

GAYMAR®

Auto SureFloat™

**Floatation Pressure Management
with Alternating Pressure and Active Sensor Technology™**

- REF C1000MS/MES Control Unit
- REF M1000S Series Mattress



Service Manual

P/N 11861-000 11/03
AW 5399

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Before you begin...

 **Important**

Review the *SAFETY PRECAUTIONS* in section 5.0 of this *Service Manual* prior to performing service.

Only qualified medical service personnel should attempt to repair this device. If you have any questions, please contact Gaymar’s technical service department.

International Customers:

Direct (716) 662-8636
Fax: (716) 662-0730

Domestic Customers:

Toll Free (800) 828-7341 extension 739
Fax: (716) 662-8795

Warranty / Symbols / Safety Precautions

1.0 Warranty

The Control Unit is warranted free of defects in material and workmanship for a period of two (2) years.

The Mattress and Overlay are warranted free of defects in material and workmanship each for a period of one (1) year.

The Control Unit, Mattress, and Overlay are warranted under the terms and conditions of the Gaymar warranty in place at the time of purchase. A copy of the warranty is available upon request. Gaymar disclaims all implied warranties including, but not limited to, the implied warranties of merchantability and of fitness for a particular purpose.

Control Units may be returned to the factory for servicing. Contact Gaymar Technical Service for return authorization prior to return.

Please contact Gaymar Customer Service if you have warranty questions.

Direct (716) 662-2551 extension 739
Toll Free (800) 828-7341

2.0 Symbols



Attention, consult accompanying documents



Type BF equipment



Dangerous voltage



Protective earth



3.0 Safety Precautions

DANGER

Risk of electric shock. Refer servicing to qualified service personnel.

WARNING

Repairs should be performed only by qualified medical equipment service personnel in accordance with this Service manual. Otherwise, damage to the Auto SureFloat system and improper therapy may result.

CAUTION

For grounding reliability, plug only into a properly grounded outlet.

Description

4.0 Description

The Auto SureFloat™ System is a portable air flotation system with on-demand alternating low pressure treatment, designed to provide benefit to patients suffering from, or at risk of, developing pressure ulcers. The system, consisting of a Control Unit and Air Flotation Mattress with it's Top Sheet, is designed to provide pressure management and patient comfort.

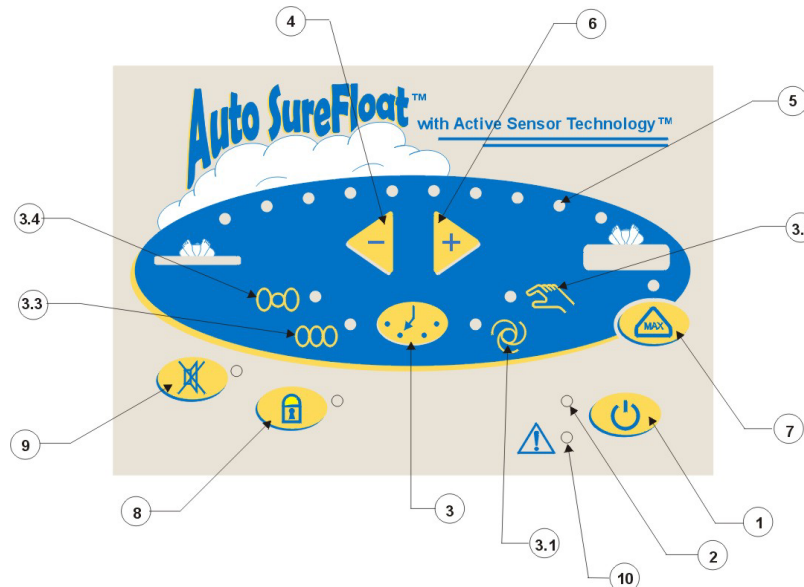
The Control Unit inflates and maintains the Mattress to user-selected settings, and can also provide on demand alternating low pressure treatment if desired. Used with the M1000S mattress, featuring Active Sensor Technology, the system automatically adjusts the Mattress to the optimal fill level ensuring complete flotation pressure management.

Mattress

The Mattress base consists of twenty transverse air cells constructed of a low shear nylon. Each of the individual cells is a minimum of eight inches tall (inflated height) and spatially oriented above a two inch convoluted foam base. The M1000S Mattress utilizes 4 specialized air cells in the center region of the Mattress which contain active sensors for detecting patient flotation level.

Covering the entire Mattress assembly is a low-friction, low-shear producing, vapor permeable, nylon Top Sheet. The Top Sheet surface creates a membrane impermeable to liquids, air and bacteria though still permeable to water vapor. Quilted onto the base of the Mattress Top Sheet is a spun bonded polyester fiberfill that exhibits less frictional resistance to nylon than that of the patient's skin. When the patient moves, the Top Sheet tends to move relative to the air cells rather than relative to the patient, minimizing shearing effects. Additionally, the quilting acts to provide a diffusion layer by which the water vapor can be drawn away from the patient, resulting in more efficient evaporation and subsequent reduced skin maceration.

5.0 Operator Control Panel (Figure 1)



1. **ON/STANDBY** switches Control Unit between On and STANDBY modes.
2. **POWER INDICATOR LED** indicates AC power is present to the Control Unit.
3. **MODE SELECT** Press repeatedly to toggle through operating modes, Auto/Float, Auto/A/P, Manual/Float and Manual/A/P.

3.1 AUTO MODE (Sensor cord from M1000S mattress must be connected to control unit) Mattress will automatically inflate to optimal level based on information received from active sensors in mattress. The indicator adjacent to the icon, will light while automatic mode is active.

Note: Connecting the mattress sensor cord while the unit is not in automatic mode will cause the Control Unit to enter automatic mode immediately.

If Sensor cord from mattress becomes disconnected from control unit while in Auto mode, alarm will sound.

3.2 MANUAL MODE Mattress inflation level user-determined by Comfort Adjust (- , +) setting. The indicator adjacent to the icon will light while manual mode is active.

3.3 FLOAT MODE all cells within mattress will be uniformly inflated when this icon is illuminated.

3.4 AP MODE. (Alternating Pressure) Adjacent cells within mattress will be alternately inflated and deflated in this mode. The indicator adjacent to the icon will light while AP mode is active. Note: AP mode is temporarily suspended in max inflate mode.

4. **SOFT (-)** decreases the inflation level of the bed while Control Unit is in manual mode only. Pressing once will decrease the setting by one comfort level. Pressing and holding will rapidly change the setting.
5. **COMFORT CONTROL INDICATOR** displays the current inflation level setpoint.
6. **FIRM (+)** increases inflation level of the bed while in manual mode only. Pressing once will increase the setting by one comfort level setting (~2.5mmHg). Pressing and holding will rapidly change the setting.
7. **MAX INFLATE** selects/deselects the max inflate mode (maximum mattress firmness). The indicator adjacent to the button will flash while max inflate mode is active. After 30 minutes, max inflate mode will cancel.
8. **LOCKOUT** activates or cancels lockout mode. Press and hold for three seconds to activate or cancel mode. The indicator adjacent to the button will light while lockout is active. In lockout mode, only the MAX INFLATE button is operational. All other buttons are temporarily inactive.
9. **ALARM SILENCE** silences indefinitely, the audible alarm.
10. **POWER FAIL INDICATOR** flashes when power supplied from line cord is interrupted while the Control Unit is operating. To avoid an inadvertent power fail alarm, place the unit in STANDBY mode before disconnecting power from Control Unit.

