SERVICE MANUAL

DYNA-FORM™

Low Air Loss System

Direct Healthcare Services

Delivering the Promise

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2. Introduction

2-1. General

The Dyna-Form Low Air Loss mattress is a high quality and affordable support surface suitable for medium to very high risk pressure ulcer treatment. It has been specifically designed for the prevention of pressure ulcers and offers an affordable solution to providing 24-hour pressure relief.

2-2. System Description

This product is intended to reduce the incidence of pressure ulcers while optimizing patient comfort and also to assist pain management as may be prescribed by a physician. The system is designed for use in the following care settings:

- ▶ Hospital
- ▶ Nursing home or individual home care setting for long-term care.

3. Setting Up/Operation

3-1. Set Up

Step 1 ▶Place the mattress directly on to the bed frame taking care not to trap any inflation tubing.
The inflation tube should be towards the foot end so that it can be connected to the inflation nozzles on the pump. See figure below for reference.

Step 2 ▶ Secure the mattress straps to the bed frame (only secure straps loosely to the moving parts of the bed frame, if applicable).

Step 3 ▶Cover with a cotton sheet to avoid direct skin contact and reduce friction.

Step 4 ▶Hang the pump over the frame or board at the foot end of the bed.
Make sure the pump is secured.

Step 5 ▶Connect the inflation tubes from the mattress to the pump's inflating nozzles.
Make sure they are properly attached.

NOTE！

Double check and make certain the air hoses are not kinked or tucked under the mattress.
Also check to ensure the CPR valve is properly attached and can be reached easily.

Step 6 ▶Plug the power cord into an electrical outlet with grounded/earthed AC power.
This product should be grounded/earthed.
The power cord has a grounded/earthed wire with a grounding pin.
This three-pin plug must be plugged properly into an outlet and grounded as shown in the figure in the Grounding Instructions section.

NOTE！

Before inserting the plug into the outlet, make sure the voltage is compatible.

Step 7 ▶Turn on the power by pressing the power switch at the right side of the pump.
Proceed to the Operation section.

Step 8 ▶Make sure to disconnect the pump by unplugging the power cord when it is not in use.

3-2. Profiling the Mattress

The system may be used while the bed is in the profiled or knee-break position:

▶With the bed in its present position, loosen or release the Overlay securing straps.

▶Change the bed to the required position (profile or knee-break).

▶ Re-secure the securing straps.

NOTE！ Straps must be attached to moving parts of the bed frame to avoid damaging the bed mechanism and stretching the overlay.

3-3. Moving the Bed & Power Cuts

CAUTION: The patient will not receive the benefit of the system while it is disconnected and the power unit is switched off. Therefore the system should be reconnected as soon as possible once the bed has been moved to its new position.

If you need to move the bed with the Mattress still inflated or in the event of a major mains power failure, carry out the following procedure:

1. **MATTRESS**

▶ Disconnect the quick coupler from the power unit and quickly close the lid marked “Transport”.

2. **POWER UNIT**

▶ Switch off the power on the pump. Disconnect from the power plug.

The mattress & bed can now be moved

3-4. CPR Procedure

In the even of an emergency that requires the care provider to perform CPR on the patient, pull the CPR strap immediately to release the air quickly from the mattress and disconnect the air intake tube between mattress & pump. The mattress will deflate to provide a firm base for CPR.

The CPR strap is located at the top end of the mattress on the right-hand side.

3-5. Deflation , Removal & Storage

▶Roll from the foot end towards the head end. The foot-end strap (if supplied) can then be stretched around the rolled mattress to prevent unrolling.

▶Do not fold, crease or stack the mattress and store for long periods.

3-6. Alarms & Fault Finding

Alarms

▶ If the pressure is lower than 8 mmHg, the low pressure alarm will be turned on. When the power is turned on, the low pressure alarm has a 40 minutes delay.

