Specification for Anaesthesia Boyles Apparatus

1. General Requirement
   a) Compact and modular, 2 gas Anaesthesia workstation with an integrated ventilator for adult to infants and integrated airway monitor for airway pressures and volume.
   b) The machine should be suitable for low and minimal flow anesthesia application with compliance compensation of breathing ckt, fresh gas flow compensation/ decoupling.
   c) The machine should have 3 drawers
   d) The anaesthesia machine, inbuilt ventilator, vaporizer and patient monitor should be manufactured by same company
   e) The system should have upto 2 Hrs. battery backup
   f) System should confirm to US FDA / European CE and EN 60601-2-13 (Requirement for safety and essential performance of anaesthesia system)

2. Gas delivery system
   a) Should have pin index yokes for Oxygen & Nitrous Oxide besides separate connection for Central gas supply for Oxygen, Nitrous Oxide.
   b) The machine should have pressure gauges for cylinders & central supply lines mounted on front of Anaesthesia machine for better visibility. The gas connections should be non-interchangeable.
   c) The system should be suitable to use at minimal flow upto 700ml fresh gas setting.
   d) Automatic cutoff of N2O by Oxygen pressure failure.
   e) Hypoxic guard for linear regulation of minimum oxygen concentration at 23% volume
   f) Audible visual oxygen failure alarm.
   g) Emergency Oxygen flush at 30 – 70 L/min bypassing the vaporizer.

3. Flow meter
   - Dual Cascade type flow meter tubes for Oxygen & N2O.Range 20 ml / min to 10 Lit/min.
     Calibrated in multiple scales. Single tube for air 100 ml to 14 L/ min.

4. Vaporizer
   - Machine should have possibility to mount two quick mount type vaporizer for easy interchangeability, and safety with interlock facility.
   - Should be provided with a Temperature / pressure compensated and flow independent
   - Should be capable of connecting Vaporiser for Isoflurane / Sevoflurane / Halothene / Desflorane
   - Vaporizer should have extended delivery range from 0 to 6 Vol. %
   - The vaporiser should be calibration free.

5. Breathing System
   - Should have fresh gas de-coupled semi closed circle absorber system.
   - Should have adjustable pressure relief valve from 5 to 75 mbar.
   - The system should have leak and compliance test (including patient hoses upto the Y piece).
   - Should have compact breathing system with approx 1.7 Ltr. Volume capacity.
   - Should have an external fresh gas outlet for connecting Magill or Bain’s circuit
   - The system should have integrated breathing system warmer to prevent condensation in breathing system and patient comfort (to prevent delivery of dry fresh gases to lungs or mucociliary transport of fresh gas).
   - The device should have port for anaesthesia gas scavenging system.

6. Anaesthesia Ventilator
   - The system should have inbuilt ventilator with electronically controlled and pneumatic or Piston driven technology.
   - Should not require changing of bellows for adult & infants.
- Should have minimum screen size of 6".
- Modes: Manual/Spont, Volume Controlled
- The same ventilator should be capable to be upgrade to pressure support.
- Tidal Volume: 20 ~ 1400 ml
- PEEP: 0 ~ 20 mbar
- Breathing Frequency: 4 to 60 BPM
- I:E Ratio: 4:1 to 1:4
- Inspiratory pause: 0 ~ 50% of Ti
- Should have Desflurane compensation.
- Should be able to ventilate with atmospheric air, in case of total gas supply failure.

8. Airway monitoring
- Integrated monitor for electronic monitoring and display of following parameters:
  - Expiratory Tidal Volume
  - Expiratory Minute volume
  - PEEP, Peak & Mean and Plaetau airway pressure
  - Frequency
  - Waveform display for Airway pressure.

9. Alarm limits & alarms
- Adjustable high / low limits with audio and visual alarms for the following:
  - Minute volume
  - Airway pressure (inc: stenosis and disconnect)
  - Insp oxygen concentration
  - Audio power supply fail alarm
  - Fail to cycle warning

10. Machine should have RS 232 connectivity port

Scope of supply
- 2 gas Anaesthesia machine with Patient Monitor
- Trolley with 3 drawers
- Writing surface
- Pin Index yokes for O2 & N2O
- Pipeline connections for all three gases
- Electrically operated piston based Anaesthesia ventilator
- Isoflurane Vaporiser
- Semiclosed breathing system
- Adult & Pediatric autoclavable patient tubings
- Anaesthetic mask size – Adult & child
- Vaporisers for Isoflurane
- Central gas supply hoses (Color coded)

Price to be quote for:
1. System with 1 year warranty and CMC charges for next 10 years
2. System with 5 year warranty and CMC charges for next 5 years
3. Price list of all proprietary consumables required