VOCSN Tech Specs

Five therapies. One device.

VOCSN integrates five separate devices including a ventilator, oxygen concentrator, cough assist, suction, and nebulizer, into one unified respiratory system for hospital, institutional, transport, and home environments. VOCSN is controlled with an intuitive touchscreen operating system to deliver treatments in seconds instead of minutes.

CUSTOMIZABLE THERAPY CONFIGURATIONS

VOCSN is customizable to each patient. VOCSN can include all five therapies or just the mix of therapies needed, scaling with patient need.

Simple
- Ventec One-Circuit™
- Intuitive touchscreen operation
- Quick and easy setup

Mobile
- Five therapies in one device
- 70% lighter and smaller than five devices
- Up to 9 hours of on-board battery

Care Changing
- Touch Button Cough™
- Uninterrupted ventilation between therapies
- Designed to reduce risk of circuit misconnects
# VOCSN System Tech Specs

## Patients
- Invasive and non-invasive ventilation (including mouthpiece)
- Adult and pediatric patients greater than 5 kg

## Clinical Environments

### Hospitals
- Emergency departments
- Step-down units
- Military hospitals

### Institutions
- Long term acute care (LTAC)
- Skilled nursing facilities
- Long-term care/nursing homes

### Transport
- Inter-hospital
- Intra-hospital
- Emergency medical services
- Military transport
* Not yet for use with aircraft

### Home Care
- Home healthcare
- Home based transport

## Alarm Volume
- 65 to 85 decibels

## Battery Power
- Up to 9 hours of continuous use (ventilation only)
  - 2 external hot swappable lithium-ion batteries (5,800 mAh each)
  - 1 Internal battery (3,900 mAh)
- Note: Simultaneous use of therapies will decrease battery operating time

## Power Sources
- AC (wall plug-in)
- DC (wheelchair and external batteries)
- VOCSN Batteries (3 batteries – 15,500 mAh total)

## Dimensions
- **Width:** 10.25 inch (26 cm)
- **Height:** 11 inch (28 cm)
- **Depth:** 7.5 inch (19 cm)

## Electromagnetic Compatibility and Protection
- IEC 60601-1-2
- Additional ESD levels: ±8 kV contact / ±15 kV air
- Additional Radiated RF Immunity level: 20 V/m
- Additional Magnetic Fields level: 30 A/m
- Tested for RFID immunity

## User Interface
- 7 inch (17.75 cm) easy to use color LCD touchscreen

## Weight
- 18.3 lb (8.3 kg) (including 2 removable batteries)

## Operating Environment
- **Temperature:** 5 °C to 40 °C
- **Humidity:** 15% to 90% (non-condensing)
- **Atmospheric:** 700 to 1060 hPa

---

*Not yet for use with aircraft*
Ventec One-Circuit™

The Ventec One-Circuit™ allows patients to switch between therapies with the touch of a button. Rather than several cumbersome tubes connecting to separate devices, the Ventec One-Circuit™ eliminates clutter to create one easy-to-manage system for comfort and peace of mind.

Ventec One-Circuit™ Specs

<table>
<thead>
<tr>
<th>Circuits – Single Limb</th>
<th>Size</th>
<th>Circuit Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Circuit with integrated</td>
<td>19 mm (adult)</td>
<td>Humidifier Bypass (cough therapy)</td>
</tr>
<tr>
<td>flow transducer, drive, and proximal</td>
<td>15 mm (pediatric)</td>
<td>Secretion Trap (cough therapy)</td>
</tr>
<tr>
<td>flow sense lines and compatible with</td>
<td></td>
<td>Integrated Oxygen Direct™</td>
</tr>
<tr>
<td>Touch Button Cough™ therapy</td>
<td></td>
<td>Tube (oxygen therapy)</td>
</tr>
<tr>
<td>Mouthpiece</td>
<td></td>
<td>Heated circuit for use with</td>
</tr>
<tr>
<td>Valveless compatible for masks</td>
<td></td>
<td>humidifier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOCSN integrated bacterial filter</td>
</tr>
</tbody>
</table>
**ACTIVE CIRCUIT**

The inline design and dual bellows of the active circuit provide the performance of an active valve with the size and convenience of a passive valve. The patent pending valve design supports cough and ventilation functions in a single circuit and combines the drive and sense lines into a single trilumen tube. Additionally, VOCSN uses advanced software technology to help prevent historical problems associated with condensation to optimize Vte sensing, accuracy, and triggering by purging condensation on every breath.

