Puritan Bennett™ 980 Ventilator System
Product Training Pre-Read: Overview of the Features and Operations

Breathe More
NATURALLY
Information and Best Practices for More Effective Training
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Introduction

The information in this pre-read guide is intended to lay the groundwork for your Puritan Bennett™ 980 ventilator training session. You may choose to read this entire overview of features and benefits before your training or focus on those sections that relate to your clinical environment.

This guide is designed to help make your training session as effective as possible by familiarizing you with the Puritan Bennett 980 ventilator so you can have a more immediate impact on the treatment of your patients. As you read this booklet, a space is provided for notes or questions for the trainer. Use this guide as a quick reference before, during and after your training session.

We look forward to working with you.
THE PURITAN BENNETT 980 VENTILATOR SYSTEM AT A GLANCE

The new Puritan Bennett 980 ventilator helps enable patients to breathe more naturally through some of the most innovative breath delivery technology available. Our simple, safe and smart design provides more natural ventilation that may help clinicians improve patient comfort.†

**Simple**

Our innovative user interface features a highly customizable display with intuitive screen navigation.

**Safe**

The newly designed Puritan Bennett 980 ventilator provides a unique ventilator assurance feature and an integrated expiratory filtration system.

**Smart**

Advanced synchrony tools help clinicians set the ventilator to adapt to their patients’ unique needs and help provide the appropriate level of support throughout the breath.

†Compared to conventional volume control mechanical ventilation.
THE PURITAN BENNETT™ 980 VENTILATOR IS INTENDED FOR:

- Use in neonatal through adult populations
- Invasive and noninvasive applications

THE PURITAN BENNETT 980 VENTILATOR IS AVAILABLE IN THREE CONFIGURATIONS:

- Puritan Bennett™ 980 Neonatal Ventilator—for neonatal patients only
- Puritan Bennett™ 980 Standard Ventilator—for pediatric and adult patients
- Puritan Bennett™ 980 Universal Ventilator—for neonatal through adult patients
The touch screen automatically displays the following information, depending on the state of the ventilator:

- Ventilator, apnea and alarm settings
- Patient data
- Waveforms
- Current alarm banners

In addition to the main patient ventilation parameter settings, the graphical user interface has a rotary encoder knob and several additional input keys.

1. Display brightness key
2. Display lock key
3. Alarm volume key
4. Manual inspiration key
5. Rotary encoder (knob)
6. Inspiratory pause key
7. Expiratory pause key
8. Alarm reset key
9. Alarm silence key

NEW PATIENT SETUP

On the patient setup screen, the gender and height you select will determine a predicted body weight (PBW), which in turn will determine a range of settings that are appropriate for use.

During patient setup you may set the following:

- Gender and height (or PBW)
- Ventilation type (invasive and noninvasive)
- Mode
- Mandatory type
- Spontaneous type
- Trigger type
- Primary settings, for example:
  - Rate
  - Tidal volume
  - Inspiratory pressure
  - O2%
  - PEEP

If you find the default settings conflict with your institutional guidelines, you can reconfigure the institutional defaults for New Patient Setup in Service Mode.

MAKING CHANGES TO SETTINGS AFTER INITIAL SETUP

After initial setup, it is easy to make settings changes using the “touch, turn, accept” method.
The touch screen of the Puritan Bennett™ 980 ventilator is highly configurable to specific user and patient needs. The touch screen has up to five retrievable preset configurations, enabling you to choose how much or how little patient/ventilator information to display.

Intuitive icons and graphics, and large, easy-to-read text make it simple to use the touch screen while working with a patient. Setting up the ventilator for a new patient is fast and easy.²

Monitoring patient status and making changes to ventilation parameters are also fast and easy. Both the patient's current status and long-term trending data are quickly retrievable. Patient data may be downloaded via USB ports on the back of the ventilator.

