



STAGE IV [®] - ***2000/3000***

Pressure Relieving Systems

Operating Instructions

Revised 1/14/02

SenTech Medical Systems

WARNING

Before operating this medical equipment, it is important to read this manual and to understand the operating instructions and safety precautions. Failure to do this could result in patient injury and/or damage to the product. If you have any questions, please contact SenTech Medical Customer Service at **800-474-4225** or **954-739-4972**.

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1.0 SAFETY PRECAUTIONS –

Physician Orders – The STAGE IV 2000/3000 systems should only be used by order of a physician. Always consult with the patient's physician before placing a patient on the STAGE IV 2000/3000 systems.

Contraindications – Certain medical conditions and treatments are contraindicated for use of the STAGE IV 2000/3000 systems. Always consult with the patient's physician before placing a patient on the STAGE IV 2000/3000 system.

CAUTION! SenTech Medical requires that bed frames used with the STAGE IV 2000/3000 systems have bed rails and that they are kept in the highest position during operation. Bed rails should be of sufficient height to ensure the safety of the patient lying on the mattress.

Electronic Controllers –

CAUTION! The STAGE IV electronic controllers are precision instruments. Use care when handling or transporting. Dropping, or other sudden impacts, may result in damage to the microprocessor and/or the controller.

CAUTION! Exposure of the electronic controller to any liquid while it is plugged in could result in a severe electrical hazard.

CAUTION! Only use fuses that have the same specified rating (See Section 7.0). Using fuses with higher ratings could result in damage and/or injury.

- Do not place any objects/items, such as blankets, on, or over, the electronic controller. Excessive weight on the STAGE IV 2000/3000 controllers could result in damage to the electronic controller.
- After exposure to extreme high or low temperatures, allow electronic controller to equilibrate to room temperature before operating.
- The STAGE IV 2000/3000 controllers circulate room air during operation. Exposure to smoke may cause the system to fail. Therefore, smoking by patients, or visitors, while using the STAGE IV 2000/3000 systems is strongly discouraged.
- Only use the power cord supplied with the STAGE IV 2000/3000 systems.

CAUTION! Do not attempt to repair or service the electronic controller. Repairs and service should only be done by SenTech Medical Systems. If the unit is not functioning properly, or has been damaged, unplug the unit and take it out of service immediately. Contact Customer Service at **800-474-4225** or **954-739-4972** for repair and service information.

2.0 PRODUCT OVERVIEW

The STAGE IV 2000/3000 systems are microprocessor controlled **Alternating Pressure Relief** and **Low Air Loss** therapeutic mattress systems. The needs of individual patients can be optimized by combining these therapies or operating them independently from each other.

The Alternating Pressure feature of the STAGE IV systems provide pressure relief by deflating and inflating every other air cell on a timed interval. It is widely recognized that constant pressure to a bony prominence is a leading cause of skin breakdown. The STAGE IV systems provide continuous movement of air cells that alleviates constant pressure and enhances circulation. The deflated air cells provide pressure relief, while the inflated air cells support the patient's weight.

The STAGE IV electronic controllers provide a real-time display of air pressure for both the inflated and deflated air cells. The amount of pressure to support a patient can be set automatically based on the patient's height and weight or can be manually set for custom configurations. All settings are stored in non-volatile memory. If power is interrupted, the electronic controller automatically returns to the previous settings when the power returns.

The Controlled Low Air Loss (LAL) feature of the Stage IV systems provide an optimum temperature environment to assist in patient healing and comfort. LAL therapy is delivered through a patented SenTech Coverlet that provides a flow of diffused air directly to the patients skin through thousands of microscopic micro-vents. In addition, the mattress has been designed to provide an anti-shear/anti-friction surface for patients.

3.0 INSTALLATION –

NOTE: It is recommended that all shipping and packing material be saved in the event that the product has to be sent back to SenTech Medical.

3.1 Unpacking and Inspection -

Carefully remove the controller, mattress and all accessories from the shipping cartons. Inspect all items for any damage that may have occurred during shipping. Any damages, or missing components, should be reported to SenTech Customer Service as soon as possible.

