

Section	1	Introduction	2
	2	Warnings and Cautions	4
	3	Specifications	6
	4	Controls, Connectors and Visual Indicators	10
	5	Alarm and Alert Systems	24
	6	Operating Guidelines	29
	7	Accessories	42
	8	Applications	44
	9	Cleaning and Disinfection	51
	10	Preventive Maintenance and Troubleshooting Guide	52
	11	Warranty and Service Contract	58
	12	Index	60

Introduction

▼ Respironics' Noninvasive Extrathoracic Ventilator NEV-100 is a time-cycled, pressure-limited, negative pressure ventilator that is used in a variety of clinical applications. The NEV-100 incorporates a leak compensated, dual microprocessor-based control system designed to meet some of the world's toughest safety standards.

The NEV-100's alarm system is simple, yet comprehensive to warn caregivers to intervene without sounding unnecessary alarms. The NEV-100 is the most versatile extrathoracic ventilator available today, and it incorporates a very simple interface that gives users easy control. The liquid crystal display (LCD) is designed to communicate important information to the user in an easily understood manner.

The state-of-the-art NEV-100 is a combination of the oldest form of mechanical ventilation, negative pressure, and sophisticated technology. It is suitable for home care and clinical use.

Please read this operating manual to become familiar with the NEV-100 before using it on an individual. Be certain to save the box and all packing material to safely transport the NEV-100 in the future.

NOTE: This device has been tested and complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which is 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 antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Introduction

(Continued)

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The information contained in this operating manual as well as software programs to which it relates are protected under copyright law.

Contact your home care provider or Respironics for questions or more information.

PLEASE SAVE THESE INSTRUCTIONS

Unit Disposal

▼ At the end of product life, the NEV-100 must be returned to Respironics, Inc. Dispose of accessories in accordance with local regulations.



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Definitions

IMPORTANT SAFEGUARDS

Throughout this manual the following definitions apply:



This symbol on a medical device means "Attention, consult accompanying documents".



This symbol on a medical device means IEC 601-1 Type BF equipment with floating type applied part and particular protection against electric shock.



Alternating current.



Replace fuse only with fuse of same type and rating.

- **Warning/DANGER:**
A condition that could cause electrocution or injury to a user or operator if instructions are not followed.
- **Cautions:**
A condition that could cause damage to equipment or cause inaccurate function.

Warnings

- ▲ Personnel using and operating the NEV-100 must become familiar with this instruction manual before initial setup and use. Periodically check and maintain the NEV-100 to ensure proper operation.
- ▲ Do not use equipment that does not function correctly or alerts the user to a potential problem (by sounding an alarm) until the problem is corrected.
- ▲ Ensure client safety through the presence of a trained attendant and alternate emergency equipment.
- ▲ Connect the NEV-100 to a grounded outlet only.
- ▲ Do not use the NEV-100 in the presence of flammable anesthetics.
- ▲ Do not remove any covers or panels; there are no user serviceable parts inside the unit. Refer all servicing to authorized personnel.
- ▲ If the NEV-100 comes into contact with water, unplug the unit.

Warnings

(Continued)

- ▲ Do not adjust the unit settings without the direction of your physician. Verify that proper ventilation is occurring each time the machine settings are changed.
- ▲ Unplug the NEV-100 before changing the fuse to avoid electrical shock hazard.
- ▲ Do not place or store the unit where it can fall or be pulled into a tub or sink.
- ▲ Never operate this product if it has a damaged cord or plug, is not working properly, or has been dropped, damaged or immersed in water. Return this product to Respironics for examination and repair.

Cautions

- ▲ Federal law (USA) restricts this device to sale by or on the order of a physician.
- ▲ Replace the fuses on the Back Panel only with fuses of the same type and rating.
- ▲ Performance may be affected at temperatures below 5°C (41°F) and above 40°C (104°F).
- ▲ Store at temperatures above -20°C (-4°F) and below +60°C (140°F).
- ▲ Position the NEV-100 so that the air intake ports on the side panels are not blocked.
- ▲ Turn the unit off when not in use.
- ▲ Keep the cord away from heated surfaces.
- ▲ Close supervision is needed when this product is in use by or near children or invalids.
- ▲ Turn the NEV-100 off and back on once per month to test the power failure alarm.

SECTION 3: SPECIFICATIONS

NOTE: Throughout the NEV-100 Operating Manual, pressures and alarms are referred to as being "above" or "below" other pressures. Above refers to *more negative*, and below means *less negative*.

For example, if an alarm is set from -1 cmH₂O to 1 cmH₂O below the set Negative Pressure and the Negative Pressure is -30 cmH₂O, the alarm is set from -1 cmH₂O to -29 cmH₂O.

This concept is best shown by the bar graph on the Display Screen which raises the pressure line for more negative pressures and lowers the line for less negative pressures. The bar graph is an inverted number line to better demonstrate the pressure capabilities of the NEV-100.

Main Menu Specifications

▼ The following parameters and their ranges are available on the Main Menu:

Mode

Control, Control + Sigh, Assist/Control, Assist/Control + Sigh, Continuous Negative Extrathoracic Pressure (CNEP)

Rate

4 to 60 BPM: 4-39 BPM ± .5, 40-60 BPM ± 2

Negative Pressure

-5 to -100 ± 2 cmH₂O or 5%, whichever is greater

Base Pressure

-30 to +30 ± 2 cmH₂O or 5%, whichever is greater

Inspiratory Time

0.5 to 5.0 seconds

I : E Ratio

1:0.5 to 1:29.1

Sigh Pressure

Set Negative Pressure to -100 cmH₂O—limited to twice set Negative Pressure or 20 cmH₂O above set Negative Pressure, whichever is greater

Sigh Multiples

1, 2, or 3

Sigh Frequency

1 to 20 sigh events per hour

Main Menu Specifications

Low Pressure Alarm

From -1 cmH₂O to 1 cmH₂O below the set Negative Pressure, not below Base Pressure, preset 20 second alarm delay

Standby

ON/OFF

Next Menu

Opens Next Menu display

Next Menu Specifications

▼ The Next Menu display offers these parameters and their ranges:

Print Interval

Five to 120 minutes (5 minute increments)

Print Now

Prints current parameters

Units of Pressure

cmH₂O, kPa, or mbar

Alarm History

Displays the most recent 10 alarm events

Display Brightness

Levels from 1 to 10

Date and Time

User adjustable

Menu Display

ON/OFF (Run Display)

Alarm Volume

Levels 1 to 10

Alarm Pitch

Levels 1 to 10

Remote Alarm

LC, NC or NO *

* LC stands for the Respironics Remote Alarm, NC stands for Normally Closed circuit and NO stands for Normally Open circuit. See Alarm Descriptions for more information.

SECTION 3: SPECIFICATIONS

Main Menu Specifications

(Continued)

Assist Sensitivity

Levels 1 to 10

Main Menu

Return to Main Menu

CNEP Menu Specifications

The CNEP Menu displays these parameters and their corresponding ranges:

Base Pressure

-5 to -30 ± 2 cmH₂O

Low Pressure Alarm

-1 cmH₂O to 1 cmH₂O below the set Base Pressure

Standby

ON/OFF

Next Menu

Opens Next Menu display

Front Panel Visual Indicators

Alarm Bar

Flashes red during alarm conditions.

Sigh

Flashing yellow light indicates a sigh breath is being delivered.

Alarm Silence

Flashing yellow light indicates 30 second alarm silence period is active.

Panel Lock/Unlock

Flashing yellow light indicates panel is unlocked.

AC Indicator

Constant orange light indicates electrical power is connected.

Power Switch

Constant green light indicates the NEV-100 is turned on.

Power Sources

230 VAC

50 Hz; range 198 to 264 VAC

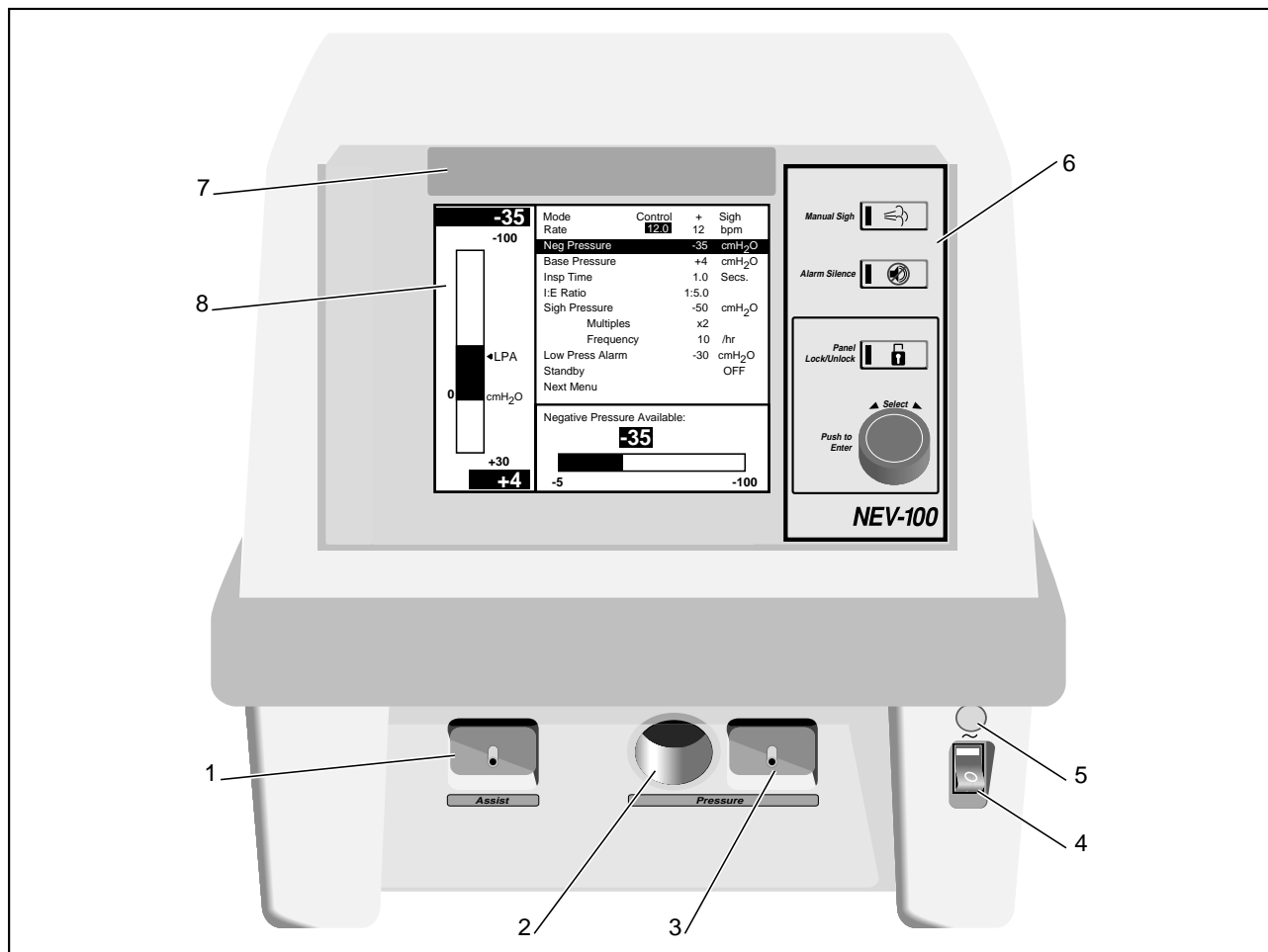
Power Consumption	Amp AC: 2.5 (Maximum) Watts AC: 600 (Maximum)
Fuse Rating	4A, 250V
Printer Output	1200 Baud Rate, 8 Data Bits, 1 Stop Bit, No Parity
Environmental Specifications	Operating 5°C (41°F) to 40°C (104°F); 5% to 95% RH, non-condensing Transport/Storage -20°C (-4°F) to 60°C (140°F); 10% to 100% RH, condensing
Physical Dimensions and Weight	Overall Dimensions 53.3 cm (21 in) x 30.5 cm (12 in) x 30.5 cm (12 in) Weight 14 kg (31 lbs)
EMC	The NEV-100 complies with applicable requirements of IEC 601-1-2.
Electrical	IEC 601-1. Class I, Type BF, ordinary protection against ingress of water.

Alarm and Alert Systems Indicators

	Flashing Alarm Bar	Pulsing Audible Alarm	Alarm Message	Continuous Audible Alarm	Information Message
Low Pressure Alarm	•	•	•		
Excessive Negative Pressure Alarm	•	•	•		
Excessive Base Pressure Alarm	•	•	•		
Inspiratory Pressure Out-of-Range	•	•	•		
Base Pressure Out-of-Range	•	•	•		
CNEP Pressure Out-of-Range	•	•	•		
Power Failure				•	
Internal Failure	•	•	*		
Constant Pressure	•	•	•		
Missing Parameter Warning	•	•	•		
High Internal Temperature	•	•	•		
Low Internal Temperature	•	•	•		
Inverse I:E Ratio Alert					•

* If Possible

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS



Front View

1. **Assist Connector**
Connect a standard nasal cannula to the assist connector if patient initiated breaths are desired.
 2. **Patient Hose Port**
Connect the straight end of patient hose into the patient hose port.
 3. **Pressure Connector**
Connect the 1/8" I.D. tubing from the patient hose connects to the pressure connector to monitor the pressure of the system.
 4. **Power Switch**
The LED power switch turns on or off the NEV-100.*
- * After the NEV-100 has been turned off, the operator must press the Alarm Silence key. This helps prevent inadvertently turning off the NEV-100.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Front View

(Continued)

5. AC Indicator

The AC indicator is lit when AC power is connected to the NEV-100.

