THE PURITAN BENNETT™ 980 VENTILATOR

EDUCATION PRESENTATION

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OVERVIEW

This guide is provided as a convenience companion document to the Operator's Manual. It is not intended to replace the Operator's Manual, which should always be available while using the ventilator. It is important to familiarize yourself with all information in the Operator's Manual relevant to your institution's use of the ventilator, including on-screen help, instructions, warnings and cautions.

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BREATHE MORE NATURALLY

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.[1]

SIMPLE
SAFE
SMART

* Compared to conventional mechanical ventilation (VC,VC+,PC,PS)

1. Grasso S, Puntillo F, Mascia L, et al. Compensation for increase in respiratory workload during mechanical ventilation. Pressure-support versus proportional-assist ventilation. *Am J Respir Crit Care Med*. 2000;161(3 Pt 1):819-26.

OVERVIEW

The Puritan Bennett™ 980 ventilator is designed for:

- Neonatal through adult populations
- In-room use and intra-hospital transport
- Invasive (via endotracheal tube) and noninvasive (via mask, nasal prongs, or uncuffed endotracheal tube) applications

The ventilator is available in three models:

Pediatric – Adult Ventilator	Ventilates pediatric or adult patients with predicted body weights from 3.5 kg to 150 kg and with tidal volumes from 25 mL to 2500 mL.
Neonatal Ventilator	Ventilates neonatal patients with predicted body weights from 0.3 kg to 7.0 kg and with tidal volumes for mandatory volume-controlled breaths from 2 mL to 320 mL.
Universal Ventilator	Ventilates neonatal, pediatric and adult patients with predicted body weights from 0.3 kg to 150 kg and with tidal volumes for mandatory volume-controlled breaths from 2 mL to 2500 mL.

FINDING YOUR WAY AROUND

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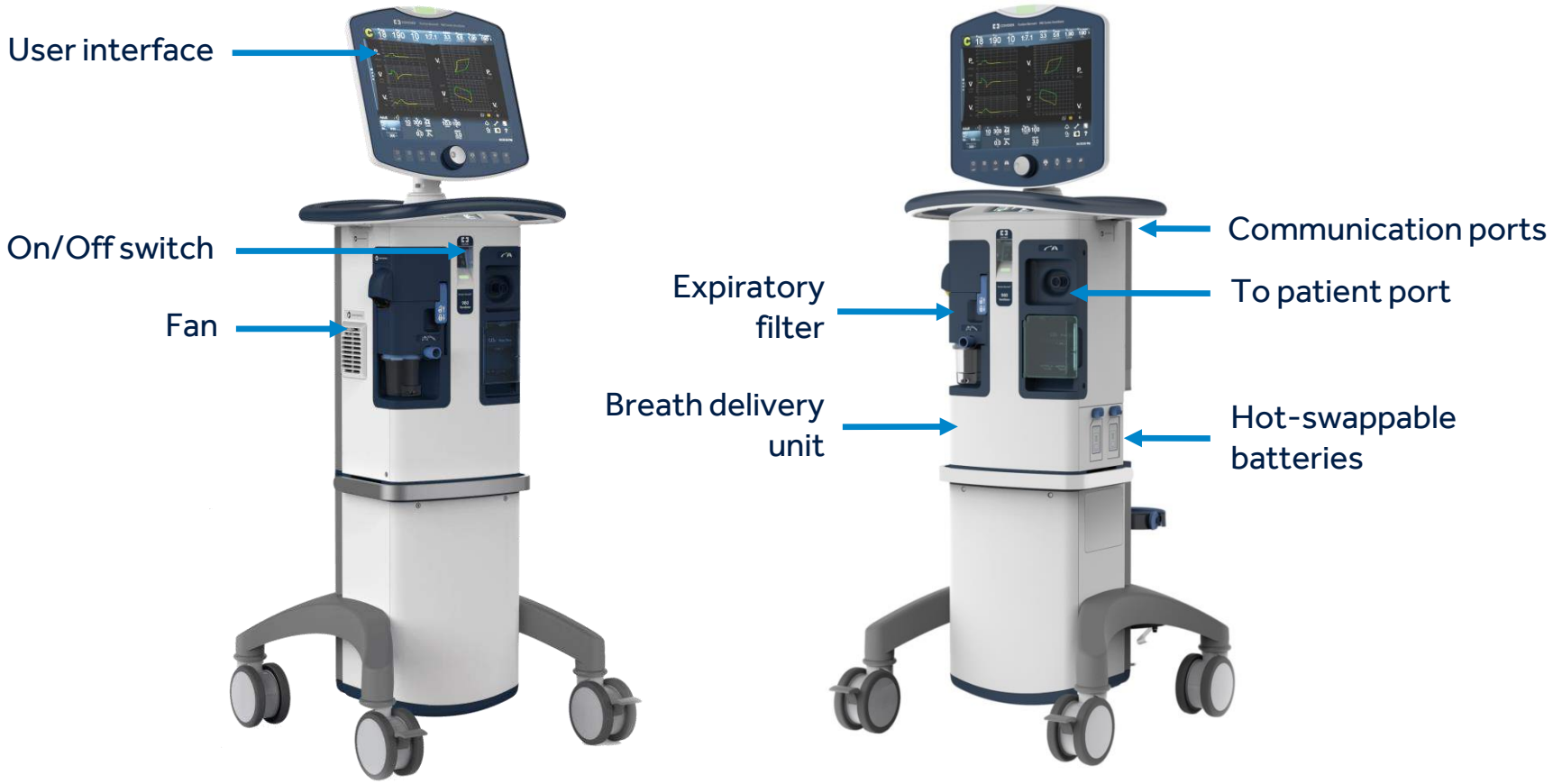
FINDING YOUR WAY AROUND



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FINDING YOUR WAY AROUND THE USER INTERFACE

Touch screen

Patient data banner on top

- Additional patient data display tab
- Large font data display tab

Left menu tab

Graphics in middle

Ventilator setup button lower left

Constant access icons

Bezel control keys

Adjustment knob

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POSITIONING THE USER INTERFACE FOR EASE OF VIEWING

The user interface can be repositioned for easier viewing.

