I'm not robot

Trilogy 202 ventilator user manual

This document is a user manual for the Trilogy 202 ventilator, owned by Philips Respironics, and is protected under US copyright law. Permission is required to copy or reproduce this material. The user guide includes information on package contents, intended use, warnings, cautions, contraindications, system overview, symbols, and front panel descriptions. Chapters cover topics such as page settings (pages 5-8), ventilator alarms (pages 9-10), connecting the device to a patient (page 7), remote alarm units (page 8), technical specifications (chapter 11), a glossary (chapter 12), and EMC information (chapter 13). The Trilogy 202 user manual serves as an introduction to understanding the device's capabilities and usage guidelines. Use of any other adapter or cable may cause improper operation of the ventilator. Contraindications If patient has conditions such as inability to maintain patent airway or clear secretions, risk for aspiration of gastric contents, consult healthcare professional before using device in non-invasive mode. Rear and Side Panels Symbol Description * AC Power Connector * Secure Digital (SD) Card Slot * Serial Port Connector * Remote Alarm Connector * Ethernet Connector * DC Power Connector * Oxygen Inlet Consult accompanying instructions for use. Type BF Applied Part Trilogy 202 user manual... Page 22 Separate collection for electrical and electronic equipment per EC Directive 2002/96/EC. Class II (Double Insulated) Drip Proof Equipment Chapter 1 Introduction... Page 23 Trilogy 202 user manual... Trilogy 202 user manual System Description This chapter describes front and rear panel device controls and features. Front Panel Features The front panel contains control buttons, visual indicators, and display screen. Buttons Front Panel Controls and The following buttons are included on the front panel of the device. Display screen allows viewing settings, system status information, real-time patient data, alarms, and logs. Modify certain settings on display screen. See Chapter 5 for more information on viewing and modifying device settings. Sample Display Screen Trilogy 202 user manual... Side and Rear Panel Features The ventilator’s side and rear panels contain connectors and features, shown at right. 1. AC Power Inlet You can plug the AC power cord into this connector, located on the right side of the ventilator. 2. Remote Alarm/Nurse Call Connector If using optional remote alarm or nurse call system with ventilator, connect Philips Respironics remote alarm adapter cable or nurse call adapter cable to this connector. Therapy Modes The device provides Pressure Control Ventilation (PCV) and Volume Control Ventilation (VCV) for non-invasive and invasive patients. Pressure Control ventilation delivers a prescribed pressure to the patient according to set breath rate and set inspiration time parameters. A Sigh breath is a breath where 150% of the prescribed volume is delivered. The device will deliver this breath once every 100 Mandatory or Assist breaths when the Sigh setting is enabled. Sigh breaths are only available in volume modes of ventilation. Therapy Mode Table The following table summarizes all of the therapy modes and settings available in each mode. Some settings in the table are dependent upon other settings. The Trilogy 202 user manual describes different modes for delivering respiratory support. The Spontaneous/Timed (S/T) mode delivers bi-level pressure support, providing spontaneous and mandatory breaths. If a patient doesn't breathe within a set Breath Rate (BPM), a mandatory breath is delivered to ensure a minimum number of breaths per minute. In this mode, the IPAP setting is 26 cm H for mandatory breaths, EPAP is 6 cm H, and the PS pressure difference is 20 cm H. The device can also deliver Pressure Control (PC) mode, which delivers assist and mandatory breaths with a fixed inspiratory time. The PC-SIMV mode uses volume control ventilation to deliver a prescribed inspired tidal volume according to a set Breath Rate and Inspiratory Time. In this mode, the device delivers mandatory volume breaths when the time expires and then begins again. Traditional CPAP therapy is also available, which can be adjusted using C-Flex or Bi-Flex pressure relief. The Bi-Flex attribute in S mode adjusts therapy by inserting a small amount of pressure relief during inspiration and exhalation. As patient effort decreases, AVAPS adjusts peak airway pressure (PS) to maintain target tidal volume. IPAP level remains within set limits. When patient effort increases, PS reduces, ensuring IPAP stays within range. Two airflow patterns are available: square wave and ramp flow. Square wave maintains constant airflow throughout inspiration, while ramp flow starts high and decreases during inspiration. In active volume modes, peak flow must be at least 20 liters per minute to prevent waveform flattening. Parabolic leaks are proportional to patient pressure, with estimates averaged over several breaths. Patient flow is the total circuit flow minus circuit leak. A sudden change in patient flow triggers a pressure level change. The Shape Signal tracks patient flow patterns to