Alarm Conditions / Features

5.2 Alarm Conditions

5.2.1 Unit will alarm for any of the following conditions

- 1 If device is unplugged while in the RUN mode, an alarm will sound for up to 20 minutes. To correct problem, re-attach power and put unit into Standby mode, then unplug.
- 2 If Active Sensor cord is unplugged while in the Auto Mode, an alarm will sound indefinitely. To correct problem, place unit in Manual mode or re-attach Active Sensor cord.
- 3 If device has been running for 30 minutes and proper inflation level cannot be attained, an alarm will sound indefinitely. To correct problem, check for disconnected or damaged air cells or disconnected hose.

6.0 Rear and Side Panel Features (Figure 2)



C1000MES



C1000MS

1. **Hangers** for attaching to footboard or side rails on hospital bed.
2. **AIR OUTLET CONNECTORS**
3. **MATTRESS SENSOR CORD INPUT JACK** uses feedback from M1000S mattress (with Active Sensor Technology) for Automatic Mode operation.
4. **MODEL / SERIALNUMBER / IDENTIFICATION BARCODE LABEL** must not be removed from the unit. The model and serial number information is needed to arrange for returns to the factory.
5. **ACCESS HOLE** for measuring ground line resistance.

7.0 Cleaning

WARNING

Disconnect the AC power cord from the wall outlet before attempting to clean the control unit. Do not heat or steam autoclave any component of the system.

- 1.0 To clean, use soap, water and a clean cloth to wipe down the control unit, power cord, hoses and mattress or overlay. Do not use abrasive cleaners on the mattress. Wipe dry with a clean, dry cloth. Note: Blood and other body fluids must be thoroughly cleaned from all surfaces before applying disinfectants.
- 2.0 Apply any FDA approved disinfectant to the external surfaces of the control unit, hoses and mattress or overlay. Allow to completely dry. The solution contact time is what makes disinfection effective.
- 3.0 Wipe down the mattress or overlay with a clean, dry cloth to remove any excess disinfectant.
- 4.0 Top sheets of mattress may also be laundered between patient uses or as required to maintain good patient hygiene. Fill the washing machine with warm water (70 -140 °F or 21 - 60 °C). Add one cup of laundry detergent. Place no more than four top sheets in a single extra large load capacity washing machine. When wash cycle is complete, remove promptly from machine and ensure all excess water is drained from load. Place dryer on LOWEST heat setting, or AIR FLUFF if available until dry. Verify top sheet is completely dry before placing under patient.
- 5.0 If individual air cells of mattress become soiled, clean and disinfect as described above or simply replace air cell with a clean replacement. Single air cell replacement can be successfully achieved with patient remaining on the mattress. Air cells which do not contain active sensors can also be laundered. A plug is available from Gaymar to prevent water from getting inside these during laundering (P/N 30287).

WARNING

Do not launder the red colored Active Sensor Technology air cells of the M1000S mattress. Damage may result.

8.0 Routine Maintenance

8.1 Visual Check for Physical Damage

Visually check the unit for physical damage. Specifically inspect the power cord, power inlet connector, mattress sensor cord input jack, bed hooks, air outlet connectors and their O-rings. Repair or replace any broken or missing items.

Functional Check and Safety Inspection Control Unit

9.0 Functional Check and Safety Inspection

To assure optimum performance, dependability, and safety, the following should be performed annually or more frequently if desired.

WARNING	
<ul style="list-style-type: none"> Repairs should be performed only by qualified medical equipment service personnel in accordance with this Service manual. Otherwise, damage to the Auto SureFloat system and improper therapy may result. Always perform the <i>Functional Check and Safety Inspection</i> after making repairs and before returning the unit to patient use. 	

Inspection Form

An *Inspection Form* (Section 11) is provided to facilitate and document the inspection process.

Equipment or tools required:

- Current Leakage / Ground Resistance Tester
- Pressure Measurement Equipment

<u>Test Equipment Set 1</u>	<u>Part Number</u>
Adaptor (Refer to Figure 3)	11668-000
Manometer pressure gauge [0 -100 mmHg range] (Refer to Figure 3)	10392
Mattress	M1000 or M1000S Series
- Automatic Mode Test Equipment

Mattress Sensor Test Cable	20232-001
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Or

Mattress	M1000S series
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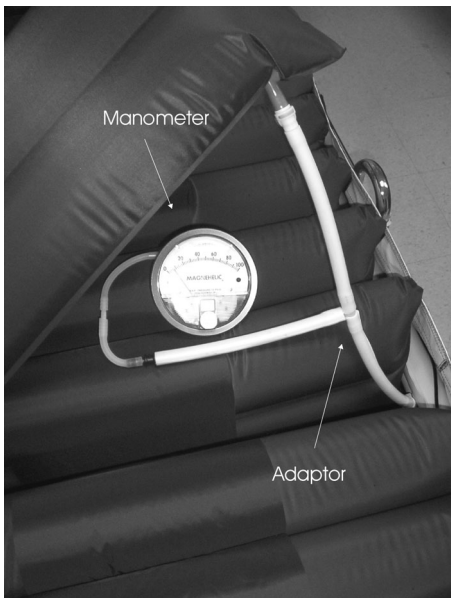


Figure 3 – Test Equipment Set 1

Using M1000 Series Mattress

- Connect pressure gauge in series between the manifold and a blue air cell in the center of the mattress.

Using M1000S Mattress (with Active Sensor Technology Cells)

- Connect pressure gauge in series between the manifold and the blue air cell adjacent to the red Active Technology cells (but the one closest to the hose end of the mattress).

Function Testing – M1000S Mattress

Test Conditions:

The following tests should be performed in a 70°F (21°C) room ambient.

Test Setup:

Attach an M1000 or M1000S Series mattress and gauge and adaptor from Test Equipment Set 1 (per Figure 3 to the control unit. Select Manual Mode with a comfort setting of 5 (half of the LED lights illuminated). It should take approximately 10 – 15 minutes to fill.

Do not connect the mattress sensor cord of the M1000S Mattress or the Mattress Sensor Test Cable to the unit's input jack at this time.

9.1 Manual Mode:

1. With the unit operating in the Manual mode, press the Firm(+) button until all the LED bars are lit on the COMFORT CONTROL INDICATOR. When pump turns off, verify the test manometer(s) reads 30 +/- 4 mmHg.

