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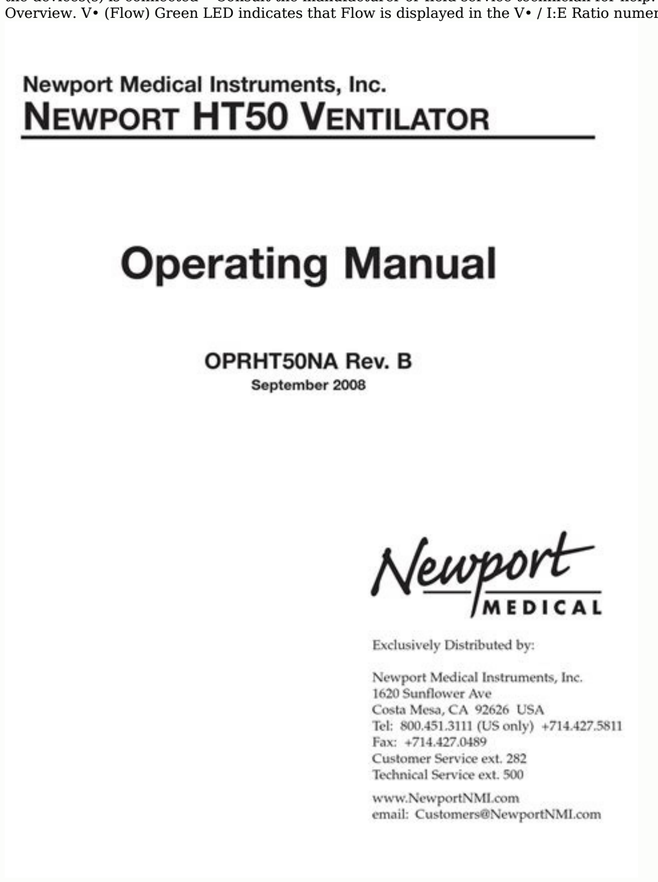
Newport ht50 ventilator operating manual

Newport ht50 ventilator service manual. Newport ht50 ventilator manual. Newport ht50 ventilator.

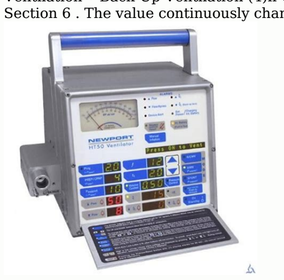
3-14 Front Panel Message Display Window . If the HT50 is ventilating you will need to press the Pressure Control button again within 5 seconds following adjustment. Factory Default Parameters Patient Settings: MODE A/CMV PEEP/CPAP 0 cmH2O Volume Control 500 mL P support 0 cmH2O tI 1.0 sec Humidifier Off ƒ 15 b/min Buzzer Volume Loud P trig –1.0 cmH2O Paw Alarms 5 cmH2O ▼Paw 40 cmH2O ▲Paw V• IAlarms 3 L/min ▼V • I 20 L/min ▲V• I (21)User Set Up: Power Save On Pressure Units cmH2O Auto Panel Lock Disabled Set Up User 42. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation.
NOTE: Manual Inflation may be prematurely cycled off in the first several breaths in Pressure Control when the initial flow has not yet been optimized. This will provide approximately 80% of the battery charge. The ventilation settings employed by Back-up Ventilation are then displayed on the front panel. Power / Green LED indicates external power is on and the internal Charging Int. Width 11 inches (27 cm) 38. Message Display Window Up to 16 characters, LED alpha numeric display Displayed monitored parameters: VT (Actual delivered tidal volume) V• I (Inspiratory minute volume) ƒ(Total breath frequency) Paw P (Peak airway pressure) Paw M (Mean airway pressure) (18)Paw B (Baseline airway pressure) H (Hours of operation) S (Software version) L (or Q) (Buzzer volume (Loud or Quiet) for audible alarm) Other displayed parameters (In USER SET UP): Power Save (On / Off) Airway Pressure Units (cmH2O / mbar) Set Up (User / Default) Auto Panel Lock (Enabled / Disabled) Tech. Always use an inline filter (p/n HT6004701 or equivalent) at the Airway Pressure Connector to protect the internal transducers from moisture or other contaminants. Battery Test) are locked, preventing accidental changes. Airway Pressure Meter –10 to 100 cmH2O / –10 to 98 mbar 15. General Warnings External power connection: To maintain grounding integrity when using A.C. power, only connect to hospital grade receptacles. (8.2 kg) with humidifier 40. In either case, all breaths delivered to the patient, whether time (ventilator initiated) or patient-triggered, are the same. Standby: HT50 dormant.



1-7 (6)OPERATOR’S RESPONSIBILITY FOR PATIENT SAFETY The Operating manual (p/n OPRHT50-NA) contains information intended to ensure safe and effective ventilator use. Use standard anti-static techniques while working inside the ventilator or handling any electronic parts. 2-1 Symbols / Labeling Table . 282 Technical Service ext. V• LED is illuminated green when flow is displayed. (7)LIMITATION OF LIABILITY The liability of Newport Medical Instruments, Inc. P support (Pressure Support Ventilation) may be used to support spontaneous efforts. NOTE: Use the tools and equipment specified in this manual to perform specific procedures. Battery charge level is best maintained by keeping the HT50 continuously connected to external power. Setting: Enables setting of control parameters and exhalation valve calibration. This manual excludes references to various hazards which are obvious to medical professionals and operators of this equipment, to the consequences of product misuse, and to potentially adverse effects in patients with abnormal conditions.
The HT50 Ventilator is guaranteed to perform to specification when the Newport HT50 breathing circuit with exhalation valve is used. The alarm is cancelled after delivered inspiratory minute volume falls below the ▲V• Ialarm setting. Only NEWPORT approved exhalation valves can be used with the HT50. P support (Pressure Support) 0 to 60 cmH2O / mbar above baseline pressure, limited to PEEP + P support ≤ 60 cmH2O / mbar 10. Inspection: Examination of actual condition. Accept the new control and target value by either pressing the selected button again; or by pressing another button to select a new parameter for adjustment, or by waiting 5 seconds without making a change. Parameter Adjustment:Use the ▲Up/▼Down buttons to adjust ventilation control parameter values (including Pressure Control and Volume Control values), alarms, and humidifier setting (if available). Ext. NOTE: There is approximately a two second delay in going from Standby to Setting condition. (8)confirm that the defect is covered by the terms of this warranty. 2. During Manual Inflation, the breath is terminated if (1) the Manual Inflation button is released, or (2) the ▲Paw (High Pressure) alarm is violated or (3) three seconds have elapsed. Please review all WARNINGSand Cautionsoutlined in this manual prior to using the HT50 for the first time. Paw Meter (airway pressure meter) Range: –10 to 100 cmH2O / 98 mbar The Paw meter displays airway pressure. The corresponding value (numerical display) will blink. P trig Green LED blinks on to indicate patient breathing effort. SPECIFICATIONS • Intended Use • Symbols / Labeling Table • Controls / Alarms / Monitors • Hardware Requirements • Miscellaneous Specifications • Humidifier Specifications • Air / Oxygen Entrainment Mixer Specifications • Oxygen Blending Bag Kit Specifications Section 3 . During ventilation (On condition) the displayed temperature is the measured temperature at the patient connector. The above is the sole warranty provided by NEWPORT. Battery Charge Level meter is located beneath the Paw meter.
A “PRESS AGAIN” message appears in the Message Display Window. (17)Controls/Alarms/Monitors Range/Selection 18. Attempts to continue increasing the value after this alert are permitted up to an I:E Ratio of 3:1. Do not place liquid containers in the immediate vicinity or on top of the HT50. Silence / Reset The Silence/Reset button has three functions: 1. NOTE: The battery charge level is best maintained by keeping the HT50 continuously plugged into an external power source. (34)Manual Inflation Range: 0 to 3.0 sec Pressing this button delivers an operator initiated Manual Inflation. There is a risk of explosion if used in the presence of flammable anesthetics. Maintenance: Required inspection, service, and repair of the device. To obtain a copy, please contact your local Newport Sales Representative or contact our Customer Service Department using information below. The low alarm limit is limited to 1 < the high alarm limit setting. The alarm is reset by a time or patient trigger. When Auto Lock is active, all touch buttons (except Silence/Reset and Int. During Back-up Ventilation, the Low ▼V• I(Back-up Vent) alarm indicator blinks, an audible alarm sounds, and “LOW V• i (BUV)” is displayed in the Message Display Window. The ▼Paw alarm limit does not apply to spontaneous breaths in SIMV mode.
Volume Control (tidal volume) Range: 100 to 2,200 mL, ATPS NOTE: When Volume Control is first initiated, or when a large change is made to the volume setting, it may take 5 or 6 breaths to reach the volume setting. The value adjustment is accepted if (1) the user presses the selected parameter button again, or (2) the user selects a different parameter, or (3) five seconds elapses. Operating Humidity 15 to 95% non-condensing 31. (NEWPORT) or its representatives. The P trig LED indicator illuminates each time the airway pressure reaches the set P trig level, and turns off once the airway pressure has returned to baseline pressure. If this equipment does cause harmful interference with other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: • Reorient or relocate the receiving device • Increase the separation between the equipment • Connect the equipment into an outlet on a circuit different from that to which the devices(s) is connected • Consult the manufacturer or field service technician for help. NEWPORTor its authorized representatives must be promptly notified upon detection of the defective material or equipment. Product modification or misuse can be dangerous. (23)OPRHT50NA B0908 INDICATORS, ALARMS & CONNECTORS Front Panel Overview. V• (Flow) Green LED indicates that Flow is displayed in the V• / I:E Ratio numeric window display.