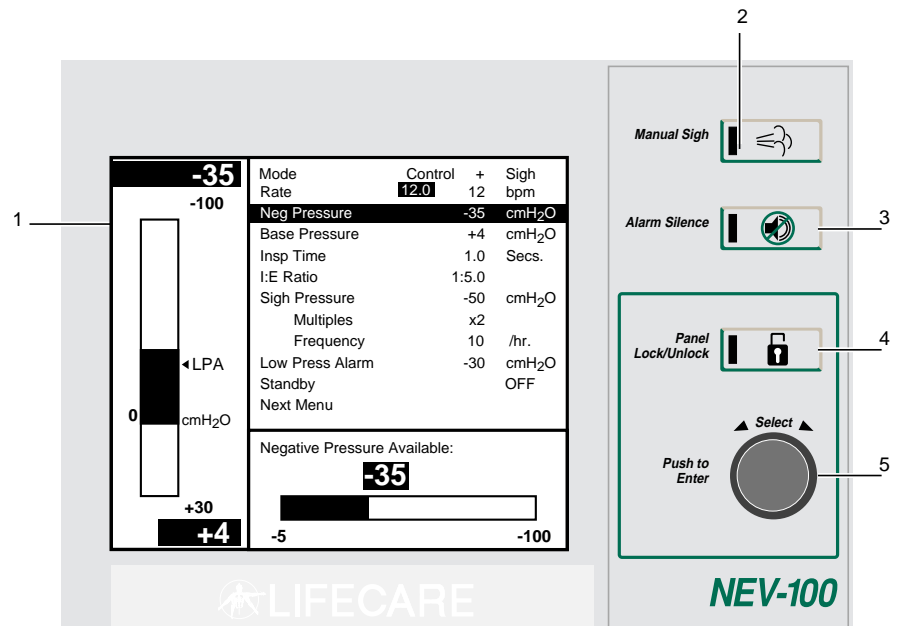
6. Control Panel

7. Alarm Bar

The alarm bar flashes red during alarm conditions.

8. Display

Control Panel



1. Manual Sigh Key and LED

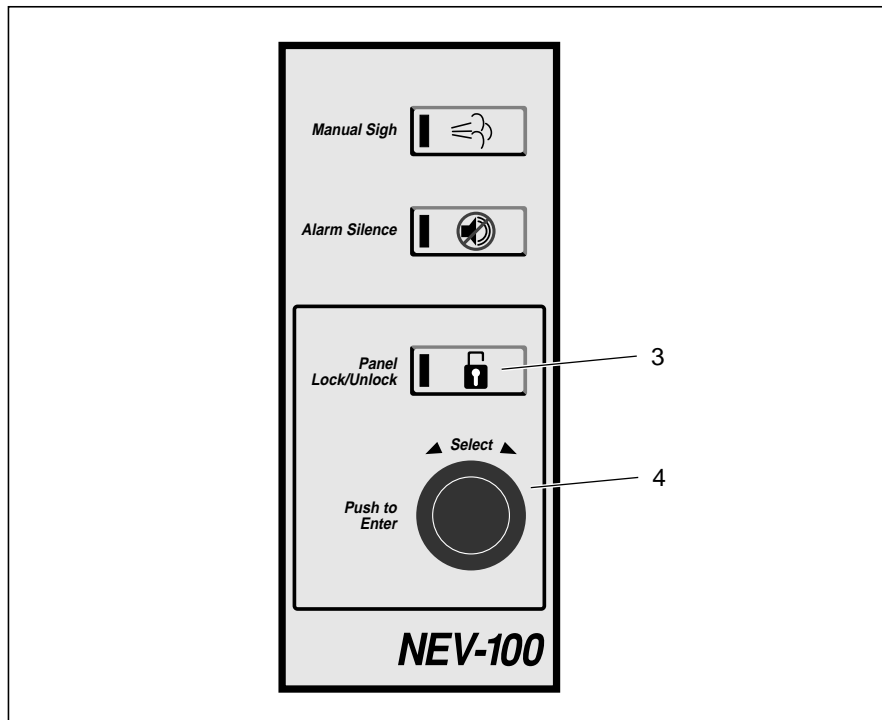
Press the manual sigh key to deliver a sigh breath during all modes except CNEP. A sigh breath is initiated within the next two breaths. The sigh is delivered at the pressure selected on the Main Menu. The LED illuminates during a manual sigh as well as scheduled sighs.

2. Alarm Silence Key and LED

Press the alarm silence key to silence alarms for 30 seconds. The LED flashes during the alarm silence period.

Control Panel

(Continued)



3. Panel Lock/Unlock Key and LED

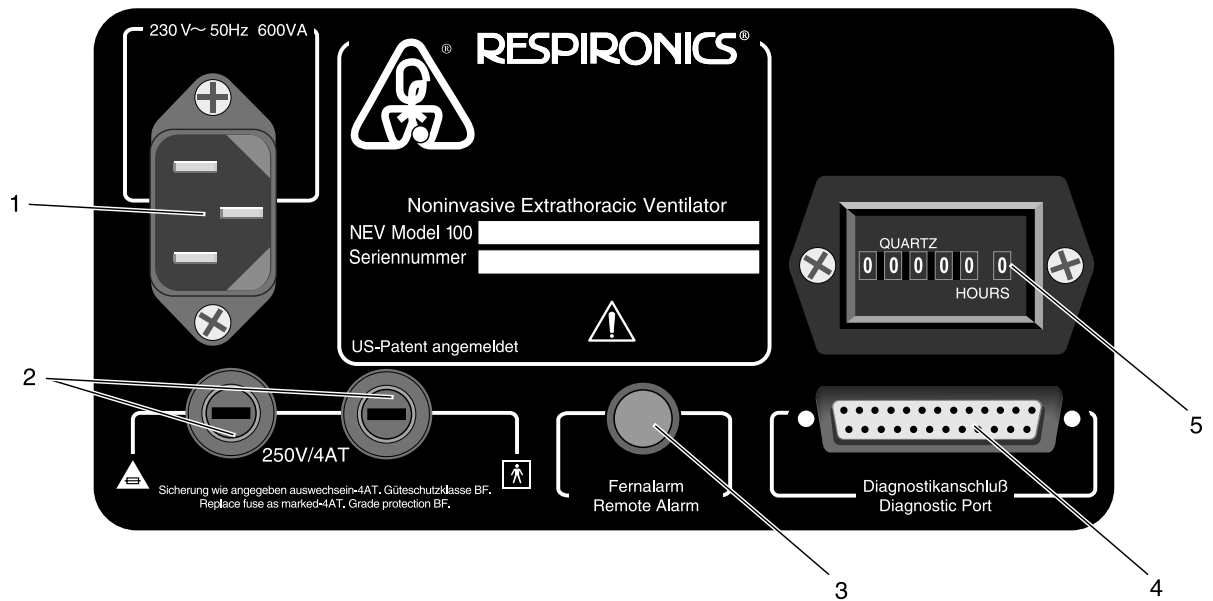
Press the panel lock/unlock key to unlock the panel and access the menus for changes. The panel automatically locks 30 seconds after the Select/Enter knob is last used, or it may be locked immediately by pressing this key again. The LED flashes as long as the panel is unlocked.

4. Select/Enter Knob

The select/enter knob has four functions which are available only when the panel is unlocked.

- a. Rotate the knob to scroll through the parameters to highlight the parameter desired for change.
- b. Press the knob to access the highlighted parameter.
- c. Rotate the knob to scroll through the options for the parameter highlighted in the Menu Section.
- d. Press the knob to enter the new choice for the parameter in the Message Area.

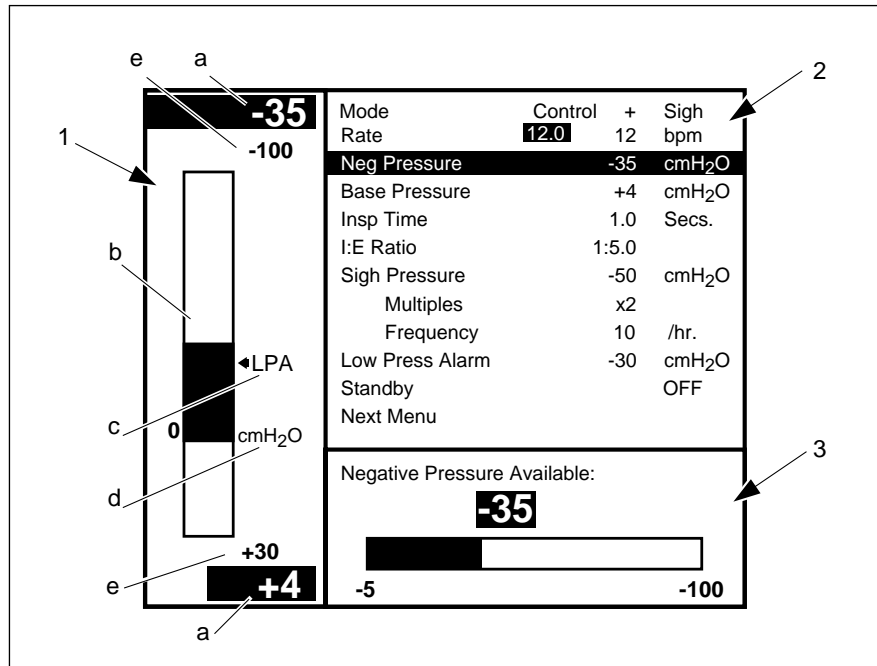
SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS



Back Panel

- 1. Power Cord Receptacle**
Securely connect the power cord to the receptacle.
- 2. Fuse**
Replace the fuse only with the same fuse as indicated on the back panel label.
- 3. Remote Alarm Connector**
Used to connect the Respironics Remote Alarm or hospital central alarm systems to the unit. See Section 5, Alarms and Alerts, for details on connecting the NEV-100 to hospital central alarm systems.
- 4. Diagnostic Port**
Used to connect the NEV-100 to an external printer or computer terminal.
- 5. Hour Meter**
A real time hour meter displays the total number of hours the NEV-100 has been operating.

Display Screen



▼ The display screen is divided into three sections:

1. Pressure Display Area

- a. Numerical display of the peak pressures delivered, or in the case of CNEP mode, the current pressure level.
- b. A dynamic bar graph of the actual pressure.
- c. The position of the Low Pressure Alarm (LPA) setting.
- d. The units of pressure selected.
- e. Constants labeling bar graph pressure range.

2. Menu Display Area

This section displays the menus with the parameter selections. There are 3 menus on the NEV-100—Main Menu, Next Menu, and CNEP Menu.

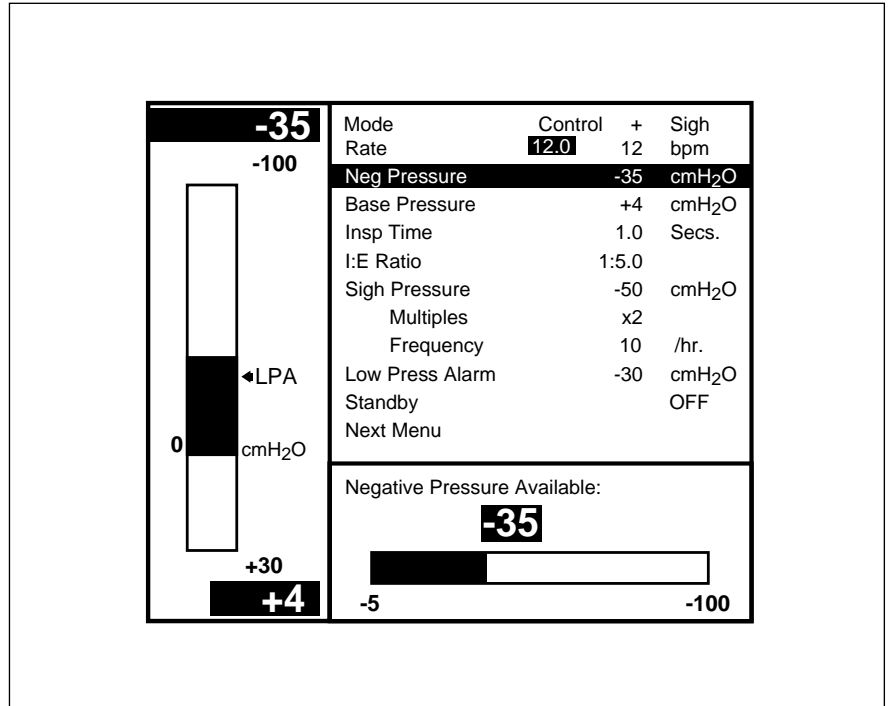
3. Message Area

This section displays available choices for a parameter that has been selected, as well as alarm and alert messages.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Main Menu Options

▼ Below is the *Main Menu* with Negative Pressure selected. The available range for Negative pressure (-5 to -100) is listed in the Message Area. The selected choice (-35) is highlighted. The Pressure Display Area shows the digital peak pressure values (-35 and +4) and a bar graph display of system pressure.



The following items are adjustable on the Main Menu:

Mode

The NEV-100 operates in five different modes: Control, Control + Sigh, Assist/Control, Assist/Control + Sigh, CNEP

Control

All patient breaths are delivered at set respiratory rate, set pressure and set inspiration time or I:E ratio.

Control + Sigh

Control mode with sighs delivered at the pressure selected by user. Sigh multiples and frequency are user adjustable.

Assist/Control

This mode functions the same as Control mode, but the patient is able to initiate additional breaths by making a minimal inspiratory effort through a nasal cannula.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Main Menu Options

(Continued)

Assist/Control + Sigh

This mode permits the user to initiate breaths as in Assist/Control, and sigh breaths are delivered at user adjustable pressures, multiples and frequency.

Continuous Negative Extrathoracic Pressure (CNEP)

This mode permits the user to adjust a continuous negative baseline pressure from -5 to -30 cmH₂O. When this mode is selected, no breaths are cycled by the NEV-100.

Respiratory Rate

The rate control is available from 4 to 60 breaths per minute. This range decreases when a high inspiratory time is selected.

Two rates are listed next to the rate parameter on the menu. The highlighted first number is the actual rate. The set rate is the number on the right. No rate is delivered during CNEP mode.

Negative Pressure

The Negative Pressure is adjustable from -5 to -100 cmH₂O.

The Negative Pressure is the peak negative pressure at which the user is ventilated.