9.2 MAX INFLATE:

1. Press the MAX INFLATE button. When pump turns off, manometer should indicate pressure 2.5mmHg greater than that measured in previous step.

9.3 AP Mode:

1. Select Manual/AP Mode with a comfort setting of 5 (half of the LED lights illuminated).
2. Allow unit to run until pump turns off and venting is complete. Record pressure in this zone.
3. Within 2½ minutes, pressure will cycle in the zone you are measuring. Again allow pump to turn off and wait for unit to complete venting then record pressure.
4. The difference in pressure from step 3 to step 4 should be 8mmHg ±2mmHg.

9.4 Automatic Mode: (Must use M1000S series mattress or Mattress Sensor Test Cable)

1. Connect the mattress sensor cord of the M1000S Mattress or the Mattress Sensor Test Cable to the jack on the right side panel of the control unit. This should cause the unit to enter Automatic mode by itself.

If using the Mattress Sensor Test Cable:

- Electrically jumper the wire ends of the Test Cable together. This simulates a bottomed patient. Insure that the control unit responds by eventually lighting all the LED bars on the COMFORT CONTROL INDICATOR. This may take approximately 2 - 3 minutes to occur.
- Disconnect the jumper from the Test Cable. This simulates a lofted patient. Insure that the control unit responds by eventually turning off all the LED bars except the bottom one. This may take approximately 3 – 4 minutes to occur.

If using the M1000SMattress:

- On any one of the 4 red Active Sensor Technology cells, press down so that the top surface of the cell contacts the bottom of the cell. Insure that the control unit responds by eventually lighting all the LED bars on the COMFORT CONTROL INDICATOR. This may take approximately 2 - 3 minutes to occur.
- Release hand pressure on the Active Sensor Technology cell. Insure that the control unit responds by eventually turning off all the LED bars except the bottom one. This may take 3 – 4 minutes to occur.

Function Testing – M1000S Mattress

Note: If the unit doesn't respond properly, suspect either a mattress failure or a control unit failure. Rule out the mattress failure by performing the M1000S Mattress Function Test of Section 10.0

2. Press the AUTO button to exit the Automatic mode. Disconnect the mattress sensor cord or the Mattress Sensor Test Cable from the unit .

9.5 Electrical Safety:

Perform electrical safety testing using a current leakage/ground resistance tester.

1. Current leakage values should not exceed 300 uAmps for 120V units or 500 uAmps for 230V units.
2. The line resistance between the ground pin on the power plug and its internal connection should be less than 0.5 ohms. A hole has been provided in the back of the unit to allow access to the internal connection for this measurement. See Figure 2.

If any of the tests outlined above were not satisfactory, the control unit should not be put into service. Refer to the calibration and or troubleshooting sections of this manual for assistance in determining, repairing the problem.

10.0 Function Testing – M1000S Mattress

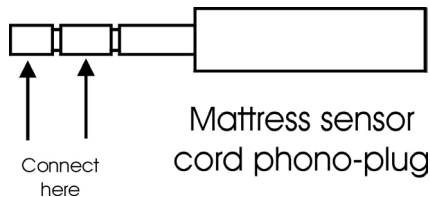
Required Tools:

- C1000MS or C1000MES control unit
- ohmmeter or continuity tester

Setup:

1. Connect the mattress to the control unit. Do not connect the mattress sensor cord of the mattress to the control unit.
2. Operate the control unit in the Manual/Float mode to inflate the mattress.
3. Allow mattress to fully inflate then connect one lead of the ohmmeter (or continuity tester) to each of the two metal end sections of the mattress sensor cord's phono-plug. (Figure 4)

Figure 4



10.1 Sensor Function:

1. Press down on the first of the 4 red Active Sensor Technology air cells so that the top surface of the cell contacts the bottom of the cell. Insure that the measuring device indicates "continuity" or zero resistance in this scenario.
2. Release hand pressure on the Active Sensor Technology cell. Insure that the measuring device now reads "no continuity" or infinite resistance.
3. Repeat steps 1 and 2 on all four of the Active Sensor Technology cells.

11.0 Inspection Form

C1000MS / MES Series Control Unit			
Serial Number _____			
	Item	Requirements	Results
8.1	Physical Inspection OK?		Yes/No
9.1	Manual Mode All LED bars lighted	 30 +/- 4 mmHg	Yes/No _____mmHg
9.2	MAX INFLATE	~2.5mmHg > step 9.1	Yes/No _____mmHg
9.3	Automatic Mode	Controller lights all LED bars during patient "bottoming" simulation?	Yes/No
		Controller lights one LED bar during patient lofted" simulation?	Yes/No
9.4	AP Mode	Alternates every 2 minutes 30 seconds	Yes/No
		Internal mattress pressure difference in A/P cycle 8 mmHg ±2	Yes/No _____mmHg
9.5	Electrical Safety Current Leakage	less than or equal to 300uA for 120V unit?	Yes/No _____uA
		less than or equal to 500uA for 230V unit?	Yes/No _____uA
	Ground Resistance	< 0.5 ohms?	Yes/No

Troubleshooting

12.0 Troubleshooting

In general, it is best to approach a problem or malfunction by first determining if the problem is due to either the mattress or the control unit. In other words, test each independently first. Use a known good control unit, or any other means of inflation to test the mattress.

12.1 Troubleshooting M1000S Series Mattress

Failure of the Active Sensor Technology Cells (which are specific to the M1000S mattress) requires replacement of the entire cell assembly. See Section 10.0 for evaluation of proper functioning of these cells.

Aside from the Active Sensor Technology Cells specific to the M1000S Mattress, potential problems with the M1000 Series mattress could include unintended leaks in the system, disconnected cells, and kinked or twisted hoses or manifold. Troubleshooting these requires only the use of a good control unit or other device to inflate the mattress.

Leaks in Mattress, Manifold, or hoses

Unintended leaks can be felt and heard without the use of any special equipment. There should be no detectable air escaping from any portion of the system. Punctures or tears in any of the components should be addressed by replacement of that component.

