



Page 1 User Manual REF 1067236 1067235 JH 12/3/09... Page 2 This work is protected under Title 17 of the United States copyright code and is the sole property of Philips Respironics. No part of this document may be copied or otherwise reproduced, or stored in any electronic information retrieval system, except as specifically permitted under United States... Trilogy 202 user manual Table of Contents Chapter 1. Introduction...... ....1 Package Contents ...... ....1 Intended Use ...... ...2 Warnings and Cautions ...... ...3 Warnings ... .....3 Cautions ...... ...8 Notes .. .10 Contraindications ..11 System Overview ....12 Rear and Side Panels . ..44 High Vte Alarm 11 Symbols .... ..12 Chapter 2. Page 5 Low Oxygen Flow ..... ..43 High Oxygen Inlet Pressure ...... ..43 Low Oxygen Inlet Pressure ......43 Circuit Disconnect Alarm ...43 Apnea Alarm .. ...12 Front Panel ... 44 Low Vte Alarm ....46 High Minute Ventilation Alarm ..46 Low Minute Ventilation Alarm ...... ..46 Low Battery Alarm . ......46 High Temperature Alarm . ....47 Replace Detachable Battery Alarm ...... .48 Keypad Stuck Alarm ...... ....108 Chapter 6. Ventilator Alarms ...... .. 112 Remote Alarm .. ..109 Audible and Visual Alarm Indicators .. .. 110 Alarm LED Indicators .... .. 110 Audible Indicators ... ....111 Alarm Messages ..... ...114 Trilogy 202 user manual... Page 8 Using a Remote Alarm Ventilator to the Patient Unit.. .... 134 Using a Secure Digital (SD) Card ... ...137 Visual Inspection ......138 Initial Setup ...... ..133 Using a Nurse Call System ...... . Page 9 Chapter 11 ..165 Limited Warranty ......169 Trilogy 202 user manual... Trilogy 202 user manual 1. Introduction This chapter provides an overview of the Trilogy 202 device. Package ...161 Index ... Technical Specifications Contents The Trilogy 202 system may include the following components. Some components are optional accessories that may not be packaged with the device. Trilogy 202 is intended for pediatric through adult patients such as wheelchairs and gurneys only when in an institutional setting. Warnings and Cautions Warnings A warning indicates the possibility of injury to the user or operator. Patient Monitoring Prior to placing a patient on the ventilation. equipment •... Page 13 SD Card When you changes the device prescription, alarms, and other settings Prescription using the SD card, Trilogy 202 requires that the caregiver review and Changes prior to the changes prior to the changes being used by the device. The caregiver review and Changes prior to the changes prior to the changes prior to the changes prior to the changes being used by the device. settings are correct and compatible with the patient after using this feature. Page 14 Philips Respironics. Proper operation of the device, including alarms, with other circuits has not been verified by Philips Respironics. Proper operation of the device, including alarms, with other circuits has not been verified by Philips Respironics. When the device is not in operation and the oxygen flow is left on, oxygen delivered into the tubing may accumulate within the device's enclosure. Fire or Explosion. Trilogy 202 user manual... Page 16 Respiratory Rate, and Apnea alarms should be used in conjunction with the Circuit Disconnect alarm. Trilogy 202 offers the following circuit type selections: • Passive •... Discontinue use and replace if damaged. Repairs and adjustments must be performed by Philips Respironics- authorized service personnel only. Unauthorized service could cause death or injury, invalidate the warranty, or result in costly device damage. Page 18 (hours or full charge-discharge cycles). The battery Charge-discharge cycles). Detachable Battery with the ventilator. Cleaning Do not steam autoclave the ventilator. Doing so will destroy the ventilator. An external Battery Should only be connected to the ventilator. An external Battery should only be connected to the ventilator. cycle, lead acid battery. Use of any other adapter or cable may cause improper operation of the ventilator. Contraindications If the patient has any of the following conditions, consult their health care professional before using the device in a non-invasive mode: • Inability to maintain a patent airway or adequately clear secretions • At risk for aspiration of gastric contents •... Rear and Side Panels Symbol Description AC Power Connector Secure Digital (SD) Card Slot Serial Port 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 2. System Description This chapter 1 Entroduction... Page 23 Trilogy 202 user manual 2. System Description This chapter 1 Entroduction... Page 23 Trilogy 202 user manual 2. System Description This chapter 4. System Descriptin the control buttons, visual indicators, and display screen. Buttons Front Panel Controls and The following buttons are included on the front panel of the device. The display screen allows you to view settings, system status information, real-time patient data, alarms, and logs. You can also modify certain settings on the 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, 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. Page 27 7. Remote Alarm/Nurse Call Connector If you are using an optional remote alarm or nurse call system Rear Panel with the ventilator, you can connect the Philips Respironics remote alarm adapter cable or nurse call adapter cable to this connector. Trilogy 202 user manual 3. Modes, Features, and Alarms Therapy Modes The device provides Pressure Control Ventilation (PCV) and Volume Control Ventilation (VCV) for non-invasive and invasive patients. 