**PASSIVE CIRCUIT**

The Ventec passive circuit is light, small, and easy to use. Our unique passive valve is designed to close the leak during cough exsufflation, thus making Touch Button Cough™ possible without changing circuits.
Circuit Highlighted Technology

**OXYGEN DIRECT™**
The Oxygen Direct™ system minimizes oxygen lost to leaks and dead space, improves battery life, and makes using supplemental oxygen easier. VOCSN includes advanced pulse dose technology and an independent O2 tube inside the patient circuit. The system delivers oxygen directly to the patient interface during the first two thirds of the patient’s breath, when the patient needs oxygen most.

**VENTEC HUMIDIFIER BYPASS**
The Ventec Humidifier Bypass allows the patient to remain connected to the humidifier while using the Touch Button Cough™ therapy. The bypass attaches to the humidifier water chamber to allow humidified air to reach the patient during ventilation and insufflation. Then, during exsufflation, check valves redirect the flow of air to bypass the water chamber of the humidifier.

**VENTEC SECRETION TRAP**
The Secretion Trap is added to the circuit to capture mucus after the cough and helps to make the Touch Button Cough™ possible. As mucus enters the trap, the VOCSN suction system removes mucus from the circuit.
Ventilation

VOCSN brings next generation technology, breathing comfort, and ease of use to ventilator patients.

The VOCSN critical care ventilator provides invasive, noninvasive, and mouthpiece ventilation. Designed to work in hospital, institutional, transport, and home environments, VOCSN delivers a comprehensive set of ventilation modes and settings to meet patient needs. The advanced unified respiratory system combines responsive leak and circuit compensation as well as precision flow trigger controls to enable comfortable breathing and accurate therapy.

Highlighted Technology

READY FOR HOSPITALS, TRANSPORT, AND EMERGENCY APPLICATIONS
Using a customized radial blower and advanced software, VOCSN meets the rigorous ISO 80601-2-12 international standard for critical-care ventilators.

ADVANCED LEAK COMPENSATION
VOCSN automatically compensates for high flows and large leaks up to 75 L/min at 20 cmH2O. This reduces nuisance alarms and allows the use of more comfortable noninvasive masks.

CIRCUIT COMPENSATION
Typically only found in critical care ventilators, circuit compensation helps overcome lost volume in the patient circuit. This technology improves airflow delivery accuracy during volume ventilation, which is especially important for pediatric patients.

THERAPY TRACKER
The integrated Therapy Tracker records alarms and all changes to settings to the ventilator as well as all ancillary therapies.

INTEGRATED OXYGEN BLENDING AND MONITORING
VOCSN includes an internal oxygen concentrator as well as inlets for low and high pressure oxygen sources. An onboard FiO2 monitor displays and tracks oxygen delivery and together with the onboard oxygen blender, allows you to set precise high pressure oxygen delivery. If external oxygen becomes disconnected, VOCSN activates an alarm and allows you to easily switch to the internal concentrator, providing an emergency backup source of oxygen.
## Ventilation Tech Specs

