

Department of Chemical Engineering- Indian Institute of Technology Delhi  
Hauz Khas, New Delhi- 110016, INDIA

**TECHNICAL SPECIFICATIONS**

**{Elemental Analyzer/ CHNSO ANALYSER}**

**MAIN FEATURES**

**NOTICE INVITING QUOTATIONS – DATE EXTENSION**

**Sub: Purchase of Elemental Analyzer/ CHNSO ANALYSER**

Sealed quotations in separate envelop of technical and commercial bid kept in a one sealed outer envelope are invited for purchase of a Elemental Analyzer/ CHNSO ANALYSER as per specifications given below. Your sealed quotation should reach latest by 4 PM on 25th October 2013 to Mr. Vishesh Kumar ([vishesh.iitd@gmail.com](mailto:vishesh.iitd@gmail.com)) Department of Chemical Engineering, Lab (Block II-185), Indian Institute of Technology – Delhi (IIT Delhi), Hauz Khas, New Delhi - 110016. Your quotation should be super scribed “Purchase of Elemental Analyzer/ CHNSO ANALYSER due on 25th October 2013”.

**Dated: 26.09.13**

S. No.	Specifications
1.	Principle of operation: Elemental analysis determines the weight percent of carbon, hydrogen, nitrogen and sulfur present in all heterogeneous / homogenous samples like biomass, coal, pitch tar, coke, fuels (both for SOLID and LIQUID samples) etc. The instrument is automatic and computer controlled. The elemental analyzer would have the following technical specification. The system must use static and dynamic combustion processes for Sample Followed by Reduction, Trapping, Complete GC Separation, or (Separation of product gases should be carried out using frontal chromatography, if any then please specify) and Detection of the Products by Thermal Conductivity Detector, and data acquisition/analysis system.
2.	The ability to use helium/Argon/Nitrogen as a carrier gas as well as Argon/helium for CHN and CHNS measurements is essential from lower maintenance and operational point of view. The analyzer must have automated Gas Saver as well as Wake up options to improve efficiency and reduce cost.
3.	Sample Size: upto 500mg or above (please specify) and a microbalance must supplied by branded company is required to allow for high accuracy and precision measurements.
4.	Auto microbalance should be fully Microcomputer controlled. Maximum sensitivity of 0.1 µg with 10.0-g capacity, keyboard with five-digit, seven-segment LCD display and microcomputer control. Built-in microprocessor functions include Automatic Tare, Automatic Calibration, and Automatic Range Selection., automatic weight transfer, Internal Storage capacity for minimum 500 sample weights, statistical calculations and

	weight factoring using multiplicative or additive factors. Must include: Standard Stirrup Kit, 20 pans for Standard Stirrup, Tare Weight Set (1 mg to 1 g), Calibrating Weight, and Non-magnetic Forceps. Instrument provides compatibility to an external balance, printer.
5.	Instrument Range <ul style="list-style-type: none"> <li>• Carbon : 0.001 to 100 mg (specify both minimum &amp; maximum)</li> <li>• Hydrogen : 0.001 to 12 mg (specify both minimum &amp; maximum)</li> <li>• Nitrogen : 0.001 to 50 mg (specify both minimum &amp; maximum)</li> <li>• Sulfur : 0.001 to 20 mg (specify both minimum &amp; maximum)</li> </ul>
6.	Precision Range (@ 100 mg) (Please specify) <ul style="list-style-type: none"> <li>• Carbon: 0.5% RSD or lower</li> <li>• Hydrogen: 1%RSD or lower</li> <li>• Nitrogen: 0.5% RSD or lower</li> <li>• Sulfur : 1% RSD or lower</li> </ul>
7.	Detection Method: Nitrogen, Carbon, Hydrogen, Sulfur :Optimized, low- noise, non dispersive Infrared (IR) or GC-TCD cell method or Sulphur by Flame Photo Metric Detector.
8.	Analysis Time for all the elements: As low as 5 minutes if higher please specify the reason and with the analysis time means a total analysis time that includes the autoloader sequence.
9.	Furnace: The standard furnace is programmable for ensuring complete oxidative combustion of various types of samples. The maximum operating temperature of the vertical/ horizontal resistance furnace for CHN is 1050±50°C and that of horizontal/ vertical resistance furnace for S is 1400±50°C. The system must ensure complete combustion of all types of sample with different matrices. Flexible carrier gas: Argon gas maybe used instead of Nitrogen to reduce cost. It should have optimised Combustion: Allows for customisable combustion conditions to minimise high purity oxygen use. If any type of furnace then please specify with reasoning. (Please mention specification of the furnace).
10.	Maintenance free auto loader : for minimum 30 samples or above upto 120 samples
11.	Loading head capable to quick and easy removal from the main body and promoting fast ash removal.
12.	Instrument performs moisture removal with a pre-chiller and thermoelectric cooler, if any other cooling system then please specify properly.
13.	Conforms to Methods: Indian/ International standard like ASTM (ASTM D 5291,ASTM D-5373,ASTMD-1552, ASTM D-4239,ASTM D-5016,ASTM D-1619 etc) etc.
14.	May have the facilities for to collect all evolved gases in a collection apparatus called Ballast and it uses a small aliquot from this apparatus to perform all reductions and detections.
15.	Instrument uses a Windows®-based operating software that supports compliance to 21 CFR Part 11 regulations, contain an on-board help manual, and perform wellness checks based on user-defined Service conditions with specific PC-MODEL and its branded name should be specific (Complete data acquisition system) .
16.	If the Instrument is provided with remote service diagnostics with a separate software package that is designed specifically to connect the user with the instrument vendor's