Mattress Replacement: The box contains a completely assembled mattress replacement system. This system consists of:

- 1.5 Inch Foam Mattress
- Air Cell Assembly with CPR Pull
- Top Coverlet with Low Air Loss Hose
- CPR Hose Assembly (Hospital Grade Only)

Electronic Controller: The electronic controller is in a separate box containing:

- Electronic controller
- Power cord
- Operating Instructions

3.2 Installation Requirements –

STAGE IV 2000/3000 systems are designed to operate in a controlled environment, which is free from extreme temperatures, high humidity and/or excessive amounts of airborne particulates, such as dust and smoke. The controller can be plugged into any standard wall outlet and hung on the upper outside edge of the footboard on most hospital and home care beds.

3.3 Installation of Air Mattress:

Mattress Replacement System: No assembly is required.

Remove the current mattress from the bed frame and replace with the STAGE IV Mattress assembly. The hose connections should be positioned at the bottom left of the bed.

There are two (2) sets of straps with D-rings on each side and one (1) at the head of the mattress. Use these straps to secure the mattress replacement to the bed frame.

IMPORTANT: Make sure that the attachment of the mattress does not interfere with bed movement/operation.

3.0 INSTALLATION (Continued) –

3.4 Installation of CPR Pull –

1. For Hospital Grade systems, attach the CPR assembly to the mattress by inserting the black round hose assembly into the CPR socket located at the *foot* of the mattress and turning it counterclockwise $\frac{1}{4}$ of a turn.
2. For standard systems, the CPR is located at the *head* of the mattress and has already been installed at the factory. Although, no further installation is required, the CPR should be inspected to ensure that it has not loosened or disconnected during shipping.

3.5 Installation of Electronic Controller -

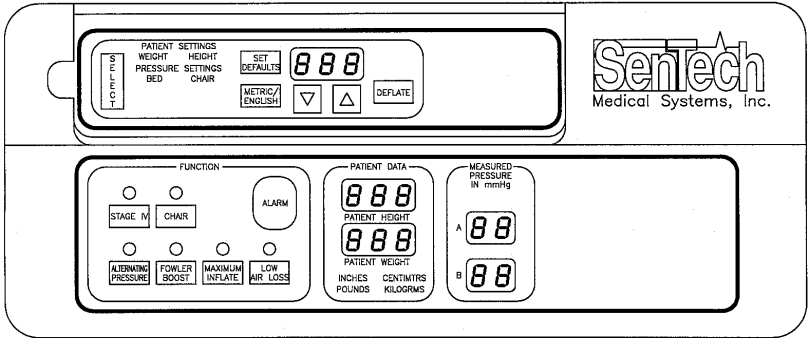
1. Hang the STAGE IV 2000 or 3000 controller over the footboard of the bedframe.
2. **Coverlet Hose:** Connect the single Low Air Loss hose from the center of the coverlet to the connector on the right side of the controller labeled “Low Air Loss”.
Mattress Hoses: Connect the hoses from the left side of the mattress shell to the connectors on the left side of the electronic controller:
 - Stage IV 2000 – Two (2) hoses connected in any order.
 - Stage IV 3000 - Six (6) color-coded hoses connected to the corresponding color-coded connectors on the left side of the controller i.e., red to red, green to green, etc.

NOTE: Each connector should tightly “click” into place.

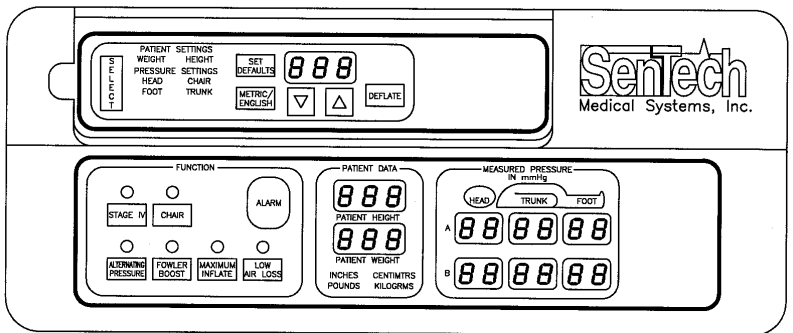
3. Plug into electrical outlet. Turn the POWER on with the power switch located next to the electrical cord, on the right side panel of the controller.
4. Inflate the mattress by pressing the blue MAX INFLATE key on the touch panel. In this mode all mattress cells are inflated to 40 mmHg to provide a firm, flat surface. The MAX INFLATE mode will last for 20 minutes, unless it is interrupted by pressing any other function key. The system will then automatically revert back to the previous operating mode.

