Respironics bipap vision service manual

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 DescriptionAbout BiPAP Focus Noninvasive Ventilator System provides noninvasive breathing support for adult patients weighing 30 kg (66 lbs.) or greater. The BiPAP Focus Ventilator System provides a single level of positive pressure to the patient. Spottaneous/Timed (S/T),

which provides two levels of positive pressure (one during inspiration and one during exhalation), and delivers timed breaths if the patient does not initiate a breath. The BiPAP Focus System alarms annunciate when high or low pressure regulation, apnea, patient disconnect, low power, or loss of mains power conditions occur. The system displays a real-time estimated delivered pressure bar graph. An Apnea Rate (#Apnea) Alarm is provided to alert the caregiver to repeated periods or more. The caregiver can set the value for how many apnea periods (10 seconds or more) can occur within an hour before alarming. The total number of Apnea periods (10 seconds or more) can occur within an hour before alarming. The total number of Apnea periods (10 seconds or more) can occur within an hour before alarming. more) for the previous hour is displayed as part of the patient data. Because the previous hours data is displayed, the number of apnea periods for the first hour is an estimate only. The BiPAP Focus System includes Alarm Silence and Alarm Pre-silence features. Battery backup provides a minimum of 45 minutes of backup power at default settings in case AC power is not available (for example, during transport within the hospital). The BiPAP Focus System features Digital Auto-TRAK, which allows it to recognize and compensate for unintentional leaks and promote synchrony by adjusting its trigger and cycle algorithms to maintain optimum performance. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F 1System DescriptionIntended UseThe BiPAP Focus Ventilator System provides noninvasive ventilation for adult (30 kg or 66 lbs. or greater) patients for the treatment of respiratory insufficiency and distress, and obstructive sleep apnea. The BiPAP Focus System is appropriate for acute, sub-acute, and intra-hospital transport settings. The BiPAP Focus System is intended for use with nasal and full face masks. The BiPAP Focus System is not intended to be a life-support device. Contraindicated for patients with any of the following conditions: Lack of spontaneous respiratory drive Inability to maintain a patent airway or adequately clear secretions At risk for aspiration of gastric contents Acute sinusitis or otitis media HypotensionPatient PrecautionsAdvise the patient to immediately report any unusual chest discomfort, shortness of breath, or severe headache. If skin irritation or breakdown develops from the use of the mask, refer to the mask instructions for appropriate action. Potential side effects of noninvasive positive pressure therapy include: ear discomfort, conjunctivitis, skin abrasions due to noninvasive interfaces, gastric distention (aerophagia). Restricts this device to sale by or on the order of a physician. 2BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 2: WarningsWARNING: To avoid the risk of fire, use this device in well-ventilated areas away from flammable anesthetics. Do not use in a hyperbaric chamber or other similarly oxygen-enriched environments. WARNING: When using the BiPAP Focus System, an alternative means of ventilation should always be available. WARNING: To reduce the risk of electric shock, ensure that the AC power cord is undamaged and always disconnect the device from AC power is disconnected, always disconnect the mains supply at the wall outlet. WARNING: The BiPAP Focus System should not be used adjacent to or stacked with other equipment. If adjacent use is necessary, the BiPAP Focus System should be observed to verify stable orientation and normal operation. WARNING: The patient should be disconnected if operating in any mode other than Normal operating mode. WARNING: Failure to enter Standby mode before switching the ON/ OFF switch on the back of the unit to the OFF position (O) will cause the unit to alarm for two minutes indicating the unit was not powered off correctly. This is a safety feature. If it occurs, turn the unit back ON (|) in Normal mode and then shut it down correctly. WARNING: Medical electrical equipment requires special precautions regarding electromagnetic compatibility (EMC) and BiPAP Focus Noninvasive Ventilator System 1027404 Rev F 3Warningsmust be installed and put into service according to the EMC information provided in this user manual. WARNING: All components of the breathing circuit are intended for single patient use only: do not attempt to sterilize or reuse. Follow all applicable federal and local regulations for disposal or recycling. WARNING: This device is not for use with intubated patients. WARNING: Do not use this device close to MRI or high-frequency devices, such as electro surgery or diathermy equipment. WARNING: Do not use this device with anesthetic gases. WARNING: Do not use flammable disinfectants on or near this device. WARNING: Before using the BiPAP Focus System on a patient, allow the device to acclimate to conditions of use following transport or storage. WARNING: Do not use the system if the screen is unreadable. If this occurs turn the ON/OFF switch to the OFF position (O). WARNING: Service and the ventilator. WARNING: Service on this device should only be performed by qualified service technicians. See the BiPAP Focus System Service Manual for equipment repair information. WARNING: Do not make any unauthorized changes to the ventilator. WARNING: Service Manual for equipment repair Use only Respironics recommended batteries. WARNING: Keep any sources of ignition as far as possible from the device when using oxygen-enriched gas. WARNING: Use the BiPAP Focus System with Respironics approved patient interfaces and circuits only, to assure accuracy of patient data and correct alarm performance. To avoid the risk of increased mask pressure during exhalation, do not use any component or accessory other than those listed in this manual.4 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FWarningsWARNING: Do not cover or block the exhalation port on the Vision circuit, to assure accuracy of patient data and correct alarm performance. WARNING: Use of the bacteria filter at the outlet port of the machine is mandatory. The displayed pressure compensates for the pressure drop due to the BiPAP Vision single patient use circuit and the bacteria