VOCSN

Troubleshooting Quick Reference Guide

Whenever an alarm occurs, **monitor the patient closely to ensure adequate therapy is delivered**, and take the following action(s) to diagnose and resolve the issue:

Alarm	Recommended Troubleshooting Actions
Apnea activates when VOCSN has not delivered assist or spontaneous breaths (or coughs) for the set Apnea alarm duration.	☐ Ensure the Apnea alarm is set appropriately given the patient's Breath Rate and spontaneous rate. ☐ Ensure the Flow Trigger control is set appropriately. ☐ Check patient triggered icon and waveforms to determine if patient is attempting to initiate breaths. (If the patient is not initiating breaths, the alarm is working as intended.) ☐ Check for problems with patient triggering such as low drive due to medication, or copious secretions, or excessive mask or cuff leak. ☐ For Active circuits, turn on Leak Compensation if needed. ☐ If the problem persists, replace the circuit.
Battery Use activates whenever VOCSN switches from external power to battery power, or from any power source (including removable battery) to internal battery power. **Internal Battery Low** activates when VOCSN internal battery charge status falls below 50%. **Internal Battery Critically Low** activates when the internal battery is disconnected, faulty, or when the battery is critically low (charged to less than 33% its capacity).	When using battery power, battery alarms are normal. ☐ Monitor battery charge status, and connect an external source of power when available. ☐ To clear the Battery Use alarm while using removable, rechargeable battery power, navigate to the Alarm Log and select "Clear List" twice. When using AC power, check to ensure there's a power connection symbol in the status bar. If the power symbol is present, VOCSN is powered. ☐ Clear the alarm by navigating to the Alarm Log and selecting "Clear List" twice. If there is no power connection symbol in the status bar: ☐ If the green light on the power adapter block is illuminated, check that all power adapter cabling is securely connected, and that the cable is securely connected to the power port in the back of VOCSN. ☐ If the green light on the power adapter block is off (not illuminated): 　☐ Ensure power adapter is plugged into the wall outlet. 　☐ Ensure the AC power cord is securely plugged into the power adapter block. 　☐ Plug something else into the same wall outlet to ensure it is powered. 　☐ If the problem persists, replace the AC power adapter.
Check O2 Source activates when a connected source of external low-pressure oxygen is used and the monitored FiO2 falls below 24%.	☐ Check to ensure the low-pressure oxygen source is connected. ☐ Make sure the low-pressure oxygen source is turned on and is producing oxygen, or is not depleted.
Check Patient Circuit activates when VOCSN detects an inadequate leak in a passive or valveless circuit, or an error in the flow sensor of an active circuit.	☐ Run a Pre-Use Test. ☐ For Passive circuits, check the VOCSN Leak monitor. If needed, locate and resolve any unintentional leaks in the patient circuit (or around the patient interface), and ensure the exhalation valve is not obstructed (for example, by crystallized medications in the exhalation valve). ☐ For Active circuits, make sure the flow sensor (multilumen) tubing is securely connected to VOCSN and the active exhalation valve. ☐ If using a nebulizer (particularly with sticky medications), install a filter (HMEF or bacterial filter) between the nebulizer and the patient circuit exhalation valve. ☐ If using Cough therapy, and patient secretions are entering the patient circuit, install a filter (such as an HMEF), and/or use a 6" length of corrugated circuit tubing between the patient interface and the patient circuit exhalation valve during Cough to catch secretions. ☐ For heated circuits, ensure there is no water accumulation in the tubing or valve. ☐ If the problem persists, replace the patient circuit.
High Breath Rate activates when the monitored breath rate is higher than the set High Breath Rate alarm limit.	☐ Ensure the High Breath Rate alarm is set above the patient Breath Rate plus spontaneous rate. ☐ Check for patient secretions, and use Suction therapy to clear them if needed. ☐ Empty any excess condensation in the patient circuit. ☐ Check the VOCSN Leak monitor. If it is high, locate and resolve any unintentional leaks in the patient circuit (and around the patient interface). ☐ If VOCSN is auto-triggering, adjust the Flow Trigger setting if needed.

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Alarm	Recommended Troubleshooting Actions
High FiO2 activates when the monitored FiO2 percentage is higher than the set High FiO2 alarm limit.	☐ Check to ensure there are no unintended sources of gas or oxygen connected to VOCSN or the patient circuit.

High Minute Volume activates when the monitored Minute Volume is larger than the set High Minute Volume alarm limit.	☐ Ensure the alarm is set appropriately for the patient Breath Rate plus spontaneous rate.
	☐ Check to see if the monitored Breath Rate is high. If so:
	    ☐ Check for auto-triggering and adjust the Flow Trigger control setting if needed.
	    ☐ If you are using an active Ventec One-Circuit and humidifier, clear any condensation from the active exhalation valve.