All ventilation parameters are entered via the touch screen's graphical user interface (GUI). Simple hand motions (swipe, double-tap and drag-and-drop) activate most functions on the touch screen. These gestures will be familiar to any user of a smart phone, tablet or handheld device.
ALARM MANAGEMENT

The Puritan Bennett™ 980 ventilator provides low-, medium- and high-priority alarms, each with a unique sound. If a high-priority alarm is not acknowledged within 30 seconds, the alarm volume escalates to maximum value, regardless of the user’s alarm volume setting.

ALARM VIOLATIONS ARE VISUALLY INDICATED IN THREE PLACES:

- The dome lamp on top of the touch screen
- On alarm banners on the touch screen
- On alarm settings screen on the touch screen
The newly designed Puritan Bennett™ 980 ventilator provides a unique ventilator assurance feature and an integrated expiratory filtration system.

**Features and Benefits**

**KEY BENEFITS**

Puritan Bennett 980 ventilator bacterial/viral filters have efficiencies of >99.999%.

**VENTILATOR ASSURANCE FEATURE**

Ventilator assurance is a new sophisticated safeguard system, unique to the Puritan Bennett 980 ventilator. In the event of certain system failures, the ventilator will continue to deliver ventilatory support as close to the ventilator’s settings as feasible. Most ventilators go into ventilator inoperative state under certain alert conditions. The Puritan Bennett 980 ventilator reduces the number of conditions where this could happen, which may provide a safer environment for the patient.

**UNIQUE FILTRATION SYSTEM**

The Puritan Bennett 980 ventilator has an integrated heated expiratory filtering system. An increasing number of infection control protocols cite the use of N95 or N100 respirators by clinicians to reduce the risk of exposure to airborne pathogens. Clinicians should expect the same level of protection from exhaled gases from potentially infected patients. Puritan Bennett™ filtration is designed to meet this expectation.
The Puritan Bennett™ PAV™+ software is a spontaneous breath type that enables the patient to dictate the breath he or she receives, and helps clinicians more clearly understand the work required by the patient to breathe.

Like other spontaneous breath types, the PAV™+ software assists patient efforts, but unlike other spontaneous breath types, the operator does not set pressure or volume. The operator sets the %Support setting (5% to 95%), tube type and tube size. The %Support setting determines the percentage of mechanical support used to offload the patient’s work of breathing.

The PAV™+ software provides ventilatory support proportional to the patient’s inspiratory effort, letting the patient determine the duration and depth of each breath. The PAV™+ software begins to assist an inspiration when flow (generated by the patient’s inspiratory muscles) appears at the patient wye. If the patient ceases inspiration, the assist also ceases.

The PAV™+ software measures the patient’s resistance (R) and compliance (C) every four to 10 breaths. It also measures flow and volume every five milliseconds. Through the use of the equation of motion, patient-generated muscular pressure ($P_{MUS}$) and the actual work of breathing can be calculated in real time. It’s important to note that in mechanically ventilated patients, both R and C can vary considerably over time. The PAV™+ software continuously and automatically measures and adjusts to these changes. This maintains the preselected percentage of assistance to the patient’s respiratory workload.

**How PAV™+ Software Works**

Advanced synchrony tools help clinicians set the ventilator to adapt to their patients’ unique needs and help provide the appropriate level of support throughout the breath.

**Key Benefits**

- Promotes spontaneous breathing by requiring patient effort throughout the breath
- Automatically adjusts every five milliseconds to changes in the patient’s demand
- May help improve patient comfort
- Helps improve patient-ventilator synchrony