trigger inspiration or cycle expiration based on breathing patterns and circuit leaks. For spontaneous breathing modes, Spontaneous Expiratory Threshold (SET) cycles to expiration when flow decreases by a set percentage of peak flow. All flows and volumes are expressed in BTPS, while pressures are relative to atmospheric pressure. The ventilator features various alarms and informational messages, prioritized from high to low priority. This device's warning and info messages should be taken seriously, especially since they're high-priority alerts. There are several types of alarms: High Oxygen Flow occurs when the oxygen concentration is too high for over 30 seconds; Low Vti Alarm happens if the tidal volume is consistently low; and High Temperature Alarm warns about potential overheating issues inside or outside the device. Additionally, there are battery-related messages like Battery Not Charging Info Message, which signals a charging issue, Check External Battery Info Message indicating problems with the external power source, and Battery Depleted Info Message announcing when the internal battery runs out of power. Furthermore, proper setup and operation are crucial; for instance, patients reliant on the ventilator should be constantly monitored by qualified staff. To prevent accidental disconnection, secure the AC power cord using the retainer provided on the device's back. Also, ensure all connections are properly made when plugging in the device to a wall outlet not controlled by a switch. If the AC power is supplied between 5˚ C and 40˚ C, according to the instructions provided with the Philips Respironics Trilogy deep cycle lead acid battery, it's recommended to use the External Battery Cable for more detailed information on operating other adapters or cables. Refer to page 64 of the user manual for further guidance. CAUTION: The detachable Lithium-Ion battery pack should be removed from its protective cover and attached securely to the back of the ventilator after a certain number of hours of use. The procedure for setting up an active flow circuit on a Trilogy 202 device involves removing the proximal tubing that attaches to the ventilator, installing the O Inlet Connector, and connecting the oxygen source to the device. This setup allows for the attachment of a high-pressure oxygen supply. The device's settings can be viewed and changed through various screens, including the Main Menu screen, Setup screen, Options menu, and Monitor screen. The latter displays detailed information about the therapy, including the current mode, airway pressure, mean airway pressure, and minute ventilation. In the Trilogy 202 clinical manual, page 84 discusses the Status Panel Indicators. These indicators, described in the following table, provide crucial information about the device's status. Status Panel Indicator Description Displays Full Menu Access mode, allowing users to adjust all prescription settings. Indicates a Secure Digital (SD) memory card is inserted into the ventilator. Page 85: Battery level warning, with less than 10 minutes remaining, the battery symbol turns red and indicators become empty. The On-Screen Button Panel is illustrated on page 84. Note that button variations depend on the displayed screen. Key features include: * Event Log: viewing a list of all events, such as ventilator setting changes or alarms. * Information: detailed information about the device, including software version and serial number. Changing Device Settings and Alarms: From the Main Menu, navigate to the Settings and Alarms menu. You can customize pressure units displayed by the device. Note that Chapter 6 provides detailed information on each alarm. Circuit Type: To change circuit type, access the Setup screen with airflow turned off. There are three options: Passive, Active PAP, or Off. Apnea Alarm: This setting enables or disables the apnea alarm. You can adjust the setting from 10 to 60 seconds in 5-second increments or disable it altogether. Respiratory Rate Alarm: You can choose to disable this alarm or adjust the setting from 4 BPM to 80 BPM in 1 BPM increments. 1. Low Inspiratory Pressure Setting: Configures alarm for low inspiratory pressure. User-settable only in Continuous Positive Airway Pressure (CPAP), Automatic CPAP (AC), and Synchronized Intermittent Mandatory Ventilation (SIMV) modes. Limitations: - Not settable lower than PEEP + 2 cmH O - Not settable higher than High Inspiratory Pressure 2. Ramp Length Allows setting ramp time in minutes. Disables ramp by selecting Off. Range: 5 to 45 minutes in increments of 5. 3. Ramp Start Pressure Setting will not be displayed when: - Ramp length is set to off - In increments of 1 cmH O from the CPAP pressure setting 4. Rise Time Used to maintain target volume of airflow during Spontaneous breath. Range: 1 to 6 minutes in increments of 1. 5. Pressure Support Setting to deliver pressure support during inspiratory phase of Spontaneous breath. Range: 0 to 30 cmH O in increments of 1. 