Base Pressure

The Base Pressure is adjustable from -30 to +30 cmH₂O. The absolute value of the Base Pressure cannot exceed 5 cmH₂O below the set Negative Pressure value.

Base Pressure is the peak pressure of the system during expiratory phase. This may be positive, negative or 0 cmH₂O.

Inspiratory Time

Inspiratory Time (Ti) is set from 0.5 to 5.0 seconds. This range is decreased when high respiratory rates are selected.

Ti and I:E Ratio are directly interrelated parameters, so setting the value of one causes the other to be calculated. The parameter that is set last is the controlling parameter.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Main Menu Options

(Continued)

I:E Ratio

I:E Ratio is adjustable from 1:0.5 to 1:29.1. This range may be reduced depending on the other selected parameters.

Inspiratory time to Expiratory time ratio. An inverse I:E ratio may be achieved. A message is displayed in the Message Area stating, "Inverse I:E Ratio selected" and no alarm is activated.

Sigh Pressure

The Sigh Pressure is set between the set Negative Pressure and -100 cmH₂O. It is limited to twice the set Negative Pressure setting or 20 cmH₂O above the set Negative Pressure, whichever is greater.

The NEV-100 delivers set sigh breaths during Control + Sigh and Assist/Control + Sigh modes. The set sigh pressure operates for both manual sigh and scheduled sigh events. The increased inspiratory time for a sigh breath is proportional to the increase in negative pressure. The sigh breath I:E ratio is 1:2.

Sigh Multiples

Sigh Multiples are available in 1, 2 or 3 sigh breaths in a row.

Sigh Multiples determines how many sigh breaths are given in a row each time sigh events are scheduled.

Sigh Frequency

The frequency of sigh multiples delivered is adjustable from 1 to 20 times per hour.

This parameter determines how many times an hour sigh events are delivered.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Main Menu Options

(Continued)

Low Pressure Alarm (LPA)

This alarm is set from -1 cmH₂O to 1 cmH₂O below the regular Negative Pressure setting. If a negative Base Pressure is selected, the LPA range becomes 1 cmH₂O above the Base Pressure setting and 1 cmH₂O below the Negative Pressure setting.

The Low Pressure Alarm (LPA) is the only alarm that must be set. The LPA setting is a point through which the system pressure must pass. If the pressure doesn't cross this point within 20 seconds, the LPA alarms audibly and visibly.

During CNEP mode, the pressure must remain above the LPA setpoint. If the pressure falls below this point for longer than 20 seconds, the LPA alarms audibly and visibly.

Standby

Selecting Standby ON stops the NEV-100 from cycling, but maintains power to the control panel and display screen. This is useful when initially setting up the NEV-100 or when short interruptions in use are desired, such as adjusting a chest shell. The Standby mode remains activated as long as adjustments are being made and reverts to normal operation (Standby OFF) three minutes after the panel becomes locked.

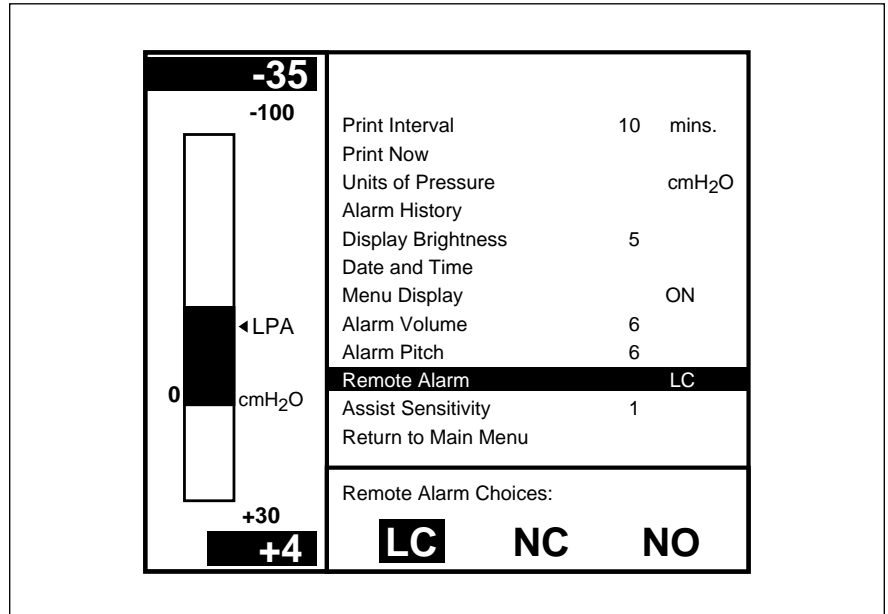
Next Menu

Choosing this parameter brings up the next menu screen for more parameters.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Next Menu Options

▼ Below is the *Next Menu* with the Remote Alarm selected. The available selections for Remote Alarm (LC, NC, NO) are shown in the Message Area with the selected choice (LC) highlighted. The Pressure Display Area shows the digital peak pressure values (-35 and +4) and a bar graph display of system pressure.



The following items are set on the Next Menu screen:

Print Interval

The print interval is set to print every 5 minutes to every 120 minutes, in 5 minute increments.

The frequency of printed messages to a printer or terminal are controlled with this parameter.

Print Now

This option is used when the NEV-100 is connected to a terminal or printer. When this parameter is chosen, the NEV-100 prints the parameter settings immediately, independent of the set print interval. See Section 7, Accessories, for more information.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Next Menu Options

(Continued)

Units of Pressure

The NEV-100 displays pressure in either cmH₂O, kPa or mbar .

Set parameters are displayed in the chosen unit of pressure. The unit of pressure may be changed at any time and the NEV-100 automatically converts the parameter settings to reflect the change.

Alarm History

The alarm history feature chronologically lists the last 10 alarms with the time and date they occur. This information is printed if an external printer is connected.

Display Brightness

This adjusts the LCD backlighting to adapt to various lighting conditions.

Date and Time

Any military time or date. The date and time are stored in the NEV-100 using a real time clock and military time. These values are set by the user.

Menu Display

The Menu Display may be changed to a Run Display which blanks the Menu Display Area on the LCD screen when the panel is locked.

Alarm Volume

Adjust the alarm volume with this parameter.

Alarm Pitch

Adjust the alarm pitch using this parameter.

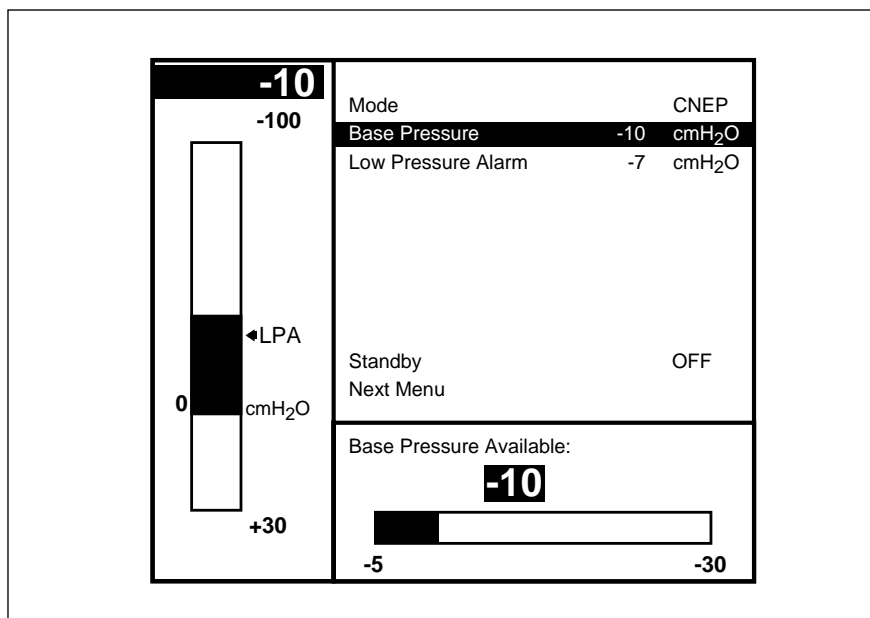
SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

Next Menu Options (Continued)	LC (Respironics), NO (Normally Open), NC (Normally Closed)
Remote Alarm	The Remote Alarm selection allows the user to use the NEV-100 with the Respironics Remote Alarm (LC on the display). The NEV-100 also operates with most hospital central alarm systems using the NO or NC option.
Assist Sensitivity	The Assist Sensitivity parameter controls the triggering level of the Assist Sensor during Assist/Control and Assist/Control + Sigh modes. Breaths are sensed through a nasal cannula.
Return to Main Menu	Choosing this option returns the screen to the Main Menu.

SECTION 4: CONTROLS, CONNECTORS AND VISUAL INDICATORS

CNEP Menu Options

▼ Below is the *CNEP Menu*. The Base Pressure is highlighted. The Message Area shows the range available (-5 and -30) and position of the selected value (-10). The Pressure Display Area shows a digital and bar graph display of system pressure.



In CNEP mode, the operator can adjust the following parameters:

Base Pressure

The Base Pressure is set from -5 cmH₂O to -30 cmH₂O. CNEP mode allows the user to breathe spontaneously at a set negative baseline pressure. This mode is similar to Continuous Positive Airway Pressure in a positive pressure system.

Low Pressure Alarm

The Low Pressure Alarm is adjustable from -1 cmH₂O to 1 cmH₂O below the set Base Pressure. The Low Pressure Alarm (LPA) condition occurs if the Base Pressure drops below the set LPA for 20 seconds.

CNEP Menu Options

(Continued)

Standby

Selecting Standby ON stops the NEV-100 from cycling, but maintains power to the control panel and display screen. This is useful when initially setting up the NEV-100 or when short interruptions in use are desired, such as adjusting a chest shell. The Standby mode will remain activated as long as adjustments are being made and will revert to normal operation (Standby OFF) three minutes after the panel is locked or when Standby is set to OFF.

Next Menu

Choose the Next Menu option to display the *Next Menu* screen.

SECTION 5: ALARM AND ALERT SYSTEMS

Low Pressure Alarm (LPA)

▼ The Low Pressure Alarm is the only alarm the user must set. All other alarms are set automatically. The LPA alerts the user to hose disconnects or excessive leaks.

In all modes except CNEP, this alarm is set from -1 cmH₂O to 1 cmH₂O below the set Negative Pressure. If the Base Pressure is negative, the LPA range becomes 1 cmH₂O above the Base Pressure to 1 cmH₂O below the Negative Pressure.

During CNEP, the LPA is adjustable from -1 cmH₂O to 1 cmH₂O below the set Base Pressure.

NEV-100 monitors the pressure wave and compares it to the LPA point set by the user. If the pressure wave does not cross (up or down) the LPA point within 20 seconds, it alarms. During CNEP, if the pressure remains below the LPA point for 20 seconds, the NEV-100 alarms. The alarm bar flashes red, the pulsing alarm sounds, and the Message Area displays: *Low Pressure Alarm: Check for leaks or disconnects*. Pressing the alarm silence key silences the audible alarm, but the flashing alarm and alarm message continues until the alarm condition is remedied or the panel is unlocked to make parameter adjustments.

If the negative pressure is adjusted to a point where it meets the LPA, the LPA automatically drops to 1 cmH₂O below the set Negative Pressure. If the Base Pressure is adjusted more negative to a point where it meets the LPA, the LPA automatically rises to 1 cmH₂O above the set Base Pressure. This feature prevents most nuisance alarms but may require adjustment according to the specific clinical situation.

Excessive Pressure Alarms

▼ The NEV-100 automatically sets two alarms to guard against excessive base and negative pressures. The NEV-100 has a sophisticated method of assuring that the pressure does not inadvertently rise above the set parameter. These excessive pressure alarms may occur if a large leak around a chest shell, for example, is suddenly corrected and there is no longer a need to compensate for the leak. During the alarm conditions the NEV-100 adjusts the valve to bring the pressure back down and adjusts for the next breath.

The alarm bar flashes and the alarm sounds during excessive pressures. Even after the alarm condition is corrected, the alarm message remains in the Message Area until another alarm message is displayed or the panel is unlocked to make adjustments. The audible portion of these alarms may be silenced by pressing the Alarm Silence key.

Excessive Pressure Alarms

(Continued)

Excessive Negative Pressure Alarm

This alarm setpoint is automatically set at 10 cmH₂O above the negative and sigh pressures. An alarm condition occurs immediately if the negative pressure exceeds the set Negative Pressure by 10 cmH₂O. During this alarm the Message Area displays: *Excessive Negative Pressure*.

Excessive Base Pressure Alarm

During the expiratory phase, this alarm condition occurs if the Base Pressure reaches +10 cmH₂O or 10 cmH₂O more positive than the set Base Pressure, whichever is greater. This alarm condition occurs during CNEP mode if the actual base pressure reaches 10 cmH₂O more negative than the set Base Pressure. During this alarm the Message Area displays: *Excessive Base Pressure*.

Pressure Out of Range Alarms

▼ The NEV-100 automatically compensates for new leaks and higher pressure resulting from fewer leaks, e.g., adjusting a chest shell to create a better seal. The NEV-100 responds to pressure variations by adjusting the blower motor RPM and the aperture of the valve. Pressure Out of Range Alarms occur if the set Negative or Base Pressures cannot be achieved within a given period of time. The alarm sounds, the alarm bar flashes and an alarm message is displayed.

Inspiratory Pressure Out of Range

If the negative pressure cannot be achieved within 3 cmH₂O in two minutes, the Message Area displays: *Inspiratory Pressure Out of Range—Evaluate settings or check for leaks*.

Sigh Pressure Out of Range

An alarm occurs when the set sigh pressure cannot be achieved within 3 cmH₂O in 12 sigh events. The Message Area displays: *Sigh Pressure Out of Range—Evaluate Settings or check for leaks*.

Base Pressure Out of Range

This alarm occurs when the Base Pressure cannot be achieved within 3 cmH₂O in 5 minutes in all modes except CNEP. This alarm occurs in CNEP mode if the Base Pressure cannot be achieved within 3 cmH₂O in 2 minutes. The Message Area reads: *Base Pressure Out of Range—Evaluate settings or check for leaks*.