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. Trilogy 202 user manual... Therapy Mode Table are dependent upon other settings. For instance, if the circuit type is set to Active with Flow, then the Flow Trigger Sensitivity, Leak Compensation, and Flow Cycle settings will display. Page 31 = Pressure Supported IPAP = 26 cm H PS = IPAP-EPAP = 20 cm H PRESSURE 5 seconds 8 seconds 8 seconds 8 Mode Enter S mode TIME Trilogy 202 user manual... Page 32 Spontaneous/Timed (S/T) Mode In Spontaneous/Timed (S/T) mode, the device delivers bi-level pressure support. This mode provides Spontaneous/Timed (S/T) mode, the device delivers bi-level pressure support. setting. This ensures that the patient receives a minimum number of breaths per minute. Page 33 IPAP = 26 cm H = Mandatory Breath EPAP = 6 cm H Rate = 10 BPM PS = IPAP- EPAP = 20 cm H PRESSURE seconds seconds seconds seconds records seconds records seconds records r Control (PC) mode, the device delivers bi-level pressure support. This mode delivers Assist and Mandatory breaths. This mode is identical to S/T mode, except that all breaths have a fixed inspiratory time. IPAP = 26 cm H = Mandatory Breath EPAP = 6 cm H = Mandatory Breath Rate = 5 BPM = Assist Breath PRESSURE 12 seconds Inspiratory Time. Control Ventilation (CV) Mode In Control Ventilation (CV) mode, the device delivers volume control therapy. Page 37 Mandatory breaths deliver the Tidal Volume setting during inhalation and provide a lower Peak End Expiratory Pressure (PEEP during exhalation. Trilogy 202 user manual... Page 38 During the time window, if patient effort is detected, either a Spontaneous breath is delivered for the first patient effort. If the last breath delivered was an Assist or Spontaneous breath, then an Assist breath is delivered for the first patient effort of the window. Traditional CPAP Therapy TIME C-Flex returns to the set pressure by the end of exhalation, when the airway is most vulnerable to closure. Trilogy 202 user manual... Bi-Flex Note: Bi-Flex is only available In S mode, the Bi-Flex attribute adjusts therapy by inserting a small up to 25 cmH O in S mode. amount of pressure relief during the beginning part of exhalation. In the following diagram, the bold lines represent Bi-Flex is only available In S mode. normal BiPAP therapy. (IPAP Max) settings. AVAPS averages V and changes the PS value gradually. This occurs over several minutes. The rate of change is slow, so that the patient is not aware of breath-to-breath pressure changes. Trilogy 202 user manual... Page 42 As patient effort decreases, AVAPS automatically increases PS to maintain the target tidal volume. The IPAP level will not rise above IPAP Max, even if the target tidal volume is not reached. Conversely, as patient effort increases, AVAPS will reduce PS. IPAP will not fall below IPAP Min, even if the target tidal volume is exceeded. With a square wave pattern, airflow is generally constant throughout inspiration of the breath. FLOW Square Flow Pattern TIME Ramp With a ramp flow pattern, the airflow starts high and decreases throughout inspiration of the breath. FLOW 50% of Peak Flow Ramp Waveform Pattern TIME Trilogy 202 user manual... For the active circuit in volume modes, peak flow is required to be a minimum of 20 l/min. The wave form may be flattened when the combination of Inspiratory Time and Tidal Volume set points would result in a flow of less than 20 l/min. Therefore, for some settings, a Ramp flow pattern. Parabolic leak is proportional to the square of the patient pressure; therefore, the leak estimate is correlated to the changing patient pressure. Both algorithms include unintentional circuit leak and the patient flow. The calculated patient flow is a primary input into the triggering and cycling mechanisms. Page 47 A sudden change in patient flow will cross the shape signal, causing the pressure level to change. IPAP Pressure EPAP Cycle to EPAP Shape Signal Crossover Signal Point Estimated Flow Patient's flow pattern with the Shape Signal provides a sensitive mechanism to trigger to inspiration or cycle to expiration in response to changing breathing patterns and circuit leaks. Spontaneous breathing in all modes except T, CV, AC, and SIMV, is