Indira Gandhi Memorial Hospital
Male', Republic of Maldives
Biomedical Engineering Department

Technical Specification for Equipment

Technical Specifications for Biomedical Test Equipment

No	Item	Purpose	Specification
01	Electrical Safety Analyzer	For testing electrical safety compliance of medical devices per IEC 60601, NFPA-99, or equivalent.	• Standards Supported: IEC 60601, AAMI/NFPA 99, IEC 62353 • Test Functions: Earth/ground bond test, insulation resistance, leakage current (patient, enclosure, earth), point-to-point testing • Test Current (Earth Bond): 200 mA to 25 A AC • Insulation Test Voltage: Up to 500 VDC • Leakage Current Measurement Range: 0.1 µA to 20 mA • Accuracy: ±1% or better • Display: 5" or larger color display • Connectivity: USB, Wi-Fi, Bluetooth, Ethernet • Data Logging: Internal storage with export options (CSV/PDF) • Power Requirements: 100–240 V AC, 50/60 Hz • Accessories: Power cord, test leads, carrying case, calibration certificate
02	Multisimulator (Patient Simulator)	To simulate physiological parameters for	• Simulated Parameters: - ECG (Normal, arrhythmia, neonatal)

		testing patient monitors.	- Respiration - IBP (2 channels) - NIBP simulation - Temperature (T1, T2) - SpO2 (compatible with major monitor brands) • ECG Range: 30–180 bpm • Respiration Rate: 10–100 bpm • IBP Simulation Range: 0–300 mmHg • Temperature Simulation: 25–45 °C • NIBP Cuff Simulation: Adult, Pediatric, Neonatal • Waveform Accuracy: ±2% • Display: Touchscreen or tactile buttons • Battery Life: ≥ 8 hours • Power Supply: Rechargeable Li-ion battery with AC adapter • Calibration Certificate: NIST traceable or equivalent
03	Defibrillator Tester	To test performance and safety of manual, AED, and automatic defibrillators.	• Defibrillation Energy Range: 0–360 Joules • Waveform Compatibility: Monophasic & Biphasic • Energy Measurement Accuracy: ±2% • Charge Time Measurement: Yes • ECG Simulation: 12-lead with arrhythmia simulation • Paddle Plate Compatibility: Adult and pediatric • External Load Selection: 25, 50, 75, 100 Ω

			• Shock Detection: Automatic with waveform capture • Display: Color LCD with waveform analysis • Memory: Stores >1000 test records • Connectivity: USB, Bluetooth or Ethernet • Battery: ≥ 6 hours operation per charge
04	Ventilator Analyzer	To verify performance of mechanical ventilators.	• Flow Range: ±300 L/min • Flow Accuracy: ±2% of reading • Pressure Range: -10 to +100 cmH_2O • Pressure Accuracy: ±1% or ±0.1 cmH_2O • Volume Accuracy: ±1% • O_2 Sensor Range: 0–100%, Accuracy: ±1% • Measurements: Tidal Volume, Inspiratory/Expiratory flow, Pressure, Respiratory Rate, I:E ratio • Display: 5–7” color touch display • Modes: Real-time waveform and numeric • Connectivity: USB, Wi-Fi, SD card export • Software: PC software for data logging and reporting • Power Supply: Internal battery with ≥6 hr backup
05	Infusion Device Analyzer	To test flow accuracy and occlusion alarm of infusion pumps.	• Flow Rate Range: 0.1–9999 mL/h • Accuracy: ±1% or better • Backpressure Simulation: 0–1000 mmHg • Channels: Minimum 2 channels • Bolus Measurement: Yes • Occlusion Alarm Detection: Yes

			• Data Display: Real-time flow rate and volume • Test Duration: Programmable test period • Memory: Stores up to 1000 results • Connectivity: USB and SD card • Power: Internal rechargeable battery, 6+ hours backup
06	Digital Pressure Meter	For pressure measurement and calibration.	• Measurement Range: -4 bar to +12 bar • Accuracy: ±0.25% of full scale or better • Resolution: 0.01 bar or better • Display: Digital LCD with backlight • Units: Bar, psi, kPa, mmHg, selectable • Overpressure Protection: Yes • Port Type: 1/4" NPT or compatible • Power Supply: Battery operated or USB rechargeable • Auto Zero & Hold Function: Yes • Calibration: ISO/IEC 17025 certificate
07	Digital Thermometer	For precise surface or air temperature measurement.	• Temperature Range: -50 to +150 °C • Accuracy: ±0.2 °C (typical) • Sensor Type: Thermistor or IR sensor • Response Time: <1 second (for IR), <10 sec (for probe) • Display: Digital with °C/°F toggle • Power Supply: Battery (AAA or coin cell) • Features: Auto-off, Data hold, Min/Max record • Probe Type: Surface or penetration (if probe-based)

			• Calibration Certificate: ISO or NIST traceable
08	Digital Multimeter	For general electrical diagnostics in biomedical equipment.	• Display: 6000–20,000 count LCD, backlit • Voltage Measurement: AC/DC up to 1000V • Current Measurement: AC/DC up to 10A • Resistance: Up to 60 MΩ • Capacitance: Up to 10 mF • Frequency: Up to 1 MHz • Temperature Measurement: Optional (thermocouple input) • Safety Rating: CAT III 1000V / CAT IV 600V • Data Hold, Auto Range: Yes • True RMS: Required • Continuity/Diode Test: Audible • Protection: Overload and fuse protected • Power: 9V battery or equivalent • Accessories: Test leads, case, temperature probe

User and Technical Training:

- Vendor must provide comprehensive user training for all operators and technicians.
- Training should include both hands-on and theoretical sessions.
- Training certificates must be provided to all participants.

Software Requirement

The software must serve as a centralized test management solution for biomedical test equipment. It should interface with multiple test devices, collect data, generate customizable reports, and support data exchange with a CMMS system.

Bid Documentation

Bidders must submit:

- All certificates & test reports.
- Product data sheet & brochures.
- Recommended spare parts & consumables list.
- Manufacturer's certificates.

End of Specification