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TOUCH SCREEN NAVIGATION

- Swipe
- Double-tap
- Drag
- Touch and hold
- Drag and drop
- “Touch, turn, accept”

SETTING UP THE PURITAN BENNETT™ 980 VENTILATOR PRIOR TO USE

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SETTING UP PRIOR TO PATIENT USE

Setting up for patient use will include installing:

- Filters
- Humidifier
- Breathing circuit
- EVQ*
- Air and oxygen hoses
- Puritan Bennett™ proximal flow sensor (if applicable)

Powering on and performing a short self test (SST)

* U.S. only

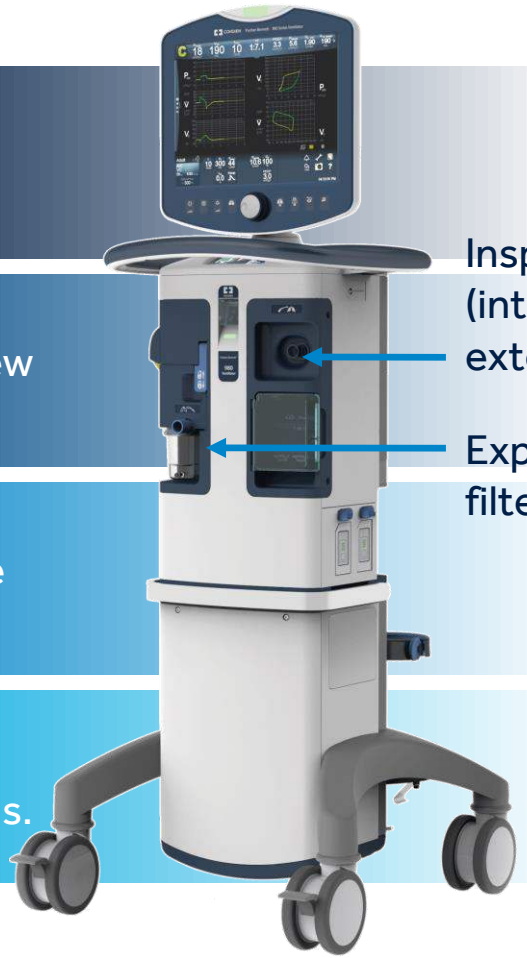
INSTALLING THE FILTERS

Three filters help reduce the spread of pathogens.

Expiratory filter is heated to keep the gas that flows through it from cooling to the dew point and creating condensate in the filter.

Reusable and disposable filter options are available.* An optional drain bag is available for managing condensate.

Pediatric-adult and neonatal applications use different expiratory filter configurations.



Inspiratory filters (internal and external)

Expiratory filter assembly

* Only disposable inspiratory and expiratory filters may be used in the U.S.

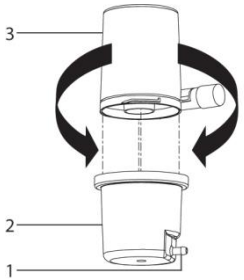
INSTALLING THE INSPIRATORY FILTER ON THE 'TO PATIENT' PORT

- Install the inspiratory filter on the "To Patient" port by pushing it directly onto the port.
- Ensure the direction of the flow arrow is pointing outward, toward the patient circuit's inspiratory limb.

* Only disposable inspiratory and expiratory filters may be used in the U.S.

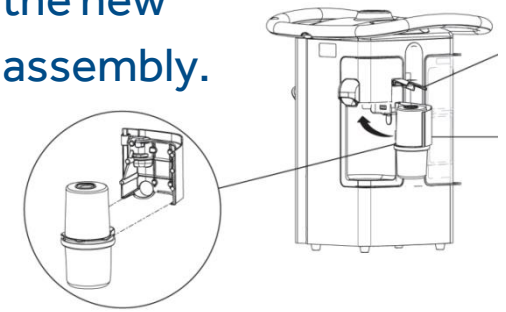
INSTALLING THE EXPIRATORY FILTER ASSEMBLY: PEDIATRIC-ADULT APPLICATION

1) Assemble the condensate vial and reusable expiratory filter.



2) Raise the expiratory filter latch to unlock the expiratory filter door.

3) Insert the new filter* assembly.



4) Lower the expiratory filter latch.

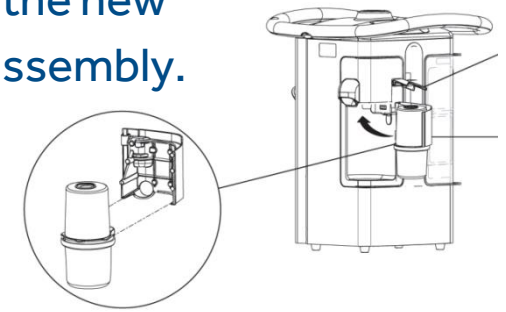
* Only disposable inspiratory and expiratory filters may be used in the U.S.

INSTALLING THE EXPIRATORY FILTER ASSEMBLY: NEONATAL APPLICATION

1) Raise the latch, (remove adult door if applicable), install the neonatal filter door if applicable.

2) Raise the expiratory filter latch to unlock the expiratory filter door.

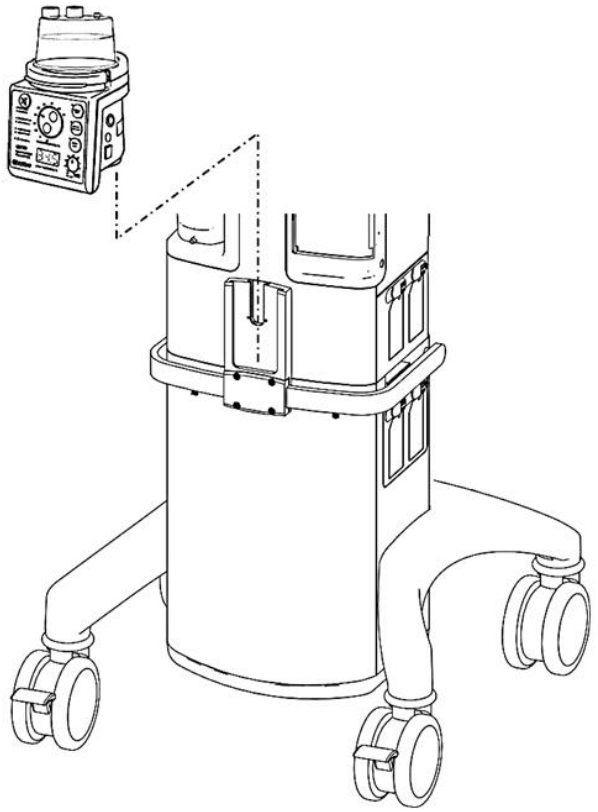
3) Insert the new filter assembly.



4) Lower the expiratory filter latch.