Disconnected Cells

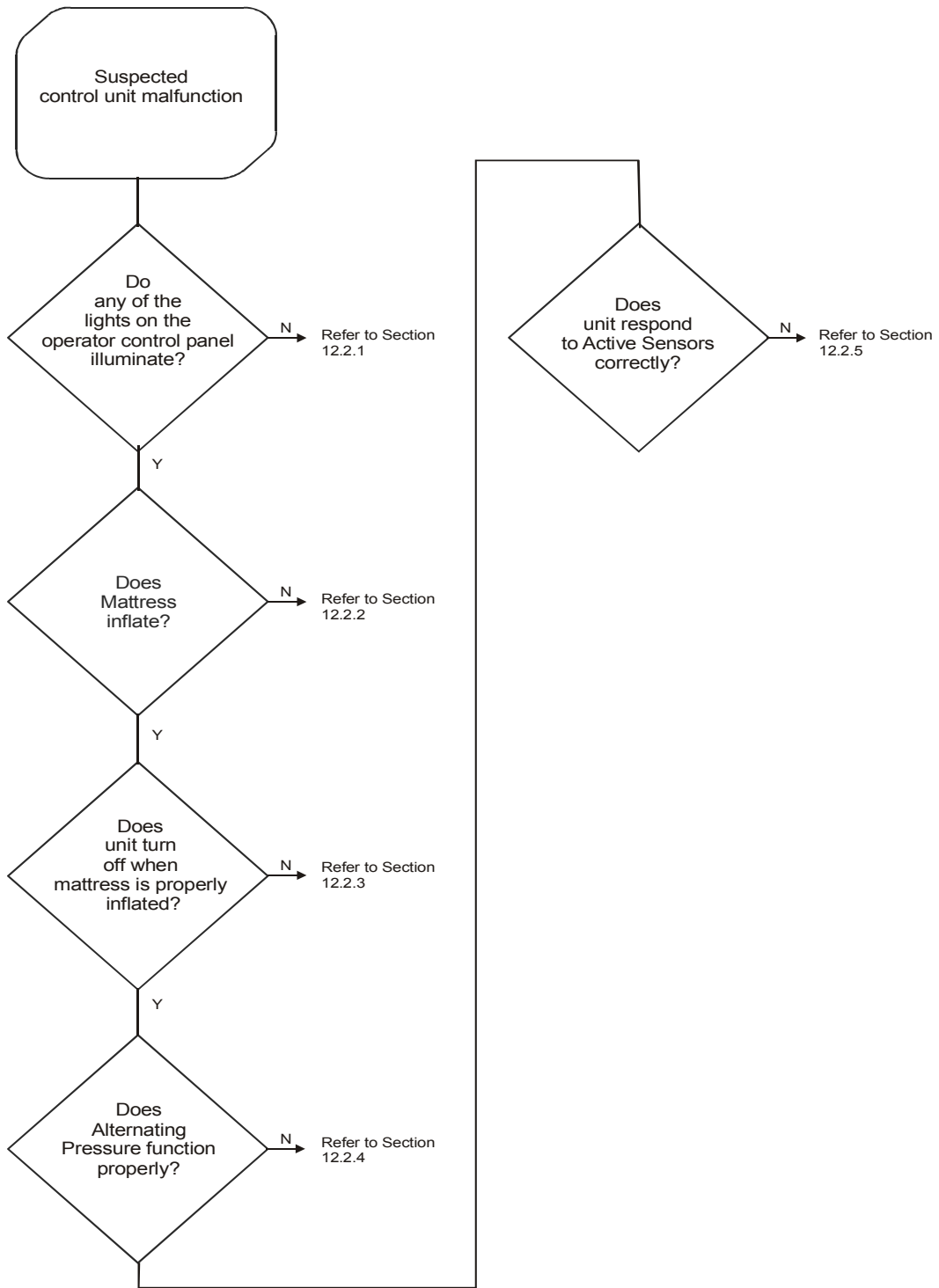
Disconnected cells should be reconnected. Occasionally the white quick connect fittings can come out of the red/orange nipples in either the cells or the manifold, and should be re-inserted with a liberal amount of cyanoacrylate (super glue) gel adhesive on the barbs. Wipe off any excess after insertion.

Kinks/Twists in Manifold

Kinked or twisted manifolds and hoses will restrict airflow. Re-arrange components if kinks or twists are found.

12.2 Troubleshooting the Controller

Figure 5.



12.2.1 Control Unit Appears Dead

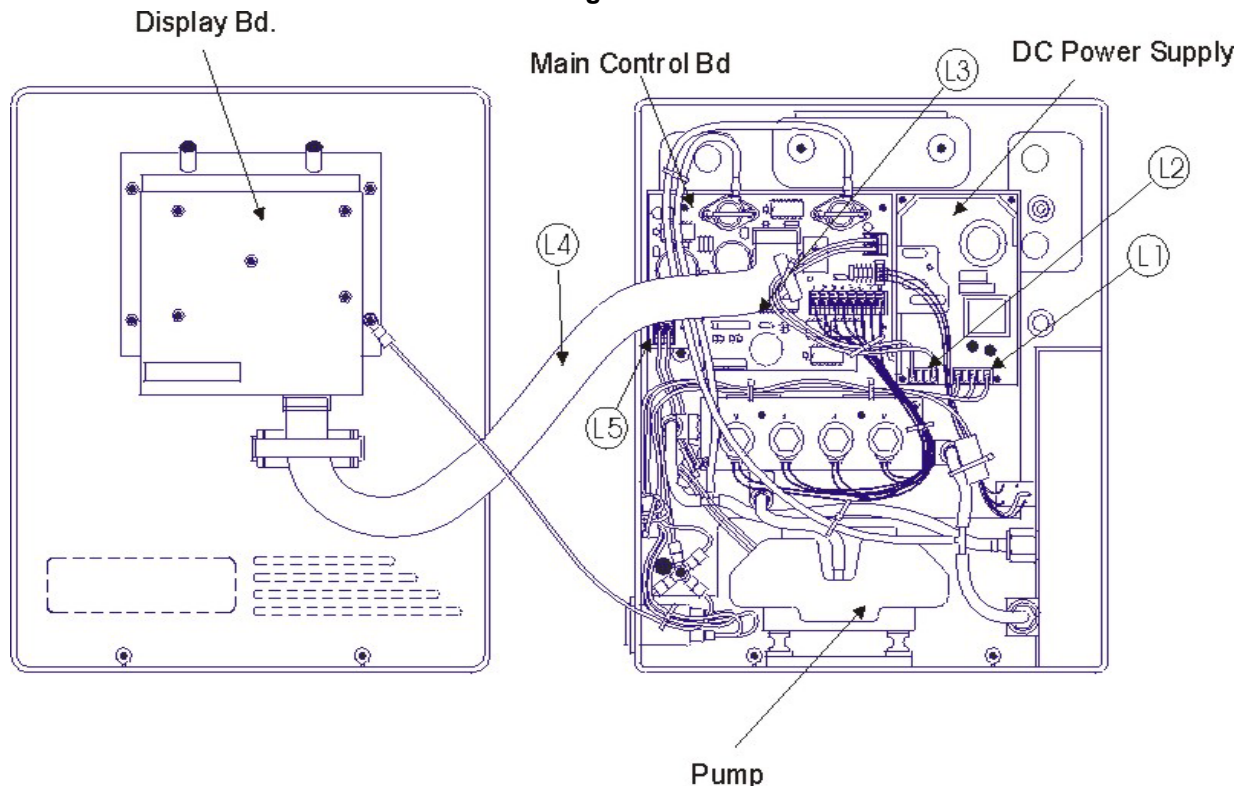
(No Indication of Power in Lights of Operator Control Panel)

1. Open unit by removing the four screws holding the front and rear enclosures together.

DANGER
Risk of electric shock when parts are electrified.