4.0 OPERATION –

The control panels for the STAGE IV 2000/3000 electronic controllers are shown in the diagrams below. Refer to these diagrams as you read the OPERATION section.



STAGE IV 2000 CONTROL PANEL



STAGE IV 3000 CONTROL PANEL

4.1 Functions and Settings –

Many of the functions and settings on the STAGE IV 2000 and Stage IV 3000 systems are the same. Where differences are present, they will be noted.

Power The ON/OFF switch is located next to the electrical cord on the right side of the controller. The switch will illuminate in the “ON” position

FUNCTIONS: The following controls are located on the front display panel:

Stage IV Sets the system to the “BED” operating mode with a 5 minute cycle time when in Alternating Pressure.

Chair Sets the system to the “CHAIR” operating mode with a 2.5 minute cycle when in Alternating Pressure.

Alternating Pressure/Air Floatation Activates/Deactivates Alternating Pressure Relief mode. When activated, the system operates in alternating pressure mode. When deactivated, the system operates in Air Floatation mode.

Fowler Boost Activates/Deactivates the Fowler Boost feature. When activated, the set pressure in the mattress (Stage IV 2000), or the trunk area (Stage IV 3000), is automatically increased by 20%. This feature is used for patients in bed that are put in an inclined or “Fowler” position. It is not available when the system is in the MAX INFLATE or CHAIR modes.

Maximum Inflate Activates/Deactivates the MAX INFLATE mode. In this mode, all mattress cells are inflated to a pressure of 40 mmHg to provide a firm, flat surface. This mode will last for 20 minutes, unless interrupted by the pressing of any function key. The system will then revert back to the pre-set STAGE IV operating mode. When the system is in the chair mode, the Maximum Inflate switch is inactive.

Low Air Loss Activates/Deactivates the Low Air Loss (LAL) feature. When activated, a gentle diffused flow of air is delivered through the LAL coverlet. This feature is not available when the system is in CHAIR mode.

SETTINGS: The following settings are located under the black cover on the top portion of the control panel:

Select Scrolls through the various setting fields. The active field is displayed in the update window and the appropriate indicator is illuminated. The table below shows the selection options available:

	<u>PATIENT</u>	<u>PRESSURE</u>
STAGE IV 2000	WEIGHT HEIGHT	BED CHAIR
STAGE IV 3000	WEIGHT HEIGHT	HEAD TRUNK FOOT CHAIR

UP/DOWN Arrow Keys Used to increase or decrease the patient data or pressure settings.

Auto Set Automatically adjusts the pressure settings based on the patient weight and height entered. Selecting "Auto Set" will override custom set pressures.

Note: Changing the patient data does not automatically update the pressure settings. Auto Set must be pressed to incorporate the change.

Metric/English Toggles the units of measurement used for the patient weight and height between English (inches & pounds) and Metric (centimeters and kilograms).

Deflate Allows air to be pumped out of the mattress automatically. After ten (10) minutes, the pump automatically shuts off. During deflation, all displays and indicators, except the deflate indicator, will be shut off. If this key is pressed in error, press the key again to deactivate and the system will revert to it's previously programmed state.

4.2 Indicators -

Alarm Located on the display panel and will illuminate and audibly sound when the mattress fails to reach the set pressure for three consecutive cycles, approximately 30 minutes.

Inches / Pounds Illuminates when the patient data is displayed in English units of measurement.

CM / KG Illuminates when the patient data is displayed in Metric units of measurement.