INSTALLING THE HUMIDIFIER

- The humidifier bracket accommodates Teleflex (Hudson RCI) and Fisher & Paykel humidifiers.
- To install, slide the rear of the humidifier into the corresponding slot on the humidifier bracket, until it is fully seated.
- During SST, enter the humidifier volume setting when you enter the breathing circuit type.
  - The operator's manual contains a chart with the Fisher & Paykel and Teleflex Hudson RCI chamber volumes listed. Different settings are used for neonatal versus pediatric and adult applications.



INSTALLING THE BREATHING CIRCUIT

The breathing circuit type should be selected based on the patient's predicted body weight (PBW).

If changing a breathing circuit type, run an SST.

- The circuit type and PBW entered during the SST will determine the new patient ventilation and alarm settings and also the range limits.

Circuit type	PBW
Neonatal	0.3 kg to 7 kg
Pediatric	7 kg to 24 kg
Adult	>24 kg

PURITAN BENNETT™ PROXIMAL FLOW SENSOR (NEONATAL APPLICATION ONLY)

Measures flow, volume and pressure at the patient wye; does not control flow volume or pressure

Intended for neonatal invasive ventilation

To install the sensor:

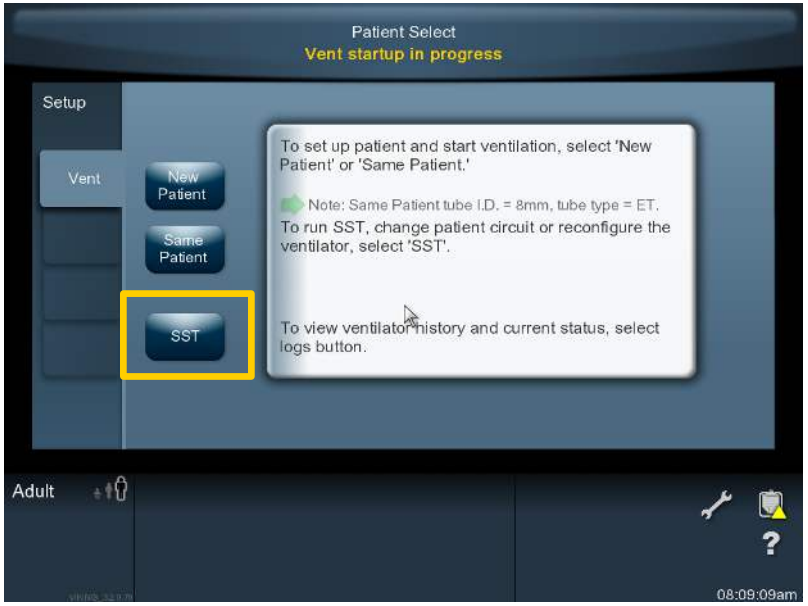
- Install during SST (according to prompts).
- Install the sensor end at the patient circuit wye.
- Attach the other end to the keyed pneumatic connector on the ventilator's front panel behind a clear door.

ABOUT THE EXHALATION VALVE FLOW SENSOR ASSEMBLY (EVQ)

- Contains the expiratory port, expiratory flow sensor, exhalation valve diaphragm, expiratory filter seal and pressure sensor filter
- Can be cleaned and disinfected if a high-risk communicable contamination occurs
- Disinfection is not required on a routine basis

POWERING ON

Power on using the ON/OFF switch



WHY PERFORM THE SHORT SELF TEST (SST)?

- Impacts accuracy of breath delivery and spirometry
  - The SST is a way of calibrating the ventilator to the circuit and humidifier you are using. It impacts both breath delivery and spirometry.
  - The power-on self test (POST) does basic testing of the system. The SST expands that testing. It is the best way to prepare the ventilator for patient use.
- Run SST following a circuit change, change in circuit configuration (including circuit type, additions and removal of water traps and accessories, humidifiers, proximal flow sensor) and/or every 15 days.
- In the event that the patient is connected without ventilation parameters being specified, the ventilator enters Safety PCV, a safe mode of ventilation. Complete the parameter selection to exit Safety PCV.

PERFORMING A SHORT SELF TEST (SST)

- Select the patient circuit type and humidification, and then follow the amber-colored prompts.
- As a general rule, keep doing what you are prompted to do until you are told to do something else. For instance, if you are prompted to occlude the patient wye, keep occluding it until you are told not to.
  - You are given the option to repeat a test if there is a failure. When necessary, you may also continue in the presence of an alert.
- The SST status screen will display the test in progress and the results of completed tests.
- After completing the SST you will proceed with the patient setup process.

PATIENT SETUP

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PATIENT SETUP

- You can choose to set up a new patient or the same patient.
- In New Patient setup, you can choose a full manual setup or the Quick Start feature.

New patient	Manual setup	Quick start
	1. Select **PBW** or **Gender and Height** 2. Select ventilation type—**Invasive** or Noninvasive (**NIV**) 3. Select a Mode 4. Select Mandatory, Spontaneous and Trigger types 5. Set the Primary settings 6. Touch **Accept** or **Accept ALL** to confirm the change(s)	1. Touch **New Patient**. 2. Enter PBW or gender and height. 3. Touch **Quick Start**. 4. Connect the circuit wye adapter to the patient's airway or interface connection.
Same patient	The ventilator will be ready to start ventilating at the settings in place at power down.	

HOW TO ENABLE AND DISABLE THE PURITAN BENNETT™ PROXIMAL FLOW SENSOR

- To enable/disable the Proximal Flow Option
  - Touch the Configure/Wrench icon
  - Touch the Options tab
  - Touch the Prox tab
  - Touch the Enabled or Disabled button.
- To initiate a Manual Purge, touch the Start button

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HOW THE PURITAN BENNETT™ PROXIMAL FLOW SENSOR IMPACTS MONITORING

When the Proximal Flow Sensor is enabled, new and replacement data values appear, representing data measured with the Proximal Flow Sensor. The monitored volume labels have a Y added to indicate that the measurement comes from the Proximal Flow Sensor.