2 A Input) 50 / 60 / 400 Hz 12-30 VDC, max. The alarm resets when airway pressure is < 3 cmH2O/mbar below baseline. OPERATOR’S RESPONSIBILITY • Operator’s Responsibility for Patient Safety • Limitation of Liability • Warranty • Definitions • Typing Conventions • Warnings and Cautions • Factory Maintenance or Repair • Contact Information Section 2 . Volume) Red LED indicates low inspiratory minute volume alarm limit (Back-Up Vent) is violated. 3-1 Front Panel Controls and Indicators . Exhalation Valve NEWPORT'SHT50 exhalation valve (P/N HT600039) is manufactured and designed specifically for the NEWPORTHT50 Ventilator. Front panel controls allow trained operators to select between a number of operational modes, pressure support and volume or pressure control. A heat moisture exchanger, or other humidification device, should be used until the unit is connected to A.C. power at which time the built-in humidifier can be used. To turn the humidifier Off, press and hold the Humidifier On button for three seconds.
Clearing alarm messages: Press the Silence/Reset button to clear all alarm messages in the Message Display Window and to release latched LED indicators when the cause for the alarm is no longer present.
(25)On Condition: SPONT or Setting Condition: A/CMV, SIMV, or SPONT Select—Adjust (▲Up / ▼Down)—Accept Select the Pressure Control or Volume Control button. Push To Unlock Buttons & Pressing button unlocks front panel buttons if locked by Indicator automatic panel lockfeature. Batteries cannot be disposed of with normal waste. When Auto Lock is set to “Enabled” in User Set Up and the ventilator is in On condition and 30 seconds have elapsed without pressing any buttons, the Auto Lock function is automatically activated and the (Auto Lock On) LED illuminates green. Proper emergency back-up equipment must be immediately available during transport. Auto Lock On Green LED indicates that the panel is currently locked. Alarms ▲Paw (High Pressure) Red LED indicates high peak airway pressure, high baseline pressure, or occlusion alarm violation.
Pressing this button displays the set target temperature in the adjacent window. MODE Control The MODE control buttons enable the user to switch between the following operational modes: • A/CMV • SIMV • SPONT In A/CMV and SIMV, mandatory breaths can be pressure controlled or volume controlled. V• display is not available during Pressure Controlled breaths or SPONT mode. Changing the MODE Control The MODE control buttons (A/CMV / SIMV / SPONT) function differently in Setting and On conditions. External A.C. /D.C. (Battery 100-240 VAC, max. LED lights to indicate that Silence is active. No other warranty, expressed or implied, is intended. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to other devices in the vicinity. NOTE: Flow can be adjusted indirectly by changing the tidal volume (Volume Control) or tI settings. NOTE: The high inspiratory minute volume alarm limit is limited to 1 > the low alarm limit setting. To temporarily unlock parameters when Auto Panel Lock is active, push the Push To unlock button for at least one second. The alarm resets when Paw drops to within 5 cmH2O / mbar of the set PEEP/CPAP level. Storage Humidity 0 to 95% non-condensing 36. Continuous oxygen monitoring is required for patient safety. On / Standby This button toggles between the following conditions: Standby (if attached to external power, the battery is being charged) Setting (allows setting of control parameters) On (enables ventilation) Standby Standby: The HT50 is dormant and ventilation is not enabled. Adjust the set target airway pressure by pressing the ▲Up/▼Down controls while the LED and numerical display are blinking. THEORY OF OPERATION • General System Overview • A/CMV Mode (Assist/Control Mandatory Ventilation) • SIMV Mode (Synchronized Intermittent Mandatory Ventilation) • SPONT Mode (Spontaneous Ventilation) • P support (Pressure Support) • Pressure Control Ventilation • Volume Control Ventilation • Back-Up Ventilation (4)ii OPRHT50NA B0908 • Introduction • Assembling the Ventilator • Ventilator Set Up Procedure with Exhalation Valve Calibration • Patient Set Up Procedure • Built-in Humidifier (model HT50-H, HT50-HB) • Air / Oxygen Entrainment Mixer (Optional Accessory) • Oxygen Blending Bag Kit (Optional Accessory) Section 6 . The value continuously changes when the ▲Up/▼Down controls are pressed and held. 2-7 Air / Oxygen Entrainment Mixer Specifications .



Switching from Volume Control to Pressure Control: Press the Pressure Control button. NOTE: Additional information intended to avoid inconveniences during operation. You should use an external power source. The design of the HT50 ventilator, the Operating and Service manuals, and the labeling on the ventilator take into consideration that the purchase and use of the equipment is restricted to trained professionals, and that certain inherent characteristics of the ventilator are known to the operator. ForumsDocumentsVideosNews Full text (1)NEWPORT HT50 VENTILATOR Operating Manual OPRHT50NA Rev.



