

## Setup and Monitoring Instructions – Anesthesia Machine as an ICU Ventilator

### SETUP

- Insure manual ventilation device readily available
- Connect/Check Central Gas Supplies
  - Check Line pressure – 45 psi or better
  - Full E-cylinders of oxygen and air as backup
  - Remove nitrous oxide hoses and cylinders
  - Bellows ventilators configured for compressed air supply Biomed can do with manufacturer guidelines
- Scavenger
  - Connect to suction or allow to enter patient room
- Vaporizers
  - Remove or drain
- Configure machine with disposables
  - Breathing Circuit
  - Filters
    - HMEF on airway, gas sampling on machine side
      - Second filter on the expiratory limb if possible (required if no filter on airway)
  - ?? Active humidifiers NOT recommended but may be needed if no HME. Will require special monitoring if placed.
  - Large (3 Liter) Reservoir Bag
  - Gas analyzer for oxygen and carbon dioxide
- Perform Self Test
  - Compliance measurement essential – do not change disposables after this
  - Confirm no errors
- Check alarms, set limits, set to max volume  
NOTE: Defaults may not apply to ICU patients
  - Inspired CO2 alarm at 5 mmHg
  - Expired CO2 alarm for permissive hypercapnia
  - Pressure alarms – High and low if apnea pressure alarm
  - Volume/Minute Ventilation
- Set APL valve to 0 cmH2O

### INITIATE THERAPY

- Fresh Gas Flow Options
  - Option 1: Low fresh gas flow to conserve oxygen
    - Preserves humidity
    - **CO2 Absorbent must be available and maintained**
    - **Inspired CO2 Alarm must be set to 5 mmHg**
  - Option 2: Fresh gas flow => minute ventilation
    - No CO2 Absorbent needed (increase FGF if Inspired CO2 present)
    - Humidification is essential – consider active humidifier
- Setting Oxygen Concentration
  - Electronic Flowmeters – Set delivered concentration and monitor inspired oxygen that results
  - Mechanical Flowmeters
    - Air/oxygen mix needed for delivered O2 concentration (see table)
  - Inspired oxygen concentration will need to be monitored especially during low flows - it will be less than the set concentration
- Set Ventilator (See CCM guidance)
  - Ventilation Mode
  - Settings
    - Rate
    - Volume
    - I:E Ratio
    - PEEP
- Start Ventilator
  - **SET SPIROMETRY LOOP REFERENCE IF AVAILABLE WHEN VENTILATION STARTED**
  - **NOTE PRESSURE AND FLOW WAVEFORMS – CONSIDER PHOTO OF BASELINE SCREEN**
  - Record monitored values
    - Pressure – Volume relationships
    - Gas concentrations as expect

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MONITORING SCHEDULE (Record manually time and value if EMR not connected to machine)

Task	Continuous	Hourly	q 4 hours	q 24 hours
Alarms	X			
CO2 Absorbent		X		
Monitored Parameters <ul style="list-style-type: none"> <li>• Insp Oxygen</li> <li>• Insp and Exp CO2</li> <li>• Insp Pressure</li> <li>• Tidal Volume</li> <li>• Spirometry</li> <li>• <i>Agent concentration</i></li> </ul>		X		
Inspect for humidity and secretions <ul style="list-style-type: none"> <li>• Filters</li> <li>• Water trap</li> </ul>		X		
<i>Check Vap Fill if Sedating</i>				
Change Filter/HME			X	
Increase FGF to MV or above for 15 minutes			X	
Perform Self Test*				X

\*Anesthesia machine WILL NOT provide ventilation during the self-test. An alternate ventilation strategy that can be maintained for several minutes is required. Consider transport ventilator if manual ventilation bag not likely to be successful. Power to the machine should be cycled between every patient and at least every 25 days.