

MSHS Ventilator Fleet Overview

Updated 3/28/2020



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Critical Care Ventilators



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Critical Care Ventilators

- The ventilators in this category will be capable of handling all ICU patients safely and effectively.

Puritan Bennett PB840



- Modes
 - A/C, SIMV, PS, Bilevel
- Mandatory Breath Type
 - Volume (VC), Pressure (PC), PRVC (VC+)
 - NIV mode
- Touchscreen and dial knob navigation
- Adult/Pediatric/Infant
- Inspiratory/Expiratory hold functions for Pplat and Intrinsic PEEP monitoring
- Pressure/Flow/Volume waveforms and Flow/Volume + Pressure/Volume loops
- External alarm and streaming capabilities

Puritan Bennett PB980



- Modes
 - A/C, SIMV, PS, Bilevel
- Mandatory Breath Type
 - Volume (VC), Pressure (PC), PRVC (VC+)
 - NIV mode
- Adult/Pediatric/Infant (>7 kg)
- Same as PB840 with additional monitor and patient safety features
 - Multiple graph views (up to 5 can be displayed)
 - Adjustable patient data parameters (Default will look the same as the PB840)
 - Vt/IBW monitoring
- External alarm and streaming capabilities

Dräger Dura



- Modes
 - Volume control
 - Pressure control
 - CPAP/BIPAP
 - Support Ventilation
 - Combination Of Modes
 - Intermittent mandatory Ventilation
 - NIV is optional
- Delivers up to +35 of PEEP
- Delivers 21%-100% FiO₂
- Inspiratory and Expiratory hold function to measure plateau pressure
- Visual waveform monitoring
- Simplified settings, knob dial

Dräger Evita/Evita XL



- Modes
 - IPPV
 - IPPVAssist/CMV
 - CMVAssist – SIMV
 - SIMVPsupp – MMV
 - MMVPsupp – BIPAP
 - BIPAP ASB
 - BIPAP1 Assist / PCV+
 - PCV+Psupp
 - PCV+Assist – APRV – CPAP
 - CPAPASB / CPAP/Psupp
 - CPAP/Psupp – ILV
- Pressure/Flow/Volume waveforms and Flow/Volume + Pressure/Volume loops
- Plateau pressure monitoring

GE Carescape R860



- Modes
 - A/C, SIMV, PS, Bilevel, APRV
- Mandatory Breath Type
 - Volume (VC), Pressure (PC), PRVC (VC+)
 - NIV mode
- Easy navigation interface via touchscreen and dial knob
- Optimal PEEP (software)
- FRC clinical support tool (software)
- Spirodynamics and transpulmonary pressure
- PEEP Titration and Vd/Vtt
- Up to 4 waveforms and loops may be displayed at the same time

Nihon Kohden NKV-550



- Indicated for continuous ventilation
- Specs available: https://www.accessdata.fda.gov/cdrh_docs/pdf18/K181695.pdf
- Adult/Pediatric/Neonatal
 - Assisted/Control Mandatory Ventilation (A/CMV), Synchronized Intermittent Mandatory Ventilation (SIMV) or Spontaneous Ventilation (SPONT)
- Lung Protection software
- PEEP recruitment software

Servo-I/Servo-S/Servo-U



- Modes
 - A/C, SIMV, PS, Bilevel
- Mandatory Breath Type
 - Volume (VC), Pressure (PC), PRVC (Similar to VC+)
 - NIV mode
- Inspiratory/Expiratory hold functions for Pplat and Intrinsic PEEP monitoring
- Pressure/Flow/Volume waveforms and Flow/Volume + Pressure/Volume loops
- Adult/Pediatric/Infant
- Servo S is similar to Servo I with updated display but is not touchscreen (utilizes dial)
- Servo U is a touchscreen device

Vyair Avea



- Modes
 - A/C, SIMV, PS
- Breath Types
 - VC, PC, PRVC, APRV (Bilevel)
- Pressure/Volume waveforms as well as Flow/Volume loops available

Vyaire Vela



- Modes
 - A/C, SIMV, PS
- Breath Types
 - VC, PC, PRVC, APRV (Bilevel)
- Pressure/Volume waveforms as well as Flow/Volume loops available