2. Apply power and test for mains voltage (120 VAC / 230 VAC) at input to AC/DC power supply, black and white wires on 5 pin connector. See L1 in Figure 6. If appropriate line voltage is present, continue to step 3. If no voltage is present, check power supply or wall outlet and check for loose terminals on supply lines from power entry module.
3. Test for 12VDC at output of AC/DC power supply, red and black wires on 4 pin connector. See L2 in Figure 6. If voltage is present, continue to step 4. If no voltage is present, replace AC/DC power supply.
4. Measure DC voltage at U7, pin 4 (L3). There should be 5.0 VDC. If not, replace Control Bd.
5. Press and hold On/Standby switch. The 5.0 VDC at pin 4 should drop to 0VDC until the switch is released. If not, check ribbon cable connection from J2 on Main control bd to J1 on Display bd.(L4) If ribbon cable is connected per figure 6, and voltage does not drop as indicated, replace Display bd.
6. If all of the above tests were successful, and there still is no indication of power on the display panel, replace control bd.

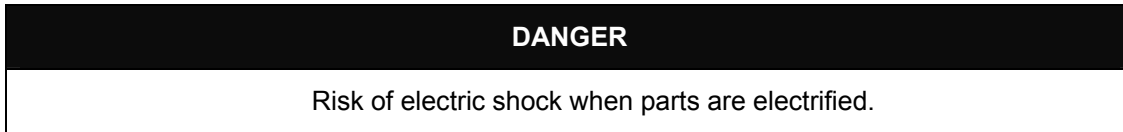
Figure 6.



Troubleshooting

12.2.2 Mattress will not inflate, but Operator Control Panel Appears Functional

1. Open unit by removing the four screws holding the front and rear enclosures together.



2. Insure the control unit is ON in Manual/Float mode. Does pump run? If so, proceed to step 4. If not, test for voltage of greater than 10 VAC at the J1 connector on the control PC board, pins 1&2. See Figure 6 (L5). If proper signal is present and pump does not turn on, replace pump assy. p/n 10325. If proper signal is not present, replace Control PC bd. p/n 11754-000
3. Disconnect mattress from Control unit. With pump running, hold hand adjacent to hose connections on side of unit. Is there any air flow? If so, proceed to step 5. If not, measure DC voltage at J3, across pins 3-4 and pins 7-8. If 12VDC is not present, replace Control PC bd. If present, suspect damaged or dirty solenoid valves. Clean or replace solenoid assy. p/n 11479-001.
4. If pump turns on yet mattress fails to inflate, check for a disconnect between each air cell and manifold assy within mattress or damage to an air cell or hose. Reconnect or replace as necessary

12.2.3 Pump does not turn off

1. First, check for a disconnect between each air cell and manifold assy within mattress or damage to an air cell or hose. Reconnect or replace as necessary
2. Open unit by removing the four screws holding the front and rear enclosures together.
3. Check for disconnected or pinched air lines. Reconnect or repair as necessary.
4. If all of the above items check out OK, replace Control Bd.

12.2.4 A/P Mode not functioning properly

1. Open unit by removing the four screws holding the front and rear enclosures together.
2. Refer to Section 9.4 of Function Test.
3. If unit fails function test, first check for disconnected or pinched air lines within control unit. Reconnect or repair as necessary.

12.2.5 Unit not responding to Active Sensors

1. Check to make certain sensor cable assembly is plugged into control unit.
2. If connected, perform function test per section 9.3 and 10.1
3. If device fails function test, open unit by removing four screws holding the front and rear enclosures together.
4. Check electrical connections on Sensor Jack assembly per Figure 8
5. If connections look OK, disconnect the 3 pin connector J5, from the main control bd.
6. Insert small leads (such as those found on 1/8 watt resistors) into end of connector at pins 1 & 3 (white and black)
7. Measure continuity between pins 1 & 3. With no cord plugged into sensor jack assy., there should be 0 ohms resistance.

Troubleshooting

8. If connection is open, replace sensor jack assy.. If OK, connect mattress sensor test cable 20232-001 to sensor jack assy
9. With the ends of the test cable not jumpered together, there should be no continuity (open) between pins 1 & 3.
10. Now check continuity between pins 2 & 3. With the ends of the test cable not jumpered together, there should be no continuity (open)
11. Electrically jumper the ends of the test cable together. There should be continuity between pins 2 & 3.
12. If not, replace sensor jack assy.
13. If everything checks out and unit will still not pass section 9.3 of function test, replace main control bd.

13.0 Calibration

The calibration procedure should only be performed if the unit does not pass the Function Test of Section 9.0.

Calibration should be performed in a 70°F (21°C) room ambient. Note: The calibration target numbers are different than the nominal verification values.

1. Attach an M1000 or M1000S Series mattress and gauge and adaptor from Test Equipment Set 1 (per Figure 3) to the control unit and allow the system to operate for at least 15 minutes in Manual/Float mode with one half (5) of the LED lights on the COMFORT CONTROL INDICATOR lit (to allow the system to come to stable operating temperatures). The gauge and adaptor should be in series with the first air cell (from the foot end) in the mattress.
2. The M1000S Series mattress is broken up into two distinct zones to facilitate A/P operation. Zones A and B. Each zone is calibrated individually.
3. Enter the control unit's calibration mode by pressing and holding, for approximately 3 seconds, the Alarm Silence and Lockout buttons WHILE plugging the control unit into the wall outlet. (you must continue to hold the buttons until the unit beeps). After releasing the buttons, the unit will display 5 LED lights on the COMFORT CONTROL INDICATOR while alternately flashing the On/Standby and Lock lights. The A/P light will also be illuminated indicating that the unit is ready for calibration information for Zone A.
4. The control unit will attempt to fill both Zones to 15mmHg. Allow control unit to fill mattress until pump turns off. Check the gauge. It should read 15mmHg. If not, repeatedly pressing the – Soft or + Firm buttons will increment the pressure in 0.5mmHg increments. (example: measurements indicate internal mattress pressure of 18 mmHg. press soft button 6X to correct) If, after making the necessary adjustments, there is no change in pressure, reconnect the gauge to the adjacent cell in the mattress and repeat.
5. Once the mattress has been adjusted to the proper pressure, press the Mode key to conclude calibration of Zone A and store the values. The controller will immediately commence calibration of Zone B. The A/P indicator should turn off and the Manual indicator should light. (**NOTE:** pressing the On/Standby button at any time during this procedure will result in exit from the cal procedure without storing new values.)
6. Re-connect the gauge to an immediately adjacent cell within the mattress and allow unit to fill Zone B to 15mmHg.
7. Again check the gauge pressure and make adjustments per step 4 as necessary to achieve 15mmHg in Zone B.
8. Press the Mode button again to conclude calibration of Zone B and store these values.
9. The unit will automatically go into Standby mode.
10. Before resuming operation, remove power to unit by unplugging. This will conclude the calibration process.