(29)If the HT50 is in Setting condition, changes are made by pressing the requested MODE button once. See Theory of Operation pg 4-4 for more details. Minute Volume Alarm is activated when the delivered inspiratory minute volume exceeds the High ▲ V• Ialarm setting. Weight 16.7 lbs. The HT50 is suitable for use in hospital, sub-acute, emergency room, home care environments as well as for transport and emergency response applications. A green LED indicates which operational mode is active. Defects caused by misuse, mishandling, tampering, or by modifications not authorized by Newport Medical Instruments, Inc. It is also referred to as base or baseline pressure.
The HT50 front panel is shown in Figure 3-1 on pg 3-3. The primary internal battery should be replaced every 12 months or sooner if the use time no longer meets the needs of the user. Observe all of the WARNINGSand Cautionsposted in this manual and on labels found on the HT50 Ventilator and associated accessories. . Switching from Pressure Control to Volume Control: Press the Volume Control button. The new limit can be retained by (1) pressing the selected button again to accept the alarm setting, (2) selecting another parameter for adjustment, or (3) allowing five seconds to elapse without adjustment. Make certain the power cord ferrite is always attached to the A.C. power cord to ensure that the HT50 meets EMC requirements. The buyer shall not be entitled to make liability recoveries from NEWPORTdue to such situations. Humidifier On Green LED indicates humidifier is active. The value in the adjacent display window will blink. I:E Ratio (inspiratory time to expiratory time) Range: 1:99 to 3:1 I:E Ratio shares a numeric display window with V• . When PEEP/CPAP is set above 0, the ventilator mode is CPAP (without P support) or Bilevel Positive Airway Pressure (with P support). (NEWPORT) is subject to and limited to the exclusive terms and conditions as set forth herein. Notes also indicate important procedures to be followed. NOTE: In SPONT mode the ▼Paw alarm is inactive but the value can be preset. Newport retains the discretion to select the most suitable of these options. SIMV (Synchronized Intermittent Mandatory Ventilation) In SIMV, the user may choose to pressure or volume control mandatory breaths. The On/Standby indicator is not lit. An audible beep sounds and the LED is extinguished. The blue area indicates medium to full battery charge. 2-2 Hardware Requirements . During this time, the HT50 performs a self test and will light all displays on the front panel.



If the requested MODE button is not pressed within 5 seconds, the change is cancelled. For an indepth description, please review FRONT PANEL CONTROLS AND INDICATORS. SIMV Green LED indicates that SIMV mode is active. Set Ptrig as close to 0.0 cmH2O as possible without autotriggering to maximize triggering synchrony. NOTE: Manual Inflation is only available in A/CMV and SIMV modes. When temperature adjustment is complete and (1) five seconds have elapsed without touching the control, (2) the Humidifier On button is pressed again, or (3) another parameter is selected for adjustment, the display stops blinking and the measured temperature is displayed. Pressing a parameter button without pressing either the ▲Up or ▼Down control button within 5 seconds causes the parameter to retain its current value. Tel: +32.2.732.59.54 Fax:+32.2.732.60.03 email:mail@obelis.net (14)OPRHT50NA B0908 Intended Use .

I:E LED is illuminated green when I:E Ratio is displayed. Ventilation is continued during the alarm condition, using the pressure measurement of the internal sensing line.

The same LED that blinks during Low ▼Paw violations blinks when this alarm is activated. Enabling/Disabling Auto Panel Lock Auto Panel Lock can be enabled or disabled via User Set Up (see pg 3-27). In either case, all mandatory breaths delivered to the patient, whether time (ventilator initiated) or patient-triggered, are the same. Newport is not responsible for deterioration, wear, or abuse. (On-Setting/LED off) Press again to begin ventilating (On-Ventilating/LED on). When 30seconds have elapsed without pressing any buttons, the Auto Lock is automatically activated again. Operates at 19,200 baud. NOTE: In SPONT mode, the Pressure Control is not utilized but the value can be preset. If the LED does not light, check all power connections and resolve any problems. LED blinks yellow to indicate humidifier alarm condition. In all cases, Newport will not be liable beyond the original selling price. Miscellaneous Description 29. tI (inspiratory time) Range: 0.1 to 3.0 sec The tI setting determines the inspiratory time for mandatory breaths (volume or pressure control). 3-5 Front Panel Alarms . ƒ(Frequency) 1 to 99 b/min 7. The LED on the selected Mode will blink green and the Message Display Window will read “PRESS AGAIN.” Press the button again within 5 seconds to confirm the mode change, or the previously selected mode will continue. Internal Battery Test Button and Indicator When the HT50 is powered by the dual internal battery, the LED on this button illuminates. 1-1 Limitation of Liability . Maximum Limited Airway 100 cmH2O (98 mbar) Pressure (Safety Valve) 12. On / Standby Green LED indicates that the HT50 is ventilating. If the inspiratory time setting causes the flow rate to reach the maximum or minimum level of the flow specification, adjustment of tI ceases, a beep sounds, and a setting limitation message appears in the Message Display Window. The HT50 operator is solely responsible for selecting the appropriate level and method of patient monitoring. The following are exceptions to this warranty: 1. If attached to external power, the Ext. Power/ Charging Int.

Note: The transition to a new pressure or volume target may require several breaths. Always use appropriate monitors to ensure sufficient oxygenation and ventilation (such as pulse oximeter and/or capnograph) when the HT50 Ventilator is in use on a patient. (39)▲ V•I(High Insp. Push to Unlock Button and Auto Lock Indicator Auto Panel Lock can be enabled or disabled via User Set Up (see pg 3-29). Press and hold the Push to Unlock button for at least one second to unlock the panel and enable the activation of all touch buttons for adjustment. Monitored Information:The ▲Up/▼Down controls are used to access and display monitoring messages in the Message Display Window. NOTE: The Low ▼Paw Alarm does not function in SPONT mode. Press the ▲Up control to increase or the ▼Down to decrease the affected parameter value. Allows Alarm Output put for interfacing with central alarms systems. Specifically, the HT50 is applicable for adult and pediatric (i.e. infant, child and adolescent) patients, greater than or equal to 10 kg or 22 lbs., who require the following general types of ventilatory support, as prescribed by an attending physician: positive pressure ventilation with assist/control, SIMV and SPONT modes of ventilation. Select the desired parameter by pressing its touch button once. 12 A 26. 3-27 (24)FRONT PANEL OVERVIEW The following is an overview of the HT50 front panel button functions. HT50 HELP GUIDE (5)OPRHT50NA B0908 Operator’s Responsibility for Patient Safety . With its patented, self-contained gas supply source, the HT50 requires no external air compressor. Service: Measures required to maintain a specified condition. Any breath in progress immediately cycles to exhalation. When the Battery Empty audible alarm sounds continuously, only a limited time of internal battery power remains and an alternate power source should be found immediately. WARNING The Insp. Back-up Ventilation is functional in all modes. In the Setting condition, the displayed temperature is the measured temperature at the humidifier bottle outlet. Pressure Control PEEP +5 to 60 cmH2O / mbar (Target Pressure) 4. RS-232C Interface /Remote 8 pin SEMCONN connector. Always use the A.C. power cord supplied with the HT50. Device Alert Red LED indicates ventilator malfunction alert. Instructions, warnings and caution statements are therefore limited to the specifics of the Newport HT50. On: Pressing the On/Standby button once more changes the ventilator from Setting to On. In the On condition, the HT50 is ventilating and the On/Standby indicator is lit green. The alarm violation is cancelled when one mandatory breath is delivered without a ▼Paw alarm violation. DESCRIPTION OF CONTROLS, INDICATORS, ALARMS & CONNECTORS • Front Panel Overview • Front Panel Controls & Indicators • Front Panel Alarms • Front Panel Message Display Window • Left Side Connectors • Right Side Connectors • Optional Accessories • User Set Up Section 4 . NOTE: See pg. On Condition: A/CMV or SIMV Select—Adjust (▲Up / ▼Down)—Accept Select the Pressure Control or Volume Control button. Operating Temperature –18ºC to 50ºC NOTE: For proper operation at low range temperatures (-18°C), the HT50 must be started in a normal room temperature environment and allowed to run for 30 minutes prior to transfer to colder environment. (38)▲Paw (High Pressure) Alarm (user adjustable) Audible Alarm: Intermittent beep Visual Alarm: ▲Paw indicator blinks red Message Window: HIGH PRESSURE The High ▲Paw Alarm is activated when airway pressure (Paw) reaches the ▲ Paw alarm limit setting. See User Set Up on pg 3-27 for more details. Volume 1.1 to 50.0 L/min ▼V• I Insp. The internal batteries are warranted for six months. (11)not in use to insure best battery performance. NOTE: The dual internal battery charges whenever the HT50 is connected to an external power source. Always use a clean patient circuit. Monitored information includes volume, frequency, pressure values and operation information.