High PEEP (or **High EPAP** in Bi-Level Mode) activates when the monitored PEEP is greater than PEEP plus the set High PEEP alarm limit.	☐ If using an Active patient circuit, ensure the multilumen tube is tightly connected to VOCSN and the exhalation valve. ☐ Note that if the alarm occurs while the patient is breath stacking, it is working as intended. ☐ Check for auto-triggering and adjust the Flow Trigger control setting if needed. ☐ If the problem persists, replace the patient circuit.
High Pressure activates when the monitored Airway Pressure exceeds the set High Pressure alarm limit for more than the number of consecutive breaths set with the High Pressure Delay control.	☐ Ensure the High Pressure alarm is set appropriately for the patient as their condition changes (for example, through sneezes, coughs, and/or yawns). ☐ Check for blockages or obstructions in the circuit and patient airway. (For example, saturated or clogged HME or bacterial filters, in-line suction catheters, or patient secretions during volume ventilation.) ☐ If the problem persists, replace the patient circuit.
Inop activates when VOCSN experiences a loss of power without available battery backup power, when the battery depletes and is the only available source of power, or when a software or hardware failure renders VOCSN unable to safely deliver therapy and/or monitor the patient.	☐ Immediately provide the patient with an alternate source of ventilation. ☐ Press the On/Off button again to restart VOCSN. ☐ If the device remains inoperative, contact your local Ventec Life Systems representative for service.
Internal Battery Critically Low	☐ See "Battery Use" on page 1.
Internal Battery Low	☐ See "Battery Use" on page 1.
Low Breath Rate activates when the monitored Breath Rate is less than the set Low Breath Rate alarm limit.	☐ Ensure the alarm limit is set appropriately for the patient Breath rate plus spontaneous rate. ☐ Check patient and waveforms to determine if patient is attempting to initiate breaths. (If the patient is not initiating breaths, the alarm is working as intended.) ☐ Check to ensure all connected components are clean and not clogged (such as filters and HMEs). ☐ Ensure the Flow Trigger control is set appropriately. ☐ For Active circuits, turn on Leak Compensation if needed. ☐ If the problem persists, replace the patient circuit.
Low FiO2 activates when the monitored FiO2 falls below the set Low FiO2 alarm limit.	☐ Ensure the Low FiO2 alarm setting is appropriate for the delivered FiO2. ☐ Check to ensure the high-pressure oxygen source is connected, and is not depleted. ☐ Make sure the high-pressure oxygen source is turned on, and is delivering oxygen.
Low Inspiratory Pressure activates when the monitored Peak Inspiratory Pressure falls below the set Low Inspiratory Pressure alarm limit.	☐ Ensure the Low Inspiratory Pressure alarm is set below the patient peak inspiratory pressure, taking into account changes in airway resistance and/or lung recruitment. ☐ Check the VOCSN Leak monitor. If it is high, locate and resolve any unintentional leaks in the patient circuit (and around the patient interface). ☐ If the problem persists, replace the patient circuit.

Alarm	Recommended Troubleshooting Actions
Low Minute Volume activates when the monitored Minute Volume falls below the set Low Minute Volume alarm limit.	☐ Ensure the Low Minute Volume alarm is set appropriately, taking into account changes in patient breathing habits at night. ☐ Check the VOCSN Leak monitor. If it is high, locate and resolve any unintentional leaks in the patient circuit (and around the patient interface). If using a trach tube, ensure the cuff is properly inflated. ☐ During pressure-control ventilation, check the patient for reduced lung compliance or airway blockages.
Low PEEP (or **Low EPAP** in Bi-Level Mode) activates when the monitored PEEP falls 5 cmH2O below the set PEEP control for 3 consecutive breaths.	☐ Check the VOCSN Leak monitor. If it is high, locate and resolve any unintentional leaks in the patient circuit (and around the patient interface). ☐ Run a Pre-Use Test. ☐ If the alarm continues, replace the patient circuit.
Maintenance Due activates when the Sys. PM Due In monitor falls below 0, indicating that VOCSN is due for maintenance. This alarm can be reset for up to 8 hours by clearing the alarm.	☐ When convenient, contact your local Ventec Life Systems representative to schedule service. (Note that this alarm will activate every 8 hours until service is completed.)