Patient Data	Displays patient height and weight as entered in the “Patient Data”. This data is used by the microprocessor to calculate pressure settings, when AUTO SET is selected.
Measured Pressure	Continuously displays the actual air pressure in mmHg that is delivered to the air cells in the mattress. The STAGE IV 3000 displays the measured pressure in the HEAD, TRUNK and FOOT zones. The STAGE IV 2000 shows measured pressure delivered to the whole mattress. The “A” and “B” on the display panel show the pressure in alternate air cells.

4.3 Programming Electronic Controller –

Top Portion of Controller:

1. Open the black cover located on top of the controller. Select the preferred units of measurement for patient data by pressing the METRIC/ENGLISH key. You will see your selection lit in the bottom portion of the display under “Patient Data”.
2. Toggle the SELECT key until PATIENT WEIGHT is lit. Using the up and down arrow keys select the appropriate patient weight. Weight is adjusted in 10-pound increments. Round the patient’s weight up to the nearest 10-pound increment.
3. Toggle the SELECT key until PATIENT HEIGHT is lit. Using the UP and DOWN arrow keys select the appropriate patient height.
4. Press AUTO SET. The pressure setting is now automatically set for that patient.

NOTE: The AUTO SET setting is not appropriate for all patients. Some patients may require custom settings for optimal therapy. To select a custom setting for the Stage IV 2000, toggle the SELECT key until BED is displayed and adjust the pressure by using the UP and DOWN arrow keys. To select custom settings for the Stage IV 3000, toggle to the HEAD, TRUNK or FOOT and adjust the pressure by using the UP and DOWN arrow keys. After readjusting the pressure setting, DO NOT hit AUTO SET.

Bottom Portion of Controller:

1. From the bottom left area of the display select which therapy and features you wish to operate. Be sure that STAGE IV is selected and lit while the patient is in bed. If using a SenTech Air Chair Cushion, select CHAIR.

Bottom Portion of Controller (Continued):

2. Select the therapy desired. The STAGE IV 2000/3000 has the ability to provide **ALTERNATING PRESSURE (AP)** or **AIR FLOATATION (FLOAT)**, and **LOW AIR LOSS (LAL)** therapies:
 - For AP, press the blue ALTERNATING PRESSURE key until it is lit.
 - For FLOAT, turn the Alternating Pressure off by pressing the blue AP key. The alternating pressure light will not appear lit. LAL may be operated simultaneously with AP or FLOAT, or not at all.
 - For Low Air Loss (LAL), press the yellow LOW AIR LOSS key until lit.
3. For patients that are in a Fowler position, i.e., an inclined or sitting position, it is recommended that the FOWLER BOOST be activated by pressing the blue FOWLER BOOST key until lit.
4. Select the MAX INFLATE for a firm surface throughout the entire bed by pressing MAX INFLATE key on the control panel. When MAX INFLATE is selected, it disables all other functions and only LAL will operate.

4.4 CPR Operation –

For emergency situations that require rapid evacuation of the air in the mattress, the STAGE IV 2000/3000 systems are equipped with CPR pulls:

4.4.1 Standard CPR -

The CPR Pull is located at the *head* of the mattress on the patient's right side.

1. To activate, firmly pull the red tag labeled "CPR". To increase deflation rate, disconnect the hoses from the controller.
2. All air cells will begin to deflate and air will be rapidly evacuated. Rate of evacuation is dependent on the weight of the patient.
3. To resume normal operation of the mattress, close the CPR device by fully inserting the CPR hoses onto the connector. The Stage IV 2000 has two (2) CPR hoses; the Stage IV 3000 has four (4) hoses.

4.4.2 Hospital Grade CPR Pull –

The CPR pull is located at *foot* of the mattress on the patient's right side.

1. To activate, rotate $\frac{1}{4}$ turn clockwise and pull.
2. All air cells will begin to deflate and air will be rapidly evacuated. Rate of evacuation is dependent on the weight of the patient.
3. To resume normal operation of the mattress, close the CPR device by fully inserting the "CPR" assembly and rotating $\frac{1}{4}$ turn counterclockwise.