When the I:E Ratio is inverse, the I:E Ratio indicator illuminates once every breath. Min. Operating Altitude Sea level to 15,000 ft (0 to 4,572 m) There is no altitude limitation when HT50 is operated in a pressurized environment. 1620 Sunflower Ave (13)Phone numbers: Toll-free within the United States: 800.451.3111 Worldwide: 1.714.427.5811 Fax numbers: Main fax: 1.714.427.0489 Technical Service fax: 1.714.427.0572 Website: www.NewportNMI.com / www.ventilators.com Email: Info@NewportNMI.com Department extensions: Customer Service: 282 Technical Service: 500 (24-hour pager activated after Technical Service department hours) Clinical Support: 123 (24-hour pager) Corporate Office Monday through Friday, 8:00 am to 5:00 pm hours: (USA Pacific Time) Technical Service Monday through Friday, 7:00 am to 4:00 pm hours: (USA Pacific Time) HT50s distributed internationally have CE authorization (H, HT50-H1) and are represented by: Obelis, s.a. , 34 Ave de Tervuren, bte 44, B-1040 Brussels, Belgium. CLEANING & MAINTENANCE • Cleaning & Disinfecting • Maintenance • General Warnings Section 7 . While the humidifier is On, the target temperature can be readjusted at any time by pressing the Humidifier On button and using the ▲Up/▼Down controls. To adjust the High or Low V• Ialarm limit, press the ▲ or ▼V • I button. The selected time value is displayed in the window adjacent to the selector button. 3. (12)After servicing an HT50, it must completely pass an Operational Verification Procedure (see Service Manual) before being returned to patient use. Do not open the ventilator or perform service on an open unit while connected to external power. The set tidal volume is displayed in the adjacent window if the HT50 is ventilating. The safe use of the HT50 Ventilator requires a full understanding of its operation and adherence to the manual’s instructions. Any product which proves to be defective in workmanship or material will be replaced, credited, or repaired. 2-8 (15)INTENDED USE This device is intended to provide continuous or intermittent mechanical ventilator support for the care of individuals who require mechanical ventilation. All settings and adjustments in the different ventilation modes must be made in accordance with a physician’s prescribed therapy. The target pressure is the set P support plus the PEEP level. To verify the exhaled minute volume, use a separate exhaled volume monitor.

Current pricing for scheduled maintenance and labor rates can be found in Newport Medical Instruments Annual Price List.

Clean all external parts of the ventilator prior to servicing. A comprehensive alarm system is built-in to alert the user to violations of set safety limits. Minute Volume Alarm is activated when delivered inspiratory minute volume falls below the Low ▼V• Ialarm limit setting. Humidifier On Button (HT50-H, HT50-HB only) Range: 19ºC to 39ºC This touch button activates the built-in humidifier. High ▲Paw and Low ▼Paw Alarm Control and Display (airway pressure) Range: Paw –10 to 100 cmH2O / 98 mbar High ▲ Paw Alarm 4 to 99 cmH2O / 97 mbar Low ▼Paw Alarm 3 to 98 cmH2O / 96 mbar The ▲ Paw button allows the selection of the high (peak) airway pressure alarm setting. When the green Volume Control LED illuminates, the adjacent window displays the set tidal volume. Blinking LED indicates a breath with an inverse I:E Ratio. During Setting condition, all adjustable LEDs are lit. 1-3 Warnings and Cautions . 16. Otherwise, the ventilator will continue to alarm until the necessary service is performed. Attempts to continue increasing the value after this alert are permitted up to an I:E Ratio of 3:1. Height (includes handle) 10 inches (26 cm) 37. Main Power On Main Power Standby Equipotentiality Refer to Operating Manual Applied Parts Type BF Alarm Setting Audible Alarm Silence/Reset High Alarm Set High Alarm Low Alarm Set Low Alarm | ▲ ▲ (16)SYMBOLS/LABELING TABLE Controls/Alarms/Monitors Range/Selection 1.

Any liability based upon product warranty, whether breach of warranty or otherwise, is limited regardless of any fault attributable to NEWPORTand the nature of the action (including breach of warranty, negligence, and strict liability). See pg 5-10 for more details. The parameter’s numeric display will blink. WARNINGS AND CAUTIONS At all times, strictly follow this Manual. P trig (Sensitivity) –9.9 to 0 cmH2O / mbar, pressure triggering (Patient Effort Indicator LED blinks once each time the airway pressure reaches the P trig setting.) 8. WARRANTY The Newport HT50 Ventilator is guaranteed to be free of defects for a period of two (2) years from date of delivery. ▼Paw (Low Pressure) Alarm (user adjustable) Audible Alarm: Intermittent beep Visual Alarm: ▼Paw indicator blinks red Message Window: LOW PRESSURE The Low ▼Paw Alarm is activated when airway pressure remains below the ▼Paw alarm limit setting for two consecutive mandatory breaths. The label on the inside of the front panel cover door is meant to complement not replace the Operating manual. At high volumes and pressures, the Battery Empty Alarm will occur much sooner after the Battery Low Alarm, than it will at lower volumes and pressures. PEEP/CPAP Range: 0 to 30 cmH2O/mbar The PEEP/CPAP setting establishes airway pressure in the patient circuit during the exhalation phase. 3-24 for a list of setting limitation messages. (optional) Oxygen Blending Bag Kit Specifications Pneumatic Requirements: Oxygen 0-10 L/min (calibrated) Air Atmospheric pressure FIO2 Control: FIO2, indirectly adjusted from 0.21 up to 1.00 via oxygen flow (L/min) WARNING Continuous oxygen monitoring is required for patient safety. HT50 ACCESSORIES • HT50 Parts & Accessories Appendix C . Adjust the tidal volume level by pressing the ▲Up/▼Down controls while the LED and numerical display are blinking. 2-7 Oxygen Blending Bag Kit Specification . Manual Inflation delivers the set flow rate (in Volume Control) or the set target pressure (in Pressure Control), but inspiratory time is controlled by the user. Liquids that get into the ventilator can cause equipment malfunction and damage. NOTE: The value of PEEP/CPAP plus P support cannot exceed 60 cmH2O/mbar. Minute Volume) Alarm Back-up Ventilation (user adjustable) Audible Alarm: Intermittent beep Visual Alarm: ▼V• Iindicator blinks red Message Window: LOW V• i LOW V• i (BUV) (if back-up ventilation is active) The Low Insp. The ƒ (frequency) setting determines the minimum number of time-triggered mandatory breaths delivered each minute. Back-up Ventilation Back-up Ventilation is an alarmed function that activates when the delivered inspiratory minute volume (V• I) falls below the Low▼V • I setting. When the alarm is no longer violated, the indicator latches (stays lit).

FRONT PANEL ALARMS The front panel alarm LED indicators blink when an alarm limit setting is violated. Always ensure that the green Ext. Controls Volume Control Green LED indicates Volume Control ventilation. Turning the HT50 On and Off The On/Standby button toggles between the following conditions: Standby Setting On Standby Press On/Standby button once to go from Standby to Setting. 17. The HT50 does not have a built-in alarm system to notify user of a failure or disconnect of the oxygen source. Pressing the ▲Up button again allows you to scroll through the messages. Repair: Measures required to restore a specified condition.