$V_{TI\ Y}$	Inspired tidal volume (mandatory or spontaneous) at patient circuit wye
$V_{TE\ Y}$	Exhaled spontaneous/mandatory tidal volume at patient circuit wye
$V_{TE\ SPONT\ Y}$	Exhaled spontaneous tidal volume at patient circuit wye
$V_{TE\ MAND\ Y}$	Exhaled mandatory tidal volume at patient circuit wye
$V_{E\ TOT\ Y}$	Exhaled total minute volume at patient circuit wye

HOW PURITAN BENNETT™ PROXIMAL FLOW SENSOR AND PURITAN BENNETT™ LEAK SYNC SOFTWARE AFFECT MONITORING

V_{TLY}	Inspired tidal volume (mandatory or spontaneous) at patient circuit wye (Leak Sync enabled and leak adjusted)
V_{TL}	Inspired tidal volume (mandatory or spontaneous) (Leak Sync enabled and leak adjusted) as measured by the ventilator's internal sensors

MAKING SETTINGS CHANGES AFTER INITIAL SETUP

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MAKING SETTINGS CHANGES AFTER INITIAL SETUP

There are several ways to access settings changes after initial setup:

Swipe the **Menu** tab on the left margin of the touch screen and touch the **Setup** button.

Touch the **Vent Setup** button in the bottom-left corner of the touch screen display.

Touch a parameter in the lower margin of the touch screen.

MANAGING ALARMS

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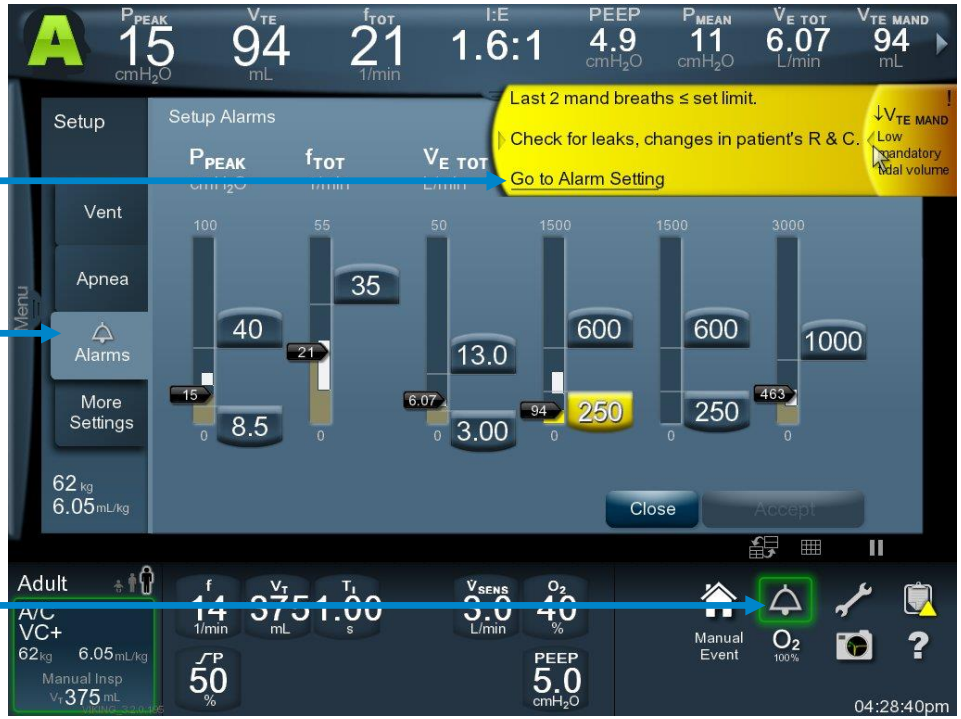
MANAGING ALARMS

There are three ways to access the Alarms screen:

Touch the hotlink from an alarm violation message.

Swipe the **Menu** tab to open the Settings menu, then touch the **Alarms** settings tab.

Touch the alarm icon (constant access icon).



APNEA ALARM
NOT ON THE ALARM SCREEN

- Touch the Vent Setup button to access the Apnea settings tab.
- Apnea alarm triggers apnea backup:
  - Current apnea ventilation settings are displayed.
  - Non-apnea ventilation settings may be changed during apnea backup.
  - Apnea timer resets with every breath.
  - Autoreset of apnea backup occurs when the patient triggers two consecutive inspirations and the exhaled volume is equal to or greater than 50% of the delivered volume. To manually reset it, touch the Alarm Reset key.
  - Apnea ventilation setting for inspiratory pressure or tidal volume is also used for manual inflations; it is displayed in the Vent Setup button.

ALARM CONDITIONS

- Alarm violations are visually indicated in three places:
  - The omnidirectional lamp on top of the touch screen
  - On the alarm banners
  - On the alarm settings screen
- Low-, medium- and high-priority alarms—unique sounds
- Alarm loudness escalates if a high-priority alarm is not acknowledged within 30 seconds and then again at 60 seconds.
- Alarm banners indicate which alarm has been violated and provide a base message. Touching the individual alarm banner causes an expanded explanation to appear, containing analysis and remedy messages, and may contain a link to the alarm log or the alarms settings screen.

OMNI-DIRECTIONAL LED

Normal mode	▪ Steadily lit green
Alarm condition	▪ LED flashes—color corresponds to alarm priority
Concurrent alarms	▪ LED displays highest-priority color
Alarm de-escalates	▪ Latched (sides) displays highest priority ▪ Center displays current alarm priority

ALARM PRIORITIES

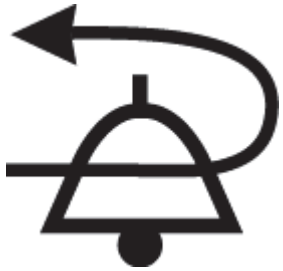
Alarm priority	Visual indicator	Audible indicator/Reset criteria
Low A change in the patient-ventilator system has occurred.	▪ Yellow LED ▪ Yellow alarm banner on screen ▪ Yellow bar next to alarm setting icon on Alarms screen	▪ Low-priority audible alarm (two tone, non-repeating) ▪ LED indicator turns off and autoreset is entered into the alarm log.
Medium Prompt attention necessary.	▪ Flashing yellow LED ▪ Yellow alarm banner on screen ▪ Yellow bar next to alarm setting icon on Alarms screen	▪ Medium-priority audible alarm (a repeating sequence of three tones) ▪ LED indicator turns off and autoreset is entered into the alarm log.
High Attention required to ensure patient safety.	▪ Flashing red LED ▪ Red alarm banner on screen ▪ Red bar next to alarm setting icon on Alarms screen ▪ High-priority audible alarm (a sequence of five tones that repeats twice, pauses, then repeats again)	▪ Visual alarm indicators remain steadily illuminated following an autoreset. ▪ The alarm reset key must be pressed to extinguish visual indicator.
Immediate Attend to immediately.	▪ Specific to alarm condition or component failure	▪ Continuous tone alarm sounding for at least 120 seconds in the case of Vent Inop or complete loss of power

AUDIO PAUSED

- Temporarily mutes the audible alarm for 2 minutes.
- Audio Paused key LED illuminates.
- Countdown timer appears.
- Press Alarm Reset to cancel audio paused interval.
- If the condition that caused the alarm still exists, the alarm activates again.
- Press Audio Paused key again to restart audio paused interval.