SECTION 5: ALARM AND ALERT SYSTEMS

Power Failure Alarm

▼ If the power source fails, or power source is inadequate, the power failure alarm sounds continuously. The alarm bar does not illuminate. This alarm can only be silenced by using the alarm silence key. This alarm sounds for at least 20 minutes. Turn off the NEV-100 to avoid a power surge when power is reapplied to the unit. The Power Failure Alarm occurs even if the Alarm Silence key has previously been activated.

Warning: The NEV-100 cannot operate if a loss of AC power occurs. The user must find an alternate means of ventilation.

Constant Pressure Alarms

▼ If the pressure tubing becomes disconnected, or some other circumstance prevents pressure feedback to the NEV-100, it stops trying to compensate within 20 seconds and go into standby. The audible alarm sounds constantly and does not respond to the Alarm Silence key. The alarm bar flashes and an alarm message is displayed in the Message Area. To cancel the alarm, the user must turn off the NEV-100 and then press the Alarm Silence key. The user must then check for secure hose and tubing connections. When the problem is corrected, the user can turn the NEV-100 back on.

Constant Pressure Alarm

In ventilation modes Control, Control + Sigh, Assist, and Assist + Sigh, the Constant Pressure Alarm occurs if the NEV-100 detects less than 2 cmH₂O difference between the average inspiratory and expiratory pressures for 20 seconds. The Message Area displays: *Constant Pressure Level Alarm. Check for leaks or disconnects. Turn off and back on when ready.*

Inadequate Constant Pressure Alarm

In CNEP mode, this alarm occurs if the NEV-100 senses pressure below -3 cmH₂O for 20 seconds. The Message Area displays: *Inadequate Constant Pressure. Check for leaks or disconnects. Turn off and back on when ready.*

Internal Failure Alarm

▼ This alarm activates if an internal system failure is detected. The NEV-100 has sophisticated software to monitor hardware and software failures. If an Internal Failure occurs, the alarm bar flashes, the pulsing audible alarm sounds and the Message Area reads: *Internal Failure- Do Not Use, Call for Service.* If an Internal Failure is severe enough it may not be possible to display any message. The NEV-100 does not operate if an Internal Failure condition occurs.

Missing Parameters Warning

▼ When the NEV-100 is turned on, the set parameters are verified and displayed on the Main Display. If during the diagnostic check the saved parameters cannot be verified, the alarm bar flashes, the pulsing audible alarm sounds and the Message Area reads: *System Settings In Doubt—Enter values for all items*. The unit does not operate and goes into Standby ON. Enter the desired values as described in Section 6.0, Operating Procedure. The unit begins operation when all parameters have been reentered and Standby is OFF.

High Internal Temperature Alarm

▼ If the internal temperature reaches 45°C (113°F), the Message Area reads: *High Internal Temperature Alarm—Check air vents for blockage*. If the air vents are not blocked and the alarm condition remains, the NEV-100 should be turned off immediately and returned for service. The alarm bar will flash and the audible alarm will sound continuously. Inattention to a high temperature alarm could result in internal damage and an internal failure of the NEV-100.

Low Internal Temperature Alarm

▼ If the internal temperature is 5°C (41°F) or below, the Message Area reads: *Low Internal Temperature Alarm* when the unit is going through its self test. The alarm bar flashes, and the alarm sounds continuously.

If this alarm occurs directly after the NEV-100 has been exposed to unusually cold temperatures, it is best to turn off the NEV-100 and wait a few minutes for it to warm up. If the alarm continues after the NEV-100 is turned back on, return the NEV-100 for service.

Warning: During High and Low Internal Temperature Alarm conditions, the NEV-100 may not operate within the specifications listed in this manual. If either of the alarms persist, the operator should return the NEV-100 for servicing.

Inverse I:E Ratio Alert

▼ An inverse I:E ratio may be set as low as 1:0.5. If an inverse ratio is set, the Message Area displays the advisory message: *Inverse I:E Ratio has been selected*. The message is blanked when a different parameter is selected or the panel is locked.

SECTION 5: ALARM AND ALERT SYSTEMS

Remote Alarm Interface

▼ The NEV-100 is designed to accept an optional Respirationics Remote Alarm. The Remote Alarm is connected to the Remote Alarm Connector using a BNC type connector.

This same connector may be used with many types of hospital alarm systems. The user must determine whether the hospital alarm system is a normally open or normally closed system. The Remote or Hospital Central alarm selection may be changed using the Remote Alarm parameter on Next Menu. See 8-j in Section 6, Operating Procedure, to adjust the Remote Alarm selection.

Alarm Interface with Printer or Terminal

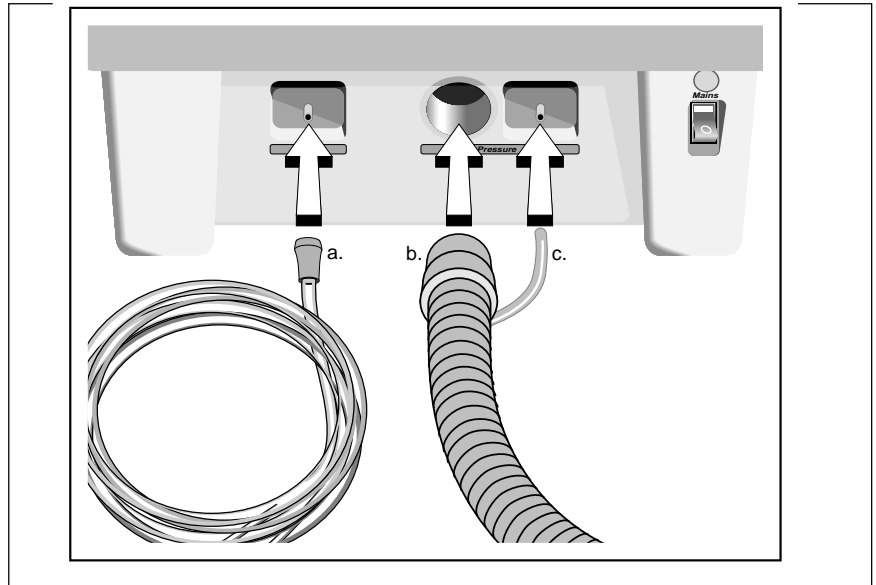
▼ The Alarm History Record stores the last 10 alarm events, beginning with the most recent alarm. The type of alarm, date and time are displayed. This record is accessed on the Next Menu. The operator can either view the alarm history on the screen or on a computer terminal or printout.

Immediately following an alarm occurrence, a printout displays specific information about the alarm, including any numeric data available. Timing of the normal print routine is not altered by alarm occurrences. See Next Menu options for details on accessing the Alarm History Record.

Operation Guidelines

1. Connect Power Source

Connect the power cord to the rear of the NEV-100 and plug it to a 120 VAC power source. The AC power visual indicator illuminates whenever the AC power source is connected.

2. Attach the Hose and Tubing

- a. (Optional) Connect the 3/16" I.D. tubing from a cannula to the Assist Connector to detect patient efforts. This connection is only required in Assist/Control or Assist/Control + Sigh modes.
- b. Attach the straight end of large hose to the NEV-100 Patient Hose Port located in the center of the Front Panel.
- c. Connect the 1/8" I.D. tubing from the proximal pressure line to the Pressure Connector on the Front Panel.

3. Turn on NEV-100

Press the Front Panel Power Switch to turn on the unit. The LCD control screen illuminates and the NEV-100 starts its self test.

Operation Guidelines

(Continued)

4. Diagnostic Self Check on Start-Up

- a. The message *LIFECARE NEV-100* appears on the screen next to the hourglass and magnifying glass symbols to indicate a wait while the NEV-100 is undergoing a diagnostic self test.
- b. The Built in Self Test revision number of the Start-up Software is displayed across the bottom of the screen.
- c. The screen then displays the Operational Software revision number.
- d. Check that the Front Panel visual indicators light sequentially to confirm the integrity of each LED. The two microprocessors then check each other to verify that all software is working accurately.
- e. Users should check that an alarm sounds briefly to verify the successful completion of the self-test and confirm the integrity of the alarm.
- f. The NEV-100 now goes into normal operation.

5. Self-Test Failure

In the event of a NEV-100 Self-test failure, the alarm bar flashes and the pulsing audible alarm sounds.

If possible, the following message is displayed: *Internal Failure—Do not use. Call for service.*

Warning: The NEV-100 does not operate if the self-test fails. Refer the unit to an authorized service center for repair.

6. Missing Parameters Warning

- a. If the NEV-100 parameters in memory cannot be verified, the alarm bar flashes, the pulsing audible alarm sounds and the following appears in the Message Area: *System Settings in Doubt—Enter Values for All Items.*
- b. The NEV-100 does not operate but the display is lit. To silence the warning alarm, the operator must unlock the panel, and reenter all parameters.

7. Set All Parameters on the Main Menu

When the NEV-100 is being used for the first time or adjustments are desired, new parameters must be entered. The following general procedure applies to changing all parameters.

Operation Guidelines

(Continued)

7. Set All Parameters on Main Menu (Continued)

Press the Panel Lock/Unlock key and turn the Select/Enter knob until the desired parameter to change is highlighted. Press the knob to access that parameter, and a range for that parameter is displayed in the Message Area at the bottom of the LCD. Change the parameter by rotating the knob. When the desired value is highlighted in the Message Area, press the knob to enter this value. Other parameters may now be changed using the Select/Enter knob. If no other changes are desired, the panel may be locked by either pressing the Panel Lock/Unlock key or by waiting 30 seconds for the Panel to lock automatically.

a. Switch to Standby ON

If making several setting changes, it is best to make set the unit to Standby ON. When Standby is ON, the NEV-100 does not cycle but power is still directed to the Control Panel and Display Screen. While the user is getting settled, it is also helpful to switch Standby to ON.

To turn Standby to ON, unlock the Panel, and rotate the Select/Enter knob until *Standby* is highlighted. Press the Select/Enter knob. ON and OFF are displayed in the Message Area. Rotate the knob until ON is highlighted. Press the Select/Enter knob to enter Standby ON. The Standby mode remains activated as long as adjustments are being made and reverts to normal operation (Standby OFF) three minutes after the panel becomes locked. Standby may immediately be cancelled by selecting the Standby parameter and changing it to OFF.

b. Select Mode

With the panel unlocked, select the mode by rotating the Select/Enter knob until *Mode* is highlighted. Press the knob. *Control*, *Control + Sigh*, *Assist/Control*, *Assist/Control + Sigh*, and *CNEP* modes are available in the Message Area. To change the mode turn the Select/Enter knob until the desired mode is highlighted. Press the Select/Enter knob to enter this new mode. The message at the bottom of the LCD disappears and the new mode appears on the Main Display.

At this point, if CNEP is entered, a different menu appears on the screen. Please see 9. *Set CNEP Mode Parameters* in this section for more details.

c. Select Rate

There are two numbers next to Rate. The highlighted number on the left is the actual rate, and cannot be set. The number on the right is the set rate. The normal range is 4 to 60 breaths per minute, but the range can vary depending on the other set parameters, such as inspiratory time. Set the rate to a slightly higher frequency than the user's spontaneous respiratory rate.

Operation Guidelines

(Continued)

c. Select Respiratory Rate (Continued)

To set the rate, turn the Select/Enter knob until *Rate* is highlighted. Press the Select/Enter knob. The Message Area displays the available respiratory rate range. Turn the Select/Enter knob until the desired rate is highlighted and press the Select/Enter knob to enter this value.

d. Select Negative Pressure

Negative Pressure settings range from -5 to -100 cmH₂O, adjustable in 1 cmH₂O increments. Before setting the negative pressure, the user's spontaneous tidal volume is determined. Beginning with a low negative pressure, increase the negative pressure until the desired tidal volume is achieved. The tidal volume is measured with a face mask and a hand-held respirometer.

To set a new negative pressure, turn the Select/Enter knob until *Negative Pressure* is highlighted. Press the Select/Enter knob. The Message Area at the bottom of the LCD displays the range of negative pressures available. Turn the Select/Enter knob until the desired pressure is highlighted and press the Select/Enter knob to enter this value.

e. Select Base Pressure

To enter a new value for the Base Pressure, turn the Select/Enter knob until *Base Pressure* is highlighted. Press the Select/Enter knob. The Message Area at the bottom of the LCD displays the range of settings available. The normal range available is -30 to 30 cmH₂O, but the range may vary depending on the set Negative Pressure. The Base Pressure cannot be set within 5 cmH₂O of the set Negative Pressure value. Turn the Select/Enter knob until the desired pressure is highlighted and press the Select/Enter knob to enter this value.

f. Select Inspiratory Time or I:E Ratio

Either the Inspiratory Time or the I:E ratio can be set. Setting the value of one causes the other to be calculated. For example, a Ti cannot be set that results in an I:E ratio less than 1:0.5 or an I:E ratio that results in a Ti beyond the range of 0.5 to 5.0 seconds. The parameter that is set last is the controlling parameter.

Operation Guidelines

(Continued)

f. Select Inspiratory Time or I:E Ratio (Continued)

1) Set Inspiratory Time

Inspiratory time is set from 0.5 to 5.0 seconds in 0.1 second increments. To set a new inspiratory time, rotate the Select/Enter knob until *Inspiratory Time* is highlighted. Press the Select/Enter knob. The Message Area displays the range of settings available. Turn the Select/Enter knob until the desired value is highlighted and press the Select/Enter knob to enter this value.

2) Set I:E Ratio

The I:E Ratio is adjustable from 1:0.5 to 1:29.1. This range may be reduced depending on the other selected parameters. An inverse I:E ratio may be achieved. A message is displayed in the Message Area stating: *Inverse I:E Ratio selected* and no alarm activates.

