

## INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

## MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. No. (PR.1000041833)

Rx No. 6100001839

## **Specifications for Gas Analyser**

Sr. No.	Technical Specification	Compliance (Yes/No)	Additional Information if Any
1.	The Data Acquisition & Analysis software.  The system should have at least 32 channels input configuration for recording and C type USB based.  The Data recorder should have a high sampling rate of 100 KHz or more.  ADC resolution of 16 bits on all gain ranges and variable sampling speed on each channel with continuous record and display up to 32 data channels.  Should be capable of powering available external devices of up to 350W  The system should be able to be powered from mains, laptops, or portable battery packs for increased portability in different experimental setups.  A facility for ECG with real-time vector cardiography analysis is needed to evaluate the magnitude and direction of the cardiac axis during exercise.  It should be supplied with a strain gauge bridge circuit amplifier that automatically zeros to calculate the peak pressure during exercise.  It should be supplied with a compatible electronic stethoscope that allows the user to amplify or record heart and lung sounds. A sound selector switch is used to select the proper frequency for listening to either heart or breath sounds.  The respiratory belt should be DC-based and suitable for Stenography / breath-holding experiments.  The system should provide real-time data recording through online and offline analysis.  The graphs and report can be simple customization and printing option  Online data streaming to MS Excel and MATLAB and Editable macros for customization  Should have software-controlled filtering High Pass, Low Pass filters, & C Coupling, Digital filters, band pass filters, & Main filters.  Export formats should allow the export of Binary, IGOR, MATLAB, QuickTime, Wav, Text, Excel, etc.  The facility will perform an online and offline complete heart rate variability analysis (Time &		

2	Frequency domains), ECG interpretation, PQRST amplitudes, and ST elevation analysis.  • The gas analysis metabolic should automatically generate the VO2 oxygen consumption, VCO2 carbon dioxide production, VE Expired minute volume, RER respiratory exchange ratio, ECG, HRV, Body Temperature, and Pressure Saturate BTPS, Standard Temperature and Pressure Dry STPD, (VE / VO2), (VE / VCO2), etc.  • The system should measure the anaerobic threshold, basal metabolic rate, Respiratory Expenditure Ratio RER, Resting Energy Expenditure, and VE in calorific values.  • Should automatically generate several Metabolic graphs like VE vs Time, VE vs VCO2, VCO2 vs VO2, RER vs Time, VCO2 vs Time, VO2 vs Time	
2.	<ul> <li>Research grade Gas Analyser O2 and Co2</li> <li>It should have highly sensitive oxygen and carbon dioxide sensors with adequate variable flow ranges for the best performance and results.  CO2 Sensor Sensor  Type: Infrared, optical absorption Type: Visible spectrum (760 nm) Range: 0-10% CO2 Range: 0-100% O2 Linear Output: 0-1V (0-10% CO2) Linear Output: 0-1V (0-100% O2) Resolution: 0.1% CO2 Resolution: 0.1% CO2 The Gas analyzer should have a pump controller on/off switch, a gas sampling port, and a dial for selecting variable pump sampling rates (approx. 35 to 200 mL/min).</li> <li>The system should simultaneously record and analyze all the required parameters in a single screen for interpretation and computation of results.</li> <li>The system should have a physical mixing chamber suitable for extremely high and low ventilation ranges.</li> <li>Accessories: Mouthpiece, headgear, tubing and flow sensors, mixing chamber</li> </ul>	
3.	<ul> <li>Documentation &amp; Certification</li> <li>Manufacturer should have ISO certification for quality standards.</li> <li>It should be CE/US FDA/ IEC/BIS, as well as other safety standards-approved products.</li> <li>Demonstration of the equipment and necessary training will be provided by the experts if required.</li> <li>The manufacturer should have experience in Manufacturing &amp; Installation of the quoted product for at least 05 years. Documentary proof should be attached.</li> <li>Warranty 5 years</li> <li>Manufacturers should assemble the instrument and validate its functionality.</li> </ul>	