ALARM RESET

- Use for any *non-technical alarm.*
- Resets the color of the dome light.
- Reinitializes the algorithm the ventilator used to detect the alarm (except for A/C POWER LOSS, LOW BATTERY, NO AIR SUPPLY, NO O_2 SUPPLY, PROCEDURE ERROR alarms and active battery alarms).
- Captured in the log if there is an active alarm.



ALARM LOG – UP TO 1000 EVENTS

The Alarm Log contains the last 1000 alarms that have occurred, whether they have been reset or autoreset, the priority level, and their analysis messages.

- Accessible during Normal and Service states
- Records:
  - Date/time-stamped entry when an alarm is detected, escalated, reset or autoreset
  - Date/time-stamped entry if the ventilator enters backup ventilation
  - Priority level
  - Analysis message
  - Audio paused interval begins, ends or is cancelled
- If one or more alarms have occurred since the last time the alarm log was viewed, a yellow triangle appears on the touch screen indicating there are unread items.
- Alarm log is cleared when New Patient is selected during the ventilator startup process.

PATIENT DATA AND DATA MONITORING

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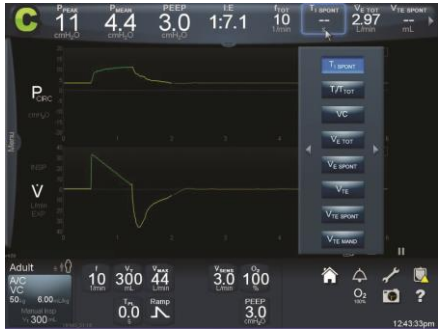
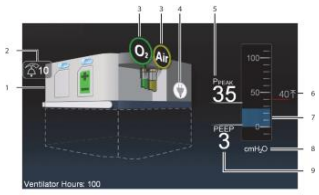
LOCATING COMMONLY USED PATIENT DATA VALUES

- Patient data banner
- Graphics



- Additional patient data screen

- Large-font patient data screen



Status display

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PATIENT DATA BANNER

- Eight patient data measurements are displayed across the top of the touch screen.
- Four on the right can be swiped to the left or right in order to display additional data.
- Double-tap a cell to show the data available for viewing and select the one to be displayed.
- A “blank cell” feature is available to reduce the number of patient data measurements showing in the top banner.

GRAPHICS

- The Puritan Bennett™ 980 ventilator displays color-coded waveforms for flow, pressure and volume versus time.
- It also displays color-coded loops for volume versus pressure and flow versus volume.
- The inspiratory portion of a mandatory breath is green, the inspiratory portion of a spontaneous breath is orange and exhalation is always yellow.

GRAPHICS: CHANGING THE SCALE AND MAXIMIZING/MINIMIZING

Two ways to change the scale of a graphic:

- Touch and drag the scale.
- Touch to select the scale and then use the adjustment knob to change the scale.

Graphics can also be enlarged to full screen by double-tapping the graph, swiping upward, or tapping the arrow in the upper-right corner.

To return to the previous size, tap the arrow in the upper-right corner of the graph again, swipe downward or double tap the graph.

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GRAPHICS: PAUSE AND REVIEW

- Graphics can be paused, and historical data (up to 60 seconds) can be reviewed.
- Touch the Pause icon in the lower-right corner.
- Drag or use the adjustment knob to move the cursor and identify measurements along the waveform(s) or loop.
- Numerical data continues to update while waveform/loop plotting is paused.
- Touch the Pause icon again to unpause the graphics.

GRAPHICS: STORING A SCREEN IMAGE

- Touch the camera icon to store an image of the screen.
- May be used with or without Pause.
- Data continues to update during the pause—graph and numerical data on a stored image will not likely be aligned.
- Open the Menu tab (left margin of screen) and touch **Screen Capture** to access stored screen images and download through the USB port.

SCREEN LAYOUT FOR GRAPHICS

- Use the waveform layout icon to access alternate screen configurations.
- You can choose to display up to three waveforms and two loops simultaneously in the waveform area.

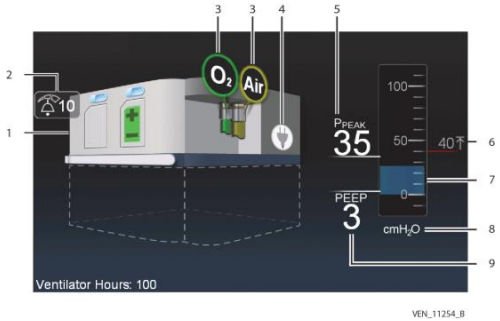
ADDITIONAL PATIENT DATA

- Tap or swipe down the tab in the center of the lower margin of the patient data banner to display additional patient data.
- View page 1 or tap page 2 to view another set of additional patient data.
- Additional patient data values have fixed positions.

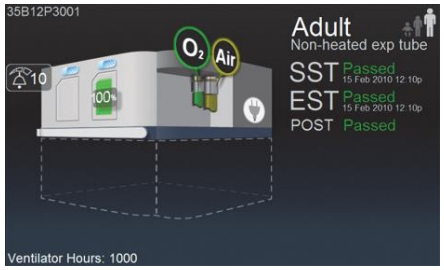
PATIENT DATA LARGE FONT SCREEN

- Tap the tab in the center of the lower margin of the additional patient data screen to view the large-font patient data screen.
- Double-tap a cell to show the data and waveforms/loops available for viewing and select the one to be displayed.

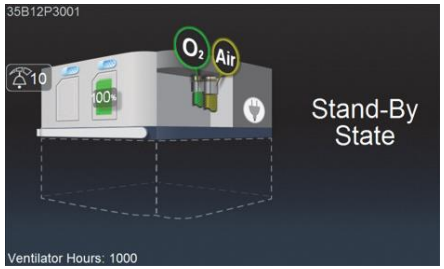
STATUS DISPLAY (ON BREATH DELIVERY UNIT)
VISIBLE WHENEVER POWER IS ON – NOT INTERACTIVE



During ventilation, the status display shows gas sources, power source, battery status, alarm volume setting, ventilation hours and circuit pressure graph: pressure units, ↑P_{PEAK} alarm setting and P_{PEAK}/PEEP values.



Before starting ventilation, the status display shows the EST, SST and POST results, including the patient circuit size and type cleared by SST.