called Spontaneous Expiratory Threshold (SET). Page 49 For example: if the flow cycle sensitivity setting is set to 25%, when the flow has decreased by 25% of the peak flow, the device will cycle to the EPAP/PEEP level. Trilogy 202 user manual... BTPS Compensation All flows and volumes used in Trilogy are expressed in BTPS - Body Temperature atmospheric Pressure Saturated with H All pressures are expressed relative to atmospheric pressure. Ventilator Alarms This section describes all of the ventilator alarms to low priority alarms to low priority alarms and finally informational messages. This is a high priority alarm. It occurs when there is a leak in the internal air delivery system that allows oxygen to build up inside the device. The alarm is generated when the internal oxygen Flow This is a high priority alarm. It occurs when the concentration of oxygen from the device is 10% above the FiO set point for more than 30 seconds. This could be caused by a problem with the output of the oxygen source. High Vti alarm setting for three consecutive breaths. The device continues to operate. The alarm will automatically terminate when a breath occurs in which the delivered tidal volume does not reach the High Vti alarm setting. Trilogy 202 user manual... Low Vti Alarm This is a high priority alarm. It occurs when the delivered tidal volume is less than the Low Vti alarm setting for three consecutive breaths. The device continues to operate. The alarm will automatically terminate when a breath occurs in which the delivered tidal volume exceeds the Low Vti alarm setting. 10 minutes of battery run time remains. Trilogy 202 user manual... High Temperature Alarm This alarm occurs when the estimated patient airstream temperature or the ventilator continues to operate. Internal fans are started when the medium priority alarm is generated. If the condition causing the high temperature is not corrected and the temperature continues to rise, the alarm will escalate to the high priority alarm. Battery Not Charging Info Message occurs when the device has detected an error condition with the battery that prevents it from accepting a charge. The device continues to operate. Battery charging stops. Trilogy 202 user manual... Check External Battery Info Message occurs when a bad connection exists to the external battery, if available, or the internal battery. Battery Depleted Info Message This info message occurs when the affected battery is fully depleted. Page 59 Trilogy 202 user manual... Trilogy 202 user manual 4. Ventilator. WARNING It includes the following setup information: Ventilator dependant patients should be continuously • Properly positioning the device monitored by qualified • personnel... To prevent accidental removal of the AC power cord from the device, secure the AC power cord to the device. Trilogy 202 user manual... Page 62 2. Plug the pronged end of the cord into a wall outlet not CAUTION connected to a wall switch. The device may only be operated 3. Ensure that all connections are secure. If AC power is connected at temperatures between 5° C correctly and the device is operating properly, the green AC and 40°... Refer to the instructions supplied with the Philips Respironics Trilogy deep cycle lead acid battery. Use External Battery Cable for detailed information on how to operate of any other adapter or cable the device using an external battery. Page 64 Detachable Battery pack. To The detachable battery pack, remove the protective cover and the amount of use (hours or full snap the battery into place on the back of the ventilator. Page 65 Attaching the Detachable Detachable Detachable reduce the service life of the Battery detachable or internal battery and other internal components of the ventilator. Trilogy 202 user manual... Page 66 One side of the detachable battery has a set of LEDs that indicate the amount of charge left on the battery. You can press the button below the LEDs to view how much charge remains: Battery Capacity All 5 LEDs are lit 80-100% capacity 4 LEDs are lit 60-79% capacity... Monitoring screen. If the symbol appears as an empty red Battery Symbol battery on your screen, contact Internal Battery Trilogy 202 user manual... Page 68 There are several DC power indicators that will display on the Monitoring screen to which battery is in use (if applicable), if the batteries are low, charging, or discharged, etc. The following table explains all of the DC power indicators. DC Power Indicator Lescription Battery In Use Indicator A black box will appear around the battery that is in use. Exhalation Device: to tubing to the 22mm O.D. end of the the disposable circuit. passive exhalation device. Trilogy 202 user manual... Page 70 2. Connect the other end of the Passive Exhalation Device Flexible Bacteria Filter Tubing Note: The device does not provide circuit compliance compensation in volume modes. Refer to the