### Controls

<table>
<thead>
<tr>
<th>6 Modes of Ventilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Spontaneous</td>
</tr>
<tr>
<td>○ Bi-Level (including functionality similar to timed back-up S/T, AVAPS®, timed ventilation, and BiPAP® functions as well as volume targeted functionality similar to PRVS)</td>
</tr>
<tr>
<td>○ Assist/Control-Pressure (including volume targeted functionality similar to PRVC)</td>
</tr>
<tr>
<td>○ Assist/Control-Volume</td>
</tr>
<tr>
<td>○ SIMV-Pressure (including CPAP and volume targeted functionality)</td>
</tr>
<tr>
<td>○ SIMV-Volume</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apnea Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 60 BPM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breath Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 60 BPM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circuit Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Automatic circuit compensation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customizable Ventilation Therapy Pre-sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ 3 pre-sets, customizable name and settings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPAP/PEEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Active circuit: 0 to 25 cmH2O</td>
</tr>
<tr>
<td>○ Passive circuit: 4 to 25 cmH2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FiO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 to 100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 90%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Active or Passive Circuit: 1 to 9 L/min</td>
</tr>
<tr>
<td>○ Mouthpiece circuit: 1 to 3 L/min (breaths are triggered by patient effort or by simply placing your mouth on the mouthpiece)</td>
</tr>
</tbody>
</table>

### Monitors

<table>
<thead>
<tr>
<th>Airway Pressure Manometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 80 cmH2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breath Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 BPM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculated FiO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 to 100%</td>
</tr>
<tr>
<td>The calculated FiO2 monitor calculates the delivered FiO2 during pulse dose oxygen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaled Tidal Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2000 mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FiO2 Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 95%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphic Waveforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
</tr>
<tr>
<td>Flow</td>
</tr>
<tr>
<td>Volume</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I:E Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.9:1 to 1:9.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leak</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 L/min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Airway Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 50 cmH2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minute Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 60 L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive End Expiratory Pressure (PEEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 45 cmH2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peak Inspiratory Pressure (PIP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 85 cmH2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tidal Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 1500 ml</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 to 3.0 seconds</td>
</tr>
</tbody>
</table>
Ventilation Tech Specs (continued)

## Alarms

### Apnea
- Off, 10 to 120 seconds

### Battery Alarms
- Battery Use Alarm
- Internal Battery Low
- Internal Battery Critically Low

### Circuit Integrity Alarms
- Check Patient Circuit
- Patient Circuit Disconnect

### Device Alarms
- Device Maintenance
- Inoperative Alarm
- System Fault

### High Breath Rate
- Off, 10 to 99 BPM

### High FiO2
- Off, 24 to 99%

### High Minute Volume
- Off, 1 to 59 L

### High PEEP
- Off, 3 to 20 cmH2O above set PEEP

### High Pressure
- 10 to 80 cmH2O

### High Pressure Alarm Delay
- None, 1 to 2 breaths

### Low Breath Rate
- Off, 4 to 80 BPM

### Low FiO2
- Off, 19 to 92%

### Low Inspiratory Pressure
- Off, 1 to 40 cmH2O

### Low Minute Volume
- Off, 0.1 to 50 L

### Low PEEP
- Off/On
- When on, automatically activates when monitored PEEP falls 5 cmH2O below the set PEEP

### Very Low FiO2
- FiO2 less than 18%

## Ventilation Therapy Tracker

- Logs changes to ventilation settings
Oxygen

The VOCSN internal oxygen concentrator and Oxygen Direct™ system deliver the equivalent of 6 L/min of oxygen. External oxygen sources can be connected when needed.

VOCSN can deliver the equivalent of 6 L/min of oxygen using the onboard internal oxygen concentrator.

The Oxygen Direct™ system uses an independent oxygen tube inside the circuit. This enables oxygen to be delivered directly to the patient in pulse dose mode during the beginning part of the breath, precisely when the patient needs oxygen most.

The oxygen system is up to three times more efficient than stationary concentrators. This significantly decreases the size of the oxygen concentrator and maximizes battery life. Most importantly, it makes traveling and using oxygen easier.

---

**Highlighted Technology**

**INTERNAL OXYGEN CONCENTRATOR**

The internal oxygen concentrator produces the equivalent of up to 6 L/min or up to 40 percent oxygen in adult patients. The redesigned pressure swing adsorption process and Oxygen Direct™ system mean more oxygen is generated using less battery power.