To enter a new I:E ratio turn the Select/Enter knob until *I:E Ratio* is highlighted. Press the Select/Enter knob. The Message Area displays the range available. Turn the Select/Enter knob until the desired value is highlighted and press the Select/Enter knob to enter this value.

g. Set Sigh Pressure

The set sigh pressure is used for both the manual sigh and scheduled sigh events. The sigh pressure is set between the set Negative Pressure and -100 cmH₂O. The sigh pressure is limited to twice the set Negative Pressure or 20 cmH₂O above the set Negative Pressure, whichever is greater.

To enter a new value for the sigh pressure, turn the Select/Enter knob until *Sigh Pressure* is highlighted. Press the Select/Enter knob. The Message Area displays the range of settings available. Turn the Select/Enter knob until the desired value is highlighted and press the Select/Enter knob to enter this value.

The increased inspiratory time for a sigh breath is proportional to the increase in negative pressure. The sigh breath I:E ratio is 1:2.

NOTE: When a sigh event occurs, there may be “ramp up” breaths prior to the actual sighs. Following a sigh event there may be “ramp down” breaths. The “ramp breaths” will deliver a pressure below the sigh setting, but higher than a normal breath.

SECTION 6: OPERATING GUIDELINES

Operation Guidelines

(Continued)

h. Select Sigh Multiples

Sigh multiples are available in 1, 2, or 3 consecutive sigh breaths.

To enter a new value for the sigh multiple, turn the Select/Enter knob until *Sigh Multiple* is highlighted. Press the Select/Enter knob. The Message Area displays 1, 2 and 3. Turn the Select/Enter knob until the desired multiple is highlighted and press to enter this value.

i. Select Sigh Frequency

The frequency of sigh multiples is adjustable from 1 to 20 times per hour. For example, if Sigh Multiples are set at 2 and Sigh Frequency is set at 10 times an hour, every 6 minutes 2 sighs are given in a row, for a total of 20 sighs an hour.

To enter a new value for Sigh Frequency, turn the Select/Enter knob until *Sigh Frequency* is highlighted. Press the Select/Enter knob. The available range appears in the Message Area. Rotate the Select/Enter knob until the desired value is highlighted and press to enter this value.

j. Set Low Pressure Alarm Setpoint

Warning: The Low Pressure Alarm alerts the user to a disconnect or system leak. Respirationics recommends that this alarm is set within 5 to 10 cmH₂O of the set Negative Pressure.

This alarm is set from -1 cmH₂O to 1 cmH₂O below the Negative Pressure setting. If a negative Base Pressure is selected, the LPA range becomes 1 cmH₂O above the Base Pressure and 1 cmH₂O below the Negative Pressure setting. The LPA occurs if system pressure does not cross (up or down) the LPA setpoint within 20 seconds.

To enter a new setpoint for the LPA, turn the Select/Enter knob until *Low Pressure Alarm* is highlighted. Press the Select/Enter knob. The Message Area displays the range of settings available. Turn the Select/Enter knob until the desired setpoint is highlighted and press to enter this value.

The Low Pressure Alarm is set to within 1 cmH₂O of the set Negative Pressure. If the set Negative Pressure is adjusted to a point where it meets the LPA setpoint the LPA automatically drops to 1 cmH₂O below the level of the set Negative Pressure.

Operation Guidelines

(Continued)

j. Set Low Pressure Alarm Setpoint (Continued)

If the Base Pressure is adjusted more negative, to a point where it meets the LPA setting, the LPA setting automatically rises to 1 cmH₂O above the set Base Pressure. This feature prevents most nuisance alarms but may require adjustment according to the specific clinical situation. See Section 5, Alarms and Alerts, for more information.

All other alarms are automatically set by the NEV-100.

k. Move to Next Menu

Choose the Next Menu option to set parameters on the Next Menu screen.

8. Set Parameters in Next Menu**a. Set Print Interval**

To use the print interval option, the NEV-100 must be connected to an external printer or computer terminal via the Diagnostic Port. (See Section 7, Accessories, for a complete description.)

Print Interval controls how frequently the NEV-100 settings and messages are printed. Parameter values and messages are printed on a printer or computer terminal from every five to 120 minutes, in five minute increments.

To change the print frequency, turn the Select/Enter knob until *Print Interval* is highlighted. Press the Select/Enter knob. The Message Area displays a range from five to 120 minutes. Turn the Select/Enter knob until the desired value is highlighted and press to enter this value.

The Printer is activated in two situations:

1) Normal Operation

In normal operation, the NEV-100 output settings during each set interval. Machine settings are printed for the following parameters: Mode; set Rate; actual Rate; Negative Pressure; Base Pressure; Inspiratory Time; I:E Ratio; peak pressure readings of the previous breath; Sigh settings; Low Pressure Alarm; Assist Sensitivity level; Serial Number; Software Revision Level; and date and time of the report.

Operation Guidelines

(Continued)

a. Set Print Interval (Continued)

2) Alarm Condition

When an alarm occurs, all the information listed above in Normal Operation is printed immediately. Specific information about the alarm, including any numeric data available, is also printed. Timing of the normal print routine is not altered by alarm occurrences.

b. (Optional) Print Now

To use this option, the NEV-100 must be connected to an external printer or computer terminal. See *11. Connect Printer or Appropriate Computer Terminal* in this section for more details.

Print Now prints the following parameter settings immediately: Mode; set Rate; actual Rate; Negative Pressure; Base Pressure; Inspiratory Time; I:E Ratio; peak pressure readings of the previous breath; Sigh settings; Low Pressure Alarm; Assist Sensitivity level; Serial Number; Software Revision Level; and date and time of the report.

To activate the Print Now option, turn the Select/Enter knob until *Print Now* is highlighted. Press the Select/Enter knob to activate the printer. The use of the Print Now function does not affect the print interval already selected.

c. Set Units of Pressure

The NEV-100 is capable of displaying pressure in either cmH₂O, mbar or kPa. To change this value, rotate the Select/Enter knob until *Units of Pressure* is highlighted. Press the Select/Enter knob and the choices cmH₂O, mbar and kPa is displayed in the Message Area. Rotate the Select/Enter knob until the desired unit of pressure is highlighted. Press the Select/Enter knob to enter the new unit of pressure.

d. Check Alarm History

The NEV-100 stores a record of the last ten alarm conditions. To access this information, turn the Select/Enter knob until *Alarm History* is highlighted. Press the Select/Enter knob and the most recent alarm condition is displayed. Press the Select/Enter knob again to view each previous alarm condition one at a time. This information is printed if an external printer or terminal is connected. To exit Alarm History, either view all ten alarms or lock the panel.

Operation Guidelines

(Continued)

e. Set Display Brightness

This selection adjusts the LCD backlighting to provide the desired lighting level. To adjust this level, rotate the Select/Enter knob until *Display Brightness* is highlighted. Press the Select/Enter knob and the Message Area displays levels from 1 to 10, 10 being the brightest. As the knob is rotated, the lighting behind the LCD changes. Press the Select/Enter knob to enter the desired level of backlighting.

f. Set Date and Time

The date and time are stored in the NEV-100 using a real time clock and military time.

To set these values, rotate the Select/Enter knob until *Date and Time* is highlighted and press the Select/Enter knob.

The Message Area displays the following parameters: Year, Month, Day, Hour and Minute.

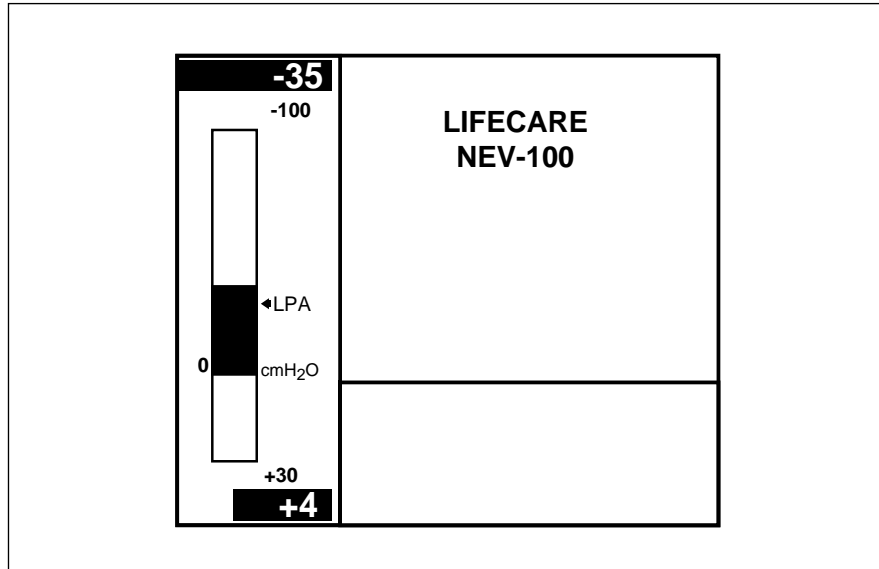
Rotate the Select/Enter knob until the desired values are highlighted and press the knob to select each value.

Continue through all the parameters until all items have been selected.

Operation Guidelines

(Continued)

g. Set Menu Display (Run Display)



Screen showing the *Run Display*

The Menu Display may be changed to a Run Display which blanks the Menu Display Area on the LCD screen. This feature enhances the user friendliness of the NEV-100.

To switch the Menu Display to the Run Display rotate the Select/Enter knob until *Menu Display* is highlighted. Press the knob to select Menu Display. Rotate the knob to highlight "OFF" and press. When the Panel is locked, only "LIFECARE NEV-100" is displayed in the Menu Display Area.

Both the Bar Graph Manometer and the Message Area remain normally displayed. All parameters remain the same and Alarm and Alert systems will function as usual.

The menus may be viewed anytime by unlocking the Panel. When the Panel is unlocked, the NEV-100 displays the last menu that was displayed on the screen before the Panel was locked.

Operation Guidelines

(Continued)

h. Set Alarm Volume

The Alarm Volume is adjustable. Rotate the Select/Enter knob until *Alarm Volume* is highlighted and press the knob. Volume levels from 1 to 10 are displayed, 10 being the loudest. The current alarm volume is audible. Rotate the Select/Enter knob until you reach the desired level of Alarm Volume is obtained. Press the knob to select that value.

i. Set Alarm Pitch

The Alarm Pitch is adjustable. Rotate the Select/Enter knob until *Alarm Pitch* is highlighted. Press the knob to display levels 1 to 10 in the Message Area. The current Alarm Pitch level is audible. Rotate the knob until you reach the desired level of Alarm Pitch is obtained. Press the Select/Enter knob to enter the new pitch level.

j. Set Remote Alarm

The Remote Alarm selection allows the user to use the NEV-100 with the Respironics Remote Alarm (Refer to Section 7, Accessories, for more information on the Respironics Remote Alarm).

The NEV-100 may also be used with most hospital central alarm systems. When an external alarm system is connected, the NEV-100's audible alarm automatically activates the external alarm. First the alarm must be connected to the Remote Alarm Connector on the Back Panel. The user must then determine whether the alarm system is Normally Open (NO) or Normally Closed (NC), and adjust the Remote Alarm parameter accordingly.

To change the Remote Alarm selection, rotate the Select/Enter knob until *Remote Alarm* is highlighted. Press the Select/Enter knob to display the three options in the Message Area. Rotate the Select/Enter knob to highlight the desired option and press the knob to select LC, NO or NC.

k. Set Assist Sensitivity

The Assist Sensitivity parameter is used only during Assist/Control and Assist/Control + Sigh modes. For the NEV-100 to sense patient breathing efforts, the user must wear a nasal cannula connected to the Assist Connector. Then the NEV-100 uses the Assist Sensitivity level to detect the breathing effort of the user and begin a breath.

The Assist Sensitivity is adjustable from levels 1 to 10, level 1 being the most sensitive. To change the Assist Sensitivity level, rotate the Select/Enter knob until *Assist Sensitivity* is highlighted. Press the knob to display the levels in the Message Area. Rotate the Select/Enter knob to highlight the desired level and press the knob to enter the new sensitivity level.

Operation Guidelines

(Continued)

9. Set CNEP Mode Parameters

In CNEP mode, the operator must set the parameters on the CNEP Menu and the Next Menu. For procedures to set parameters on the Next Menu, please see Number 8 in this section. Following is the procedure to set CNEP menu parameters:

a. Set Base Pressure

In CNEP, the Base Pressure is adjustable from -5 to -30 cmH₂O.

To set the Base Pressure, rotate the Select/Enter knob until *Base Pressure* is highlighted. Press the knob to display the Base Pressure range in the Message Area. Rotate the knob until the desired value is highlighted. Press the Select/Enter knob to enter the new value.

b. Set Low Pressure Alarm Setpoint

During CNEP, the Low Pressure Alarm setpoint must be set from -1 cmH₂O to 1 cmH₂O below the set Base Pressure.

To set the Low Pressure Alarm, rotate the Select/Enter knob until *Low Pressure Alarm* is highlighted. Press the knob to display the Low Pressure Alarm range in the Message Area. Rotate the knob until the desired setpoint is highlighted. Press the Select/Enter knob to enter the new setpoint.

c. Select Standby

Standby may either be ON or OFF. When Standby is ON, the NEV-100 is not functioning mechanically, yet power is still directed to the Control Panel and display screen.

To switch the NEV-100 into Standby ON, turn the Select/Enter knob until *Standby* is highlighted. Press the Select/Enter knob. The choices *ON* and *OFF* appear in the message display area. Rotate the Select/Enter knob until *ON* is highlighted and press to enter into Standby.

The Standby mode remains activated as long as adjustments are being made and reverts to normal operation (Standby OFF) three minutes after the panel becomes locked.

d. Advance to Next Menu

To advance to the Next Menu, rotate the Select/Enter knob to highlight *Next Menu*, then press the knob.