filter (see Accessories on page 81 for ordering information). WARNING: Check that the orientation of the oxygen safety valve is correct. WARNING: Connect oxygen only on order of a physician. WARNING: When connecting oxygen to the circuit, use an in-line safety valve and do not allow oxygen to be entrained through the air inlet. WARNING: Observe the patient and monitor continuously using pulse oximetry and arterial blood gas measurements as needed during oxygen administration. WARNING: Inspired oxygen concentration can vary according to settings, patient breathing patterns, and leak rate. WARNING: To avoid oxygen accumulation in the ventilator, put it into Normal operating mode before turning the oxygen OFF before putting it into Standby or turning the unit OFF. WARNING: Do not use a Heat and Moisture Exchanger (HME) with the BiPAP Focus due to high resistance to flow. WARNING: The BiPAP Focus System can deliver pressure of 42 cmH2O is possible. WARNING: It is important to inspect and replace the air inlet filters at the recommended intervals to avoid introducing foreign matter into the systemBiPAP Focus Noninvasive Ventilator System 1027404 Rev F5WarningsWARNING: The BiPAP Focus System will operate. WARNING: To avoid the risk of fire, use only Respironics-approved batteries. All battery connections are keyed to ensure proper connection. WARNING: When running on battery, the high flows that occur during a patient disconnect will cause the battery to deplete in as little as 2 minutes. Connect A/C power immediately if the Battery Depleted Alarm sounds to avoid total loss of power. WARNING: To avoid the risk of electrical shock, do not touch the communication ports on the ventilator and the patient simultaneously. WARNING: Do not perform the Preoperational Check with a patient attached. WARNING: Do not remove the power cord retaining clip from the device. WARNING: If placing the BiPAP Focus System on a flat surface or the stand, ensure that the surface is stable. WARNING: Do not use the BiPAP Focus for physical support. WARNING: Stow the machine, patient circuits, power cords and accessories safely when not in use. WARNING: When using oxygen bleed-in, verify that the orientation of the oxygen safety valve is correct before use.6BiPAP Focus Noninvasive Ventilator System 1027404 Rev FWarningsWARNING: Do not connect any device other than remote alarm cables if the unit is on a patient. Only use cables recommended by Respironics. WARNING: This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or federal laws. (Within this system, the backlight lamps in the monitor display contain mercury.)BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis
page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank.8BiPAP Focus Noninvasive Ventilator System 1027404 Rev F7WarningsThis page is intentionally blank Focus System, ensure that all parts listed on the packing list are included in the shipment. Inspect all parts for damage before use, and immediately report any discrepancies to your Respironics representative. System Components The BiPAP Focus System includes the ventilator, a DC power supply with mains (AC) power cord, and a reusable inlet filter. SetupWARNING: To avoid the risk of personal injury or equipment damage: Set up the device so that cables and hose do not pose a tripping hazard. Do not use the device for physical support if moving a person. Use proper technique for lifting the device. Use Respironics-approved patient circuits and interfaces only. Lift the unit as shown in Figure 1. Do not lift the unit by the inlet filter at the rear of the unit or by the front panel.Lifting the BiPAP Focus UnitCAUTION: Lift the unit or by the front panel.BiPAP Focus Noninvasive Ventilator System 1027404 Rev F9SetupFigure 1: Lifting the BiPAP Focus UnitAfter removing all packaging materials, remove the protective plastic cover from the display, and wipe the exterior of the BiPAP Focus clean with a damp cloth and mild detergent solution before the first use (see Care and Maintenance on page 55). Also clean the ventilator exterior between each patient use and as needed. The BiPAP Focus Ventilator is shipped with the battery disconnected. The battery must be connected before the BiPAP Focus Ventilator will operate. Connecting the battery is a routine action, therefore a qualified service technician is not required. Follow these simple steps to connect the battery: 1. Ensure that the ON/OFF switch is in the OFF position (O) and that the power cord is disconnected.10BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSetup2. Turn the unit over, remove the battery compartment cover Significant System 1027404 Rev FSetup2. Turn the unit over, remove the battery by plugging the white-keyed battery cable connector into the keyed slot. Push the connector in until it locks in place as shown in Figure 3. Battery compartment white-keyed battery cable connector to the keyed slot.4. Replace the battery pack in the battery compartment, close the cover, and tighten the screws. Connect the power cord.BiPAP Focus Noninvasive Ventilator System 1027404 Rev F11SetupMountingThe BiPAP Focus System can be placed on a flat surface or secured to a stand as seen in Figure 4. WARNING: If placing the BiPAP Focus System on a flat surface or the stand, ensure that the surface is stable. Safe cord stowageFor complete assembly instructions, see P/N 1033089.BiPAP Focus PlatformThumbwheelFigure 4: BiPAP Focus Noninvasive Ventilator System is powered by a DC power supply connected to AC mains (Figure 5). The unit also has an internal battery as a backup power source. The internal battery can run the system for 45 minutes at default settings (see Specifications on page 61 for default settings). The internal battery charging cycle is active whenever the system is connected to AC power and the back panel ON/OFF switch is ON (|) and the CHARGING LED is illuminated.ON/OFF switch BiPAP Focus System DC power supply connection and retaining clipDC power supply To AC power Figure 5: Connected before the BiPAP Focus System will operate. Connect battery during initial setup (see pages 8 and 9). NOTE: If the unit is being set-up for the first time (out of the box), it is recommended that the unit gets a full battery charge. This also applies after the unit has been stored for 2 weeks or longer.BiPAP Focus Noninvasive Ventilator System 1027404 Rev F13SetupCAUTION: To prevent the premature depletion and reduced life expectancy of the battery, store the ventilator with AC power connected and the ON/OFF switch in the ON (I) position. When the ventilator