14.0 Repair / Replacement Procedures

WARNING

- Repairs should be performed only by qualified medical equipment service personnel in accordance with this Service manual. Otherwise, damage to the Auto SureFloat system and improper therapy may result.
- Always perform the *Functional Check and Safety Inspection* after making repairs and before returning the unit to patient use.

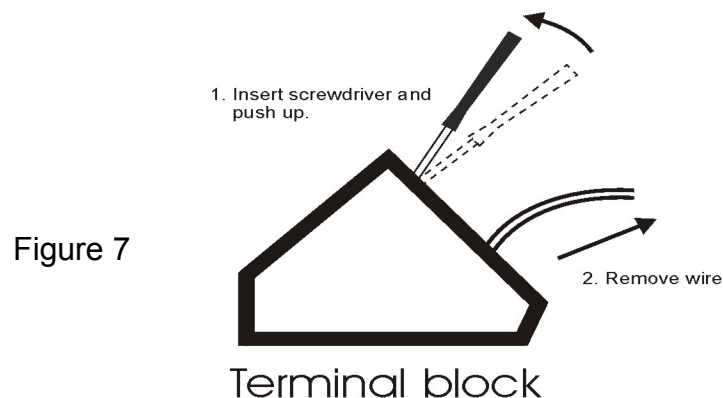
CAUTION

The PC boards within the control unit contain electronic components that are highly sensitive to static discharge. Wear a static control device (grounding strap) when inside the unit to event electrostatic discharge.

14.1 Replacing the Pump

Removing the pump:

1. Open unit by removing the four screws holding the front and rear enclosures together.
2. Remove the Sensor jack assembly from the rear housing.
3. Loosen and remove the two 1/8" hex screws that anchor the base to the rear housing.
4. Loosen and remove the two 3/8" ground nuts and disconnect all 4 ground wires.
5. Cut wire tie on output hose of pump and disconnect output tubing.
6. Remove screw securing ferrite ring clamp to solenoid assembly.
7. Disconnect wires from J1 on main control bd. (refer to figure 7 below)
8. Remove ferrite ring from wires and save.
9. Carefully lift base to gain access to the 4 cross-recess screws securing the pump to the rear housing.
10. Remove 4 screws securing pump.



Installing the replacement:

1. Loop wires from pump through ferrite ring 3X and leave approximately 4" of wire between pump and ferrite ring.
2. Attach new pump to rear housing using 4 cross-recess screws.
3. Secure base to rear housing. Note: when securing ground lug, make certain to use one nut to secure base, next place a lockwasher over stud, then attach the 4 ground wires and finally the last ground nut.
4. Attach wires to J1 on main control bd per wiring diagram, figure 8
5. Secure ferrite clamp to solenoid assembly.

Repair / Replacement Procedures

6. Reattach hose to output of pump and secure with wire tie.
7. Re-attach sensor jack assembly.
8. Close and secure enclosure.

14.2 Replacing the Control PC Board Assembly (in Rear Enclosure)

Replacing the Control PC board assembly will require re-calibration of the unit per section 13.

Removing the Control PC Board Assembly:

1. Open unit by removing the four screws holding the front and rear enclosures together.
2. Disconnect the 2 wire connectors, J4 and J2 from the PC board.
3. Disconnect the individual wires from terminal blocks at J1, J3 and J5.
4. Remove tubing from pressure transducers on pc bd.
5. Remove 4 screws securing pc bd to base of rear enclosure and remove pc bd.

Installing the replacement:

1. Place the new PC board on the mounting standoffs.
2. Secure board to the standoffs with four screws.
3. Reconnect the 2 wire connectors to the PC board. When re-attaching the ribbon cable at J2, make certain ribbon cable is pointing down (toward pump).
4. Re-connect individual wires to terminal blocks following connection diagram, figure 8
5. Re-connect tubing to pressure transducers. The shorter of the two lengths of tube gets connected to PS1 and the longer length to PS2.
6. Close and secure enclosure.
7. Unit must now be calibrated per section 13.0 above

14.3 Replacing the Display PC Board Assembly (in Front Enclosure)

Removing the Display PC Board Assembly

1. Open unit by removing the four screws holding the front and rear enclosures together.
2. Disconnect ribbon cable from J1
3. Remove 5 nuts securing pc bd assembly to front enclosure and extract pc bd..

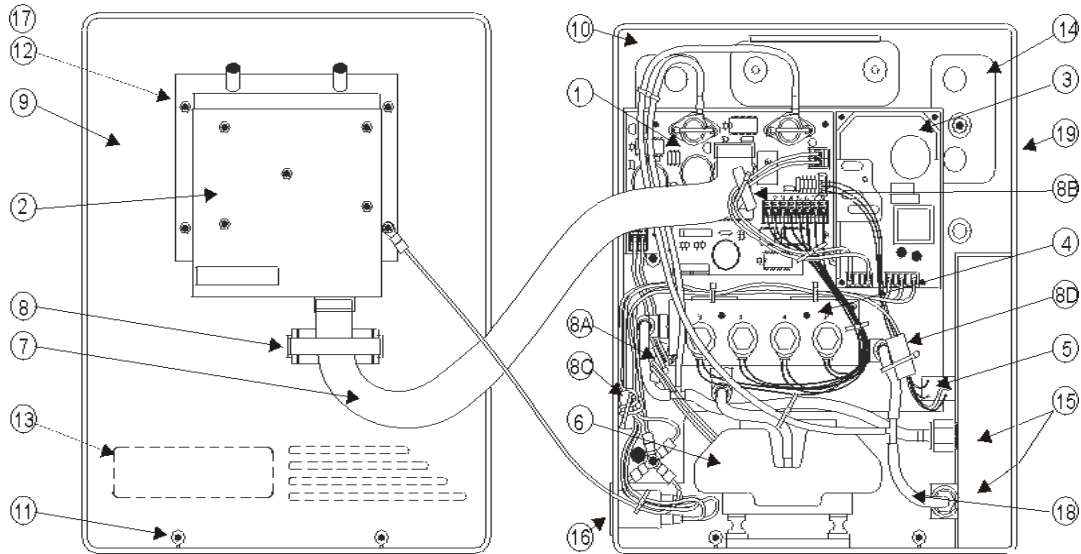
Installing the replacement:

1. Place the new pc bd over mounting studs and secure with mating nuts
2. Re-attach ribbon cable with ribbon pointing away from front enclosure.
3. Close and secure enclosure.