Operation Guidelines

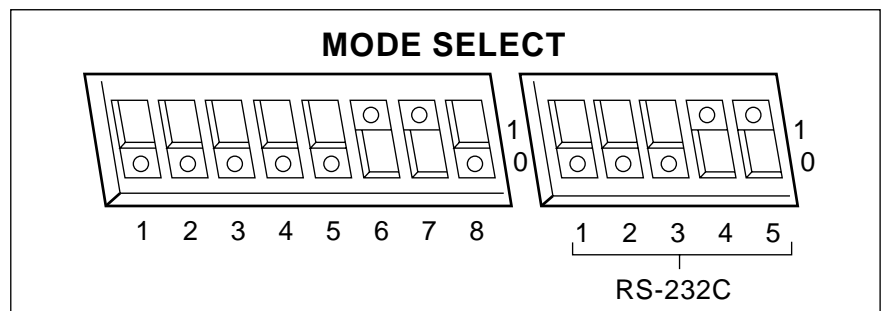
(Continued)

10. Connect Remote Alarm (Optional)

The NEV-100 is designed to accept an optional Respiration Remote Alarm or other hospital alarm system. If desired, connect the remote alarm to the Remote Alarm Connector on the back panel. Refer to the Respiration Remote Alarm Manual for details of operation.

11. Connect Printer or Appropriate Computer Terminal (Optional)

The NEV-100 is designed to accept a printer or computer terminal. The printer or terminal may be connected to the Diagnostic Port on the Back Panel. Position the printer mode select and protocol switches as indicated below.



Several setting combinations are possible with various printers. Respiration recommends you follow the manufacturer's instructions supplied with your printer.

12. Connect Individual to Ventilator

Refer to Section 8, Applications, for a detailed description of using the NEV-100 with various application devices.

Respiration recommends after setting new parameters that these parameters be verified and checked. Check routine parameters regularly during ventilator use.

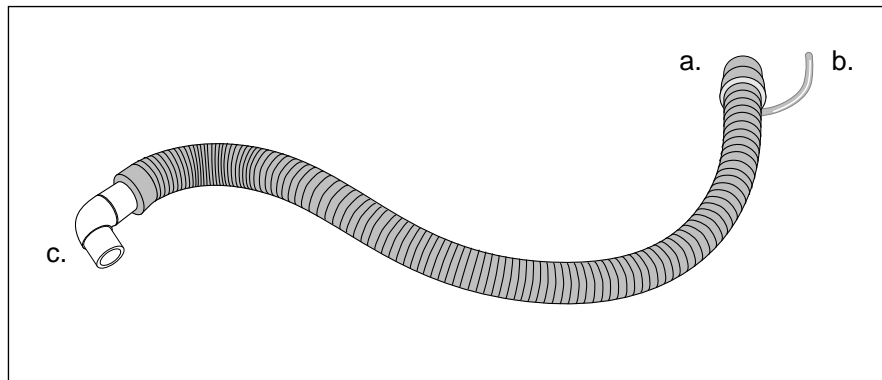
The NEV-100 incorporates feedback mechanisms, such as pressure readings, and may take readings over several breaths, while other parameters are monitored nearly continuously. Always allow the NEV-100 to stabilize, following changes, before making further adjustments.

Additional ventilator parameter monitoring may also be deemed necessary for some individuals (e.g., exhaled volume monitoring, etc.).

SECTION 7: ACCESSORIES

Hose

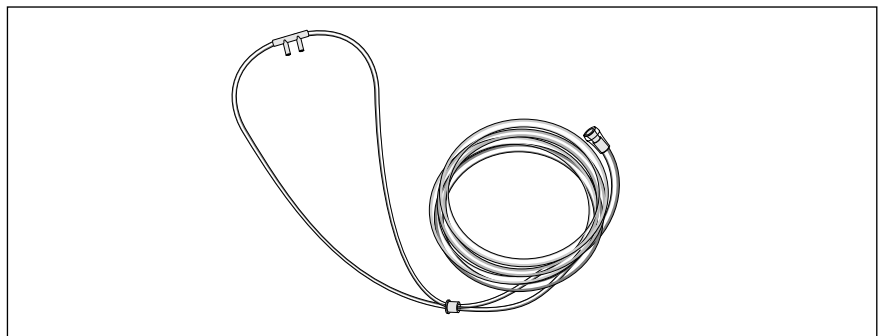
▼ The straight end (a) of this hose connects to the Patient Hose Port on the Front Panel. The 1/8" tubing (b) from the hose connects to the Pressure Connector on the NEV-100 to monitor proximal pressure. The "elbow" end (c) connects to the application device.



06081 Hose, NEV-100, with pressure line

Nasal Cannula

A Nasal Cannula is used in the assist mode to sense inspiratory efforts and initiate a breath. The cannula is worn in the nose and around the ears. It is then connected to the Assist Connector on the Front Panel.

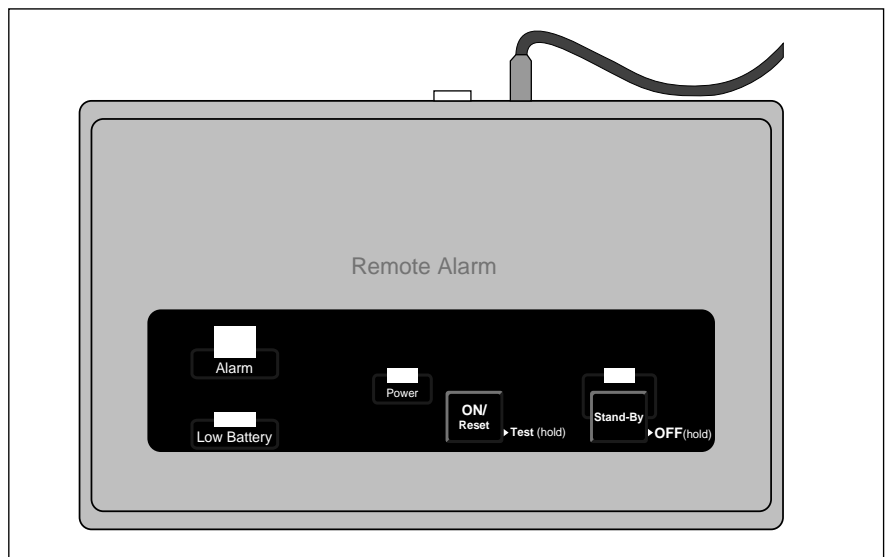


27130 Nasal Cannula

Remote Alarm

▼ The Respironics Remote Alarm alerts the user of an alarm condition at a distance of up to 300 feet from the ventilator. An audible tone sounds and a red light flashes to indicate that an alarm condition exists. Power is supplied by an internal 9 VDC alkaline battery that provides at least three months of continuous operation.

The Remote Alarm may also operate on household current with the DC converter. The Remote Alarm sounds if the cable connecting it to the ventilator becomes disconnected or shorted. The Remote Alarm also functions with a Call Button (#34906). Refer to the *Remote Alarm User's Manual* for details of operation and accessory list.



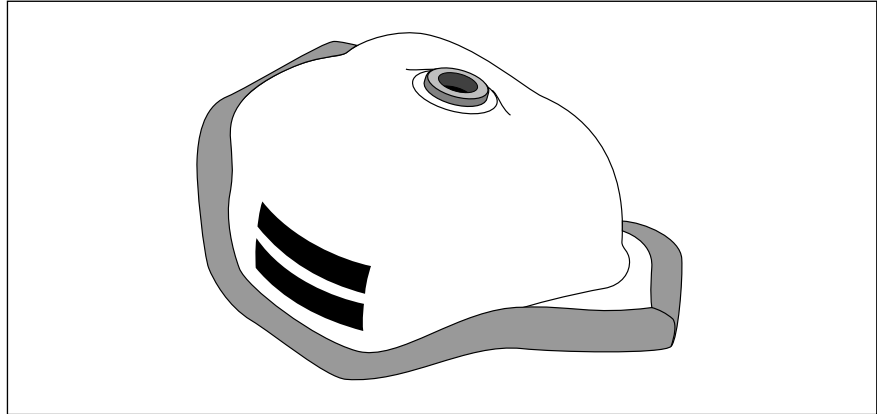
- 34004 English Remote Alarm
- 34005 German Remote Alarm
- 34006 French Remote Alarm

Printer

For routine printout of reports and alarm messages from the NEV-100. Respironics recommends you follow the manufacturer's instructions supplied with your printer.

Chest Shells

▼ There are a number of ways to apply negative pressure with the NEV-100. This section describes various application device options.



Soft Seal Chest Shell

Chest shells are the easiest application device to apply and maintain, especially in the home care setting. These shells provide a small chamber over the chest and abdomen in which the NEV-100 creates negative pressure. They are used in a wheelchair, giving the user mobility. Chest Shells are also easy for the user to take off and put on for personal needs. Chest Shells are best tolerated by individuals having close to normal hip and chest configuration. With proper fit, the Chest Shell may be worn in a reclining, sitting or standing position.

While Chest Shells can provide for adequate inspiratory volumes, they rest on the chest and may not allow for as much chest expansion as body suits or chambers.

Chest Shells are available in a variety of sizes to fit infants to large adults.

1. Fitting the Client

- a. Select the largest length shell that comfortably fits the user from the suprasternal notch to above the pubic crest. The shell must fit snugly to the rib cage on both sides and extend slightly beyond the mid axillary line towards the back.

Chest Shells

(Continued)

1. Fitting the Client (Continued)

- b. Determine the appropriate fit using these measurements:
 - 1) Measure from the suprasternal notch to the navel.
 - 2) Measure from the suprasternal notch to the pubic crest.
 - 3) Average these two measurements to determine the finished length of the shell.
 - 4) Measure from the anterior mid-axillary line, armpit to armpit, across the nipple line. Divide this measurement by two to determine the finished width of the shell.
 - 5) Measure height and weight if possible.
 - 6) Record general body description (note abnormalities or characteristics, i.e., scoliosis, hollow areas, large breasts).
- c. Use the size/dimension chart (#29500 for Soft Seal Chest Shells) to determine the appropriate size.

CAUTION: A shell that is too small creates a restrictive condition prohibiting proper ventilation and decreasing tidal volume. A shell that is too large it may be difficult to create an airtight seal.

Custom Shells

- ▼ If none of the listed shell sizes fit the user, a custom shell may be ordered. The fitting process is accomplished with the aid of a body cast made of the anterior torso. Body cast services are available through Respirationics, or arrangements may be made at a local hospital or orthopedic clinic. For body cast instructions, contact Respirationics.

NOTE: A padding kit (#10110) is available to modify earlier style Chest Shells to accommodate minor body contours.

Using a Chest Shell

1. Securing the Chest Shell

The Chest Shell is held in position by the use of straps which extend around the back of the user and attach to the shell. Tighten the straps to draw the shell edges snugly against the user. Overtightening the straps may cause restrictions and discomfort.

10010 strap, small pair for Chest Shell sizes 2A-3A

10020 strap, medium pair for Chest Shell sizes 3 1/2A-5A

10030 strap, large pair for Chest Shell sizes 5 1/2A-6 1/2A

2. User Preparation

The user must wear a soft single layer garment. In most cases a T-shirt is satisfactory. This prevents skin irritation when the shell is worn. Irritation is common during initial use of the shell (approximately one week), but lessens shortly thereafter. Cornstarch may also be applied to the skin as an additional precaution. Never place the Chest Shell directly on the user's skin.

3. Application of Negative Pressure

Once the user has been instructed how to use the Chest Shell, place the shell on the user and fit it snugly using the straps.

- a. Follow the operating procedures for the NEV-100. Attach the elbow end of the hose to the shell.
- b. Evaluate the negative pressure in 5 cmH₂O increments until user comfort and proper ventilation are achieved as prescribed by the physician.
- c. Occasionally a slight positive pressure of 2 to 5 cmH₂O is desirable to break the negative pressure at the end of each cycle. Some increased pressure may enhance exhalation.

4. Precautions

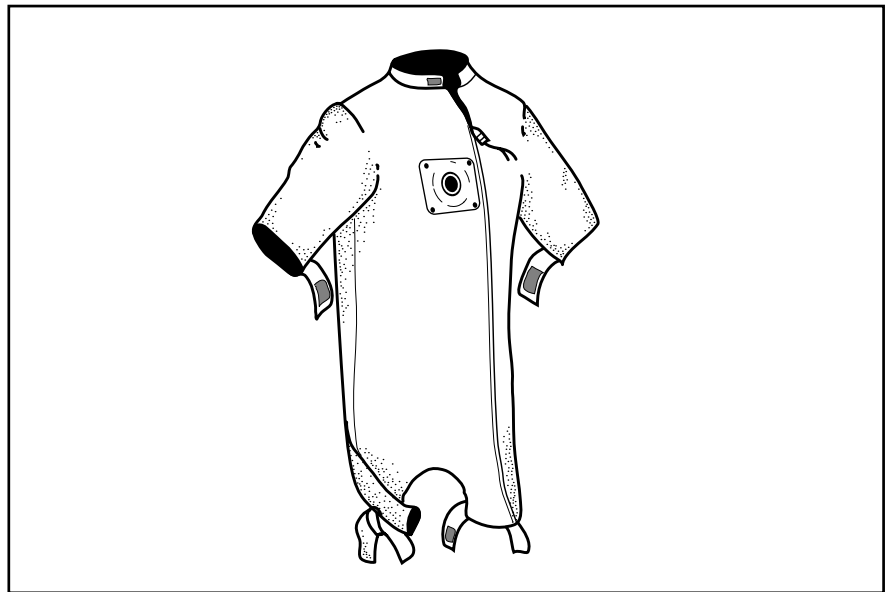
- a. Negative pressure is contraindicated in the presence of upper airway constriction.
- b. High negative pressure results in a 'crushing' sensation.
- c. Skin must be clean and dry, free of wounds, IVs, feeding tubes, etc.

5. Cleaning

Wipe clean the Chest Shell with detergent and warm water. Never steam autoclave a Chest Shell.

Nu-Mo Garments

▼ Nu-Mo garments cover a larger area than Chest Shells and do not impinge on the chest and abdomen. Thus they can offer a larger inspiratory volume to the user. They are also easier to fit around chest irregularities since they seal around the extremities instead of the chest. Respiroics offers several styles and sizes of Nu-Mo garments that accommodate infants and adults.