Table 3.3 Controls and Advanced Settings Associated with Breath Type & Mode

BREATH TYPE & MODE	VOL A/C	VOL SIMV	PRES A/C	PRES SIMV	PRVC A/C	PRVC SIMV	CPAP / PSV	APRV / BIPHASIC	NPPV A/C	NPPV / SIMV	NPPV / CPAP / PS
PRIMARY CONTROLS											
RATE bpm	✓	✓	✓	✓	✓	✓			✓	✓	
VOLUME ml	✓	✓			✓	✓					
INSP PRES cmH ₂ O			✓	✓							
NPPV INSP PRES cmH ₂ O									✓	✓	
PEAK FLOW L/min	✓	✓									
INSP TIME sec			✓	✓	✓	✓			✓	✓	
INSP PAUSE sec	✓ (NOT IN VSYNC)	✓ (NOT IN VSYNC)									
PSV cmH ₂ O		✓		✓		✓	✓	✓			
NPPV PSV cmH ₂ O										✓	✓
PEEP cmH ₂ O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FLOW TRIG L/min	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
% OXYGEN %O ₂	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PRES HIGH cmH ₂ O								✓			
TIME HIGH sec								✓			
TIME LOW sec								✓			
PRES LOW cmH ₂ O								✓			
APNEA (PRESSURE & VOLUME) SETTINGS							✓	✓			✓
ADVANCED SETTINGS AVAILABLE WITHIN EACH MODE	Vsync Vol limit, Flow Cycle), Sigh, Waveform Bias flow	Vsync, Sigh, Waveform, PSV cycle, PSV Tmax, Bias flow, Vol limit, Flow Cycle)	Assured Vol, PC Flow cycle, Bias flow	Assured Vol, PC Flow cycle, PSV cycle, PSV Tmax, Bias flow	Bias flow, Vol Limit, PC Flow cycle	Vol limit, PC Flow cycle, PSV cycle, PSV Tmax, Bias flow	PSV cycle, PSV Tmax, Bias flow	PSV cycle, PSV Tmax, Bias flow, T High Sync, T High PSV, T Low Sync	PC Flow cycle, Bias flow	PC Flow cycle, PSV cycle, PSV Tmax, Bias flow	PSV cycle, PSV Tmax, Bias flow

Anesthesia Machines

Critical Care Capable



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Anesthesia Machines

- These machines, typically utilized by anesthesia in the operating room, are capable of ICU-level critical care ventilation.
- Monitoring capabilities **vary** based upon model.

GE Aisys CS



- Highest acuity model
- Similar to Aestiva, Aisys, and Avance
- B850 Patient Monitor
 - Critical care level
- Mode of ventilation will be SIMV PCV-VG
 - Synchronized Intermittent Mechanical Ventilation
 - Pressure Controlled
 - Ventilation Volume Guarantee

GE Avance/Avance CS²



- CS² is newest model
- Similar footprint to Aestiva, Aisys, and Aisys CS2
- B650 Patient Monitor
 - Critical care level
- Mode of ventilation will be SIMV PCV-VG
 - Synchronized Intermittent Mechanical Ventilation Pressure Controlled Ventilation Volume Guarantee

GE Aisys Carestation



- Similar footprint to Aestiva, Aisys CS2, and Avance
- Two possible monitors
 - **B650**: critical care level
 - **B450**: can be used for critical care monitoring, but there are limitations (3 leads instead of 5)
- Mode of ventilation will be SIMV PCV-VG
 - Synchronized Intermittent Mechanical Ventilation Pressure Controlled Ventilation Volume Guarantee

GE Carestation 650



- Smallest footprint
- Only at MSQ
- **B450 Patient Monitor**
 - Can be used for critical care monitoring, but there are limitations (**3 leads instead of 5**)
- Mode of ventilation will be SIMV PCV-VG
 - Synchronized Intermittent Mechanical Ventilation Pressure Controlled Ventilation Volume Guarantee

GE Aestiva 3000 Carestation



- Similar footprint to Aisys, Aisys CS2, and Avance
- Two possible monitors
 - **B650**: critical care level
 - **B450**: can be used for critical care monitoring, but there are limitations (**3 leads instead of 5**)
- Modes
 - PC, VC, SIMV, PSV Pro

Dräger Fabius GS/GS Premium



- Similar footprints
- Highest acuity model
- Requires external monitor
 - Philips MP-50s, MP-70s or MP-90s
 - All are critical care level
- Mode of ventilation
 - SIMV + PCIMV

Dräger Tiro



- Smaller footprint than Fabius
- Requires external monitor
 - Philips MP-50s, MP-70s or MP-90s
 - All are critical care level
- Mode of ventilation
 - SIMV + PCIMV

Narkomed GS



- Requires external monitor
 - Philips, GE or others
 - All are critical care level
- Mode of ventilation
 - VC only

Penlon SP2



- Requires external monitor
 - Philips, GE or others
 - All are critical care level
- Modes of ventilation
 - PCV, PSV, SIMV, SMMV

Critical Care Capable



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Critical Care Capable

- These ventilator devices can be used to support critical care ventilation if necessary.
- These have the capability of handling critical care patients but would not be considered ideal.