500 www.NewportNMI.com (2)HT50 Operating Manual OPRHT50NA DATE REVISION PAGES EFFECTED September 2007 A New release, for dual internal battery updates from OPRHT50B rev. Silencing alarms: Press the Silence/Reset button to silence all alarms for 60 seconds.

NOTE: Review the HT50 Operating Manual and Theory of Operation (Section 4 of this manual) before using the ventilator. Battery LED is lit green, indicating that the internal battery is being charged. Cancel a latched indicator by pressing the Silence/Reset button. Preventive Maintenance: Maintenance performed at regular intervals to keep the device in good working condition. Pressing this control button, followed by pressing the ▲Up/▼Down controls, allows the adjustment of the target airway pressure setting. When new and fully charged, the internal battery system provides up to 10 hours of power. The alarm will sound at the new setting. The Panel will relock 30seconds after the last button is pushed. NOTE: In SPONT mode, the Volume Control is not utilized but the value can be preset. Rubber and plastic components and materials are guaranteed to be free of defects at time of delivery. 32. The blinking P trig LED is referred to as the Patient Effort Indicator. NOTE: In Pressure Control ventilation, PEEP/CPAP cannot be set higher than 5 cmH2O/mbar below the set Pressure Control setting.

Each battery use time is different based on your conditions. Any time the active P support control is pressed, P support flow delivery slows to a lower level then it gradually increases to the appropriate level as pressure rise is re-assessed. To Accept the new control and target value you must pressthe desired control button (Volume or Pressure) a second time. LED lights to indicate internal battery system operation and alarms. NOTE: In SPONT mode, the ƒsetting is not utilized but the value can be preset. Changing Default Settings: The ▲Up/▼Down controls are also used in User Set Up to change a set up value.

Pressure Control Green LED indicates Pressure Control ventilation. If a fault is detected in the ventilator and its life support functions are in doubt, immediately discontinue use; use an alternative (10)method of ventilation until the fault has been corrected. I:E Ratio is determined by the ƒand tI settings. See page 4-5 for a complete description of Back-up Ventilation. Changing a Parameter (or Multiple Parameters) Select—Adjust (▲Up / ▼Down)—Accept Select the parameter by pressing the labeled button (i.e. ƒ, P trig, etc). SPONT Green LED indicates that SPONT mode is active. 43. Misc. (30)SPONT (Spontaneous Ventilation) In this mode, all breaths are patient triggered by spontaneous efforts.

The numbers on the Paw meter do not reflect the percent of charge. To restart the humidifier, correct the alarm condition and press the Humidifier On button. If patient effort doesn’t cause airway pressure to drop enough to meet the P trig threshold or if the patient doesn’t breathe, the HT50 will deliver the set ƒ (frequency) of mandatory breaths each minute. All touch buttons (except Silence/Reset and Internal Battery Test) are locked, preventing accidental parameter changes. 1-7 Contact Information . 3-26 User Set Up . Defective material or equipment must be returned to NEWPORT or its authorized representative. Setup (Technical set up, refer to Service Manual) 23. Patient safety may be achieved through a wide variety of means such as electronic surveillance of equipment performance and patient condition. Representatives of Newport are not authorized to modify the terms of this warranty. See pgs 20 and 3-21 for more details. QUICK CHECK PROCEDURE • Introduction • Set Up • Standard Test Settings • Quick Check Procedure • Pass / Fail Check Off Sheet • Abbreviated Check Procedure Appendix B . Frequent deep discharge of the internal battery system will decrease the amount of time the HT50 will operate on battery power from a full charge state. or Copy Newport HT50 Operator's Manual Extended embed settings 2-5 Humidifier Specifications . Battery button is pressed.

3-23 Left Side Connectors. The Message Display Window shows “Press ON to Vent,” suggesting that the On/Standby button needs to be pressed if you want the HT50 to start ventilation. If successful, ventilation will continue, but in an alarmed state. Front Panel Indicators Modes A/CMV Green LED indicates that A/CMV mode is active.

The user is alerted to tI settings which result in an inverse I:E Ratio by an audible beep and an “Inverse I:E” message in the Message Display Window. Target pressure is referenced to ambient (atmospheric pressure).

Unlike A/CMV, the ƒ (frequency) setting in this mode determines the total rather than the minimum number of time (ventilator) or patient triggered mandatory breaths delivered each minute.

30. NOTE: If in the On condition and switching between Volume Control and Pressure Control, the value adjustment for the new breath type selected (Volume or Pressure) will be accepted as noted above, but the breath type (VC or PC) will only change if the user presses the new breath type control button again. Newport Medical does not approve of the use of any type or brand of exhalation valve that has not been tested and approved by Newport Medical for use with the HT50. These alarms indicate that an alternate source of ventilation must be utilized. When the battery system is completely discharged, the LED blinks red. Displays the calculated flow delivered from the ventilator during volume controlled mandatory breaths. Failure to identify and correct alarm violations may result in patient injury. A specific written care plan must be established by the attending physician. TYPING CONVENTIONS Within the text of this manual, controls, alarms, and indicators are designated by the labeling name as they appear on the ventilator, e.g.: P support (pressure support), P trig (pressure trigger), and SPONT (spontaneous mode).

TROUBLESHOOTING • Introduction • Table 7-1 Alarms • Table 7-2 Built-in Humidifier • Table 7-3 General / Clinical • Table 7-4 Setting Limitation Messages Appendix A . The On/Standby indicator is not lit. Once the violation is no longer in effect, the indicators latch (remain steadily lit) until they are reset by pressing the Silence/Reset button. If the HT50 is unsuccessful in relieving circuit pressure, additional breaths will not be delivered unless airway pressure falls to within 15 cmH2O/mbar of (41)WARNING Any time a Device Alert violation occurs along with the message “OCCLUSION,” an alternate method of ventilation should be provided for the patient as soon as possible so that the cause of the violation can be adequately and safely investigated. To ensure complete protection under this warranty, the Warranty Registration Card must be returned to Newport within ten (10) days of equipment receipt. I:E Ratio does not function during SPONT mode. NOTE: If the Ptrig setting is not adjusted to a level that allows the patient’s inspiratory effort to be detected, A/CMV mode performs as CMV (control) mode. Contact Information Address: Newport Medical Instruments, Inc. Operating Pressure 600 to 1,100 mbar 33. However, there is no guarantee that interference will not occur in a particular installation. A yellow LED indicates the internal battery system is in use. Indicators Silence / Reset Yellow LED indicates that the audible alarm is silenced for 60 seconds. Application of this warranty is subject to the following conditions: 1. An authorized Newport Medical Instruments factory-trained technician must do all service or repairs performed on the HT50. Low Baseline Pressure Alarm (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▼Paw/Apnea indicator blinks red Message Window: LOW Pbase The Low Baseline Pressure (Low Pbase) Alarm is activated by an unstable baseline (leak in the breathing circuit) or by a baseline decrease since the last PEEP/CPAP control change. High▲ V•I and Low ▼ V•I Alarm Control and Display (inspiratory minute volume) Range: V• I 0 to 99.0 L/min High ▲ V• IAlarm 1.1 to 50.0 L/min Low ▼V• IAlarm 0.1 to 49.0 L/min This window displays the inspiratory minute volume (in liters) and is automatically updated every 10 seconds. Battery Button & Indicator Pressing button displays the internal battery charge level in the airway pressure meter (Paw) window. A/CMV (Assist / Control Mandatory Ventilation) In A/CMV, the user may choose to pressure or volume control mandatory breaths.