instructions included with the Passive Exhalation Device for more detailed setup information. Page 71 If your circuit type is Active Flow: Note: Only use the Respironics-1. Connect the Flow Sensor to an active exhalation device as approved Flow Sensor with this shown below. device. Connecting the Flow Sensor Flow Sensor Trilogy 202 user manual... Page 72 Note: If the active exhalation device to the flexible tubing to the active exhalation device to the flexible setting up an active flow circuit type remove the proximal tubing that attaches to the ventilator. (The sample illustration The oxygen input to the device must be: below shows the NIST connector being installed.) Pressure: 40 psi to 87 psi Flow: 175 SLPM Installing an O Inlet Connector Trilogy 202 user manual... To attach the ventilator to a high pressure oxygen supply: 1. Connect the oxygen source to the oxygen connector on the back of the Trilogy 202 device. Page 75 Trilogy 202 device. screens Note: There is a keypad lock inactivity time-out period. After and change ventilation settings are complete. Main Menu screen appears and an audible indicator sounds indicating you are now in Full Menu Access mode. An example Main Menu screen is shown below. Main Menu Screen (with Menu panel and Detailed View displayed) Trilogy 202 clinical manual... Page 78 When you perform this key sequence when the airflow is off, the Setup screen appears and an audible indicator sounds. An example Setup screen is shown below. panel displayed) You can go into the Options menu and permanently change the Menu Access setting to Full Menu Access. The center section, called the Status panel, displays certain symbols that indicate features being used, such as Ramp, as well as battery status. Trilogy 2020 clinical manual... Page 80 If Detailed View is turned on in the Options menu, the Monitor screen will look like the screen shown below. Monitor Screen - Detailed View On Status Panel Measured Settings Panel Monitor screen will look like the screen shown below. (for example, CPAP, S, S/T, etc.). If a special feature such as Flex, AVAPS, or Sigh is active, this feature will appear next to the therapy mode. Trilogy 202 clinical manual... Page 82 Indicator Description Date and Time If you are in Detailed View, the current date and time appear in the top right corner of the panel. (In Detailed View, they appear in the top right corner of the panel.) the center panel.) Patient Breath This symbol displays during a patient-triggered breath. Airway Pressure The manometer (bar graph) displays the Mean Airway Pressure in the Manometer and... Page 83 Displays the FiO setpoint. MinVent Minute ventilation displays the amount of air delivered to the patient over the last minute in l/min BTPS. Trilogy 202 clinical manual... Page 84 Status Panel Indicators All of the indicators that may appear on the Status Panel Indicators All of the indicators and excess mode. which means you can adjust all prescription settings. Displays when a Secure Digital (SD) memory card is inserted in the ventilator. Page 85 (less than 10 minutes remaining), the inside of the box surrounding the battery symbol will change to red, and all of the battery symbol will change to red. available battery source. Trilogy 202 clinical manual... On-Screen Button Panel The illustration below shows the on-screen Button Panel Note: The on-screen Button Panel Note: The on-screen Button Panel Note: The very bottom of the display screen is the on-screen button screen is displayed and what panel. Event Log: View a list of all events that have occurred, such as ventilator inoperative conditions, alarms, etc. • Information: View detailed information about the device, such as the device software version and serial number. Trilogy 202 clinical manual... Changing the Device Settings and Alarms Note: In the Options menu described later in this chapter, From the Main Menu screen, use the Up/Down button to select Units displayed by the device, choosing either cm H O, hPa, or... Page 89 • • Note: This chapter describes how to enable all of the device • PC-SIMV settings, including device • alarms. For detailed information • about each alarm, please refer to Chapter 6. • SIMV Trilogy 202 clinical manual... Page 90 Circuit Type Note: To change the circuit type, you must be in the There are three circuit types you can select: Setup screen with the airflow turned off. See the Full Menu • Passive Access Mode section for more • Active PAP information. Page 91 You can choose Off to disable the alarm. Or, you can increase or decrease the setting from 5 to 60 seconds in 5 second increments. For example, a setting of 10 means that the alarm will sound after the circuit has been disconnected for 10 seconds. Trilogy 202 clinical manual... Page 92 Apnea This setting enables or disables the apnea alarm. If enabled, an audible alarm will sound when an apnea is detected. You can choose Off to disable the alarm. If enabled alarm will sound when an apnea is detected. 