is stored disconnected from AC power with the power ON/OFF switch in the OFF (O) position, the battery typically becomes depleted in three months. If a 343 error code is displayed, contact Service. CAUTION: The battery is intended for back-up and intra-hospital transport only, and is not intended to be the main power source.USB portDC power supply inputON/OFF switch Shown in the OFF positionNurse call station/serial communications portPower cord retention clipFigure 6: BiPAP Focus Back PanelThe nurse call station/serial communications port can connect the BiPAP Focus System to a nurse call station alarm is activated when the ventilator is turned OFF, or put into Standby, an alarm occurs, or a system error occurs. The nurse call station alarm is deactivated when all active alarms are silenced or auto-reset. Most nurse call station systems require only normally closed (NC) connections. NO and NC nurse call station cables are available from Respironics. See Accessories on page 81 for cable ordering information. See Specifications on page 61 for pinout information.14 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSetupThe communication and USB ports allow service technicians to upgrade system software. WARNING: To avoid the risk of electrical shock, do not touch the communication ports on the ventilator and the patient simultaneously. CAUTION: The nurse call station port is intended to connect only to a SELV (Safety Extra-Low Voltage) and ungrounded system with basic insulation to ground, in accordance with IEC 60601-1. To prevent damage to the nurse call circuit, the signal input should not exceed the maximum rating of 24 VAC (Volts of Alternating Current) or 36 VDC (Volts of Direct Current) at 500 mA (milliamps), with a minimum current of 1 mA.BiPAP Focus Noninvasive Ventilator System 1027404 Rev F15SetupInstalling Air Inlet FiltersInstall the air inlet filter(s) as shown (Figure 7). To avoid introducing foreign matter into the system, a reusable air inlet filter must be installed. (See Care and Maintenance on page 55 for information on how to clean the reusable air inlet filter.) An additional ultra-fine disposable filter is also recommended for enhanced particulate filtering. Reusable gray foam filter (required) Disposable white ultrafine filter is also recommended for enhanced particulate filtering. Reusable gray foam filter (required) Disposable white ultrafine filter (optional) Figure 7: Installing Air Inlet FiltersLanguage SelectionThe following instructions describe how to select the desired language that the BiPAP Focus will display in Normal Mode. WARNING: The patient should be disconnected if operating mode. 1. Connect mains power to the unit and turn the ON/OFF switch at the rear of the unit to the ON (|) position. 2. Simultaneously press and hold the Alarm Reset and Alarm Silence keys. 3. Press the Standby key once, while continuing to hold the Alarm Reset and Alarm Silence keys. 16BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSetup4. The unit will power up and will display the following screen: Figure 8: Warning Screen 5. Press ENTER to continue past the Warning screen. The Menu screen shown in Figure 9 will appear: Figure 9: Menu Screen6. Scroll using the DOWN arrow key until System Settings is highlighted, and then press ENTER. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F17Setup7. Press ENTER again to display a list of available languages (Figure 10). Use the UP and DOWN arrow keys to scroll through the list. Highlight the desired language, and then press ENTER to select that language. Figure 10: System Settings Screen 8. After selection 18BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSetupConnecting the Patient CircuitWARNING: All components of the breathing circuit are intended for single patient use only: do not attempt to sterilize or reuse. Follow all applicable federal and local regulations for disposal or recycling. WARNING: Use the BiPAP Focus System with Respironicsapproved patient interfaces and circuits only, to assure accuracy of patient data and correct alarm performance. To avoid the risk of increased mask pressure during exhalation, do not use any component or accessory other than those listed in this manual. WARNING: Do not use any component or accessory other than those listed in this manual. WARNING: Do not use a Heat and Moisture Exchanger (HME) with the BiPAP Focus Pressure Tube and Filter Connect the pressure tube and filter in the following order: 1. Connect the proximal pressure line Attach the pressure tubing to the proximal pressure tubing to the is mandatoryBiPAP Focus Noninvasive Ventilator System 1027404 Rev F19SetupProximal pressure tube and filterBreathing circuit connection Bacteria filter (mandatory) Breathing circuit tubing (to patient interface) Proximal pressure line (not used) Figure 13: Patient CircuitWARNING: Use of the bacteria filter (see Accessories on page 83 for ordering information).20 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSetupConnecting Supplemental Oxygen at the outlet of the BiPAP Focus System, using Respironics-supplied oxygen at the outlet of the BiPAP Focus System, using Respironics-supplied oxygen to the patient circuit as shown (Figure 14). oxygen valve must not exceed 15 L/min.Oxygen enrichment adapterBacteria filter (mandatory) To flow Oxygen safety valve is correct. Table 1 shows the potential range of oxygen concentration for given tidal volume, supplemental oxygen flow, and pressure values. Substantial leaks around the patient interface can reduce the expected oxygen concentration
levels. Use this information for reference when beginning oxygen therapy and adjust oxygen flow gradually to meet patient oxygen needs. 3% FiO2 @ 10 L/min Supplemental Flow 50 +/- 3% 40 +/- 3% WARNING: Connect oxygen to be entrained through the air inlet. WARNING: Observe the patient and monitor continuously using pulse oximetry and arterial through the air inlet. blood gas measurements as needed during oxygen administration. WARNING: Inspired oxygen according to settings, patient breathing patterns, and leak rate. WARNING: To avoid oxygen OFF before putting it into Standby or turning the unit OFF. WARNING: To avoid the risk of fire, use this device in well-ventilated areas away from flammable anesthetics. Do not use in a hyperbaric chamber or other similarly oxygen-enriched environments. 22BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 4: Operational CheckThe Pre-Operational Check is a check of LEDs and alarms to be used at the discretion of the clinician. This test is recommended and may be useful for initial setup or following storage periods. WARNING: Do not perform the Preoperational Check with a patient attached. Follow these steps to perform a pre-operational check: 1. Connect system to AC power and set the ON/OFF switch to the ON (|) position. 2. Verify that the AC POWER and green BATTERY CHARGING indicators are on. 3. Press the STANDBY button to turn the system on and verify that the red ALARM indicator blinks and the audible alarm sounds. NOTE: If the ventilator has been in storage for 2 weeks or longer, allow the internal battery to charge for at least 30 minutes before performing the following step. NOTE: If a Low Battery or Battery does not begin to charge after one hour and the Batt. Charge Failure persists, contact customer service for a replacement battery. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F23OperationCAUTION: To prevent the premature depletion and reduced life expectancy of the battery, store the ventilator with AC power connected and the ON/OFF switch in the ON (I) position. When the ventilator is stored disconnected from AC power with the power ON/OFF switch in the OFF (O) position, the battery typically becomes depleted in three months. If a 343 error code is displayed, contact Service. 4. Once the system begins normal operation, disconnect the power cord from wall power. Verify the following indicator turns on. AC POWER and green BATTERY CHARGING indicators turn off. Red ALARM indicator flashes, audible alarm sounds. 5. Press ALARM RESET Verify that the ALARM LED and audible alarm turn off. The audible alarm sounds (beeps) every 10 seconds alerting the user that unit is running on the internal battery. 6. Reconnect AC power. Verify that the ON AC LED is off. Press ALARM SILENCE and verify that the vellow ALARM SILENCE indicator turns or Press ALARM RESET to cancel the silence and verify that ALARM SILENCE indicator turns off. 7. Use the CHANGE SCREEN, UP/DOWN ARROW, ENTER, and CANCEL keys to step through screens and verify the operation of each key. 8. Enter CPAP mode with a patient circuit attached and allow the ventilator to deliver gas for more than 15 seconds. Verify that a DISCONNECT (i.e., patient disconnect) alarm occurs. 9. Enter S/T mode, then step to the ALARM SETTINGS screen. Select an APNEA alarm occurs after 20 seconds. 24 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperation10. Reenter CPAP mode, clear any alarms and connect a nurse call station cable. Turn the ON/OFF switch OFF and verify: The backup alarm sounds. The nurse call station alarm activates. Pre-OperationSystem StartupOnce the BiPAP Focus System is set up, follow these steps to start operation: 1 Confirm that the back panel ON/OFF switch is in the ON (|) position. 2. Press the STANDBY button on the front panel. 3. Perform the pre-operational check as required. 4. Select the appropriate settings. See "Normal Operation" for more information. 5. Select a mask (See Accessories on page 81.) Attach to the patient circuit. NOTE: Direct the exhalation port gas-flow away from the patient. This helps to maintain patient comfort. The system is now ready to be connected to the patient until normal operation begins. Normal Operation The BiPAP Focus System features these operating modes: Continuous Positive Airway Pressure (CPAP) Mode Provides a single level of positive pressure through the patient interface. S/T mode ensures that the patient receives a minimum number of breaths per minute based on the Rate setting. If the patient does not spontaneously breathe within the cycle time determined by the Rate setting, the ventilator delivers a timed breath at the set level of IPAP. The I-Time setting determined by the Rate setting determined by the Rate setting. Pressure (IPAP) in response to spontaneous inspiratory effort and cycles to Expiratory Positive Airway Pressure (EPAP) during exhalation (see 26 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationFigure 15). The level of pressure support in S/T mode is the difference between the IPAP and EPAP settings. Cycle IPAPTriggerEPAP Rise Time Inspiratory Time Figure 15: Triggering and Cycling in S/T ModeThe Ramp Time and Ramp Start settings (Figure 16) allow the ventilator to begin at a reduced pressure (the Ramp Start setting) then gradually increase the pressure breath by breath to the prescription pressure (CPAP or EPAP), allowing the patient to fall asleep more comfortably.Airflow turned on IPAP Pressure CPAP/EPAP Pressure CPAP/EPAP Pressure lta deRamp time setting enteredRamp Start SettingsBiPAP Focus Noninvasive Ventilator System 1027404 Rev F27OperationAuto-TRAK Sensitivity Function The ventilator monitors flow through the patient circuit to determine whether the patient is inhaling or exhaling using Digital Auto-TRAK Sensitivity technology. The BiPAP Focus System adjusts its output to support breathing and compensates for normal leaks in the patient circuit using Digital Auto-TRAK leak compensation technology. patient circuit and estimates patient leak using leak estimation algorithms. Sensitivity An essential feature of S/T mode is effective detection of spontaneous breathing breathing breathing breathing efforts and circuit leaks, the BiPAP Focus continuously tracks patient breathing patterns and automatically adjusts its sensitivity thresholds to ensure optimum sensitivity as breathing patterns or circuit leaks change. The Volume Trigger algorithm triggers IPAP during spontaneous and timed breaths. The volume trigger threshold is 6 mL of accumulated patient inspiratory flow causing 6 mL of volume. When patient effort generates inspiratory and expiratory and expiratory and expiratory flow causing 6 mL of volume. flow and adjusts the spontaneous trigger and cycle thresholds for optimum sensitivity. The shape signal is a shadow image of the patients actual flow and functions as a sensitivity threshold at either inspiration or exhalation. When the patients actual flow and functions are crosses the shape signal is created by offsetting the signal from the actual patient flow by 15 L/min and delaying it for 300 milliseconds. This causes the shape signal to be crossed, causing the pressure level to change.28BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationThe spontaneous expiratory threshold (SET) algorithm (Figure 18) raises the threshold in proportion to the inspiratory flow rate for each breath. When the SET and actual patient flow value are equal, the system cycles to EPAP. Maximum inspiratory time: A maximum IPAP time of 3.0 seconds acts as a safety mechanism to limit the