2-5 Miscellaneous Specifications . Red LED indicates power switchover to internal battery. Ensure that the oxygen source is not empty before and during the use of the optional Air/Oxygen Entrainment Mixer or Oxygen Blending Bag Kit. The set PEEP/CPAP value is displayed in the adjacent window. NEWPORTshall not be liable for any special incidental or consequential damages incurred by the buyer to a third party. The alarm violation is cancelled when Paw falls below the Paw alarm limit setting and at least one second has elapsed since the alarm was activated. When the green Pressure Control LED illuminates, the adjacent window displays the set airway pressure. The user is alerted to frequency settings which result in an inverse I:E Ratio by an audible beep and an “Inverse I:E” message in the Message Display Window. Minute Volume Alarms are based on the delivered volume from the ventilator. When the HT50 is used for transport applications, ensure that the internal battery system is fully charged prior to use. The expressed warranties are in lieu of all other warranties, expressed or implied, including, without limitation, warranties of merchantability, fitness for any purpose, or noninfringement. D - 2-2, 2-3, 2-4, 2-5, 2-6, 3-12, 3-13, 6-8, 7-2, 7-3, 7-7, A-7 September 2008 B Updated to include additional dual internal battery data, update intended use statement, refine cleaning and sterilization section (3)OPRHT50NA B0908 Section 1 . The P trig setting determines the airway pressure threshold that patient effort must reach to trigger additional mandatory breaths. The HT50 does not have a built-in alarm system to notify user of a failure or disconnection of the oxygen source. The P trig setting determines the airway pressure threshold that patient effort must reach to trigger mandatory breaths and also to trigger spontaneous breaths in between mandatory breaths.

If patient effort doesn’t cause airway pressure to drop enough to meet the Ptrig threshold, or if the patient doesn’t breathe, the HT50 will deliver the set ƒ (frequency) of mandatory breaths. The numbers on the Paw meter do not reflect the percent of charge. (NEWPORT) disclaims all liability for the consequences of product alterations or modifications, as well as for the consequences which might result from the combination of this ventilator with other products, whether supplied by Newport or by other manufacturers, unless such a combination has been specifically endorsed by Newport. 27. Caution Possibility of equipment damage if disregarded. Regulatory and Agency Complies with the following international standards & requirements: Standards/Requirements IEC 60601-1:1988(+A1:1991 +A2:1995; EN 60601-1:1990 +A1:1993 +A2:1995 +A3:1996) Medical Electrical Equipment – Part 1: General Requirements for Safety (20)Enclosures (IP Code) MIL-STD-810EEnvironmental Test Methods and Engineering Guidelines IEC 601-2-12:1988Particular Requirements for the Safety of Lung Ventilators for Medical Use IEC 60601-1-2:2001 (+A1:2006) Medical Electrical Equipment, Collateral Standard: Electromagnetic Compatibility – Requirements and Tests IEC 68-2-6Test Fc Environmental Tests: Vibration (sinusoidal) IEC 68-2-29Test Eb Environmental Tests: Bump IEC 68-2-32Test Ed Environmental Tests: Free Fall IEC 68-2-36Test Fdb Environmental Tests: Random Vibration ISO 8185:1997Humidifiers for Medical Use: General Requirements for Humidification Systems ASTM F 1100-90:1990Standard Specifications for Ventilators Intended for Critical Care Use ASTM F 1246-91:1991Standard Specifications for Electrically Powered Home Care Ventilators – Part 1: Positive-Pressure Ventilators and Ventilator Circuits DO-160DEnvironmental Conditions and Test Procedures for Airborne Equipment 34. I:E Green LED indicates that the I:E Ratio is displayed in the V• / I:E Ratio numeric window display. The LED on the selected Mode will light green to confirm the selection. The ƒ (frequency) setting also establishes a timing window which determines whether a patient trigger results in a mandatory breath or a spontaneous breath. Pressing the Manual Inflation button will not initiate an inflation if the patient is currently in the inspiratory phase of a breath or if airway pressure is > 5 cmH2O (mbar) above the set PEEP/CPAP level. When the HT50 is used in home care and sub acute environments it is important that the primary caregiver has received training and has demonstrated competency in all equipment functions. Pressing this button allows the Int. As the battery ages the Battery Low alarm will occur sooner. When the HT50 is ventilating, and there are no alarm messages displayed on the Message Display Window, press the ▲Up control button to access the monitoring information. When a breathing circuit occlusion occurs, the ventilator will be unable to release the pressure, therefore additional breaths will not be delivered until the condition is corrected. Check Prox Line Alarm (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▼Paw/Apnea indicator blinks red Message Window: CHECK PROX LINE The Check Prox Line Alarm is activated when, during inspiration, the pressure measurement of the proximal pressure sensing line is significantly different from the internal back up pressure sensing line located inside the ventilator. If early cycling off continues, re evaluate the breathing circuit configuration and lengthen the tubing as necessary. 1-3 Factory Maintenance or Repair . ALARMS Indicators Indicators for violated alarms blink red. When the Auto Panel Lock is enabled, the Panel will lock 30seconds after the last button is pushed and the LED lights green. (26)Figure 3-1 HT50 Ventilator Front Panel (model HT50-H1, HT50-H1B) (27)(28)FRONT PANEL CONTROLS & INDICATORS Front panel controls that have corresponding LED indicators are included with the description of the control. NEWPORTcannot warrant or endorse the safe performance of third party humidifiers for use with the HT50. Manual Inflation 3 sec maximum (While button is pushed, the ventilator closes the exhalation valve and delivers a operator controlled breath to the patient.) 13.

Apnea Alarm (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▼Paw/Apnea indicator blinks red Message Window: APNEA The Apnea Alarm is activated when no mandatory breaths or detected spontaneous efforts occur for 30 seconds.

Battery (Push to Test) Yellow LED indicates internal battery is in use. Do not discard them in an incinerator or force them open. Perform an exhalation valve calibration each time a clean circuit/exhalation valve is installed. After the first press, the Message Display Window reads “PRESS AGAIN” and the requested MODE’s indicator starts to blink.

Setting: Pressing the On/Standby button once changes the ventilator from Standby to Setting condition.

Test the HT50 dual internal battery periodically to verify that the charge level is in the blue area. A Low Pbase violation occurs in all modes when airway pressure remains ≥ 3 cmH2O/mbar below baseline for 3 seconds. V• (Flow) 6 to 100 L/min 5.

Accept the value by either pressing the selected button again; or by pressing another button to select a new parameter for adjustment, or by waiting 5 seconds without making a change. If the needle is in the red when the test button is presed the battery charge is low. Use the ▲Up/▼Down controls to adjust the displayed alarm limit value. Alarm Silence/Reset Button Pressing button silences an audible alarm violation for 60 & Indicator seconds and resets a latched alarm indicator. 1-2 Warranty . Use only when operating on the internal battery system for accurate reading. ▲V•I (High Insp. The flow resistance of the air inlet filter, located on the right side of ventilator, is likely to increase with repeated use. P trig (sensitivity) Range: 0.0 to –9.9 cmH2O/mbar The P trig setting determines trigger sensitivity in terms of how far airway pressure must drop below the set baseline pressure for a patient’s spontaneous efforts to be detected.

Do not use electrically conductive patient circuits.

Water in the oxygen supply can cause equipment malfunction and damage. (33)NOTE: The minimum target airway pressure is 5 cmH2O / mbar above set baseline pressure. This will depend on a number of factors including settings and usage patterns.