10 means that the alarm will sound if the time between spontaneous breaths exceeds 10 seconds. Page 93 You can choose Off to disable this alarm, or you can increase or decrease the setting from 4 BPM to 80 BPM in 1 BPM increments. It cannot be set lower than the Low Respiratory Rate except to be turned off. Trilogy 202 clinical manual... Page 94 Low Inspiratory Pressure This setting configures the Low Inspiratory Pressure from 6 to 40 cmH O in increments of 1 cmH... Page 95 6. Ramp Length The Ramp Length allows you to set the ramp time. You can disable Ramp by selecting Off, or you can increase or decrease the Ramp Length setting from 5 to 45 minutes in 5-minute increments. Trilogy 202 clinical manual... Page 96 Note: The Ramp Length allows you to set the ramp time. You can disable Ramp by selecting off, or you can increase or decrease the Ramp Length setting from 5 to 45 minutes in 5-minute increments. You can increase or decrease the ramp start pressure in Ramp Length is set to Off or if increments of 1 from 4 cmH O to the CPAP pressure is set to 4 cmH patient also has access to this setting, unless the ramp length is... Page 97 Inspiratory increments. Use this setting to establish the target volume of Time, to maintain the system's gas which the ventilator will produce and deliver during each minimum and maximum peak flows. Spontaneous breath. Trilogy 202 clinical manual... Page 98 Note: The Rise Time displays if Flex is disabled. If Flex You can adjust the rise time to find the most comfortable setting is enabled, the device will use a rise time of 3. for the patient. Increase or decrease the setting from 1 to 6 until you find the right setting. Page 99 You can increase or decrease the Pressure support the ventilator will deliver during the inspiratory phase of a Spontaneous breath. Trilogy 202 clinical manual... Page 100 3. PEEP The Positive End Expiratory Pressure (PEEP) setting can be increased from 0 to 25 cmH O in active circuits and 4 to 25 O in passive circuits, in increments of 1. PEEP is the positive pressure maintained in the patient circuit during exhalation. The PEEP must be less than or equal to the pressure setting. Page 101 • Tidal Volume • Breath Rate • Inspiratory Time • Pressure Support • Flow Pattern • PEEP • Trigger Type • Sigh • Rise Time • High Inspiratory Pressure • Low Inspira Selected The Options menu appears, shown in the screen below. Options Menu The following settings are available on the Options menu. •... Page 103 Language that the software will appear in (English, French, German, etc.). The information on the screens will display in the language selected here. Trilogy 202 clinical manual... Page 104 • Pressure Units - The next item allows you to select the pressure units on the screens will display in the unit of measure selected here. WARNING •... Page 105 - The year defaults to the current year The adjustable range is from 2000 - 2099. • Hour - The hour defaults to the current hour. The adjustable range is from 12 AM - 12 PM or 0-23, depending on the selected Time Format. Trilogy 202 clinical manual... • Minute - The minute defaults to the current minute. address mode to either DHCP or Static, depending on the type of network you are using (if applicable). If the entry is an alarm, the first column shows the number of seconds that the alarm was active. Trilogy 202 clinical manual... Viewing Device Information From the Main Menu screen you can select Information to access the Information screen. You can also view the Information screen by holding the Down key for 5 seconds. This causes the detailed view of the Monitor Screen and the Information screen by holding the Down key for 5 seconds. patient's prescription When you change the device prescription, alarms and other using the SD Card. This feature lets you update a single prescription settings using the SD Card, or both prescription settings using the SD Card. black screen if the airflow was off or the Monitor/Standby screen if the airflow was on). Select Yes to start the prescription update process. Once the prescription is correct: Ventilator Off Prescription... Page 111 A confirmation screen will appear if errors occur during this process. The following table summarizes the prescription errors, their possible causes, and the actions to take. Trilogy 202 clinical manual... Page 112 Message Cause Action Prescription replaced with a update. This is caused by an valid prescription. attempt to set a value for a prescription parameter that is not valid for the therapy mode or an attempt to set a prescription parameter to an... • My Settings : View and change certain prescription settings, such as rise time or ramp starting pressure, if these settings were enabled. Trilogy 202 clinical manual... • Options Note: The Options, Alarm Log, : View and change certain device