Respiroics Nu-Mo Suit

1. Advantages of the Nu-Mo Garment
 - a. Covers more surface area of the thorax, providing more effective ventilation
 - b. Easier to fit than Chest Shells.
 - 1) Available in 3 sizes - S, M, L, with corresponding grid and backplate. Custom Nu-Mo garments are available.
 - 2) More suitable for individuals with severe skeletal abnormalities, i.e., kyphoscoliosis, scoliosis.

Nu-Mo Garments

(Continued)

2. Choosing the Appropriate Style and Size

- a. The Nu-Mo garments are available in three styles to accommodate a wide variety of clients.
- b. The Nu-Mo garments are used with a grid and backplate, which are available in three sizes:
 - 1) Small - 28" width
 - 2) Medium - 38" to 40"
 - 3) Large - Maximum 48"
- c. Measurement of the chest, hip and waist-diameter, along with consideration of height, weight, and spinal or hip deviations are helpful in determining the appropriate size of the Nu-Mo garment, and grid/backplate to be used.

3. Instructions for Use

- a. Place the fully unzipped garment flat on the bed with all the wrinkles removed. If a pullover style wrap is used, fold it like an accordion from the open lower end to a point approximately 16" below the underarm. Open the zipper (if used) and pull the Nu-Mo garment over the client's head.
- b. Place the backplate within the wrap or garment so that the top edge is even with the underarm area and the curved edges are parallel to the side seams or to the velcro holders.

NOTE: The backplate may be omitted if the maximum negative pressures required are below 25 cmH₂O and the bed is very firm. However, not using a backplate may cause excessive wear on the back of the garment from the edges of the grid.

- c. Pad the backplate as necessary to avoid discomfort.
- d. Position the user in the wrap or garment so that the top edge of the backplate is approximately 1 to 2 inches below the arch of the user's underarm.

Nu-Mo Garments

(Continued)

- e. Position the grid over the user's chest with the scooped edge towards the user's head and secure the grid to the backplate. Leave at least 3 inches of space between the user and the grid. Reposition the grid and the backplate as necessary until proper placement is achieved.
- f. Secure the sleeve and leg openings snugly, but not too tightly.
- g. Connect the hose to the wrap or garment and the NEV-100.
- h. Zip the Nu-Mo garment over the top of the grid and up to the collar. After the ventilator is running, close the collar snugly during the expiratory phase.

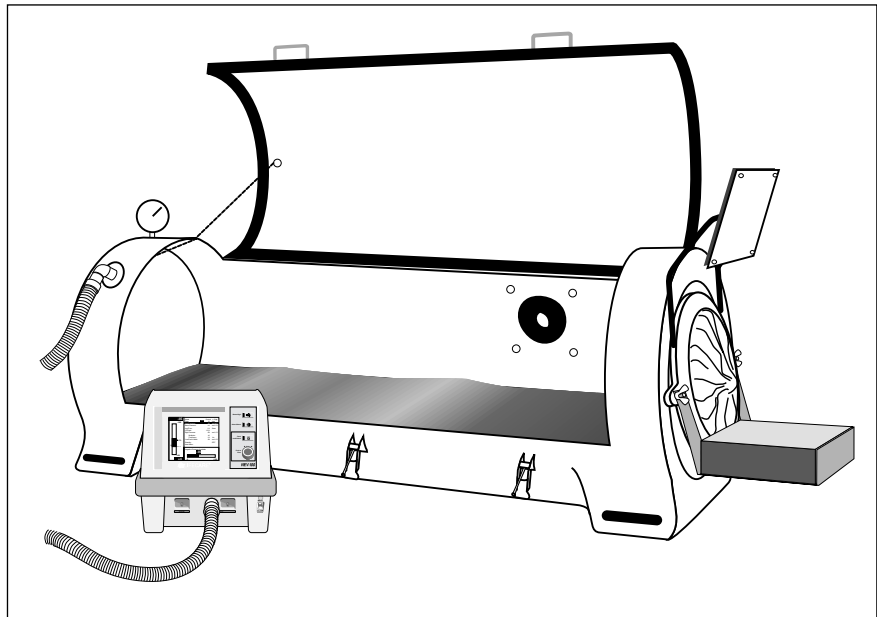
NOTE: The Nu-Mo garment must fit properly so the zipper is not subjected to strain or side load during the closing operation. The zipper chain must be held together in preparation for closing so that no side load is encountered and the slider moves easily during the closing operation.

Failure to follow this procedure may cause the zipper to pull apart at points behind the slider as the slider is moved over the chain length during closing. Always pull the slider straight with the chain so that no side load is generated. If the material inadvertently gets caught during closing, carefully open the zipper and try again with additional care.

- i. The client's neck may be wrapped with a soft cloth to reduce chafing and irritation of sensitive skin. Respironics recommends the padded collar accessory (#17142).
- j. Follow the operating procedures for the NEV-100. Attach elbow end of the hose to the Nu-Mo garment. Adjust the respiratory rate and the negative pressure to achieve the minute volume per the physician's prescription. A hand-held respirometer to verify volumes is recommended .
- k. Readjust the pressure or rate after 5 to 7 minutes, if necessary, to achieve the desired minute volume.
- l. The client may turn in the Nu-Mo garment if desired. Pillows may be required to maintain positions and to prevent decubitus ulcers.

Pressure Chambers

▼ Pressure chambers, such as the Porta-Lung, offer the advantages of the Iron Lung with more pressure capability and more portability. Since the pressure chamber covers the whole body, excluding the head, it provides more evenly distributed ventilation than body suits or Chest Shells. Designed for transport, the Porta-Lung may be used at night by the traveler or as a stationary ventilator at home. The Porta-Lung is easy to get in and out of, and comes in several sizes to fit a variety of clients.



The Porta-Lung pictured with the NEV-100

Cleaning

▼ Cleaning the NEV-100's external surfaces may be done with a mild detergent solution and a clean, damp cloth. It is best to use a lens cleaner and a soft cloth to clean the LCD window. Do not use abrasive cleaners on the case or LCD window.

Disinfection

▼ If disinfection of the NEV-100's external surfaces is required beyond cleaning procedures, use the procedure listed below.

ROUTINE DISINFECTION PROCEDURE - Use this level for ventilators and equipment (Chest Shells, hoses) that are unlikely to have been exposed to pathogens.

1. Wipe surface with a mild detergent solution.
2. Wipe off detergent residue with a damp cloth.
3. Spray surfaces with 70% Isopropyl Alcohol solution using a fine, even mist.
4. Allow to stand until dry.
5. Wipe off any remaining alcohol with a clean damp cloth.
6. Allow the cloth to completely dry, then dispose of it in the trash.

If higher level disinfection is desired, glutaraldehyde products or other common hospital disinfectants may be used. Contact Respironics for specific procedure guidelines.

Caution! DO NOT use radiation decontamination DO NOT steam autoclave
--

SECTION 10: PREVENTIVE MAINTENANCE AND TROUBLESHOOTING GUIDE

Preventive Maintenance

▼ The NEV-100 has been designed to provide virtually maintenance-free operation for extended periods of time. Take the utmost care to avoid sharp blows or dropping the NEV-100. Follow the routine maintenance schedule for optimal performance.

General Suggestions

1. Keep the ventilator exterior clean.
2. Check that the air inlets on the outside are not blocked.
3. Keep the NEV-100 away from curtains, drapes, blankets or any heat generating device

NEV-100 Maintenance

Return the NEV-100 to Respironics every 10,000 hours for preventive maintenance. Return the unit to Respironics at the end of the 2 year warranty period for a free inspection even if 10,000 hours has not yet been achieved.

WARNING: Do not open the panels on the NEV-100. Refer all service to an authorized Service Representative.

Troubleshooting Guide

Symptoms	Probable Cause	Corrective Action
Low Pressure Alarm		
<ul style="list-style-type: none"> • Alarm bar is flashing • Alarm is sounding • Message reads, "LOW PRESSURE ALARM, CHECK FOR LEAKS OR DISCONNECTS." 	<ol style="list-style-type: none"> 1. Hose Disconnected 2. Chest Shells <ol style="list-style-type: none"> a. Improper chest shell fitting b. Cracks or holes in hoses 3. Nu-Mo Garment <ol style="list-style-type: none"> a. Cuffs not sealed b. Collar not sealed c. Fabric is torn d. Zipper is defective 4. Body Chamber <ol style="list-style-type: none"> a. Door improperly seated b. Cracks in plastic 5. Alarm Setpoint alarm setpoint too close to normal negative pressure 	<ol style="list-style-type: none"> 1. Check hose connections. 2. <ol style="list-style-type: none"> a. Adjust chest shell. b. Replace hoses. 3. <ol style="list-style-type: none"> a. Tighten cuffs. b. Tighten collar. c. Replace garment. d. Replace garment. 4. <ol style="list-style-type: none"> a. Reset door or replace gasket. b. Repair or replace plastic. 5. Adjust the alarm setpoint to avoid nuisance alarms.
No Operation		
<ul style="list-style-type: none"> • Power visual indicator does light • Alarm bar is flashing • Alarm is sounding • Message may read, "INTERNAL FAILURE, DO NOT USE, CALL FOR SERVICE" or Message Area may be blank • LCD Screen may be lit or blank 	<ol style="list-style-type: none"> 1. Failed diagnostic test, or internal failure 	<ol style="list-style-type: none"> 1. <ul style="list-style-type: none"> • Turn unit off and press Alarm Silence key. • Refer to qualified service center. • Apply alternative ventilation device.
No Operation		
<ul style="list-style-type: none"> • NEV-100 is turned on but not operating • LCD is dark • No LEDs are lit • Alarm may be sounding or not sounding 	<ol style="list-style-type: none"> 1. Power cord improperly connected 2. No power to electrical outlet 3. Fuse blown on rear of NEV-100 	<ol style="list-style-type: none"> 1. Check power cord connections. 2. Check that household circuit breaker is closed or fuse is good, and that electricity is supplied to the outlet. An easy test would be to plug a lamp into the same outlet. 3. Check fuses on back panel of NEV-100.
Power Failure		
<ul style="list-style-type: none"> • Continuous audible alarm • LCD screen is dark • Alarm bar is off 	<ol style="list-style-type: none"> 1. Loss of power source 2. Power cord improperly connected 3. NEV-100 fuses are blown 4. NEV-100 has been turned off 	<ol style="list-style-type: none"> 1. Check power source circuit breaker. 2. Check for proper connection of power cord (both at wall and rear panel). 3. Replace rear panel fuses. 4. Press Alarm Silence key.

SECTION 10: PREVENTIVE MAINTENANCE AND TROUBLESHOOTING GUIDE

Troubleshooting Guide

Symptoms	Probable Cause	Corrective Action
Continuous Audible Alarm		
<ul style="list-style-type: none"> Alarm is sounding LCD screen is lit Alarm bar is off No alarm message 	<ol style="list-style-type: none"> Intermittent power outage "brown out" NEV-100 has been turned off and back on 	<ol style="list-style-type: none"> Press Alarm Silence key. Press Alarm Silence key.
Inspiratory Pressure Out of Range		
<ul style="list-style-type: none"> Alarm bar is flashing Alarm is sounding Message reads, "INSPIRATORY PRESSURE OUT OF RANGE. EVALUATE SETTINGS OR CHECK FOR LEAKS." 	<p>Leak is large enough that NEV-100 cannot compensate</p> <ol style="list-style-type: none"> Hose Disconnected Chest Shells <ol style="list-style-type: none"> Improper chest shell fitting Cracks or holes in hoses Nu-Mo Garment <ol style="list-style-type: none"> Cuffs not sealed Collar not sealed Fabric is torn Zipper is defective Body Chamber <ol style="list-style-type: none"> Door improperly seated Cracks in plastic Combination of settings and application device exceed capabilities of NEV-100 	<ol style="list-style-type: none"> Check hose connections. <ol style="list-style-type: none"> Adjust chest shell. Replace hoses. <ol style="list-style-type: none"> Tighten cuffs. Tighten collar. Replace garment. Replace garment. <ol style="list-style-type: none"> Reset door or replace gasket. Repair or replace plastic. Adjust settings or switch application method.
Base Pressure Out of Range		
<ul style="list-style-type: none"> Alarm bar is flashing Alarm is sounding Message reads, "BASE PRESSURE OUT OF RANGE. EVALUATE SETTINGS OR CHECK FOR LEAKS." 	<p>Leak is large enough that NEV-100 cannot compensate</p> <ol style="list-style-type: none"> Hose Disconnected Chest Shells <ol style="list-style-type: none"> Improper chest shell fitting Cracks or holes in hoses Nu-Mo Garment <ol style="list-style-type: none"> Cuffs not sealed Collar not sealed Fabric is torn Zipper is defective Body Chamber <ol style="list-style-type: none"> Door improperly seated Cracks in plastic Combination of settings and application device exceed capabilities of NEV-100 	<ol style="list-style-type: none"> Check hose connections. <ol style="list-style-type: none"> Adjust chest shell. Replace hoses. <ol style="list-style-type: none"> Tighten cuffs. Tighten collar. Replace garment. Replace garment. <ol style="list-style-type: none"> Reset door or replace gasket. Repair or replace plastic. Adjust settings or switch application method.