Replacement Parts List – Control Unit

15.0 Replacement Parts List – Control Unit

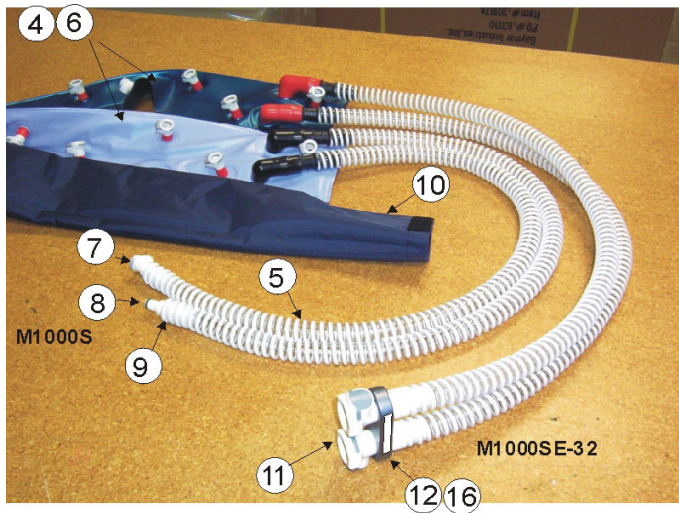
Control Unit



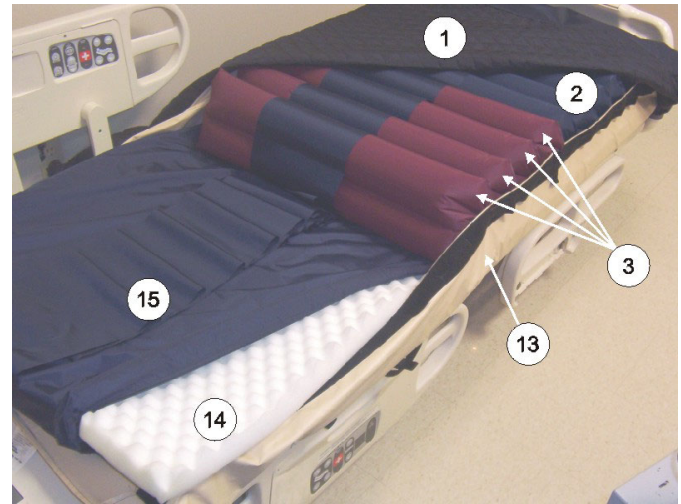
No.	Description	C1000MS	C1000MES
1	Main Control Bd	11754-000	11754-000
2	Display Bd	11753-000	11753-000
3	DC Power Supply	91565-000	91565-000
4	Solenoid Valve Assembly	11479-001	11479-001
5	Sensor Jack Assembly	11782-000	11782-000
6	Pump	10325	10325
7	Ribbon Cable Assembly	10364-18	10364-18
8	Ferrite Core (Flat ribbon cable)	91390-021	91390-021
	8A-Pump wires	91390-005	91390-005
	8B-DC Supply wires	91390-004	91390-004
	8C-AC power wires	91390-004	91390-004
	8D-Sensor Jack wires	91390-012	91390-012
9	Front housing	20213	20213
10	Rear housing	11777-000	11777-002
11	Screws for enclosure	10363 (4)	10363 (4)
12	Operator Control Panel Label (not shown)	12070-000	12070-000
13	Logo Label (not shown)	12070-000	12070-000
14	Bed hook (2 per unit) (not shown)	30297	30297-IT
15	Air outlet fittings	10044 Male 10045 Female	10037 Male (2)
16	Power Entry Filter	91368-005	91368-005
17	Backing Plate	11726-000	11726-000
18	Air Tubing	5/32ID 10140 ¼ ID 10178	5/32ID 10140 ¼ ID 10178
19	CPR Label	50041	50041
	Power Cord	USA – PC008, Continental Europe – PC001, United Kingdom – PC002, Australia – PC003, Switzerland – PC004, Italy – PC005, Denmark – PC006 Israel – PC007	PC005

Replacement Parts List – Control Unit

15.1 Replacement Parts List – Mattress



Manifold Assembly



Mattress

No.	Description	Mattress Size [†]						
		M1000S	M1000SE-32	M1000S-39	M1000S-42	M1000S-48	M1000S-54	M1000S-60
1	Top sheet*	30006-XXX (size or logo dependant)						
2	Air cell	30005	30005-32	30005-39	30005-42	30005-48	30005-54	30005-60
3	Active Sensor Technology cell assembly (M1000S mattresses only)	30310	30310-32	30310-39	30310-42	30310-48	30310-54	30310-60
4	Manifold assy (includes items 5-12, 16)	11815-000 M1000S				11888-000 M1000SE-32 only		
5	Manifold tubing	10035 by the foot						
6	Manifold	11887-000						
7	Quick Connect - female	10044-000						
8	Quick Connect - male	10045-000						
9	Hose adaptor	11813-000						
10	Hose Sleeve	30159						
11	Quick Connect - female					10057 (2)		
12	Clamp					20045 & 20046 & 10116		
13	Base	30065	30065-32 (11716-32 M1000SE-32 only) [‡]	30065-39	30065-42	30065-48	30065-54	30065-60
14	Foam	20001 (specify width)						
15	Foam cover	30065-FC	30065-FC32	30065-FC39	30065-FC42	30065-FC48	30065-FC54	30065-FC60
16	Label					12073		

* contact Gaymar for private labeled components

[†] mattress size is part of the model number which can be found inside mattress or on law label

