Technical specifications for the Elemental Analyser (CHNS-O Analyser)

Sl. No.	System parameters	Specifications	Comply/ Not Comply	Ref. Page No.
1	General	Fully automated PC controlled Elemental Analyser for determination of Carbon (C), Hydrogen (H), Nitrogen (N), and Oxygen (O) [provision] in Solids, Liquid and Semisolid Samples		
		The equipment should be built in with helium and oxygen pressure reducers and gauges to prevent air diffusion into the pneumatic circuit.		
		Combustion/reduction furnaces should come with an electronic temperature control.		
		Oxygen determination in the same furnace is to be used in the pyrolysis condition		
		Thermo-regulated Electronic Flow Control of helium or argon carrier/reference gas and oxygen flow		
2	Operating Parameter	Sample weight range: 0.02 mg to 1000 mg or better		
		Measuring range: 0.01% (100 ppm): 100% for solid samples 1 – 10 ppm (low level) for liquid samples		
		Detection Range: 0 to 100% for all elements (C,H,N,S,O) Also, the absolute measuring range of CHNSO should be specified with proof.		
		Standard deviation: ≤0.1% of absolute or better		
		LOD: 100 ppm or better		
3	Furnace System	Should have a two-zone furnace system or two separate furnaces, separate for combustion and reduction/pyrolysis with independent temperature control for each furnace. It should be possible to set the different temperature for combustion and reduction in CHNS mode.		
		Controlled furnace Temperature should be 1100 °C or better.		
		Furnace Temperature Decrease possibility by 50% in system Stand-By Mode.		
		The furnace should have a free replacement warranty for 10 years or more.		
		Should have the possibility to use ceramic/quartz ash finger to handle high halogen or fluorine contents sample		
4	Detector System	Oxygen intrusion-free thermistor technology-based Temperature stabilized TCD detector for measurement of C-H-N-S-O.		
		TCD detectors should have a warranty for 10 years or more.		
		The detector should not get affected/damaged even if Helium		
		Maintenance free detector (no maintenance required)		
5	Separation System	Combustion gases in the form of CO_2, H_2O, N_2, and SO_2 should be separated by means of the TPD/GC column.		

		Complete instrument control over elution process with provision of auto zero of baseline after each element elution.		
		Full separation of all analytes and there should be no peak tailing or peak overlap		
		Hold the combustion gases (CO_2 and H_2O), small and large adsorption filters should be provided		
6	Autosampler System	Electromechanical auto sampler system with 80 positions or more. Pneumatic autosampler is not acceptable.		
		A sample preparation device for solid and liquid samples must be included.		
7	Carrier Gas	The instrument should use Helium as well as Argon as a carrier gas in CHNS mode.		
8	Flow controller and Sensors	Should have a mass flow controller (or) electronic flow controller for the constant flow of carrier gas.		
		It should be equipped with digital flow sensors for accurate readout of flow.		
9	Instrument control and software	Must be Windows-based, compatible to the latest operating system, i.e., windows 10, and should have a display of set and actual pressures, flow rates, temperatures, and number of samples analyzed with provision for setting maintenance intervals with a warning when maintenance is needed.		
		Can be installed in the existing PC with an upgradation of the operating system, if any required by the supplying agency.		
		Should have segmented leak check through software to enable identification of the exact position of the leak.		
		The compatible software should be pre-designed for controlling the instrument, determining elements Carbon(C), Hydrogen (H), Nitrogen(N), Sulphur (S), Oxygen (O) and performing functions like automatic calculation of percentages of each element, recalculation with changed parameters, report preparation, determination of calorific values, calculation of elemental ratio viz. Hydrogen/ carbon etc.		
		Data Acquisition System: Real time graphical display of test in progress. The Data Acquisition System allows the flexibility to present the data in several ways, statistical evaluation of results. Graphs, reports of individual test can be printed. Data can be exported to other software like MS-Excel		
10	Accessories	**Separately to be quoted** for vibration-free granite table of suitable dimension for keeping the CHNSO systems, connected PC and printer.		
		Online suitable (5 KVA or better) UPS with 30 minutes power backup with the full load of the entire system under operations **to be quoted separately**.		
		Compatible branded PC Intel Core i7 with 32GB RAM, 2TB Solid State Drive, minimum 21" branded monitor, keyboard		

		and mouse with licensed Win 10 or better OS and MS Office latest version **to be quoted separately**		
		Microbalance compatible with the CHNSO system **to be quoted separately**		

11	Spares and Consumables	Provided mechanical accessories and consumables should ensure the smooth operation and maintenance of the instrument. The following consumables, but not limited to should be supplied along with the instrument:
		• All required power cords, including any cords/cables required for transfer of data from existing weighing balance to the system
		• To be supplied with all the required consumables and reagent like combustion tube, reduction tube, catalyst, water absorber etc. for 1,000 sample analysis.
		• **Separately to be quoted for**
		  ▪ CHNS kits for 2000 samples
		  ▪ Oxygen for 2000 samples
		  ▪ UHP Helium (99.995% purity) with gas filled capacity 47 Ltr water capacity
		  ▪ UHP Oxygen (99.995% purity) with gas filled capacity 47 Ltr water capacity		

12	Warranty	3 years or more comprehensive warranty on complete equipment 10 years or more warranty under standard operating conditions for furnaces and TCD, separately.		
		Optional: Additional 2 years AMC to be quoted separately		
13	Installation and training	The entire system should be installed by the company professionals.		
		A thorough technical training (minimum 7 days) in analysing and troubleshooting should be given by the technical professionals.		
		Onsite demonstration and training for the faculty/scientists to be provided periodically for handling the system and its application as per requirement.		
14	Service	Details of the trained personnel who can service the instrument on site must be provided.		
		The vendors must have a locally dedicated Sales & Service team. Problems during the warranty period should be rectified within 2 weeks or less. If there is any delay in replacement or rectification, the warranty period should be extended accordingly.		

Sl. No.	Bidder Eligibility Condition	Comply/Not Comply	Ref. Page No.
1	A list of references in India, where the bidder have supplied minimum 10 nos. of similar instrument in last five years (particularly in IIT, NIT, IISER, CSIR labs & reputed Govt. institution). PO copies or installation certificates along with contact details of end user need to be submitted as the proof of supply. IIT Bhubaneswar reserves its right to verify the claims submitted by the bidder and the feedback from the previous customers will be part of the technical evaluation.		
2	The Bidder must NOT be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration certificate should be provided.		

(Note: It is mandatory for the bidders to provide the compliance statement in tabular column format along with catalogue page number (comply/not comply) for the above points with documented proof as required. Failing which, bidders will be technically disqualified.)