Troubleshooting Guide

Symptoms	Probable Cause	Corrective Action
Sigh Pressure Out of Range		
<ul style="list-style-type: none"> • Alarm bar is flashing • Alarm is sounding • Message reads, "SIGH PRES-SURE OUT OF RANGE. EVALUATE SETTINGS OR CHECK FOR LEAKS." 	<p>Leak is large enough that NEV-100 cannot compensate</p> <ol style="list-style-type: none"> 1. Combination of settings and application device exceed capabilities of NEV-100 2. Hose Disconnected 3. Chest Shells <ol style="list-style-type: none"> a. Improper chest shell fitting b. Cracks or holes in hoses 4. Nu-Mu Garment <ol style="list-style-type: none"> a. Cuffs not sealed b. Collar not sealed c. Fabric is torn d. Zipper is defective 5. Body Chamber <ol style="list-style-type: none"> a. Door improperly seated b. Cracks in plastic 	<ol style="list-style-type: none"> 1. Adjust settings or switch applica-tion method. 2. Check hose connections. 3. <ol style="list-style-type: none"> a. Adjust chest shell. b. Replace hoses. 4. <ol style="list-style-type: none"> a. Tighten cuffs. b. Tighten collar. c. Replace garment. d. Replace garment. 5. <ol style="list-style-type: none"> a. Reset door or replace gasket. b. Repair or replace plastic.
CNEP Out of Range		
<ul style="list-style-type: none"> • Alarm bar is flashing • Alarm is sounding • Message reads, "BASE PRESSURE OUT OF RANGE. EVALUATE SETTINGS OR CHECK FOR LEAKS." 	<p>Leak is large enough that NEV-100 cannot compensate</p> <ol style="list-style-type: none"> 1. Hose Disconnected 2. Chest Shells <ol style="list-style-type: none"> a. Improper chest shell fitting b. Cracks or holes in hoses 3. Nu-Mo Garment <ol style="list-style-type: none"> a. Cuffs not sealed b. Collar not sealed c. Fabric is torn d. Zipper is defective 4. Body Chamber <ol style="list-style-type: none"> a. Door improperly seated b. Cracks in plastic 	<ol style="list-style-type: none"> 1. Check hose connections. 2. <ol style="list-style-type: none"> a. Adjust chest shell. b. Replace hoses. 3. <ol style="list-style-type: none"> a. Tighten cuffs. b. Tighten collar. c. Replace garment. d. Replace garment. 4. <ol style="list-style-type: none"> a. Reset door or replace gasket. b. Repair or replace plastic.
High Internal Temperature		
<ul style="list-style-type: none"> • Alarm bar is flashing • Alarm is sounding • Message reads, "HIGH INTER-NAL TEMPERATURE ALARM. CHECK AIR VENTS FOR BLOCKAGE." 	<ol style="list-style-type: none"> 1. Air intake vents blocked 2. Ambient temperature too high 	<ol style="list-style-type: none"> 1. Clear air intake vents (keep air intake vents at least 6" from drapes, bedspreads). 2. <ul style="list-style-type: none"> • Turn NEV-100 off and press Alarm Silence key. • Allow NEV-100 to cool to temperature less then 40°C (104°F). • If alarm persists, call for service.
Low Internal Temperature		
<ul style="list-style-type: none"> • Alarm bar is flashing • Alarm is sounding • Message reads, "LOW INTER-NAL TEMPERATURE ALARM." 	<ol style="list-style-type: none"> 1. Ambient temperature too low 	<ol style="list-style-type: none"> 1. <ul style="list-style-type: none"> • Turn NEV-100 off and press Alarm Silence key. • Allow unit to warm up to temperature greater than 5°C (40°F). • If alarm persists, call for service.

SECTION 10: PREVENTIVE MAINTENANCE AND TROUBLESHOOTING GUIDE

Troubleshooting Guide

Symptoms	Probable Cause	Corrective Action
Alert to condition of Inverse I:E Ratio		
<ul style="list-style-type: none"> Message reads, "INVERSE I:E RATIO SELECTED" 	<ol style="list-style-type: none"> I:E ratio is less than 1:1 	<ol style="list-style-type: none"> If this condition is not desired, correct by adjusting Respiratory Rate, Inspiratory Time or I:E Ratio.
Constant Pressure Level Alarm		
<ul style="list-style-type: none"> Alarm bar is flashing Alarm is sounding Message reads, "CONSTANT PRESSURE LEVEL ALARM. CHECK FOR LEAKS OR DISCONNECTS. TURN OFF AND BACK ON WHEN READY" 	<ol style="list-style-type: none"> Pressure line tubing is disconnected 	<ol style="list-style-type: none"> <ul style="list-style-type: none"> Check that pressure tubing is properly connected to Pressure Connector. To silence alarm, turn NEV-100 off and press Alarm Silence key. Make adjustments, then turn on again. NEV-100 should function normally. If alarm persists, return to service center for repair.
	<ol style="list-style-type: none"> Hose is disconnected 	<ol style="list-style-type: none"> <ul style="list-style-type: none"> Check that hose is properly connected to NEV-100 and application device. To silence alarm, turn NEV-100 off and press Alarm Silence key. Make adjustments, then turn on again. NEV-100 should function normally. If alarm persists, return to service center for repair.
Inadequate Constant Pressure in CNEP		
<ul style="list-style-type: none"> Alarm bar is flashing Alarm is sounding Message reads, "INADEQUATE CONSTANT PRESSURE. CHECK FOR LEAKS OR DISCONNECTS. TURN OFF AND BACK ON WHEN READY" 	<ol style="list-style-type: none"> Pressure line tubing is disconnected 	<ol style="list-style-type: none"> <ul style="list-style-type: none"> Check that pressure tubing is properly connected to Pressure Connector. To silence alarm, turn NEV-100 off and press Alarm Silence key. Make adjustments, then turn on again. NEV-100 should function normally. If alarm persists, return to service center for repair.
	<ol style="list-style-type: none"> Hose is disconnected 	<ol style="list-style-type: none"> <ul style="list-style-type: none"> Check that hose is properly connected to NEV-100 and application device. To silence alarm, turn NEV-100 off and press Alarm Silence key. Make adjustments, then turn on again. NEV-100 should function normally. If alarm persists, return to service center for repair.

SECTION 10: PREVENTIVE MAINTENANCE AND TROUBLESHOOTING GUIDE

Troubleshooting Guide

Symptoms	Probable Cause	Corrective Action
Excessive Negative Pressure Alarm		
<ul style="list-style-type: none">Alarm bar is flashingAlarm is soundingMessage reads, "EXCESSIVE NEGATIVE PRESSURE ALARM."	<ol style="list-style-type: none">Condition has changed from an open system to a tightly sealed system	<ol style="list-style-type: none"><ul style="list-style-type: none">NEV-100 will adjust quickly and deactivate the alarm.To speed adjustments, put NEV-100 in Standby ON, wait a moment then switch to Standby OFF.If alarm persists, return NEV-100 to authorized Service Center.
Excessive Base Pressure Alarm		
<ul style="list-style-type: none">Alarm bar is flashingAlarm is soundingMessage reads, "EXCESSIVE BASE PRESSURE"	<ol style="list-style-type: none">Condition has changed from an open system to a tightly sealed system	<ol style="list-style-type: none"><ul style="list-style-type: none">NEV-100 will adjust quickly and deactivate the alarm.To speed adjustments, put NEV-100 in Standby ON, wait a moment then switch to Standby OFF.If alarm persists, return NEV-100 to authorized Service Center.
Missing Parameters Warning		
<ul style="list-style-type: none">Alarm bar is flashingAlarm is soundingMessage reads, "SYSTEM SETTINGS IN DOUBT, ENTER VALUES FOR ALL ITEMS"Unit not operatingAlarm Silence key has no effect	<ol style="list-style-type: none">All settings cannot be verified from memory	<ol style="list-style-type: none"><ul style="list-style-type: none">Unlock the panel to temporarily silence the alarm and enter parameters.Highlight and enter all parameters on the Main Menu.The following parameters must be highlighted and entered on the Next Menu: Print Interval; Units of Pressure; Display Brightness; Main Display; Alarm Volume; Alarm Pitch; Remote Alarm; Assist Sensitivity.

Warranty

Two Year Warranty

Respironics warrants the NEV-100 free from defects in materials and workmanship for a period of two years after delivery, provided the unit is operated under conditions of normal use as described in the Operating Manual. Respironics makes replacements, repairs or issues credit for equipment or parts which are found to be defective. The defective unit may be returned prepaid to Respironics after the customer has received approval from Respironics to return the unit.

Limits Of Warranty

This Warranty is in place of all other warranties, expressed or implied. This includes the warranties of merchantability (an unwritten warranty that the product is of saleable quality) and fitness. This warranty is in place of all other obligations or liabilities on the part of Respironics including, but not limited to, contingent or consequential damages (the cost of repairing or replacing other property which may be damaged if the unit does not work properly).

This Warranty, and the rights and obligations described in it, are construed under and governed by the laws of the commonwealth of Pennsylvania, U.S.A.

What Is Not Covered

This NEV-100 Warranty does not apply to any unit or individual parts which have been repaired or altered in a way that, in Respironics' judgment, affects its stability or reliability, or which has been subjected to misuse, negligence, abuse, or accident.

This Warranty does not cover damage which may occur in shipment. If there is any damage in shipment, please contact the carrier or individual who delivered the unit.

Changes To Equipment

Respironics, its dealers and associates reserve the right to make changes to equipment built and/or sold by them. These changes do not obligate Respironics to make the same or similar changes to equipment previously built and/or sold by them.

Client Safety

Respironics has made every effort to make this a reliable and trouble-free instrument. However, there is always a possibility of unpredictable failure with any mechanical or electronic device. Respironics cannot control the manner in which the unit is used. Therefore, the buyer or user alone must determine the medical and/or mechanical suitability of the unit in every way and decide if other precautionary measures are needed to ensure client safety. Respironics is pleased to offer assistance.

Service Contract

▼ A service contract is available to extend preventive maintenance and service beyond the warranty period.

Requirements for Purchase

Service contracts can be purchased monthly or for a predetermined period. These contracts may be purchased at any time. If your equipment is placed under contract while the equipment is not under warranty, the equipment must first be inspected by an authorized Respirationics Service Representative. Any service done at this time is at the owner's expense. If equipment is covered under the two-year warranty, the equipment may be placed under a service contract without inspection.

Coverage

A service contract covers the same full line of services offered under the original warranty including preventive maintenance, non-routine service, freight-out and loaner equipment.

Freight

Freight-in is at owner's expense. Freight-out is the responsibility of Respirationics.

Service Address:

Respirationics
1001 Murry Ridge Lane
Murrysville, PA 15668 USA
1-412-731-2100

Respirationics Deutschland
Gewerbestr. 17
82211 Herrsching Germany
49/8152-93060

SECTION 12: INDEX

A	
AC Indicator	8, 11
Accessories	42, 43
Alarm	
Bar	8, 11
History	7, 20, 36
Interface with Printer or Terminal	28
Pitch	7, 20, 39
Silence Key and LED	8, 10, 11
Volume	7, 20, 39
Alarm and Alert Systems	9, 24 – 28
Applications	44 – 50
Assist Connector	10, 29
Assist Sensitivity	8, 21, 39
Assist/Control	15
Assist/Control + Sigh	16

B	
Back Panel	13
Base Pressure Setting	6, 16, 32
In CNEP	8, 22, 40
Base Pressure Out of Range	25, 54

C	
Cautions	5
Chest Shells	44 – 46
Fitting of	44, 45
Use of	46
Cleaning	51
CNEP Menu	8, 22, 23
Setting Parameters on	40
CNEP Mode	16, 22
CNEP Out of Range	25, 55
Computer Terminal	28, 41
Constant Pressure Level	26, 56
Control	15
Control + Sigh	15
Control Panel	11, 12
Custom Shells	45

D	
Date and Time	7, 20, 37
Diagnostic Port	13, 41
Diagnostic Self Check	30
Dimensions	9

E	
Disinfection	51
Display Brightness	7, 20, 37
Display Screen	11, 14

F	
FCC Compliance	2
Fuse	13
Fuse Rating	9

H	
High Internal Temperature	27, 55
Hose	29, 42
Hour Meter	13

I	
I:E Ratio	6, 17, 32, 33
Inadequate Constant Pressure	26, 56
Inspiratory Pressure Out of Range	25, 54
Inspiratory Time	6, 16, 32, 33
Internal Failure	26, 53
Introduction	2, 3
Inverse I:E Ratio	27, 33, 56

L	
LCD backlighting	20
Low Internal Temperature	27, 55
Low Pressure Alarm	7, 18, 24, 53
In CNEP	8, 22
Setpoint	34, 35, 40

D	
Date and Time	7, 20, 37
Diagnostic Port	13, 41
Diagnostic Self Check	30
Dimensions	9

M

Main Menu	6, 7, 15
Setting Parameters on	30 – 35
Manual Sigh Key and LED	11, 33
Menu Display	7, 20, 38
Menu Display Area	14
Message Area	14
Missing Parameters Warning	27, 30, 57
Mode	6, 15, 16, 31

N

Nasal Cannula	29, 42
Negative Pressure Setting	6, 16, 32
Next Menu	7, 8, 18, 19
Setting Parameters on	35 – 39
Nu-Mo Garments	47, 48, 49
Fitting of	48
Use of	48, 49

O

Operation Guidelines	29 – 41
----------------------------	---------

P

Panel Lock/Unlock Key and LED	8, 12
Patient Hose Port	10, 29
Porta-Lung	50
Power Consumption	9
Power Cord Receptacle	13
Power Failure	26, 53
Power Sources	8
Power Switch	8, 10
Pressure	
Chambers	50
Connector	10, 29
Display Area	14
Out of Range	25, 54
Tubing	29, 42
Preventive Maintenance	52
Print Interval	7, 19, 35, 36
Print Now	7, 19, 36
Printer	41, 43

R

Rate Setting	6, 16, 31, 32
Remote Alarm	7, 21, 28, 39, 41, 43
Remote Alarm Connector	13
Return to Main Menu	21
Run Display	20, 38

S

Select/Enter Knob	12
Self-Test Failure	30
Service Contract	59
Setting Parameters	30 - 35
Sigh	
Frequency	6, 17, 34
LED	8
Multiples	6, 17, 34
Pressure	6, 17, 33
Sigh Pressure Out of Range	25, 55
Standby	7, 18, 31
In CNEP	8, 23, 40
Specifications	6 – 9

T

Temperature Specifications	9
Troubleshooting Guide	53 – 57

U

Units of Pressure	7, 20, 36
-------------------------	-----------

V

Visual Indicators	8
-------------------------	---

W

Warnings	4
Warranty	58
Weight	9

NEV - 100

OPERATING MANUAL



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