6. PEEP (Positive End Expiratory Pressure) - Active circuits: 0-25 cmH O in increments of 1 - Passive circuits: 4-25 O in increments of 1 The user can select the pressure units displayed on the screens, choosing from cm Hg, mBar, or all pressure units. The warning page 105 indicates that the default year is set to the current year and the adjustable range is between 2000-2099. Hour, minute, and IP address settings allow for customization, with hour defaults at the current time (12 AM-12 PM or 0-23), minute ranging from 0-59, and IP address mode allowing for DHCP or Static setup. The user can access device information by selecting Information from the Main Menu. They can also view it by holding down the Down key for 5 seconds. Updating prescriptions is available on the SD card, warning users to select Yes to start the update process. After updating a prescription, one of several screens may appear to verify accuracy. If errors occur, a confirmation screen will display with possible causes and actions to take. The user can also view and change certain device settings in My Settings or Options. Change Log: View a list of the 20 most recent alarms or settings changes in the Full Menu... My Settings screen. To exit the menu, press the Left button (Finish) to return to the instance; if Ramp is not enabled, it will take you back to the Main Menu. The Ramp Start Pressure setting only appears on the screen when it's enabled. For example, see the screenshot below where the Ramp Start Pressure is being changed. Note that if Flex is enabled, the Rise Time setting won't be available. In the My Settings menu, you can change settings like the following: Connecting the Ventilator to the Patient Note: After finishing adjusting your ventilator settings, follow these steps to connect the device to the patient. Trilogy 202 provides features for controlling access to device settings and transferring new devices. Types of Alarms: • High Priority – Require immediate response. • Yellow Solid Indicator – A solid yellow light appears on the Alarm Indicator/ Audio Pause button when a low-priority alarm is detected. • Audible Indicators – Sounds whenever a power failure, high-, medium-, or low-priority alarm occurs, as well as for informational messages and confirmation alerts. The Alarms and Messages Screen will automatically display instead of the Monitor screen if an alarm appears in the menu banner. If you manually reset or self-cancels an alarm, the menu banner will reappear on-screen before the original alarm occurred. When a remote alarm system is used, the ventilator sends a signal to activate the alarm if it detects an alarm condition. Audio Pause and Alarm Reset Features: This section describes how to temporarily silence the audible indicator by pressing the Alarm Indicator/ Audio Pause button when an alarm occurs. The alarm system of the Trilogy 202 ventilator provides audible and visual notifications for various issues, including loss of power, high oxygen inlet pressure, high temperature, low or dead battery, and card errors. These alarms are categorized as high, medium, or low priority and require immediate attention to ensure proper functioning. For instance, if the alarm indicates a loss of power, the clinician should restore AC power to resolve the issue. Other alarms may require contacting Philips Respironics or an authorized service representative for assistance. The ventilator also requires regular cleaning and maintenance to prevent electrical shock and ensure optimal performance. This includes cleaning the exterior surfaces and detachable battery pack (if used), as well as replacing foam filters if they become damaged. Additionally, reusable circuit components should be inspected and cleaned according to institutional protocols to prevent deterioration. Preventive maintenance is crucial for extending the device's lifespan and ensuring it remains functional throughout its use. This includes tracking blower hours and following guidelines provided by Philips Respironics. Device software in the Information menu should be referred to when performing periodic maintenance. This may involve tasks based on blower hours according to the Trilogy Service Manual. For further details, consult the Trilogy 202 clinical manual. If issues arise, contact an authorized service representative or Philips Respironics for servicing. Have your device's model number and serial number ready upon calling. Troubleshooting can be found in Chapter 8 of the Trilogy 202 clinical manual. If problems persist after following these steps, contact a certified technician for assistance. The air filter may be dirty or the mask operating temperature could be the cause of excessive warm air coming out. Refer to Chapter 7 for instructions on cleaning or replacing the air filter. If water has accumulated in the exhalation diaphragm, disassemble and clean/dry the assembly. Use a low flow air source to clear any remaining water droplets from the flow tubes before reassembling. Additional accessories such as a humidifier can be used with the ventilator. Adding moisture to the airflow may reduce nasal dryness and irritation. Refer to the instructions provided with the humidifier for complete setup information. Operating the device in the presence of flammable gases is strictly prohibited, as it poses a risk of fire or explosion. Consult the Trilogy 202 clinical manual for further