5.0 MAINTENANCE AND CLEANING –

5.1 STAGE IV 2000/3000 Electrical Controller:

The STAGE IV electrical controllers are easy to maintain:

Exterior: The exterior of the controller should be periodically wiped down with an approved disinfectant and the electrical cord checked for electrical hazards.

CAUTION! DO NOT spray disinfectant directly on the electrical controller, or immerse the controller in any type of liquid. This could result in a severe electrical hazard.

Air Filters:

The filter should be cleaned every 30 days. The filter is located on the bottom of the controller. Unplug the controller and place it on its front face. Snap out the plastic filter grill and remove the filter. Rinse with water and air dry. Put the filter back into the filter housing and snap filter grill into place.

To ensure optimal performance of your STAGE IV 2000/3000 electronic controllers, calibration should be verified every 12 months. Contact SenTech Customer Service for calibration information.

- 5.2 Coverlet:** The top cover should be disinfected between patient use. While it is up to each facility to follow their own guidelines for infection control, SenTech recommends the cover be machine washed with detergent and an effective medical disinfectant. DO NOT use bleach. The cover should soak in the disinfectant solution for a minimum of ten minutes. Rinse thoroughly and air-dry, or use a “non-heat” drying cycle. DO NOT dry in a dryer using a “heat” cycle. Temperatures generated by these dryers may negatively affect the therapeutic benefit of your coverlet.
- 5.3 Outside Shell:** Wipe down shell using an approved disinfectant and air dry. If heavily soiled, the shell can be machine washed in warm water. Air Dry or use a “non-heat” drying cycle.
- 5.4 Air Cell Assembly:** Wipe air cell assembly down by hand using an approved disinfectant. Allow disinfectant to soak in. Wipe, rinse thoroughly and air dry. DO NOT MACHINE WASH OR DRY!
- 5.5 Foam Mattress:** Foam mattress is fully enclosed in 10mil urethane and should be wiped down with an approved disinfectant. If foam should be compromised, contact SenTech for a replacement.

6.0 TROUBLESHOOTING –

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
1. Alarm light is on.	The alarm is activated if the air cells do not reach programmed pressure in less than or equal to 20 minutes. This is usually an indication of an air leak in the system.	<p>a) Check the CPR connections for leaks:</p> <p>For the Standard CPR, make sure the CPR plugs are fully inserted into the hoses (Stage IV 2000 = 2 hoses / Stage IV 3000 = 4 hoses). For the Hospital Grade CPR, make sure the six (6) rubber o-rings on the CPR pull are present and not damaged and that the CPR is in the “closed” position.</p> <p>b) Be sure all hoses are properly connected to the controller.</p> <p>c) Check all hoses along the inside of the mattress. Each hose should be tightly connected.</p> <p>d) Check each air cell to ensure there are no leaks. (It will be easier to detect a possible leak if you place the system in the MAX INFLATE mode.)</p> <p>e) Once the leak has been resolved, the alarm light will automatically turn off after three cycles. To reset the system more quickly, turn the power off and then on again to reset.</p>
2. Patient is sinking or “bottoming out” while lying flat.	The pressures may be set too low for the patient’s weight.	Increase bed pressure. An increase of 3-5 mmHg is usually sufficient. However, wait at least one (1) full cycle before determining if the pressure increase was sufficient

6.0 TROUBLESHOOTING GUIDE (Continued) –

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
3. The height and weight settings appear to be reversed.	The units of measure, i.e., English or metric, may be selected incorrectly.	Select proper units of measure by pressing the ENGLISH/METRIC key and re-enter patient weight and height, if needed.
4. The pressure setting was increased, but the pressure does not appear changed.	The AUTOSET key may have been pressed by mistake which would "overwrite" all customized settings.	Re-enter pressures needed. DO NOT press AUTO SET.
5. Air is not constantly flowing into the Low Air Loss Coverlet	The internal pump gives priority to the air cells in the mattress. Once the air cells are inflated to the selected pressure, air will then be directed to the coverlet.	Allow air cells to pressurize.
6. Display readings appear "scrambled".	Power surges can cause the controller to temporarily malfunction.	Turn the controller off for five (5) seconds and then on again to reset.
7. Display readings appear abnormally high	May be caused by crimped or pinched hoses, which cause an uneven delivery of air.	Check all hoses and eliminate any restrictions, e.g., sharp bends, crimps, folds, etc.
8. Patient is "bottoming out" when in the sitting or inclined position.	Pressure is concentrated in the trunk region	Activate the FOWLER BOOST to increase pressure by 20%.