▲ Up and ▼ Down Control The ▲Up/▼Down control buttons have multiple uses on the HT50. (40)High Baseline Pressure Alarm (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▲Paw indicator blinks red Message Window: HIGH Pbase The High Baseline Pressure (High Pbase) alarm is activated when airway pressure is above the Low ▼Paw alarm limit setting at the beginning of a time activated mandatory breath. Adjust the numeric value with the ▲Up / ▼Down buttons. Volume) Red LED indicates high inspiratory minute volume alarm limit is violated. The equipment is only to be used for the purpose specified under “Intended Use” (see (9)Section 2). I:E Ratio 1:99 to 3:1 11.

Patient Range Adult - Pediatric (i.e. infant, child & adolescent) with body weight >10 kg 41. Batteries contain materials that can harm the environment. Cautions Only use medical grade oxygen with the Air/Oxygen Entrainment Mixer or Oxygen Blending Bag Kit. Charge the internal battery system for a minimum of 8 hours before powering the ventilator from the internal batteries. Caution Federal law restricts this device to sale by or on the order of a physician. (35)NOTE: The humidifier is operational only when the HT50 is powered by external A.C. power. This equipment has been tested and found to comply with the EMC limits for the Medical Device Directive 93/42/EEC (EN55011 Class A and EN 60601-1-2). Adjust the blinking target value for the selected control with the ▲Up / ▼Down buttons. Press the Silence/ Reset button again to cancel the silence period. 1. Int. PEEP/CPAP 0 to 30 cmH2O / mbar 9. Ensure that the filter is changed regularly.

Use the ▲Up/▼Down controls to adjust the displayed alarm setting value. FIO2 0.21 to 1.00 (with optional accessories) 19. DEFINITIONS WARNING Possibility of personal injury, to patient or others, if disregarded. ▼Paw (Low Pressure) / Apnea Red LED indicates low peak airway pressure, low baseline pressure, apnea, or PCV (50% of PCV setting not achieved) alarm violation. On Condition Press the A/CMV, SIMV or SPONT button. 1-2 Definitions. The value in the adjacent display window will blink. airway pressure 30 cmH2O/mbar, Power Save mode ON. On: Enables ventilation NOTE: There is approximately a two second delay in going from Standby to Setting condition. Storage Temperature –40ºC to 65ºC 35. ▼V• I (Low Insp. Pressure Control (target pressure) Range:5 to 60 cmH2O / mbar NOTE: When Pressure Control is first initiated or the setting is changed, the first few breaths may cycle off early until slope/rise is optimized. NOTE: The measured proximal temperature may be different from the set target temperature due to the environmental temperature, minute volume, patient temperature, etc. HT50 operators must recognize their responsibility for implementing safety monitoring mechanisms which supply appropriate information on equipment performance and patient condition. Depth 8 inches (20 cm) 39.

Contact NEWPORTTechnical Service Department immediately. V• (mandatory flow) Range: 6 to 100 L/min V• shares a numeric display window with I:E Ratio. A blinking yellow LED indicates low power. tI(Inspiratory Time) 0.1 to 3.0 sec 6. Pressing this control button, followed by pressing the ▲Up/▼Down controls, allows the adjustment of the tidal volume setting.

(37)NOTE: The Battery Empty Alarm and the Device Alert Alarm can not be silenced permanantly. MODE (Pressure or A/CMV Volume Control) SIMV SPONT 2. Back-up Ventilation ceases when V• I =▼V• I + 10%, at which time ventilation and front panel displays return to user-set values. Volume 0.1 to 49.0 L/min Check Prox Line Prox Paw does not match machine Paw during inspiration Humidifier (5 messages) Humidifier malfunction/disconnection Power Switchover External power to internal battery switchover alert Battery Low Minimum of 30 minutes battery time remains until shutdown Battery Empty Minimum of 15 minutes battery time remains until shutdown NOTE:The time between the Battery Low Alarm violation and the Battery Empty Alarm violation will vary depending on the ventilator load. See Theory of Operation, pg 4-5 for more details. Battery Charge Level to be read in the lower half of the Paw meter window.

Both the LED indicator and target value will blink. NOTE: If the humidifier and/or the temperature probe is removed or malfunctions or if the humidifier bottle is removed prior to turning the humidifier off, the Humidifier On LED changes from green to blinking yellow, an audible alarm sounds and the heater shuts down automatically. Always disconnect the external power supply prior to servicing. It is possible that the condition causing the alarm will self-correct, in which case the alarm is reset. The ventilator is ready for operation only when: a) It is completely assembled, and; b) The Quick Check Procedure, including the Exhalation Valve Calibration (see Appendix A, Operating Manual) or OVP (Service Manual) has been successfully completed. Pressing the On/Standby button twice while in On condition turns the ventilator from On to Standby. This allows the operator to preset and adjust controls prior to ventilation. If in ON condition, changes are made by pressing the requested MODE button twice. Constant attention by qualified medical personnel is recommended whenever a patient is ventilated with the HT50. When the HT50 is ventilating, press two times to put ventilator into Standby/Off condition (LED off). If expiratory time is longer than inspiratory time, the display format is 1:X.X. If expiratory time is shorter than tI, the display format is X.X:1. 1-3 Typing Conventions . Said liability is limited whether arising out of, or related to, the manufacture and sale of goods, their installation, demonstration, sales representation, use, performance, or otherwise. On / Standby Button Press once to put in Setting condition. The ▲ Paw alarm setting must be a value at least 1 above the ▼Paw alarm setting. The ▼Paw button allows the selection of the low peak airway pressure alarm setting.

Factory Maintenance or Repair Scheduled maintenance or repair services are available from the Newport Technical Service Department. The alarm resets when airway pressure falls to within 15 cmH2O/mbar of baseline, at which point breath delivery is resumed. 3-25 Optional Accessories . Setting Condition Press the A/CMV, SIMV or SPONT button.

28. PowerLED lights after connecting the HT50 to an external AC or DC power source (it can take up to two minutes to light). HT50-H, HT50-HB Humidifier Specifications (operates on A.C. power only) Set Target Temperature Range: 19ºC to 39ºC Operating Water Volume: 300 mL Usable Volume of Water Bottle: 265 mL Compliance at Minimum Water Level (Refill Line): 0.5 mL/cmH2O / mbar @ 23ºC Compliance at Maximum Water Level (Full Line): 0.33 mL/cmH2O / mbar @ 23ºC Intended Use: Adult and pediatric patients whose supraglottic airway is or is not bypassed. 21. It also indicates the internal battery charge level when the Int.

Minute Volume) Alarm (user adjustable) Audible Alarm: Intermittent beep Visual Alarm: ▲V• Iindicator blinks red Message Window: HIGH V• i The High Insp. Electrical Applied parts type BF 25. In addition, the user may choose to pressure support the spontaneous breaths in between mandatory breaths. In all cases, the stated minimum times for each alarm will be met, even if the two alarms occur almost simultaneously.

Battery battery is being charged. NOTE: In SPONT mode, the tI setting is not utilized but the value can be preset. To adjust either alarm, press the desired button once. 20. The functioning of this machine may be adversely affected by the operation of equipment, such as high frequency surgical (diathermy) equipment, defibrillators or short-wave therapy equipment in the vicinity.

▼V•I(Low Insp. Occlusion Alarm, Device (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▲Paw indicator blinks red at the high priority rate and Device Alert indicator blinks Message Window: OCCLUSION An Occlusion alarm is activated when airway pressure is above the set PEEP + 15 cmH2O/mbar at 3 seconds after the beginning of expiration, or at the end of expiration, whichever comes first. (36)Internal Battery Charge Level Meter The Int. (19)Hardware Requirements 24. NOTE: At temperatures over 40ºC the charging circuit is disabled and the internal battery does not charge. Auto lock is enabled/disabled in User Set Up. LED lights to indicate panel is locked. 2-1 Controls / Alarms / Monitors . While the display is blinking, use the ▲Up/▼Down controls to adjust the target temperature.