details on safety precautions. A Philips Respironics Remote Alarm unit can be used in conjunction with your device. Ensure that you test the remote alarm daily and do not rely solely on the Nurse Call feature. When inserting an SD card, use only cards available from Philips Respironics or those listed in the specifications section of this manual. The Philips Respironics DirectView software can be utilized to download prescription data from the SD card to a computer. This allows clinicians to receive and report stored data from the card. System checkout procedures are outlined in Chapter 10, detailing test procedures that should be performed by the clinician prior to connecting the device to the patient. Given article text here: The following summarizes the procedures for verifying ventilation settings on the Trilogy 202 ventilator. First, verify that the auto-reset conditions are met after setting therapy mode to AVAPS (passive circuit only) with IPAP of 20 cmH, EPAP of 4 cmH, breath rate of 12 BPM, and inspiratory time of 1.6 seconds. The trigger type is set to Auto-Trak for passive circuits. Next, check the alarm setting by waiting approximately 40 seconds after resetting the ventilator settings. Verify that the high-priority audible indicator has stopped sounding and the red light on the Alarm Indicator/Audio Pause button has ceased flashing. To restore ventilator settings, modify the values shown in Table 5 and verify that the low tidal volume alarm is functioning correctly by waiting approximately 10 seconds and checking for the alarm signals. Then, reconnect the test lung to the circuit and wait at least 40 seconds before verifying the auto-reset conditions again. Finally, verify the inspiratory pressure alarm by setting the ventilator FiO setting to 45% and connecting the oxygen input port to a source of high-pressure O (50 psi nominal). Turn on the O flow to the ventilator and verify that the set level of FiO is satisfied using an external O monitor. Shut off or disconnect the source of high-pressure O and wait one minute before verifying the following alarm signals: the internal battery symbol has a black box around it to indicate that it is in use, and the device continues to operate normally. Reconnect the detachable battery and AC power source, then verify the external battery by waiting approximately 40 seconds after resetting the ventilator settings. Check for the auto-reset conditions again, ensuring that the high-priority audible indicator has stopped sounding and the red light on the Alarm Indicator/Audio Pause button has ceased flashing. If available, connect the device to AC power and verify that the green LED is lit. If using an external battery, connect it to the ventilator and verify that the battery symbol appears on the display with some level of charge present. If correction of a failed portion is not possible, return the device to Philips Respironics or an authorized service center for service and repair. The Trilogy 202 clinical manual provides technical specifications for environmental operating, storage temperature, relative humidity, and atmospheric pressure. The charging range for internal and detachable batteries is between 10°C and 30°C. The internal and detachable batteries power the ventilator within a specific operating range. Use only SD cards and card readers available from Philips Respironics or SanDisk. Control accuracy parameters include IPAP, EPAP, and CPAP, with ranges specified in centimeters of water column (cmH2O) or as percentages of setting. The disposal guidelines for this device involve separating electrical and electronic equipment per EC Directive 2002/96/EC. The glossary defines various terms and acronyms used throughout the manual, including AC power, Assist Control therapy mode, IPAP, I:E Ratio, Mandatory Breath, Mean Airway Pressure, Spontaneous Breath, and Spontaneous Therapy mode. The device can be restored to its normal state by plugging it into AC power, inserting an SD card, or pressing the Start/Stop button, which preserves battery power. The Trilogy 202 device features a Spontaneous/Timed Therapy mode that provides a mandatory breath if the patient fails to breathe within a set timeframe. This mode is similar to S mode, but offers additional functionality. The device is designed for use in a typical home or hospital environment and should be operated in accordance with IEC standards. The Trilogy 202 also meets electromagnetic emission and immunity requirements, ensuring safe operation in various environments. However, users are advised that these guidelines may not apply in all situations due to the impact of absorption and reflection on electromagnetic propagation. The device's features include breathing circuit air inlet, humidifier, patient circuit cleaning, PC-SIMV mode, positive end expiratory pressure (PEEP), pressure control ventillation, tidal volume, and trigger type auto-trak. The user manual provides troubleshooting guidelines and instructions for operating the device. Additionally, the Trilogy 202 is covered by a two-year limited warranty from Respironics, Inc., which guarantees that the device will be free from defects in workmanship and materials.