settings, and Information items are such as your alarm volume, keypad lock, or keypad lock, or keypad discussed in detail earlier in this backlighting. ... My Settings screen. For Settings menu by pressing the Left (Finish) button to return to instance, if Ramp is not enabled, the Main Menu. the Ramp Start Pressure is being changed. Sample My Settings Screen (with Ramp Start Pressure Selected) Note: If the Flex feature is You can change the following settings in the My Settings menu, if enabled. Connecting the Ventilator to the Patient Note: Trilogy 202 provides features to control access to the device (prescription) settings After you have finished adjusting your ventilator settings, perform and to transfer new device the following steps to connect the ventilator alarms occurs. There are three types of alarms: Note If multiple alarms occur • High Priority - Require immediate response by the... Yellow Solid Indicator/Audio Pause button. The Alarm Indicator/Audio Pause button does not light up when informational messages or confirmation alerts display. Trilogy 202 clinical manual... Audible Indicators An audible indicator sounds for informational messages and to confirm that certain actions have occurred (for example, when an SD card is inserted or removed from the device). This is done so that the modification to the current parameter can be completed before addressing the alarm condition. The screen below is an example of an alarm message displayed in the menu banner. Trilogy 202 clinical manual... Page 122 Alarm in Menu Banner Screen The Alarms and Messages Screen will automatically display in place of the Monitor screen when exiting from the menu system using the Exit soft key when an alarm is displayed in the menu banner. If an alarm is displayed in the menu banner on-screen before the alarm occurred will reappear. Remote Alarm When the ventilator detects an alarm condition, if you are using a remote alarm system, a signal is sent from the ventilator to activate the remote alarm. The Remote Alarm Reset Features This section describes the Audio Pause and Alarm Reset features. Audio Pause and Alarm Reset features This section describes the Audio Pause and Alarm Reset features. audible indicator by pressing the Alarm Indicator/Audio Pause button. The alarm is silenced for two minutes and then will sound again if the cause of the alarm has not been corrected. ), or an "Audio Pause" message appears in the menu banner on the Alarm Display screen. 5. Look up the alarm in the alarm descriptions later in this chapter to determine the source of the alarm and the appropriate action. Trilogy 202 clinical manual... Alarm Summary Table The following table summarizes all of the high, medium, and low priority alarms and informational messages. Alarm Priority Audible Visual (Alarm Device Clinician Action Indicator Button Action and Display) • • Loss of Power High Red flashing button; Shuts down Restore AC power. Page 127 "High Oxygen Inlet operate oxygen input must be Pressure" message 40-87 psi. If problem continues, contact Philips Respironics or an authorized service representative. Please have the the device model number information when you call. Trilogy 202 clinical manual... Page 128 Check Pressure" message oxygen source. The oxygen input must be 40-87 psi. If problem continues, contact Philips Respironics or an authorized service representative. Please have the the device model number and serial number information when you call. Page 129 "High Temperature" If the ventilator is running off message appears. of the internal or detachable battery, move to a cooler location and/or power the device with AC power or a lead-acid battery. Trilogy 202 clinical manual... Page 130 Alarm Priority Audible Visual (Alarm Device Clinician Action Indicator Button Action Indicator Button Action Indicator Button Action Action Indicator Button Indicator Button Action I battery or AC power source Detachable High, Battery"... Page 131 A "Card Error" Continues to Remove SD Card and use another card, if available. message appears. operate Ensure card meets specifications. Check write- protect switch on card. If condition persists, contact an authorized representative of Philips Respironics. Trilogy 202 clinical manual... Trilogy 202 clinical manual 7. Cleaning and Maintenance Cleaning the Ventilator WARNING The ventilator's exterior surface and the exterior of the detachable To avoid electrical shock, always battery pack (if using) should be cleaned before and after each unplug the power cord from the patient use, and more often if needed. Rinse thoroughly to remove all detergent residue. Allow the filter to air dry completely before reinstalling it. If the foam filters should be used as replacement filters. Trilogy 202 clinical manual... Reusable Circuit Cleaning Instructions and conform to guidelines provided by Philips Respironics Clean the patient circuit