**ONBOARD FiO2 MONITOR**

The VOCSN onboard FiO2 monitor verifies accurate oxygen delivery.

**EXTERNAL OXYGEN SOURCES**

VOCSN may include low pressure and high pressure ports for external oxygen. If external oxygen becomes disconnected, VOCSN activates an alarm and allows you to switch to the internal concentrator, providing an emergency backup source of oxygen.

**INTEGRATED OXYGEN BLENDER**

VOCSN includes an integrated oxygen blender to set precise FiO2 delivery when using external high pressure sources.
Oxygen Tech Specs

**Oxygen Source**

- **Internal Concentrator**
  - Pulse Dose Mode equivalent to 0.5 to 6.0 L/min
  - Oxygen bolus is delivered during the first 62% of breath volume

- **External Oxygen Sources**
  - Low Pressure port (external concentrators)
  - High Pressure port (for tanks and in-wall)

**Oxygen Mode**

- Pulse Dose (internal and external high pressure)
- FiO2 (external high pressure)

**Oxygen Monitors**

- FiO2 Monitor (for use with FiO2 mode and with external high pressure)
- Calculated FiO2 Monitor (monitor appears when providing pulse dose oxygen)

**Oxygen Sensors**

- Integrated oxygen sensor to check oxygen generation from the concentrator
- Integrated oxygen sensor to measure oxygen flowing into the circuit from external sources

**Device Alarms**

- O2 Concentration
- System Fault
- Inoperative Alarm

**Oxygen Therapy Tracker**

- Logs when oxygen is turned on or off or settings are changed

**Battery Alarms**

- Battery Use Alarm
- Internal Battery Low
- Internal Battery Critically Low
Cough

**Touch Button Cough™ therapy can be activated in seconds, without changing the circuit.**

By unifying ventilation, cough, and suction into one system, it now takes seconds instead of minutes to administer cough therapy with Touch Button Cough™. The Ventec One-Circuit™ features a patent pending high flow valve design, allowing patients to use the same circuit for ventilation and cough. Using the Cough + Suction feature, the suction is activated during the cough therapy to clear secretions. Patients using invasive ventilation can use the Secretion Trap™ to easily clear secretions from the circuit. Once the set number of cough cycles is complete, ventilation automatically resumes.

**Touch Button Cough™:** The VOCSN cough is activated with the touch of a button to make airway clearance easy. Patients remain connected to the ventilator at all times, and there is no need to disconnect circuits between uses. The system is designed to reduce the gaps in ventilation, decrease the risk of patient misconnection, and minimize exposure to the patient’s airway.

---

**Highlighted Technology**

**ADVANCED COUGH RISE TIME**

The VOCSN uses an advanced rise time algorithm during cough. The system is designed to reduce the amount of mucus going back to the patient.

**COUGH + SUCTION**

When the Cough + Suction feature is enabled, VOCSN will automatically activate the suction therapy to facilitate easy secretion clearance.

---

**BREATH SYNC**

When Breath Sync is enabled, VOCSN monitors patient breathing and triggers a cough at a natural point in the breathing cycle. The technology allows the patient to transition gently in and out of the cough therapy and seamlessly return to ventilation.
Transitions Between Ventilation and Cough Therapy

Cough Tech Specs

**Controls**

- **Cough Cycles**: 1 to 10
- **Cough + Suction**: On/Off
- **Exsufflation Pressure**: -10 to -70 cmH2O
- **Exsufflation Time**: 0 to 5.0 Seconds
- **Insufflation Pressure**: 10 to 70 cmH2O
- **Insufflation Rise Time**: 1 to 6
- **Insufflation Time**: 0 to 5.0 seconds
- **Pause Time**: 0 to 5.0 seconds
- **Cough Presets**: 3 customizable presets

**Monitors**

- **Cough Airway Pressure Manometer**: -80 to +80 cmH2O
- **Cough Cycle Monitor**: 0 to 10
- **Cough Volume Monitor**: 0 to 4000 ml
- **Peak Cough Flow Monitor**: 0 to 350 L/min

**Cough Therapy Tracker**

- Logs when cough therapy is turned on or off or settings are changed
Suction
The quiet hospital grade suction system that is easy to transport.

