etc.
9. If the items quoted are proprietary in nature, please enclose proprietary certificate from the principals stating “certified that ----- is a proprietary item of M/s. ----- and no other manufacture make these items”.
10. If the bidder is Indian agent, the agency certificate should be enclosed.
11. Please produce compliance certificate for the specification.
12. Delivery period                      4-6 weeks on receipt of PO.
13. Directors rights                      Director reserves the rights of acceptance or rejection of any or all quotations. The discretion for increasing of the quantities demanded also vest with him.
14. Validity of quotations              Quotations will be considered valid for 3 months from the date of receipt unless otherwise stated.
15. Correspondence                      No correspondence regarding acceptance or rejection of a quotation will be entertained.
16. Samples                                  Samples when asked for, will invariably be made available and sent along with the quotations.
17. Method of submission of quotation      Quotations should be sent in a sealed cover, indicating OUR N.I.Q. REFERENCE NUMBER AND DUE DATE FOR OPENING as otherwise these will not be considered.

**The envelope must contain two SEPARATE bids:**

(i) Commercial and

(ii) Technical

18. Rejection: The quotation not conforming to the set procedures as above will be rejected.
19. Discount/Rebates Special discount/rebate wherever admissible keeping in view that the items are being supplied to an Educational Institution of National importance may be indicated.
20. Warranty 1 Year standard warranty and 2 Yrs. Extended warranty.

Prof.R.P.Sharma  
Head, CES

Prof.L.M.Das  
Chairman

Prof. M.G.Dastidar  
Memebr

Dr. K.A. Subramanian  
Member