time spent at the IPAP level during spontaneous breathing in S/T mode. If 3.0 seconds elapse in IPAP, the system automatically cycles from IPAP to EPAP. Flow reversal can occur due to a large leak around the mask or because the patients mouth is open. When the system senses this flow reversal the unit automatically cycles to EPAP.IPAPPRESSUREEPAPShape signal Estimated patient flow FLOWCycle to EPAP crossover pointTrigger to IPAP crossover pointTrigger to IPAP crossover point Figure 17: Shape SignalBiPAP Focus Noninvasive Ventilator System 1027404 Rev F29OperationIPAPPRESSUREEPAPShape signal Estimated patient flow FLOWFigure 18: Spontaneous Expiratory ThresholdSystem Shut DownTo put the system into STANDBY mode, press the STANDBY button on the front panel and select OK to confirm. To turn the system is stored or unused for several days), press the STANDBY button to enter STANDBY mode, select OK to confirm. To turn the system is stored or unused for several days), press the STANDBY button to enter STANDBY button to enter STANDBY mode, select OK to confirm. the back panel to the OFF (O) position. WARNING: Failure to enter Standby mode before switching the ON/ OFF switch on the back of the unit to alarm for two minutes indicating the unit was not powered off correctly. This is a safety feature. If it occurs, turn the unit back ON (|) in Normal mode and then shut it down correctly. The battery charging cycle is active if the system is connected to AC power and the ON/OFF switch is ON (|). To remove the system from AC power supply from its connected and the system is not in use, turn theorem ON/OFF switch to the OFF (O) position.30BiPAP Focus Front PanelFigure 19 shows the international version of the BiPAP Focus front panel. Table 2 summarizes the functions of the front panel elements. WARNING: To avoid damage to the keypad, do not use pens or other sharp objects to change settings. Figure 19: BiPAP Focus System USA Front Panel Figure 20: BiPAP Focus System 1027404 Rev F310perationTable 2: BiPAP Focus System Front Panel ControlsUSA Intl Description ALARM indicator shows if an alarm is active (flashing) or auto-reset (steadily lit indicator). NOTE: In STANDBY mode only, an active ALARM RESET clears active and auto-reset alarms or cancels an alarm silence. ALARM SILENCE mutes the audible alarm for 2 minutes. Each key press
restarts the 2-minute interval. The indicator lights (yellow) when alarm silence is active. Alarm presilence: press when no alarm is active during to show if the system is powered by AC (mains) power. Battery charge cycle is active during to show if the system is powered by AC (mains) power. AC operation (green). The green indicator turns off when the battery is fully charged during AC operation. STANDBY turns the system ON or puts the unit into Standby mode. Standby mode allows the internal battery to charge. UP and DOWN arrow keys navigate the onscreen buttons or adjust values.32BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationTable 2: BiPAP Focus System Front Panel ControlsUSA Intl Description CANCEL clears changes. Press and hold CANCEL for 5 seconds to lock and unlock the keypad. CHANGE SCREEN steps through available screens. ENTER selects or confirms a new setting. Screen Navigation Press the Change Screen key to step through the available screens. The settings screen allows you to view or change the current mode and settings for the Apnea and Apnea Rate (#Apnea) alarms. This screen also displays real-time patient data. The options screen allows you to view or change the ventilators audio and visual settings (display units, alarm volume, contrast, brightness, reverse video, and screen is unreadable. If this occurs turn the ON/OFF switch to the OFF position (O). BiPAP Focus Noninvasive Ventilator System 1027404 Rev F33OperationChanging Settings1. Use the arrow keys to highlight the desired setting and press ENTER to put the new setting into effect, or press CANCEL to exit without changing the setting. Figure 21: Changing SettingsPop-up window shows selected settingChanging Modes1. Use the UP or DOWN arrow to highlight the desired mode from the list and then press ACCEPT. 3. Review and adjust the intended settings for the proposed Mode as required. 4. Scroll to highlight Activate (Figure 22) at the bottom of the screen to activate the mode change. Note that Proposed (Mode) will flash at the top of the screen until the new mode is activated or cancelled. Figure 22: Activating a New Mode 34 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationCPAP Mode Settings Screen Figure 23 shows the CPAP Mode settings screen. Figure 23: CPAP Mode Settings Screen Includes these elements: SettingsCPAP Ramp Time Ramp Start the level of continuous positive airway pressure from Ramp Start setting to CPAP setting. The initial CPAP pressure (less than or equal to the CPAP setting). Patient DataRate Est. Vt Est. MV Leak #Apnea Measured respiratory rate. Estimated delivered tidal volume. Estimated patient leak. The number of periods (10 seconds or more) in the previous hour where the patient has not initiated a spontaneous breath. NOTE: For the first hour, this value is an estimate only. BiPAP Focus Noninvasive Ventilator (Timed) is triggering a breath. Continuous display of measured patient circuit pressure.NOTE: +++ is displayed for any parameter outside of upper ranges. --- is displayed for any parameter outside of lower ranges. ScreenFigure 24 shows the S/T Mode Settings ScreenThe S/T screen includes these elements: SettingsIPAP EPAP RiseTime Ramp Time Inspiratory positive airway pressure, the inspiratory positive airway pressure setting. How quickly the ventilator increases inspiratory pressure from EPAP pressure to 67% of the pressure support level. Period over which the ventilator increases respiratory pressure from Ramp Start setting to EPAP setting. 36BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationRamp Start RateThe initial EPAP pressure (less than or equal to the EPAP setting). Respiratory rate, used to determine if a timed breath is delivered. ITime and Rate settings cannot allow I-Time to exceed expiratory time. I-Time automatically as required to satisfy this rule.I-Time automatically as required to satisfy the s DataRate Est. Vt Est. MV Leak #Apnea Measured respiratory rate. Estimated exhaled minute volume. Estimated exhaled minute volume. Estimated exhaled minute volume. spontaneous breath. NOTE: For the first hour, this value is an estimate only. Trigger Bar graph Indicates whether the patient circuit pressure.NOTE: +++ is displayed for any parameter outside of upper ranges. --- is displayed for any parameter outside of lower ranges. See Specifications on page 61 for more information. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F370perationAlarm Settings Screen Figure 25 shows the Alarm Settings screen includes these elements: SettingsApnea #Apnea The length of time without a spontaneous breath that triggers Apnea alarm. OFF setting disables the alarm (no apnea detection). The number of apnea periods (10 seconds or more) within 60 minutes that triggers an Apnea Rate (#Apnea) alarm. Patient DataRate Est. Vt Est. MV Leak #Apnea Measured respiratory rate. Estimated delivered tidal volume. Flashes when peak inspiratory flow for successive breaths varies by more than 15 L/min. Estimated exhaled minute volume. Flashes when peak inspiratory flow for successive breaths varies by more than 15 L/min. estimate only.38BiPAP Focus Noninvasive Ventilator System 1027404 Rev FOperationBar graphContinuous display of measured patient circuit pressure. Options Screen Figure 26 shows the Options Screen Figure 26 shows the Selects Video Selects units of pressure: centimeters of water (cmH2O), hectoPascals (hPa), or millibars (mbar). Selects acreen brightness from 10% to 100%. Selects acreen brightness from 10% to 100%. Selects acreen brightness from 10% to 100%. lock timer ON or OFF. When the screen lock timer is ON, the keypad locks if no key is pressed for 2 minutes. If any key other than CANCEL is pressed, a pop-up before proceeding to the next step. Then, press and hold CANCEL for 5 seconds to unlock. the keypad. NOTE: You can manually lock the keypad by pressing and holding CANCEL for 5 seconds.40BiPAP Focus contains an internal battery. When the internal battery is fully charged, the Battery Back-up feature allows the unit to continue operation for a limited time in the event of mains power loss or during intra-hospital transport. If loss of mains power occurs, the unit will automatically switch to operate from the internal battery is NOT intended to serve as a primary power source. When the BiPAP Focus is operating on the internal battery, the On AC Power LED (green) will extinguish, the On Battery level icon will appear on the screen. Figure 27: Running on Internal Battery When the BiPAP Focus estimates that there are 10 minutes of internal battery power remaining, the unit will generate a silenceable Low Battery alarm. Mains power must be reconnected immediately to avoid loss of power. When the BiPAP Focus estimates that there are 2 minutes of internal battery power remaining, the Battery alarm. immediately to avoid loss of power to the ventilator. CAUTION: When using the Focus for patient intra-hospital transport, ensure that the DC power supply and power cord are also transported with the unit should the battery become depleted. BiPAP Focus Noninvasive Ventilator. of time the ventilator will operate on the internal battery depends primarily on the machine settings being used. The following table shows the approximate internal battery Life ExpectancyCPAP or IPAP Setting 10 cmH2O 20 cmH2O 30 cmH2O 30 cmH2O Approximate Battery Life 60 minutes 50 minutes 30 minutes 20 minute battery technology is NiMH (Nickel Metal Hydride). The battery will automatically charge when the unit is connected and the Battery Charging LED will illuminate indicating that the charging cycle is in progress. The battery is fully charged when the Battery Charging LED turns off. The charging cycle operates in Normal Mode and in Standby Mode. Battery charge time is typically less than 5 hours, but can be longer depending on environmental conditions (primarily temperature). It is important to maintain a fully charged internal battery in case of a mains power outage. Any time the BiPAP Focus has been in storage, a42 BiPAP Focus has been in storage, a42 BiPAP Focus has been in storage. rate when the unit is stored with the ON/OFF switch in the ON/OFF switch ventilator with AC power connected and the ON/OFF switch in the ON (I) position. When the ventilator is stored disconnected from AC power with the power ON/OFF switch in the OFF (O) position, the battery typically becomes depleted in three months. If a 343 error code is displayed, contact Service. CAUTION: During battery charging, disconnecting A/C mains power before charging completes may result in a Battery Depleted message. Connect A/C power immediately if Battery Depleted alarm annunciates to avoid total loss of power. Battery CareIf the number of battery powered operations is greater than 220 per year, the battery should be replaced every year. It is recommended that the battery be tested once per month. A fully charged battery is designed to operate for 45 minutes at default settings (see Specifications on page 61). If the battery does not continue to deliver gas for 45 minutes at these settings, it should be replaced. NOTE: Battery alarms will sound towards the end of the battery test. Gas delivery will continue during this time, until the battery test. illuminates this indicates that there is a problem with the battery charging cycle. If the CHARGING and the ON BATTERY LEDs are illuminated simultaneously then contact Respironics Customer Service. The BiPAP Focus self tests will also indicate when the battery needs to be replaced by displaying a Batt Charge Failure message (see AlarmsBiPAP Focus Noninvasive Ventilator System 1027404 Rev F 43Operationon page 45). Contact Customer Service to purchase a replacement battery. Operating with Humidification Two humidification options are available with the BiPAP Focus. Each humidification for a replacement battery. Humidifier See Accessories on page 81 for a complete list of accessories and part