This screen also displays valuable device messages, such as stand-by state, low or empty battery alarms, ventilation assurance (BUV) state or safe state/safety valve open.

PATIENT DATA LOG: HISTORICAL RECORD OF PATIENT DATA

- The patient data log records data every minute for a total of up to 4320 patient data entries.
- 3 tabs are contained in the patient data log: vital patient data, additional patient data-1, additional patient data-2.
- During ventilator operation, the log records:
  - Date and time of entry
  - Data label—which measurement it is recording
  - Patient data value
- Access via the clipboard icon.
- The log is cleared when the ventilator is set up for a new patient.

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MENU TAB

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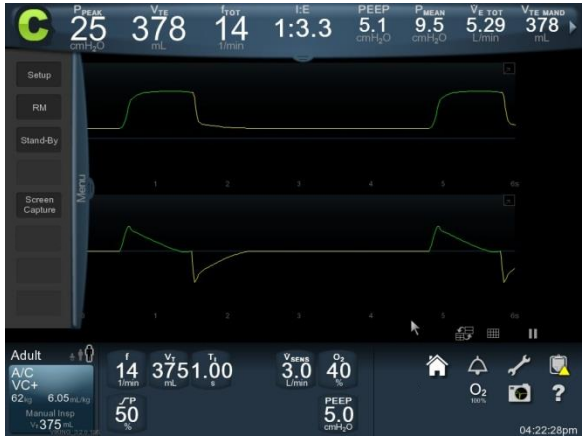
MENU TAB

- Swipe to the right to access Setup, Respiratory Mechanics, Stand-by and Screen Capture menus.
- Touch the **Setup** button to view the Vent, Apnea, Alarms and More Settings tabs. This is another way to access mode and breath type changes.



MORE SETTINGS

- Leak Sync: Enabled/Disabled
- O_2 sensor: Enabled/Disabled/Calibrate
- Humidification type: Heated Exp Tube/Non-heated Exp Tube/HME (impacts expiratory spirometry)

MORE SETTINGS

- D_{SENS}
  - D_{SENS} determines the amount of lost volume (inspiration versus exhalation) that is used to determine that the breathing circuit is disconnected.
  - A low setting (minimum 20%) is the most sensitive and a high setting (maximum 95%) is least sensitive to a leak or disconnect.
  - During NIV, the D_{SENS} value is automatically set to Off.
  - With the Puritan Bennett™ Leak Sync feature enabled, D_{SENS} is expressed in L/min instead of percent. In this case the leak compensation flow between breaths is used to determine that the breathing circuit is disconnected.
  - A D_{SENS} violation:
    - Temporarily pauses ventilation.
    - Base flow is set to 10 L/min.
    - 100% O_2 is delivered for pediatric or adult application.
    - 40% O_2 is delivered for neonatal application.

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STAND-BY

Stand-by state can be used to pause ventilation during a planned disconnect of the breathing circuit.

- Stop spray from circuit during disconnect.
- Ventilation resumes automatically when the circuit is reconnected to the patient.

Setup:

1. Touch the **Menu** tab on the left side of the touch screen.
2. Touch the **Stand-by** button. A stand-by state pending dialog appears instructing the clinician to disconnect the patient circuit. An on-screen timer allows 30 seconds for disconnect.
3. After you disconnect, you must reconfirm your intent by touching the **Confirm** button within 30 seconds.
4. Flow sensors are monitored to detect patient reconnection.
5. To exit stand-by—reconnect the patient to the ventilator.

DURING STAND-BY

- Patient-related alarms are temporarily suppressed.
- The ventilator displays an indicator that it is in stand-by state and a timer indicating the elapsed time the ventilator has been in stand-by state.
- The exhalation valve is open.
- Base flow is set to 10 L/min.
- 100% O_2 is delivered for pediatric or adult application.
- 40% O_2 is delivered for neonatal application.
- Entry into and exit from stand-by state is recorded in the general event log.

RESPIRATORY MECHANICS

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RESPIRATORY MECHANICS

Respiratory Mechanics Maneuvers are used to make certain patient data measurements and calculations, for example:

- Plateau Pressure (P_{PL})
- Static Compliance (C_{STAT})
- Static Resistance (R_{STAT})
- Intrinsic PEEP ($PEEP_I$)
- Negative Inspiratory Force (NIF)
- Occlusion Pressure ($P_{0.1}$)
- Vital Capacity (VC)

RESPIRATORY MECHANICS – INSPIRATORY PAUSE

- The Inspiratory Pause maneuver is used to determine plateau pressure, static compliance and static resistance.
- It takes place at the end of the inspiratory phase of a breath.
- Breathing efforts could skew the measurement, so it is important to ensure that the patient is not actively breathing when you perform the maneuver.

There are two ways to access this function, which can be done in two ways, automatically or manually:

1. **Access via Menu tab:**
   a) Automatic → touch **RM** key → touch **Inspiratory Pause** → touch **Start** → touch **Accept** or **Reject**
   b) Manual → touch **RM** key → touch **Inspiratory Pause** → touch and *hold* **Start** for up to 7 seconds → touch **Accept** or **Reject**

2. **Access via bezel key:**
   a) Automatic → touch and release **Inspiratory Pause** bezel key → touch **Start** → touch **Accept** or **Reject**
   b) Manual → touch and *hold* **Inspiratory Pause** bezel key for up to 7 seconds → touch **Start** → touch **Accept** or **Reject**

RESPIRATORY MECHANICS – EXPIRATORY PAUSE

- The Expiratory Pause maneuver is used to determine Total PEEP ($PEEP_{TOT}$) and intrinsic PEEP ($PEEP_I$).
- It takes place at the end of the expiratory phase of a breath.
- Breathing efforts could skew the measurement, so it is important to ensure that the patient is not actively breathing when you perform the maneuver.

There are two ways to access this function, which can be done in two ways, automatically or manually:

1. **Access via Menu tab:**
   a) Automatic → touch **RM** key → touch **Expiratory Pause** → touch **Start** → touch **Accept** or **Reject**
   b) Manual → touch **RM** key → touch **Expiratory Pause** → touch and *hold* **Start** for up to 15 seconds → touch **Accept** or **Reject**

2. **Access via bezel key:**
   a) Automatic → touch and release **Expiratory Pause** bezel key → touch **Start** → touch **Accept** or **Reject**
   b) Manual → touch and *hold* **Expiratory Pause** bezel key for up to 15 seconds → touch **Start** → touch **Accept** or **Reject**

RESPIRATORY MECHANICS – VITAL CAPACITY

- This maneuver is done to determine the maximum amount of air that a patient can exhale after inhaling all the way.
- The Vital Capacity (VC) maneuver is a coached maneuver.