per your institution's protocol. with each accessory. Inspect components for deterioration prior to use. Note: For more information.... Preventive Maintenance Label The device's blower hours are listed in the device software, in the Information menu. Refer to the Trilogy Service Manual for recommended periodic maintenance. Recommended periodic maintenance may be based on blower hours. Trilogy 202 clinical manual... Philips Respironics to have the device serviced. Please have the model number ready when you call. Chapter 8 Troubleshooting... Page 137 Refer to Chapter 13. If the problem still occurs, contact an authorized service representative or Philips Respironics to have the device serviced. Please have the model number ready when you call. Trilogy 202 clinical manual... Page 138 Issue Why It Happened What To Do Excessive Warm Air Out of The air filter may be dirty. Or, Clean or replace the air filter may be dirty. Chapter 7. The air out of the mask is in direct sunlight or near a The temperature of the air much warmer than usual. Page 139 If there is patient breath. water built up in the exhalation diaphragm, disassemble the circuit. Trilogy 202 clinical manual... Trilogy 202 clinical manual 9. Accessories There are several accessories you can use with the ventilator. Adding a Humidifier may reduce nasal dryness and irritation by adding moisture to the airflow. If you are using a humidifier with the ventilator, refer to the instructions provided with the humidifier for complete setup information. • The ventilator should not be operated in the presence of flammable gasses. This could cause a fire or explosion. Trilogy 202 clinical manual... Using a Remote Alarm Unit WARNING The remote alarm should be You can use a fire or explosion. device. There is a dedicated adapter cable assembly for connecting remote alarm, make sure you the device to the Remote Alarm unit (REF 1045291). Do not rely solely on the type listed in the specifications section of this manual. Trilogy 202 clinical manual... The card will be slightly ejected from the SD card to a computer. DirectView software to download the prescription data from the SD card. Page 145 Trilogy and report stored data from the SD card. 202 clinical manual... Trilogy 202 clinical manual 10. System Checkout Procedures This chapter details the test procedures that should be performed by the clinician prior to connecting the device to the patient. Test the Active PAP, Active Flow, and Passive circuit types if you want to do a... Table 1. If necessary, refer to Chapter 5 for instructions on modifying ventilator settings. Setting Value Dual Prescription Table 1 - Ventilator Settings and Alarms Circuit Type Active PAP, Active Flow or Menu Passive circuit only) IPAP 20 cmH EPAP 4 cmH Breath Rate 12 BPM Inspiratory Time 1.6 seconds Trigger Type (passive circuit Auto-Trak type) Flow Cycle Sensitivity... Page 149 Alarm Setting D. Verify Reset Wait 40 seconds and verify the following auto-reset conditions: • The High Priority audible indicator has stopped sounding • The red light on the Alarm Indicator/Audio Pause button has stopped flashing Trilogy 202 clinical manual... Page 150 E. Restore Ventilator Settings and change the following value shown in Table 5. Setting Value High Vte/High Vti Table 5 - Restore Ventilator Settings 3. Verify the Low Tidal Volume Alarm This procedure verifies that the Low Tidal Volume alarm is working properly. Page 151 C. Verify the Alarm Mait approximately 10 seconds and verify the following alarm signals: • The High Priority Audible Indicator sounds • A red light flashes on the Alarm Indicator/Audio Pause button Trilogy 202 clinical manual... Page 152 • The Circuit Disconnect alarm condition appears on the screen, highlighted in red D. Reconnect Test Lung Reconnect the test lung to the circuit. E. Verify Reset Wait at least 40 seconds and verify the following auto-reset conditions: • The High Priority audible indicator has stopped sounding •... Page 153 Inspiratory Pressure Alarm D. Verify Reset Setting Wait 40 seconds and verify the following auto-reset conditions: • The Medium Priority audible indicator has stopped sounding • The yellow light on the Alarm Indicator/Audio Pause button has stopped flashing Trilogy 202 clinical manual... Page 154 6. Verify the Low Inspiratory Pressure Alarm This procedure verifies that the Low Inspiratory Pressure alarm is working properly. It assumes that you have attached the test lung, verified ventilator settings, and turned on ventilator FiO setting to a source of high pressure O (50 psi nominal). Turn on O flow to the ventilator. Ventilator Settings Set the ventilator FiO setting to 45%. Trilogy 202 clinical manual... Page 156 Verify Blending A. Turn on the ventilator. B. Verify the set level of FiO is satisfied using an external O monitor. Verify alarm A. Shut off or disconnect the source of high pressure O to the