numbers. 44BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 5: AlarmsWhen an alarm is active: The ALARM indicator flashes, The alarm message is displayed, and The system sounds a repeating sequence of beeps. Certain alarms can be auto-reset, meaning that the system automatically resets the alarm condition is corrected. Alarms that do not auto-reset must be manually resets, the ALARM indicator remains steadily lit to indicate that the alarm condition is corrected. Alarms that do not auto-reset must be manually resets the alarm condition is corrected. audible and visual alarm indicators, or to cancel an Alarm Silence. Alarm Silence the ALARM SILENCE key again restarts the two-minute interval. ALARM SILENCE key again restarts the two-minute interval. ALARM SILENCE key again restarts the two-minute interval. does not affect the visual ALARM indicator. The ALARM SILENCE key lights when Alarm Silence is active. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F 45AlarmsAlarm Pre-silence is useful for avoiding nuisance alarms during certain procedures. A new alarm will not sound if Alarm Pre-silence is active. Press ALARM RESET when an alarm message window appears when an alarm occurs (Figure 28). The window can display up to three alarm messages in order of priority. Figure 28: Alarm Message Window 46 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FAlarmsAlarm Descriptions Table 4 on page 47 summarizes alarms. When more than one corrective actions do not resolve the problem, provide alternate breathing support and contact a qualified service technician. Table 4: BiPAP Focus AlarmsAlarm Message Apnea (auto-resets) Description The patient triggers a spontaneous breath. NOTE: Timed breaths are not used in determining apnea duration. Apnea Rate (#Apnea) (no auto-reset) The number of periods (10 second or more) in the previous hour where the patient has not initiated a spontaneous breath, has exceeded the #Apnea per hour alarm setting. NOTE: The number of periods for the first hour is estimated. NOTE: The number of periods for the first hour is estimated. will clear the #Apnea display to 0. Check patient and settings. Corrective Action Check patient and settings.BiPAP Focus AlarmsAlarm Message Battery Depleted (auto-resets) Description Approximately 2 minutes of battery power remain. Auto-resets when AC power is connected. Cannot be manually reset or silenced. Corrective Action Connect the system AC power and allow battery to recharge. Replace battery if necessary. Check battery connection. Replace battery. Check battery to recharge. Replace battery to recharge. breathing circuit is not obstructed. Check patient and settings. Check for leaks in breathing circuit or mask fitting. Press ALARM RESET to clear. If not in use for transport, check connection to AC power and verify that AC POWER and green BATTERY STATUS indicators are lit.Batt. Charge Failure (no auto-reset) Hi P Reg (no auto-reset) Battery not connected or voltage remains low after recharge. High pressure 5 cmH2O below set CPAP or IPAP for 500 msec. Low pressure is 5 cmH2O below set CPAP or IPAP for 60 sec.Lo P Reg (no auto-reset)Loss of AC (auto-reset)Loss of AC (auto notification alarm. Auto-resets when AC power is connected. After the Alarm Reset is pressed the unit beeps every 10 seconds when on battery. (auto-resets) Description 10 minutes of battery power remain. Auto-resets when AC power is connected. Corrective Action Connect the system to AC power and allow battery to recharge. Check connection to AC power and verify that AC POWER and green BATTERY STATUS indicators are lit. Replace battery if necessary. Disconnect (auto-resets) Ventilator has detected a patient disconnect condition for at least 15 seconds. Autoresets when disconnect condition no longer exists. Key Stuck One or more of the user interface keys has been detected as permanently pressed or stuck closed. High temperature detected inside the ventilator. Check the keypad. Run pre-use check. Contact customer service. Check the keypad or stuck closed. ventilator to acclimate to the ambient conditions. Check preature is within specified operating conditions. Allow the ventilator to acclimate to the ambient conditions. Check preature low temperature low temperature detected inside the ventilator. System 1027404 Rev F49AlarmsTable 4: BiPAP Focus AlarmsAlarm Message System Error: XXX (no auto-reset) Description The system has halted and is not provide alternate breathing support. Cycle power: if problem persists, remove ventilator from use and contact a qualified service technician. Contact customer service. Any alarm not shown above 50 BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 6: Symbols: Symbols and Labels Main Label (underside of the device): Symbols: Symbols and Labels Main Label (underside of the device): Symbols and Labels Main Label (underside of the device): Symbols: Symbols and Labels Main Label (underside of the device): Symbols and Labels Main Label (underside of the device): Symbols and Labels Main Label (underside of the device): Symbols and Labels Main Labels (underside of the device): Symbols and Labels Main Labels (underside of the device): Symbols and Labels Main Labels (underside of the device): Symbols and Labels requirements. Manufacturer Notified BodyBiPAP Focus Noninvasive Ventilator System 1027404 Rev F51Symbols and LabelsSymbolMeaning Drip-proof enclosure ingress protection. Type BF protection rating. Compliant with the Waste Electrical and Electronic Equipment and Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (WEEE/RoHS) Recycling Directives. Caution: Refer to manualKeep dryFragile, handle with care. This side up.Nurse call station connection. 18V DC input. ON/OFF switch (press 0 to turn OFF; press | to turn ON).52BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSymbols and LabelsSymbolMeaning DC power supply (mains input on plug side, 18V DC output on unit side). Fresh gas intake (air inlet).Gas output port.LOT code. Serial number. Catalogue num active and autoreset alarms or cancels an Alarm Silence. Alarm Silence. Alarm Silence is active. Standby turns the system ON or puts it into Standby mode. Power indicator LED lights up to show that the ventilator is operating from an AC power source. Battery Status LEDs indicate that either the system is powered by internal battery power (yellow) or the battery is fully charged during AC operation. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F53Symbols and LabelsThis page is intentionally blank.54BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 7: Care and MaintenanceTable 5 summarizes maintenanceTable 5 summarizes maintenancePart Battery Interval Replace the batterv if a Batt. Charge Failure alarm occurs, or as indicated in Battery Care on page 43 Between patients or as needed. Reusable: replace as needed. NOTE: The air path cannot be cleaned. Procedure The battery must be connected before use. Follow Setup instructions beginning on page 8. NOTE: If the unit has been in storage without DC power or has not been used for 3 months, the battery will require a full charge. Replace circuit and interface. Do not attempt to clean or reuse single patient use circuit and interface. Do not attempt to clean or reuse single patient use circuit and interface. Do not attempt to clean or reuse single patient use circuit and interface. attempt to clean or reuse disposable filters. Patient Circuit (including bacteria filter) Air