The VOCSN high flow suction provides quiet and effective airway clearance. Working in conjunction with the Secretion Trap, suction can be used to clear secretions from the patient's airway. VOCSN ensures consistent and precise vacuum pressure to quickly clear mucus. Plus, the suction system uses Ventec's unique sound muffler, making it more than three times quieter than traditional suction machines.

Highlighted Technology

**COUGH + SUCTION**
VOCSN activates the suction system during the cough therapy. Caregivers can activate a cough, clear the mucus, and return to ventilation in less than one minute.

**TRAVEL SUCTION CANISTER**
The 300 mL detachable Travel Suction Canister allows suction on the go. This size also supports emergency responders and transport.

**EXTERNAL SUCTION CANISTER ADAPTER**
The external suction canister adapter connects to the side of VOCSN to enable suction therapy with VOCSN while connected to any third party external suction canister.

**VENTEC SECRETION TRAP**
The suction system removes mucus from the circuit simplifying mucus management. The system allows invasive patients to remain connected to the same circuit during ventilation, suction, and cough therapies.

**CONSISTENT HIGH FLOW TECHNOLOGY**
The three piston compressor pump provides consistent high flow suction. The VOCSN suction system is capable of generating 35 L/min of flow at 450 mmHg to easily manage the removal of difficult secretions.
Suction Tech Specs

**Controls**

**Supported Suction Interfaces**
- Suction tubing and oral care tools
- Open Suction Catheters
- Closed (in-line) Suction Catheters

**Suction Canister**
- 300 ml integrated travel canister
- 1200 ml canister for hospital and home use

**Vacuum Control**
- -95 to -450 mmHg
- Default setting

**Vacuum System**
- Customized three-cylinder piston pump

**Monitors**

**Vacuum Monitor**
- 0 to -550 mmHg

**Suction Therapy Tracker**
- Logs when suction therapy is turned on or off or when settings are changed
Nebulizer

**VOCSN records each medication use and turns off the nebulizer when the therapy is complete.**

VOCSN provides an integrated 6 L/min nebulizer drive to make medication delivery seamless. VOCSN automatically compensates the airflow from the ventilator when the nebulizer drive is active to ensure accurate ventilation. The nebulizer can be battery operated for use on the go. Plus, VOCSN records data about each treatment and turns off the nebulizer once the therapy is complete.

---

### Highlighted Technology

**NEBULIZER NOISE MUFFLER**

The system uses Ventec’s unique sound muffler technology and is half the noise of traditional nebulizer systems.

**THERAPY TRACKER**

Each use of the nebulizer is recorded in the event log to help ensure medication compliance.

---

### Nebulizer Tech Specs

<table>
<thead>
<tr>
<th>Nebulizer Duration</th>
<th>Nebulizer System</th>
<th>Nebulizer Therapy Tracker</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 60 minutes, 1 minute increments</td>
<td>Three piston pump for steady flow</td>
<td>Logs when nebulizer therapy is turned on or off or settings are changed</td>
</tr>
</tbody>
</table>

---

Copyright 2018 Ventec Life Systems

VentecLife.com

Caution: U.S. Federal law restricts this device to sale by or on the order of a physician.

Technical specifications may change.
About Ventec Life Systems

Ventec Life Systems is redefining respiratory care to improve patient outcomes and reduce caregiver challenges in the hospital and home. Ventec’s leading product, VOCSN, seamlessly integrates five separate devices including a ventilator, oxygen concentrator, cough assist, suction, and nebulizer into one unified respiratory system. The team’s history of patient-centric design brings care changing innovations to life for patients, medical professionals, and caregivers.

For questions about VOCSN:

VentecLife.com
info@venteclife.com
1-844-MY-VOCSN

MKT-00001 Rev D