[‡] contact Gaymar for part number of replacement in the M1000SE-32 mattress

Connection Diagram

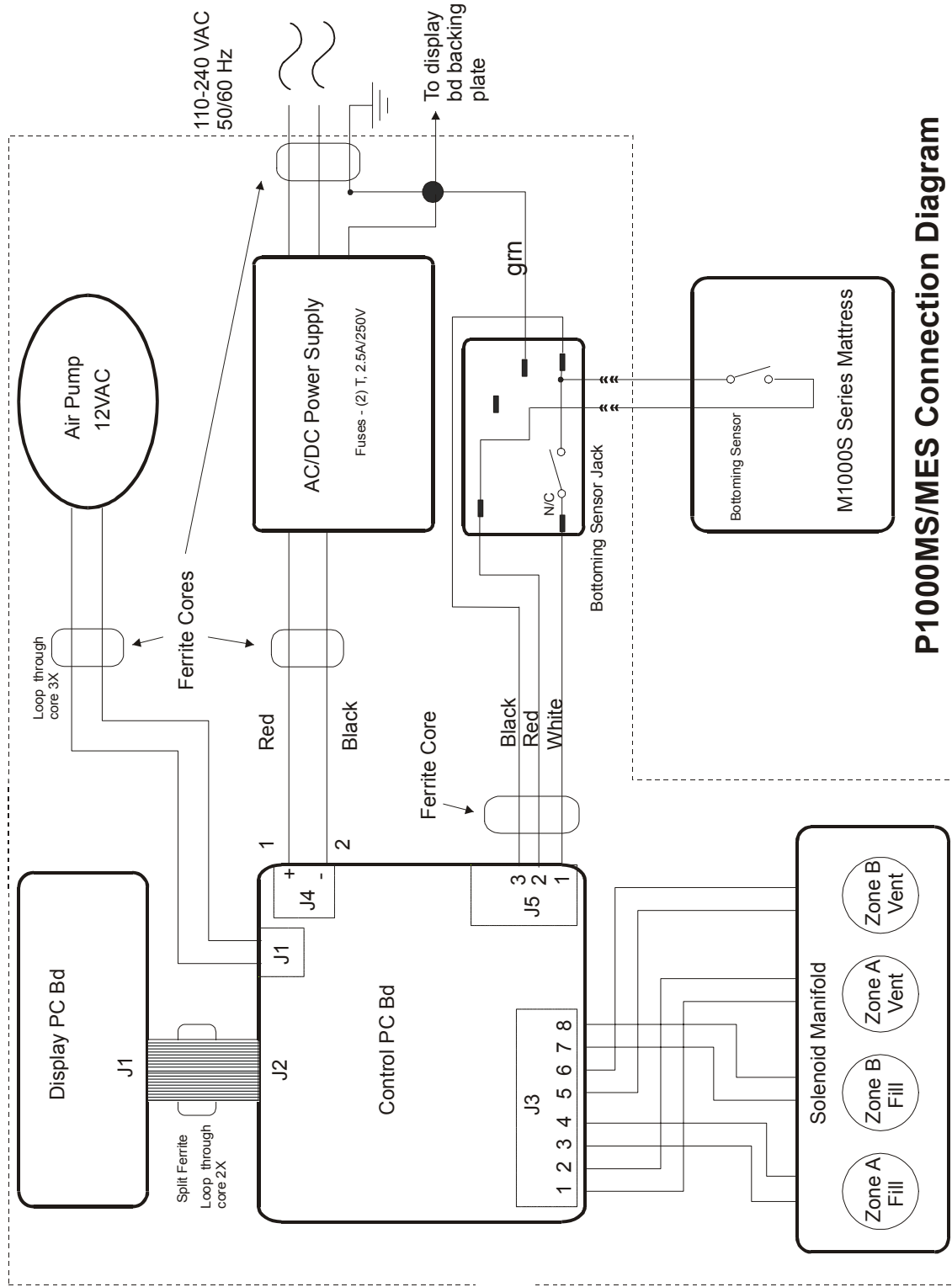


Figure 8

P1000MS/MES Connection Diagram

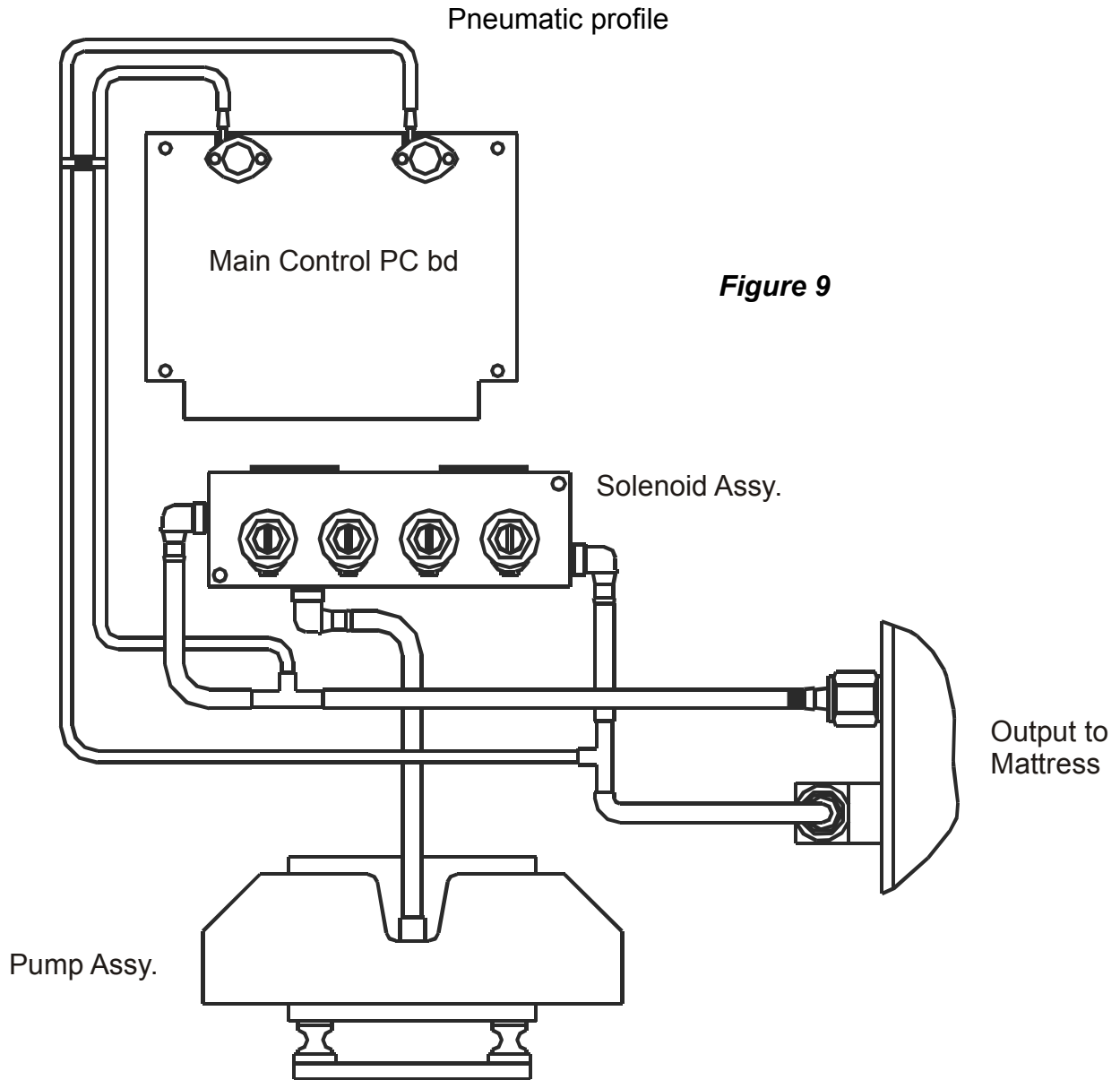



Figure 9

16.0 Specifications, Control Unit

	C1000MES
Enclosure Dimensions	10" x 12" x 4-1/2" (25 cm x 30 cm x 11 cm)
Weight	9.5 pounds (4.3 kg)
Power Cord	Detachable 14' , #18 AWG minimum, with ground wire
Overcurrent Protection	Primary 2.5A, 250V, T
Input	120 -230 VAC, 50/60Hz, 120V – 0.44A, 230V – 0.33A
Operating Ambient Temperature Range	60 to 85°F (16 to 29°C)
Classification	Class I grounded equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
	Type BF equipment
	
	UL2601-1, CSA C22.2 NO. 601.1-M90 EN 60601-1
	Continuous operation
Electromagnetic Compatibility	Meets EN60601-1-2:2001 (CISPR 11 Classified as Class B, Group 1 ISM equipment)

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