ventilator. B. Wait 1 minute and verify the following alarm signals: •... Step C and the device continues to operate. • Verify that the internal battery symbol has a black box around it to indicate that it is in use. Reconnect the Detachable Battery cable to the device and verify that the green AC LED is lit. B. Connect the external battery cable to the external battery and to the ventilator. C. Verify that the external battery symbol is shown on the display and some level of charge is present. If correction of the failed portion is not possible, return the device to Philips Respironics or an authorized service center for service and repair. Trilogy 202 clinical manual... Trilogy 202 clinical manual 11. Technical Specifications Environmental Operating Storage Temperature 5° C to 40° C -20° C to 60° C Relative Humidity 15 to 95% (non-condensing) 15 to 95\% (n batteries will power the ventilator for the full operating range of 5°... Page 161 4 to 50 cmH SD Card and SD Card Reader Use only SD cards and SD Card - 1.0 GB - REF SDSDJ-1024 SanDisk ® Card Reader/Writer - SanDisk ImageMate - REF SDDR-99-A15. Page 162 Control Accuracy Parameter Range Accuracy IPAP 4 to 50 Greater of 2 cmH O or 8% of setting EPAP 0 to 25 cmH O for Active Circuits CPAP 4 to 20 cmH... Page 163 < 2.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 < 1.5 < 9.0 electronic equipment per EC Directive 2002/96/EC. Dispose of this device in accordance with local regulations. Trilogy 202 clinical manual... Trilogy 202 clinical manual... Trilogy 202 clinical manual... Trilogy 202 clinical manual... delivers Assisted and Mandatory breaths with a user-defined inspiratory time. IPAP Inspiratory time to expiratory time to expiratory time. IPAP Inspiratory Positive Airway Pressure Light Emitting Diode l/min Liters Per Minute Trilogy 202 clinical manual... Page 166 Term/Acronym Definition Mandatory Breath A Mandatory Breath is completely controlled by the ventilator. Breaths are initiated by the ventilator according to the breath Rate (BPM) setting. Breath s are cycled according to the breath reserves battery power. The device is restored by plugging the unit into AC power, inserting an SD card, or by pressing the Start/Stop button. Spontaneous Breath Breath type in which the breath is patient-triggered. Trilogy 202 clinical manual... Page 168 Term/Acronym Definition Spontaneous (S) Therapy mode in which all breaths are spontaneous. The Mode ventilator supports breathing with user-defined Pressure Support (PS) and Rise Time values. Spontaneous/Timed Therapy mode that is similar to S mode, except that it can also (S/T) Mode deliver a mandatory breath if the patient does not spontaneously breath Information Guidance and Manufacturer's Declaration - Electromagnetic Emissions This device is intended for use in the electromagnetic environment. Page 171 3 A/m Power frequency magnetic fields Hz) magnetic field should be at levels characteristic of a typical home or hospital IEC 61000-4-8 environment. NOTE: U is the a.c. mains voltage prior to application of the test level. Trilogy 202 clinical manual... Page 172 Guidance and Manufacturer's Declaration - Electromagnetic Immunity This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment. Immunity Test IEC 60601 Test Compliance Electromagnetic Environment - Level Level... Page 173 Note 4: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. Trilogy 202 clinical manual... Trilogy 202 clinical manual Index AC Power 52 Bacteria Filter AC Power Inlet 17 Replacing 126 Air Filter Breathing Circuit Connection 88 Cleaning 124... Page 175 Options Menu 93 High Minute Ventilation 84 Oxygen Valve Connector 18 High Respiratory Rate 84 High Tidal Volume Alarm 83 Humidifier 131 Patient Circuit Cleaning 125 PC-SIMV Mode 25, 90 Positive End Expiratory Pressure Control Ventilation 89 Tidal Volume 88 Pressure Setting 90 Timed Mode 89 Pressure Support 90 Time Format 96 Trigger Type Auto-Trak 86 Ramp Feature 31 Flow Trigger 86 Ramp Length 86 Troubleshooting 127 Ramp Start Pressure 87, 107 Remote Alarm 65, 114 Remote Alarm 65, 114 Remote Alarm 65, 114 Remote Alarm Connector 18 Volume Control Ventilation 19... Page 177 Trilogy 202 clinical manual... Limited Warranty Respironics, Inc. warrants that the Trilogy 202 system shall be free from defects of workmanship and materials and will perform in accordance with the product specifications for a period of two (2) years from the date of sale by Respironics, Inc. to the dealer. If the product fails to perform in accordance with the product specifications, Respironics, Inc. will repair or replace -... Page 179 To exercise your rights under this warranty, contact your local authorized Respironics, Inc. dealer or contact Respironics, Inc. at: 1001 Murry Ridge Lane Murrysville, Pennsylvania 15668-8550 1-724-387-4000 Deutschland Gewerbestrasse 17 82211 Herrsching Germany +49 8152 93060 Trilogy 202 clinical manual...