To send your ventilator in for service, see HT50 Service Manual for repackaging and shipping instructions. Toggle Buzzer Volume (alarm loudness) between Loud and Quiet: Press and hold the Silence/Reset button when there are no alarm messages displayed to toggle the alarm audible volume between loud and quiet. (32)If the Volume Control setting causes the flow rate to reach the maximum or minimum level of the flow specification, adjustment of Volume Control ceases, a beep sounds, and a setting limitation message appears in the Message Display Window. The P trig value is displayed in the adjacent window. The V• Iwindow always displays the delivered minute volume, except when the user is in the process of setting either the High or Low V• Ialarm limit. Press again to turn On. Press twice to go from On to Standby. Occlusion Alarm, Circuit (automatic) Audible Alarm: Intermittent beep Visual Alarm: ▲Paw indicator blinks red at the high priority rate Message Window: OCCLUSION An Occlusion alarm is activated when airway pressure is above the set PEEP + 15 cmH2O/mbar at 3 seconds after the beginning of expiration, or at the end of expiration, whichever comes first. When the HT50 is used in homecare environments, proper education and training of the appointed caregiver must be provided prior to the patient leaving the health care facility. The ventilator is a restricted medical device intended for use by qualified, trained personnel under the direction of a physician. If this begins to infringe on the needed battery time, prior to scheduled replacement, the primary internal battery should be replaced. Alarms ▲Paw (High Pressure) 4 to 99 cmH2O / 4 to 99 mbar, must be 1< Low Paw ▼Paw (Low Pressure) 3 to 98 cmH2O / 3 to 98 mbar, limited by ≥ PEEP + 3 and High Paw -1 Low Baseline Pressure Paw < PEEP - 3 cmH2O/mbar for 3 sec during exhalation High Baseline Pressure Paw > PEEP + 8 cmH2O/mbar at onset of a breath or 3 sec after the start of exhalation Occlusion Paw > PEEP + 15 cmH2O/mbar at onset of a breath or 3 sec after start of expiration Apnea 30 sec ± 3 sec PCV Not Reached Paw P < 50% of PCV setting ▲V• I Insp. (7.6 kg) without humidifier 18.0 lbs. Volume Control (Tidal Volume) 100 to 2,200 mL, ATPS, ± 10% 3. Patient Circuit Reusable 22 mm I.D. adult/pediatric circuit with 3/16 inch (4.8 mm) I.D. proximal pressure sensing line, 1/8 inch (3.2 mm) I.D. exhalation valve control drive line, and exhalation valve. 3-24 Right Side Connectors . Warm-Up Time: 30 minutes Gas Leakage: 2 mL/min at airway pressure of 80 cmH2O / mbar Humidifier Output: 33.8 mg/L at a continuous flow of 10 L/min @ 39ºC Maximum Operating Airway Pressure: 100 cmH2O / 98 mbar Maximum Temperature at the Patient Wye That (22) (optional) Air / Oxygen Entrainment Mixer Specifications Pneumatic Requirements: Oxygen 35 to 90 psig (2.4 to 6.2 Bar) full operating range 40 to 70 psig (2.7 to 4.8 Bar) accuracy ± .08 Air Atmospheric pressure FIO2 Control: adjusted continuously from 0.21 to 1.00 WARNING Continuous oxygen monitoring is required for patient safety. The secondary internal battery should be replaced every 24 months. NOTE: The primary internal battery capacity diminishes with age. NOTE: The value of PEEP/CPAP plus P support cannot exceed 60 cmH2O/mbar. NOTE: Auto Panel Lock is factory preset to “Disabled” (off). See Appendix B for circuit configurations and parts list. Pneumatics Gas delivery system requires no external air compressor. See pg 3-23 for more information on the Message Display Window. The battery charge level should only be tested when the HT50 is operating on the dual internal battery. If you use the internal battery system as your primary power source, replace the primary battery as needed to ensure that the battery operation time is sufficient. Both the LED indicator and the target value will blink.

Humidifier (Optional) 19ºC to 39ºC 14. Device Alert (5 messages) Ventilator malfunction: FAULT BAT SYS, OCCLUSION, 10V SHUTDOWN, SYSTEM ERROR or MOTOR FAULT Shut Down Alert On to Standby/Off Shut Down Alert 22. YUMPU automatically turns print PDFs into web optimized ePapers that Google loves. 1620 Sunflower Ave Costa Mesa, CA 92626 USA Tel: 800.451.3111 (US only) +714.427.5811 Fax: +714.427.0489 Customer Service ext. P support (pressure support) Range: 0 to 60 cmH2O/mbar The P support (pressure support) setting determines the target rise/change in pressure during inspiration for patient triggered spontaneous breaths in SIMV and SPONT modes.

If the battery system is completely depleted, it will take approximately 10 hours to fully recharge. (31)ƒ (frequency) Range: 1 to 99 b/min The ƒ(frequency) setting determines the minimum number of time triggered mandatory breaths in the A/CMV mode and the total number of mandatory breaths in the SIMV mode. Testing while plugged into any external power source will give inaccurate readings.

Changing between Pressure Control and Volume Control The Pressure Control and Volume Control buttons function differently when in A/CMV or SIMV in On condition compared to when in SPONT mode in On condition or Settings condition. Newport Medical Instruments, Inc. The actual minute volume in the patient lungs may be significantly different in cases such as circuit leak, disconnection, and pneumothorax. Transport of patients with the HT50 requires that medical staff have a good working knowledge of the ventilator’s use and problem resolution. If the HT50 is ventilating you will need to press the Volume Control button again within 5 seconds following adjustment. LED blinks yellow to indicate Battery Low alarm condition or blinks red to indicate Battery Empty alarm condition. Always replace a blown fuse with one of proper rating for corresponding voltage range. This may be caused by a disconnected, kinked, water-filled proximal sensing line, or a blocked proximal line filter. When the HT50 is operating on battery power, the optional built-in humidifier does not function. B September 2008 Exclusively Distributed by: Newport Medical Instruments, Inc. Please recognize that any life support equipment should have appropriate alternate power sources and means of ventilation readily available in case of a mechanical or system problem. The new setting can be retained by (1) pressing the selected button again to accept the alarm setting, (2) selecting another parameter for adjustment, or (3) allowing five seconds to elapse without adjustment. However, equipment surveillance should not replace direct observation of clinical signs. NOTE: The ▼Paw alarm setting cannot be a value below PEEP/CPAP + 3.

A “PRESS AGAIN” message appears in the Message Display Window. Dual Internal Battery Primary battery: lead acid, 12 VDC, 5 AH Secondary back up battery: nickel metal hydride,12 VDC, 2.1 AH When new and fully charged, the Dual Pacinternal battery supplies power for up to 10 hours of operation at these settings: A/CMV mode, ƒ=15, Volume Control=500 mL, tI=1.0 sec, PEEP=Ø, max. If you need alternative power sources, contact Newport Medical Instruments Inc. When the Occlusion alarm is caused by a malfunction inside the ventilator, the HT50 will attempt to relieve circuit pressure through its redundant safety system.

The frequency or rate value is displayed in the window adjacent to the selector button. The set target airway pressure value is displayed in the adjacent window if the HT50 is ventilating. When the Silence/Reset indicator is illuminated, all alarms are silenced except Device Alert alarm. NOTE: Preheating the humidifier for 30 minutes prior to beginning ventilation will improve the heating performance of the humidifier.