

ANNEXURE – I

Technical Specification for Gas Chromatography System

#		Features	Requirement
1.		Instrument type	Microprocessor based Gas Chromatography system for analysis of CO, CO ₂ , CH ₄ and alcohols in Air sample by FID with Methanizer, Aromatics – BTX in Air sample by PID, O ₂ and H ₂ in Air sample by Discharge Ionization Detector. System should be quoted with Mainframe GC to mount injector, Detector, Valve for Simultaneous analysis of gaseous mixer – H ₂ , O ₂ , CO, CO ₂ , CH ₄ , alcohols, BTX without any manual intervention. Provision for upgradation and addition of MS and extra columns
2.	Gas Analysis range	CO, CO ₂ & CH ₄	1 ppm and above in Air Sample
3.		H ₂ , O ₂ , N ₂ , CH ₄ , CO	100 ppb and above in Helium
4.		Alcohols	100 ppb and above in Helium/Air
5.		H ₂ , O ₂	100 ppb and above in Air sample
6.		BTX aromatics	20 ppb and above in Air Sample
7.	GC Column Oven	Column Oven Size	15 lit or more
8.		Operating Temperature Range:	Near ambient to 450 °C or better
9.		Temperature Set Point Resolution	1 °C or better
10.		Number of Ramps/Plateaus:	7/8 or more
11.		Maximum Heating Rate:	50 °C/min or more
12.		Oven Cool-Down (22 °C ambient):	400 °C to 50 °C in about 6 min or lesser
13.		Automatic Electronic Pressure/Gas Controller:	Auxiliary Electronic Gas Controller – Qty 3
14.	Injector	A. Capillary Injector with electronic gas control:	Qty: 01. Suitable for all (0.1 mm to 0.53 mm i.d.) capillary columns
15.		Temperature Range	50 °C to 450 °C or better
16.		Pressure Range:	0–140 psi or more. Programming with three ramps and four plateaus.
17.		Gas saver mode:	Standard
18.		Modes:	Split and Splitless with EPC & auto split control
19.		Split Ratio	Up to 6000:1 or better
20.		B. Packed Column Injector with electronic gas controller:	Qty – 01. Suitable for different OD Packed columns and wide bore Capillary columns with adaptor.
21.		Temperature Range:	50 °C – 450 °C or better.
22.	Detector	A. Flame Ionization Detector (FID) with electronics gas controller and methanizer	Qty – 1. Compatible with different OD Packed & capillary columns
23.		Flameout detection	
24.		MDL:	<1.8 pg C for Dodecane
25.		Linear Dynamic Range:	>10 ⁷
26.		Maximum Temperature:	450 °C or more
27.		B. Photo Ionization Detector (PID) with Electronics gas controller	Qty – 1. Should be equipped with 10.6 eV UV lamp or suitable UV lamp. Compatible with packed and capillary columns.
28.		MDL:	<10 ppb Benzene
29.		Liner dynamic range:	10 ⁴ or better
30.		Maximum Temperature:	Up to 200 °C
31.		C. Discharge Ionization Detector	Qty - 1
32.		Discharge Ionization Detector for Trace level analysis of H ₂ , O ₂ , N ₂ , CO, CH ₄ in Helium	100 ppb and above in Air sample

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33.		Gas line filters	Good quality Helium gas line filter for Discharge Ionization Detector should be come along with system separately.
34.	GC Columns	Required Packed Columns, SS MOLESIEVE 5A, 80/100MESH, HS-Q 80/100, SHINCARBON ST 100/120 or equivalent	
35.		100% dimethylpolysiloxane capillary column or equivalent	
36.		6% cyanopropyl phenyl methyl polysiloxane capillary column or equivalent	
37.	GC Gas Sampling Valves and syringes	Automatic Helium leak tested gas sampling valve 10PORT	
38.		Automatic gas sampling valve 10PORT	
39.		Automatic gas sampling valve 6PORT	
40.		Heated Valve box to install minimum 4no.s automatic gas sampling valve	
41.		Electronic pressure controls (EPC) for all the gases.	
42.		Sulfinert inert sample loop 1 ml – Qty 3	
43.		Inert sample in/out path -tubing sulfinert (20 ft)	
44.		Installation/Startup kit	
45.		Tedler bag 1ltrs & 3ltrs	
46.		Hamilton Syringes with PTFE luer lock, syringe capacity 50 mL – Qty 2	
47.		Gas sampling bomb 500ml with needle valve – Qty 3	
48.	Softw are	Windows 10 or latest operating software compatibility based	
49.		Chromatography software for GC control, data acquisition & processing must be provided	
50.	Calibration standard	Calibration Standard – H ₂ , O ₂ 1ppm level in He 0.5 ltrs WC	
51.		Calibration gas cylinder 0.5 ltrs WC 5ppm level CO, CO ₂ , CH ₄ and alcohols	
52.		Calibration gas cylinder 0.5 ltrs WC 1 ppm level BTX	
53.	Others	Helium N5.5 grade, High Purity Hydrogen, Zero Air, Nitrogen Gas filled cylinder 47ltrs WC appx – each Qty 1	
54.		Double Stage SS Diaphragm Regulator for Helium, Hydrogen, Zero Air, Nitrogen – each Qty 1	
55.		Gas Purification Panel with fittings for all gases must be provided. There must be separate gas line filter with fittings for helium purge line.	
56.		Computer/Printer	Branded i7 PC or better (Windows 10, 16GB RAM, 1 TB HDD, 64bit or more, 30 inch monitor or more) and Laserjet Color Printer with Scanner
57.		Online UPS	20 KVA of five star rating with min. 1h back up.
58.	General Terms and Conditions	Warranty	Comprehensive warranty of three years for complete system including chiller (if external).
59.		Installation and Training	The onsite installation and commissioning of the system at CSIR-CMERI must be done by the supplier. The gas sample analysis must be demonstrated to the user's satisfaction. Training for operation and maintenance of the instrument should be provided at the time of installation.

Minimum eligibility criteria:

- ♦ The OEM should be in this business for at least 8 years. A 8 years old PO copy of similar equipment is to be included in the technical bid as evidence.
- ♦ The OEM should have at least five (05) installations of offered equipment supplied to Govt. Institutes of India. The PO copies/installation reports are to be included in the technical bid as evidence. In addition, satisfactory equipment performance reports, from these users are also to be included in the technical bid.
- ♦ OEM must have trained the service engineer of the bidder. Relevant training certificate from OEM is to be attached as evidence.