6.0 TROUBLESHOOTING GUIDE (Continued) –

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
9. Air controller is inoperable	May be caused by a power surge Or May be caused by internal damage	If the power switch does <u>not</u> illuminate when the power is turned on, check the fuse(s) located in the compartment on the electrical cord socket and replace if necessary (See Section 7.0 for fuse information and ratings). If this does not correct the problem, contact SenTech Customer Service at 800-474-4225 for Repair & Service information
10. The controller sounds like it is working, but no air is coming out.	Dirt has clogged the valves due to improper filter maintenance.	Contact SenTech Customer Service at 800-474-4225 for Repair & Service information.

7.0 PRODUCT SPECIFICATIONS –

Product Specifications for your STAGE IV 2000/3000 Systems are presented below:

Electronic Controller –

Physical Dimensions:

Height (Inches)	12.2
Width (Inches)	14.5
Depth (Inches)	6.0
Weight (Pounds)	19 (Stage IV 3000) 17 (Stage IV 2000)

Electrical Parameters:

Domestic:

Power Requirements	120V, 60 Cycle AC
Fuse	3.1A (1 fuse)*
Maximum Current	< 1.0A

Europe:

Power Requirements	240V, 50 Cycle AC
Fuse	2A (2 fuses)
Maximum Current	< 0.5A

* One (1) replacement fuse is provided with your controller and is located in the compartment on the electrical cord socket).

CAUTION! Only use fuses that have the same rating as specified above. Using fuses with higher ratings could result in damage and/or injury.

Operating Parameters:

Weight Range (Pounds)	50-500.
Height Range (Inches)	46-78
Pressure Range (mmHg)	5-50 (Bed) 40-95 (Chair)

Mattress Replacement (Fully-Inflated) –

Physical Dimensions

Height (Inches)	8.5
Width (Inches)	36
Length (Inches)	80
Weight (Pounds)	22 (STAGE IV 2000) 24 (STAGE IV 3000)

8.0 WARRANTY INFORMATION -

LIMITED WARRANTY

SenTech Medical Systems, Inc. warrants each of its products to perform in accordance with their established specifications for the following time periods starting from date the product was shipped from the SenTech facility.

STAGE IV 2000, 3000, Stage IV Star, Thera-Turn Star Systems and Millennium Systems

Compressor Pump: 3 Years
Electronic Controller: 2 Years
Soft Goods: 1 Year

Primary Care, Sentry 500, 1000, 1200 Systems

Compressor Pump: 2 Years
Electronic Controller: 1 Year
Soft Goods: 1 Year

Air Chair Systems

Compressor Pump: 2 Years
Electronic Controller: 1 Year
Soft Goods: 1 Year

Battery in Mobile Air Chair: 6 Months
Recliner Chair in Air Chair Systems: 2 Years

During the warranty period, SenTech Medical Systems, Inc. will repair or replace any products that are not performing in accordance with their established specifications, unless the failure is due to (1) customer negligence or misuse or (2) unauthorized repairs. Items not covered under warranty include, but are not limited to: staining of materials, punctures, cuts, damaged electrical cords, rips or tears, dents and lost or missing parts. Warranty repairs must receive a prior return authorization number and sent to SenTech by prepaid transportation, together with information describing the product's performance. It will be returned to the customer at SenTech's expense. Warranty repairs do not extend the life of the warranty period. During the warranty period, SenTech will provide one Bio-Med at no charge, excluding shipping.

Neither SenTech Medical Systems, Inc., its officers, directors, employees or agents shall be liable for consequential or other damages, including but not limited to personal injury, loss, or any other expense, directly or indirectly arising from the use of its products. The sole remedy for breach of the limited warranty granted herein shall be repair or replacement of the SenTech products.

All product specifications are subject to change without notice.

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