1. Touch or swipe the **Menu** tab on the left side of the screen.
2. Touch the **RM** key.
3. Touch the **Vital Capacity** tab.
4. Prepare the patient.
5. Touch and release the **Start** key.
6. Coach the patient to inhale all the way and then slowly and fully exhale.
7. Keep coaching until the exhalation is complete.
8. Touch the **Accept** or **Reject** key to save or dismiss results.

RESPIRATORY MECHANICS – OCCLUSION PRESSURE ($P_{0.1}$)

- The Occlusion Pressure ($P_{0.1}$) maneuver is used to determine the patient's neuromuscular drive to breathe.
- Like the NIF maneuver, it is done by having the patient pull against an occluded airway with the ventilator's inspiratory and exhalation valves closed.
- There are two differences between the $P_{0.1}$ and NIF maneuvers:
  1) This $P_{0.1}$ maneuver measures the negative airway pressure generated during the first 100 ms of the patient's effort.
  2) No coaching of any kind is involved.

1. Touch or swipe the **Menu** tab on the left side of the screen.
2. Touch the **RM** key.
3. Touch the **$P_{0.1}$** tab.
4. Touch and release the **Start** key.
5. Touch the **Accept** or **Reject** key to save or dismiss results.

RESPIRATORY MECHANICS – NEGATIVE INSPIRATORY FORCE (NIF)

- The Negative Inspiratory Force (NIF) maneuver is used to determine the patient's ability to pull a negative inspiratory pressure against an occluded airway.
- You can perform the maneuver for up to 30 seconds.
- During the entire time you are touching the Start key, the ventilator's inspiratory and exhalation valves are held closed.
- When working with a cooperative patient, the patient is coached to draw a maximum inspiration.

1. Touch or swipe the **Menu** tab on the left side of the screen.
2. Touch the **RM** key.
3. Touch the **NIF** tab.
4. Touch and release the **Start** key.
5. Touch the **Accept** or **Reject** key to save or dismiss results.

- The ventilator does not deliver any breaths in response to patient effort until the maneuver is completed.
- After the maneuver is completed, a PEEP restoration breath is delivered, then normal breath delivery resumes.

ADDITIONAL ICONS, KEYS, BUTTONS

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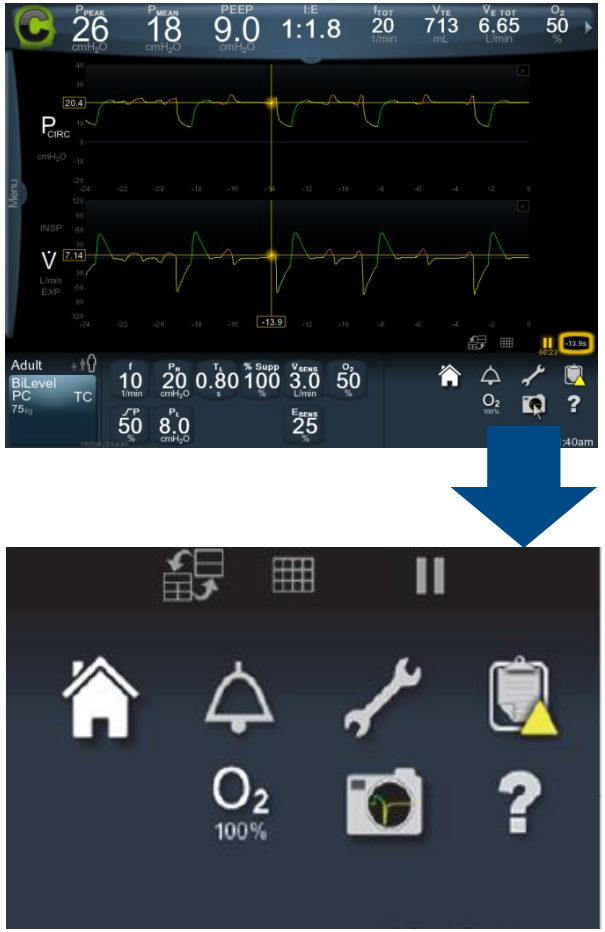
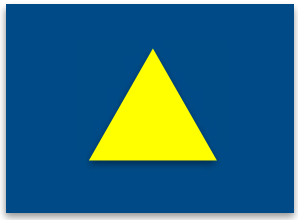
USER INTERFACE



Constant access icons	Function
Home icon (house)	Dismisses all open dialogs on the touch screen. Resumes showing ventilator waveforms screen.
Configure (wrench icon)	Opens the configure display to access SST, (history), Options, Comm Setup and Date/Time change tabs.
Logs (clipboard icon)	Opens the log screen containing tabs for alarms, settings, patient data, diagnostics, EST/SST status, general event and service logs.
Elevate O_2 (O_2 icon)	Increases oxygen concentration to the institutional default O_2 configuration, if institutional default has been configured, for 2 minutes, or allows the operator to determine the additional percentage of oxygen to increase. Terminate prior to completion of the 2-minute interval by touching **Stop**.
Screen capture (camera icon)	Captures the image displayed on the touch screen.
Help icon (question mark)	Drag the help (question mark) icon to the item in question and release. A tooltip will appear describing the item's function.

YELLOW TRIANGLE – UNREAD ITEMS ICON.

PAY ATTENTION – CHECK OR VIEW THE TAB PROMPT



BREATH PHASE INDICATOR

Breath Phase Indicator	
A	Assisted mandatory breath
C	Controlled mandatory breath
S	Spontaneous breath
	A, C, or S glows in reverse video during inspiratory phase
	A, C, or S appears solid during expiratory phase

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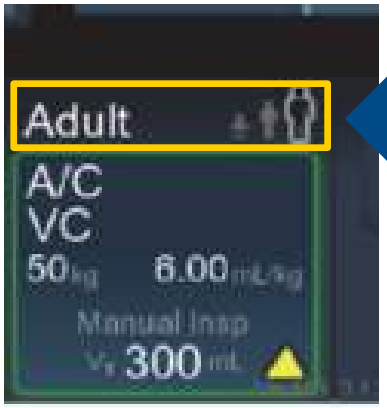
INDICATORS
PATIENT CIRCUIT INDICATOR (ADULT, PEDIATRIC OR NEONATAL)

- This indicator appears right above the Vent Setup button.
- It indicates the patient type of the patient circuit cleared during the SST.