**Features and Benefits**

- Advanced synchrony tools help clinicians set the ventilator to adapt to their patients’ unique needs and help provide the appropriate level of support throughout the breath.
- The Puritan Bennett™ PAV™+ software is a spontaneous breath type that enables the patient to dictate the breath he or she receives, and helps clinicians more clearly understand the work required by the patient to breathe.
- Like other spontaneous breath types, the PAV™+ software assists patient efforts, but unlike other spontaneous breath types, the operator does not set pressure or volume. The operator sets the %Support setting (5% to 95%), tube type and tube size. The %Support setting determines the percentage of mechanical support used to offload the patient’s work of breathing.
- The PAV™+ software provides ventilatory support proportional to the patient’s inspiratory effort, letting the patient determine the duration and depth of each breath. The PAV™+ software begins to assist an inspiration when flow (generated by the patient’s inspiratory muscles) appears at the patient wye. If the patient ceases inspiration, the assist also ceases.
- The PAV™+ software measures the patient’s resistance (R) and compliance (C) every four to 10 breaths. It also measures flow and volume every five milliseconds. Through the use of the equation of motion, patient-generated muscular pressure ($P_{MUS}$) and the actual work of breathing can be calculated in real time. It’s important to note that in mechanically ventilated patients, both R and C can vary considerably over time. The PAV™+ software continuously and automatically measures and adjusts to these changes. This maintains the preselected percentage of assistance to the patient’s respiratory workload.
PURITAN BENNETT™ LEAK SYNC SOFTWARE

The Puritan Bennett™ Leak Sync software automatically detects and compensates for leaks in the breathing circuit and patient-ventilator interface. The Leak Sync software helps reduce the guesswork in determining the appropriate settings to compensate for a leak, regardless of patient type. This unique software is designed to differentiate between flow from leaks and flow from patient respiratory effort, and then adjust quickly. The Leak Sync software also calculates the volume lost because of leaks and makes adjustments to the display of volume measurements.

The Leak Sync software option compensates for leaks up to 15 L/min for neonates, 40 L/min for pediatric patients and 65 L/min for adults.

A new leak or change in leak rate is typically quantified and compensated within three breaths.

KEY BENEFITS

• Quickly and automatically adjusts for leaks because of patient interfaces
• Helps ensure appropriate breath triggering and cycling, as well as valid patient monitoring data6,7
• Promotes synchrony during invasive and noninvasive ventilation6,7
• Reduces the occurrence of auto triggering in the presence of a leak6,7
NEONATAL VENTILATION

The Puritan Bennett™ 980 Neonatal and Universal ventilators with Puritan Bennett™ NeoMode 2.0 software are designed for respiratory support for newborns weighing as little as 300 g. Specific features include:

- **Proximal flow sensor**—Measures flows, pressures and tidal volumes right at the patient wye for neonatal applications.
- **C20/C**—Helps clinicians potentially reduce the risk of over distention by monitoring compliance of the last 20% of each inspiration compared to the entire inspiration.¹
- **Configurable O2% elevation**—Elevates O₂%; can be configured to increase to any value between 21% and 100%.
- **Noninvasive (NIV)**
- **Trending**—Captures up to 72 hours and more than 57 parameters of patient data to help you review the effectiveness of treatment over time.

PURITAN BENNETT™ NEOMODE 2.0 SOFTWARE

The NeoMode 2.0 software enables clinicians to set tidal volumes as low as 2 mL in increments as small as 0.1 mL across volumes ranging from 2 mL to 5 mL.

KEY BENEFITS

- Designed specifically for neonates with low predicted body weight
- Designed to reduce nuisance alarms when nasal prongs are used
PURITAN BENNETT™ PROXIMAL FLOW SYSTEM

The Puritan Bennett™ proximal flow system option measures flow, volume and pressure at the patient wye. When the ventilator has a proximal flow sensor installed, both proximal flow and proximal pressure measurements are obtained and displayed on the main screen. These values are used in the display of graphics. No calibration is required when in patient use. To ensure accurate pressure and flow measurements, the ventilator performs an autozero function to calibrate the proximal flow sensor.

KEY BENEFITS

• Values from proximal flow sensor are used in the display of graphics
• Proximal flow, volume and pressure data are displayed on the touch screen
• Periodic expiratory phase purging occurs for accurate pressure measurements
References
2. Internal testing Puritan Bennett™ 980 ventilator human factors testing.