LTV 1000/LTV 1200



- Ideal for chronic ventilator patients but **can be used in the critical care setting on patients with minimal ventilator requirements**
- Modes – A/C, Spontaneous
- Mandatory breath type – PC, VC
- Lacks graphics and waveforms, only displays numerical data
- **LTV 1000: PEEP valve must be added**

Versamed iVent



- Typically used in LTACH or home setting but can be utilized as a critical care vent with limited settings options
- Modes – A/C, SIMV, Spontaneous
- Breath Type – VC, PC, PS
- Adaptive flow and I-time
- Waveform and loops available
- Audible and visual alarms
- MRI Conditional

Transport Ventilators



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Transport Ventilators

- These ventilators are currently being used as transport ventilators or being utilized for mobility purposes.
- These have the capability of handling critical care patients but would not be considered ideal.
- They all lack graphical data and have limited alarm and monitoring functions

Carefusion ReVel



- Battery powered or DC power outlet
- Mode – A/C, SIMV, Spontaneous
- Breath type – VC, PC, PRVC, PS
- Airway pressure manometer (Numerical and LED indicator)
- LED patient data display (Vt, VE, PIP, PEEP)
- Docking station or maybe taken off docking for transport
- FiO2 21%-100%
- Audible alarms – PIP, Ve, RR

Pneupac Parapac and Parapac Plus 310



- Pneumatically powered via high pressure O₂ source (tank or wall)
- Single limb circuit, utilizes and exhalation valve
- CMV VC mode (Parapac Plus has CPAP mode)
- PEEP
 - Parapac - utilizes a PEEP valve
 - Parapac Plus – has built in PEEP via pressure line which can be dialed in (Max 20 CmH₂o) .
- PIP manometer gauge
- Audible high PIP alarms (can be difficult to hear from outside the room)

Sub-Acute Ventilators



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- Ideally, these ventilators are meant for patients who are chronic ventilator patients or patients with lower ventilator requirements.
 - PEEP < 8 CmH₂O, FiO₂ < 50%, Stable PIP
- These ventilators may be used in the acute care settings however have **limited monitoring capabilities**.
 - No graphics, non streaming, does not have external alarm capabilities

Trilogy EVO/100/200



- Typically used as a home ventilator
- Modes
 - A/C
 - SIMV
 - AVAPS-AE
 - NIV
- Mandatory Breath
 - PC/VC
 - SIMV-PS
- Normally does not have a 50 PSI connection
- Must have O₂ bleed in from a flow meter

Phillips V60 (Invasive Mode)



- Intended for spontaneously breathing patients who require assisted ventilation
- Requires different adapters to connect to either trach or ETT
- Mode of ventilation: PCV
- Single limb circuit with bi-directional flow

Dräger Carina



- Similar capabilities as the Phillips V60
- Primarily designed for non-invasive usage
- May be capable of being is as invasive ventilator via PC

Disposable Ventilator



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Vortran Go2



- Single patient use
- Flow powered
- PC or PS breaths
- PIP and PEEP monitoring
- 50 cmH₂o pop off valve (safety valve)
- 100% and 50% FiO₂
- One way valve allows additional flow for spontaneously breathing patients
- Comes in three pieces
 - Tee piece (patient connection)
 - Pressure manometer
 - Modulator (2 dials, pressure and respiratory rate)
- MRI Conditional

CPAP/BIPAP

Possible Invasive Capabilities



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- Depending on software, these may be capable of being used as an invasive ventilator.

Resmed S9



- Primarily designed for home use
- Preferred system for OSA
- Has IVAPS and ST with backup rate which may be able to utilized in invasive mode (testing in progress)
- Vt / RR readings
- Capable of streaming with additional hardware
- Lacks audible alarms