	service personnel then mention it properly with reasoning
17.	The ability to regenerate the copper reducing agent is essential and please specify whether you have the analyzer with the usage of combustion reagents to minimize oxygen use and scrub for halogens which can contaminate the system and Copper reduction agent regeneration: which should have connection to hydrogen gas mixtures to facilitate reduction of copper reducing agents for reuse (Please mention detection limits).
18.	Local Accessories: Suitable PC, Printer, On line UPS minimum 5KVA with 30 min backup & if higher KVA UPS then mention the reason and quote the price for local accessories individually and as separate items like He/Ar(99.99% purity), O <sub>2</sub> ( 99.99% purity), N=( 99.95% purity), any mixture of other gas cylinder gas cylinder minimum nos each.
19.	Please specify whether you will supply any sealing unit for liquid sample, Al vials min 100nos. or more and Sn capsules 100nos. or more and if are going to provide any volatile sample sealer with Sn sample pan with nos.
20.	Specify the (a) CHN Analysis kit including all necessary accessories & consumables for minimum how many numbers of runs possibility during the instrument supply period. (b) Oxygen Analysis kit including all accessories & consumables for minimum no of runs.
21.	(a) If you are providing any (a) Helium and/or Argon Gas regulator (b) Combustion Gas Regulator (c) Pneumatic Gas Regulator (d) any other kind of regulators (please specify).
22.	<ul style="list-style-type: none"> <li>• Furnace warranty for minimum number of years. They should have Manufacturer declaration for the same.</li> <li>• Vendors should have own application Lab in India for Demonstration/ Advance application Training / Application Support/ supplier list in India, specifically NCR, Delhi.</li> </ul>

• **Necessary Terms and Conditions to be mentioned or followed:**

- IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or fully) and necessary “Custom Duty Exemption Certificate” can be issued after providing following information.
  - Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists)
  - Forwarder details i.e. Name, Contact No., etc. Custom Duty Exemption
- Certificate will be issued to the shipment in the name of the Institute and Bills of Entry should be submitted to IIT Delhi later on.
- IIT Delhi is exempted from paying Excise Duty and necessary Excise Duty Exemption Certificate will be provided for which following information are required.
  - Quotation with details of Basic Price, Rate & Amount on which ED is applicable.
- Imported items should be quoted on FOB basis (Freight on Board) and FOB price be provided.

- Indian agent should be enlisted with the Department of expenditure, Ministry of Finance, Govt. of India.
- Letter from manufacturer specifically to quote for this tender is to be attached for authenticity of dealership/agency and dealer should be authorized service provider.
- Vendor should get a fresh certificate from their principal's clearly mentioning about on site comprehensive warranty for three years after installation of the system, and minimum 2 years free service after the warranty period, may please be indicated.
- Special discount/rebate wherever admissible keeping in view of that the supplies is being made for Educational purpose in respect of public institution of national importance may please be indicated.
- Vendor should attach the relevant product brochure/leaflet for the model quoted and the offered technical specification must be supported by the printed brochure.
- Validity of the quotation should be at least more than 3 months.
- Vendor will do the installation, demonstration and onsite training for the machine without any extra cost at IIT Delhi premises.
- Taxes, terms and conditions should be clearly mentioned.
- Proprietary certificate must be included for the item, if applicable.
- Valid agency certificate must be included, if applicable.
- Institute reserves the right to accept or reject any quotation without showing reasons.
- TECHNICAL and FINANCIAL bids are to be provided in 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, clearly marked as "Quotations for **Elemental Analyzer/ CHNSO ANALYSER**".
- Please quote prices at FOB/ CIF New Delhi, inclusive of installation charges.
- Quote should be in Indian Rupees as well as suitable foreign currency, and be valid for at least three months.
- Clearly indicate the tax component of the prices quoted. If prices are inclusive of tax, please mention.
- Please include any shipping/transport costs in the price.
- 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 manufacturer makes these items".
- Should a purchase order be placed, please state schedule of delivery and installation.

- The equipment should be delivered and installed by the supplier as part of the supply process in the Department of Chemical Engineering, Indian Institute of Technology (IIT) Delhi.
- In case of service related orders the vendor authorizes IIT Delhi to deduct the service tax at prevalent rates while releasing payment.
- 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 Principals should be enclosed.
- If the bidder is Indian agent, the agency certificate should be enclosed.
- One year comprehensive on-site warranty (Parts and labour) required. Extended warranty may be quoted separately.
- Required and standard accessories may be quoted separately.
- Indicate if a special discount/ rebate, wherever admissible, is provided in view of the fact that the supplies are being purchased for academic purposes in a Public Institution of national importance.
- A compliance statement of specifications should be attached.
- The Institute/ Purchase Committee have the right to accept/reject any/all bid/quotations without assigning any reasons whatsoever.
- Sealed quotation should be addressed to and be submitted to Mr. Vishesh Kumar ([vishesh.iitd@gmail.com](mailto:vishesh.iitd@gmail.com)), Department of Chemical Engineering, Lab (Block II-185) - IIT Delhi, latest by 4PM on 25.10.2013.
- Payment Options:
- As per Institute rule & regulations or after satisfactory installation.

**Prof. Kamal. K. Pant**

Department of Chemical Engineering

Indian Institute of Technology Delhi

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