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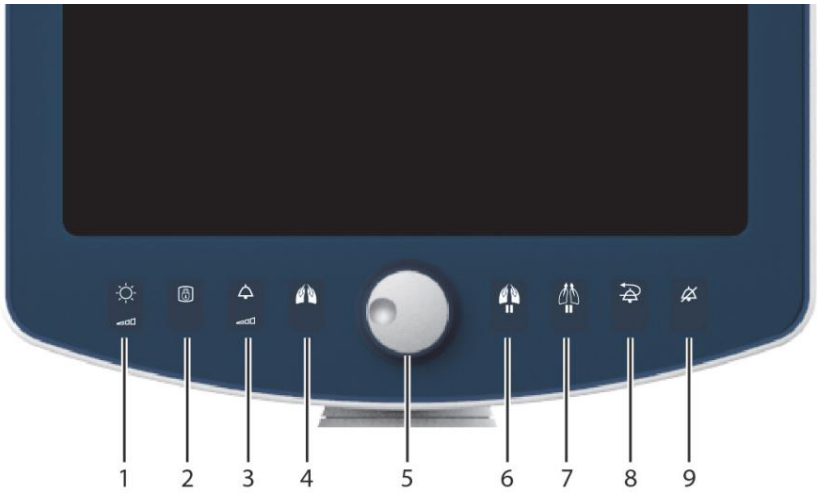
INDICATORS
SCREEN OPACITY ICON

- Appears on the vent setup screen and on all of the respiratory mechanics maneuvers screens.
- Select and then use the adjustment knob to adjust the opacity of the displayed information between 50% and 100%.
- The lower the percentage, the more the waveform display will be visible through the other screen information.

INDICATORS
PUSHPIN ICON

- Appears in the corner of the settings screen.
- Touch the Pushpin Icon to keep a settings window open.
- To reverse the action, unpin or touch the home icon.

USER INTERFACE
BEZEL CONTROL KEYS (OFF SCREEN)



Easy to Access

1. Display Brightness
2. Display Lock
3. Alarm Volume
4. Manual Inspiration
5. Adjustment Knob
6. Inspiratory Pause
7. Expiratory Pause
8. Alarm Reset
9. Audio Paused

ADDITIONAL SAFETY FEATURES

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VENTILATION ASSURANCE FEATURE

- Provides continued ventilation if the background diagnostics detect a problem with certain components in the gas mix, inspiratory or expiratory subsystems.
- If the gas mix system has a problem, either 100% oxygen or room air gas will be delivered.
- If the inspiratory or expiratory systems have a problem, the Puritan Bennett™ 980 ventilator delivers pressure control ventilation with an inspiratory pressure of 15 and a PEEP of 3.

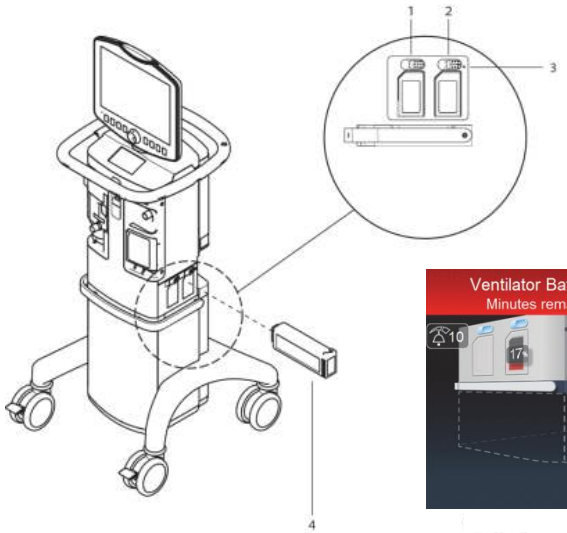
OTHER SAFETY ASSURANCE SYSTEMS

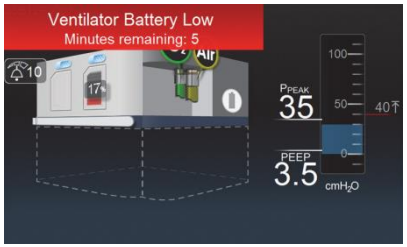
Status display shows:

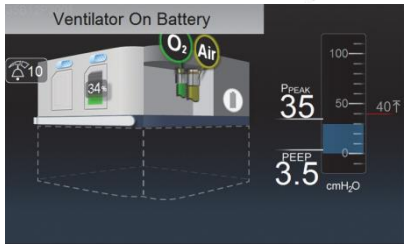
- Power source—plug symbol versus battery symbol
- Presence of batteries and their charging status
- Relative available battery charge level
- Alarms related to power source
- Patient circuit size and type
- Circuit pressure graph displaying pressure units, P_{PEAK} alarm setting, and current P_{PEAK} and PEEP values
- Presence of oxygen and air source
- Presence of compressor
- Ventilator operational hours
- Alarm loudness
- EST, SST and POST results
- Safety Valve Open/Vent Inop state

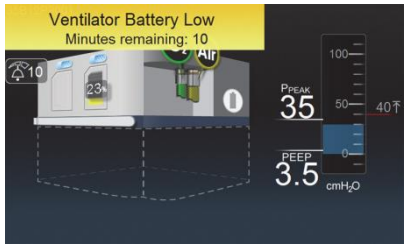
BREATH DELIVERY UNIT
HOT-SWAPPABLE BATTERIES

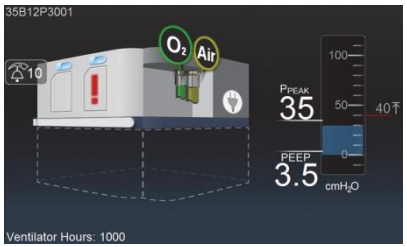
- Two battery slots
- Primary hot-swappable LiOn battery must be installed to pass POST
- Primary hot-swappable LiOn battery on right side should not be removed during normal operation
- Extended hot-swappable LiOn battery is optional
- Up to one hour of power at standard temperatures and settings/battery
- Six-hour recharge time/battery
- Charge level shown on status display and with green LEDs on battery











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ADDITIONAL ASSISTANCE

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MEDTRONIC REPRESENTATIVE

Contact your Medtronic representative

[Name, phone email]

Help Via SolvIT Center Knowledge Base

- The SolvIT Center provides answers to frequently asked questions about the ventilator system and other Puritan Bennett™ products 24 hours a day, 7 days a week.
- www.medtronic.com/covidien/support/solvit-center-knowledge-base

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