O2 Concentration activates after five minutes or more (depending on VOCSN configuration settings) when the internal O2 Concentrator produces less than 82% oxygen, or less than 80% of the target pulse dose volume. It will also activate if there is a fault with the internal oxygen sensor that measures gas created by the internal O2 Concentrator, or if the monitored oxygen tank pressure is less than 4 PSI when using an external source of high-pressure oxygen.	☐ Run a Pre-Use Test.
	☐ If using the internal O2 Concentrator, ensure there is adequate airflow around the device.
	☐ If using an external source of high-pressure oxygen, check to make sure it is connected and is not depleted.
	☐ If using a patient circuit with O2 tube:
	    ☐ Ensure the O2 tube is fully connected. The rubber connector should be flush against the side of VOCSN. (Note that it may take up to 1 hour for oxygen alarms to resolve after fixing an issue with the O2 tube connection.)
	    ☐ Check the O2 tube for blockages
	☐ If the problem persists, replace the patient circuit.

Patient Circuit Disconnect activates when VOCSN detects a large leak in an active, passive, or valveless Ventec One-Circuit. (See below for alarm behavior during High Flow therapy.)	☐ Check the VOCSN Leak monitor. If it is high, locate and resolve any unintentional leaks in the patient circuit (and around the patient interface). ☐ Run a Pre-Use Test and ensure the Circuit Type control matches the type of circuit connected to VOCSN. ☐ If the problem persists, replace the patient circuit.
Patient Circuit Disconnect (during High Flow therapy) activates when no patient breathing is detected for 20 seconds.	☐ Ensure the high flow nasal cannula (or other interface) is properly fitted to the patient. ☐ If the problem persists, replace the high flow nasal cannula.
Service Concentrator Soon activates when the VOCSN O2 Concentrator maintenance should be scheduled. This alarm can be reset for up to 8 hours by clearing the alarm.	☐ When convenient, contact your local Ventec Life Systems representative to schedule service. (Note that this alarm will activate every 8 hours until service is completed.)
System Fault activates if VOCSN detects any one of multiple system fault conditions.	☐ Use the Event Log to determine the System Fault number, then see *"System Fault Detection Criteria and Recommended Action"* in the Clinical and Technical Manual, available at VentecLife.com/VOCSNManual, and then take the corresponding action.

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Alarm	Recommended Troubleshooting Actions

Very Low FiO2 activates when the monitored FiO2 is less than 18%.	☐ Ensure there the VOCSN air inlets are not blocked, and that there is adequate air flow around the device.
	☐ Remove any oxygen sources connected to VOCSN or the patient circuit.
	    ☐ If the Very Low FiO2 alarm resolves, troubleshoot problems with the oxygen source.
	    ☐ If the Very Low FiO2 persists there may be a problem with the VOCSN oxygen sensor. Contact your local Ventec Life Systems representative for service.

Other Issues	Recommended Troubleshooting Actions
Desaturation	☐ Ensure the oximeter is connected to the patient. ☐ Check to ensure that any external source of oxygen is properly connected, and that is not depleted. ☐ Ensure the patient circuit O2 Tube is properly connected. The rubber connector should be flush against the side of VOCSN. (Note that it may take up to 1 hour for oxygen alarms to resolve after fixing an issue with the O2 tube connection.) ☐ Run a Pre-Use Test.
Multi-View	☐ Ensure VOCSN has software version 4.06R or later installed. ☐ If you are exporting to USB, ensure it is USB 2.0 compatible, and formatted to FAT32. See VentecLife.com/usbdrive to order a compatible drive.

Patient circuit performance	☐ Ensure connected patient circuit accessories (such as an HME or humidifier) are clean and not obstructed.
	☐ Run a Pre-Use Test.
	☐ If the circuit passes the Pre-Use Test, it is working as intended.
	☐ If the circuit will not pass the Pre-Use Test:
	    ☐ Check that the Circuit Type control is set correctly.
	    ☐ Replace the patient circuit.

Pre-Use Test Failing	☐ Ensure the Circuit Type control matches the type of circuit connected to VOCSN. ☐ Replace the external bacterial filter. ☐ Inspect the Internal Bacterial Filter. If it appears contaminated, replace it by carefully following the instructions in the Clinical and Technical manual.
Suction therapy does not produce a vacuum	☐ If the filter inside the Travel Suction Canister knob is wet due to cleaning or sloshing secretions, replace the Travel Suction Canister. ☐ Ensure the correct 1/4" diameter suction tubing is connected to the canister, and that it is not obstructed. ☐ If using an external suction canister, ensure there are no leaks or open ports in the lid of the canister. ☐ Remove the canister or adapter and verify the VOCSN suction port is producing a vacuum during Suction therapy by placing a finger over the hole on the left side of VOCSN. If no vacuum is produced at the port, contact Ventec Life Systems for service.

IMPORTANT NOTE: Before contacting Ventec Life Systems for service:

☐ Double-check that all controls and alarms are set appropriately for the patient condition.

☐ Perform all applicable troubleshooting actions described in this guide.

☐ Run the Checkout Procedure described in the Clinical and Technical Manual, available at: VentecLife.com/VOCSNManual. If VOCSN passes this checkout test, the device is working as intended.