inlet filter(s) BiPAP Focus System MaintenancePart Internal valve assembly Interval Every 10,000 hours of operation. Refer to the BiPAP Focus System MaintenancePart Internal valve assembly Interval Every 10,000 hours of operation. Refer to the BiPAP Focus System MaintenancePart Internal valve assembly Interval Every 10,000 hours of operation. hours of operation. System exterior As needed. Clean the exterior of the ventilator with a soft damp cloth moistened with any of the following solutions: Mild detergent or soapy water 10% bleach solution (90% water) Isopropyl alcohol (91%) Quaternary ammonium germicides (sprays or disposable cloths) Do not spray or immerse in liquid. Do not allow liquid to penetrate the system. Procedure Qualified service technician only.56BiPAP Focus Noninvasive Ventilator System 1027404 Rev FCare and MaintenanceStoring the BiPAP Focus is not in use for periods of 2 weeks or longer, it is recommended that the unit is being stored, ensure that the power switch on the back of the unit is in the OFF (O) position. If the switch is not turned OFF, the internal battery will be depleted within two weeks. If the unit is stored with the power switch in the OFF (O) position, the internal battery will be depleted within 3 months. CAUTION: To prevent the premature depletion and reduced life expectancy of the battery, store the ventilator with AC power connected and the ON/OFF switch in the ON/OFF switch ON (I) and in standby, the battery may become depleted within two weeks. When the ventilator is stored with the ON/OFF switch in the OFF (O) position, the battery typically becomes depleted in three months. If a 343 error code is displayed, contact Service. CAUTION: During battery life when system is used. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F57Care and MaintenanceCleaning the Reusable Air Inlet FilterFollow these steps to clean the reusable air inlet filter (Figure 29): 1. Remove the filter and examine for damage or debris. 2. Wash using one of the following solutions, then rinse thoroughly: Palmolive or Dawn dishwashing detergent Isopropyl alcohol (99.9%) Clorox Ultra bleach White distilled vinegar (5% acidicy) Hydrogen peroxide (3%) Sodium hypochloride (6%)3. Allow the filter to dry completely before reinstalling. Figure 29: Reusable Air Filter. CAUTION: Use only Respironics-approved filters. CAUTION: Never reinstalling. Figure 29: Reusable Air Filter filter
(gray)CAUTION: Use only Respironics-approved filters. CAUTION: Never reinstall a wet filter. attempt to clean or reuse disposable air inlet filters.58BiPAP Focus Noninvasive Ventilator System 1027404 Rev FCare and MaintenanceReplacing the Air Inlet filters at the recommended intervals to avoid introducing foreign matter into the system The reusable air inlet filter (gray) must be installed and replaced every year. An additional ultra-fine disposable filter (white) is also recommended for enhanced particulate filtering. Replacing the Battery WARNING: To avoid the risk of fire, use only Respironics-approved batteries. All battery connections are keyed to ensure proper connection. Replace the battery (Figure 30) if a Batt. Charge Failure alarm occurs, or as indicated in Battery Care on page 43. NOTE: If a Battery does not begin to be fully depleted alarm occurs, the battery may be fully depleted alarm occurs, the battery does not begin to charge after one hour and the Battery CableBattery CableB Remove the two screws that secure the battery compartment door. 3. Unplug the battery cable and remove the old battery from its compartment door and screws. 6. Reconnect the DC power supply. WARNING: Use only Respironics recommended batteries.60BiPAP Focus Noninvasive Ventilator System 1027404 Rev FChapter 8: SpecificationsDefault Settings/T mode IPAP = 12 cmH2O EPAP = 4 cmH2O EPAP = 4 cmH2O EPAP = 4 cmH2O Settings: CPAP ModeCPAP Continuous Positive Airway Pressure Ramp Time Period over which the ventilator increases inspiratory pressure from Ramp Start setting to CPAP setting. Range: 4-20 cmH2O (4-20 hPa) Resolution: 1 cmH2O (1 hPa) Dynamic accuracy: 5 cmH2O (5 hPa) Range: 0-45 min. Resolution: 5 min. Accuracy: 10% of settingBiPAP Focus Noninvasive Ventilator System 1027404 Rev F61SpecificationsSettings: CPAP ModeRamp Start Initial inspiratory pressure Range: 4 cmH2O to CPAP setting) Resolution: 1 cmH2O (1 hPa)Settings: S/T ModeIPAP Inspiratory pressure, the exhalation pressure setting Rise-Time How quickly the ventilator increases inspiratory pressure to 67% of pressure to 67% of pressure support level Range: 4-30 cmH2O (5 hPa) IPAP cannot be set below EPAP. Range: 4-25 cmH2O (4-25 hPa) Resolution: 1 cmH2O (1 hPa) Dynamic accuracy: 5 cmH2O (5 hPa) IPAP cannot be set below EPAP. Range: 4-25 cmH2O (4-25 hPa) Resolution: 1 cmH2O (1 hPa) Dynamic accuracy: 5 cmH2O (5 hPa) IPAP cannot be set below EPAP. Range: 4-25 cmH2O (4-25 hPa) Resolution: 1 cmH2O (1 hPa) Dynamic accuracy: 5 cmH2O (5 hPa) IPAP cannot be set below EPAP. Range: 4-25 cmH2O (5 hPa) IPAP cannot be set below EPAP. Rang 5 cmH2O (5 hPa)Range: 1-6 (where 1 = 0.1 sec and 6 = 0.6 sec) Resolution: 1 Accuracy: (0.15 + 10% of setting) sec62BiPAP Focus Noninvasive Ventilator System 1027404 Rev FSpecificationsSettings: S/T ModeRate Respiratory rate, used to determine if a timed breath is delivered I-Time Inspiratory time Range: 1-30/min Resolution: 1/min Accuracy: 1/min or 10% of setting, whichever is greater over a 4-minute period. I-Time and Rate settings cannot allow I-Time to exceed expiratory time. Range: 0.5-3 sec Resolution: 5 min Accuracy: 10% of setting) sec I-Time and Rate settings cannot allow I-Time to exceed expiratory time. Range: 0.5-3 sec Resolution: 5 min Accuracy: 10% of setting) sec I-Time and Rate settings cannot allow I-Time to exceed expiratory time. setting Ramp Start Initial inspiratory pressure Range: 4 cmH2O to EPAP (4 hPa to EPAP) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure are graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) Measured DataPatient circuit pressure bar graph (continuous display) Range: 0-35 cmH2O (0-35 hPa) Resolution: 1 cmH2O (1 hPa) measured at the patient exhalation port at 60 L/min is less than 1 cmH2O by virtue of mask and ventilator design. BiPAP Focus Noninvasive Ventilator System 1027404 Rev F63SpecificationsMeasured DataRate Measured respiratory rate Est. Vt Estimated delivered tidal volume Range: 0-60/min Resolution: 1/min Accuracy: (1 + 10% reading) Range: 0-4000 mL Resolution: 1 mL Accuracy (S/T Mode): (50 mL + 10% reading) (when leak

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