Fault Finding

SYMPTOM	ACTION
Low pressure alarm	▶Check connectors between the air mattress and pump. If there is any disconnection, please reconnect it. ▶Check the CPR Valves. Be sure their outlets are sealed tightly. ▶Check the air-connecting tubes. Be sure no single cell is leaking. ▶Set the highest pressure level. Keep the tubes fully inflated and inspect for air leakage. ▶Check if there is any air leakage from cells. Make sure that no leakage occurs. If any leakage occurs, please contact your equipment provider.

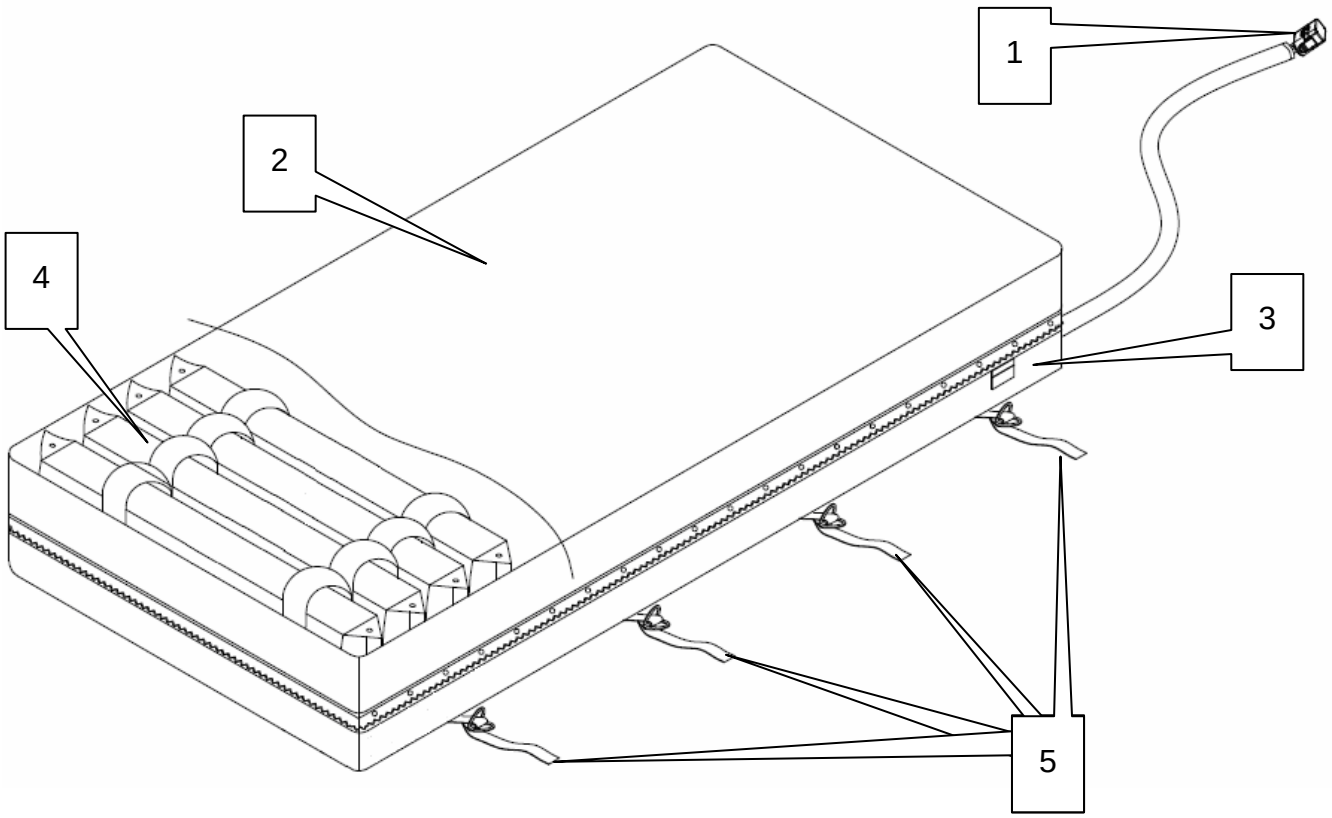
4. Construction of the Product

4-1. Major Elements of the System

The system comprises of two major elements:

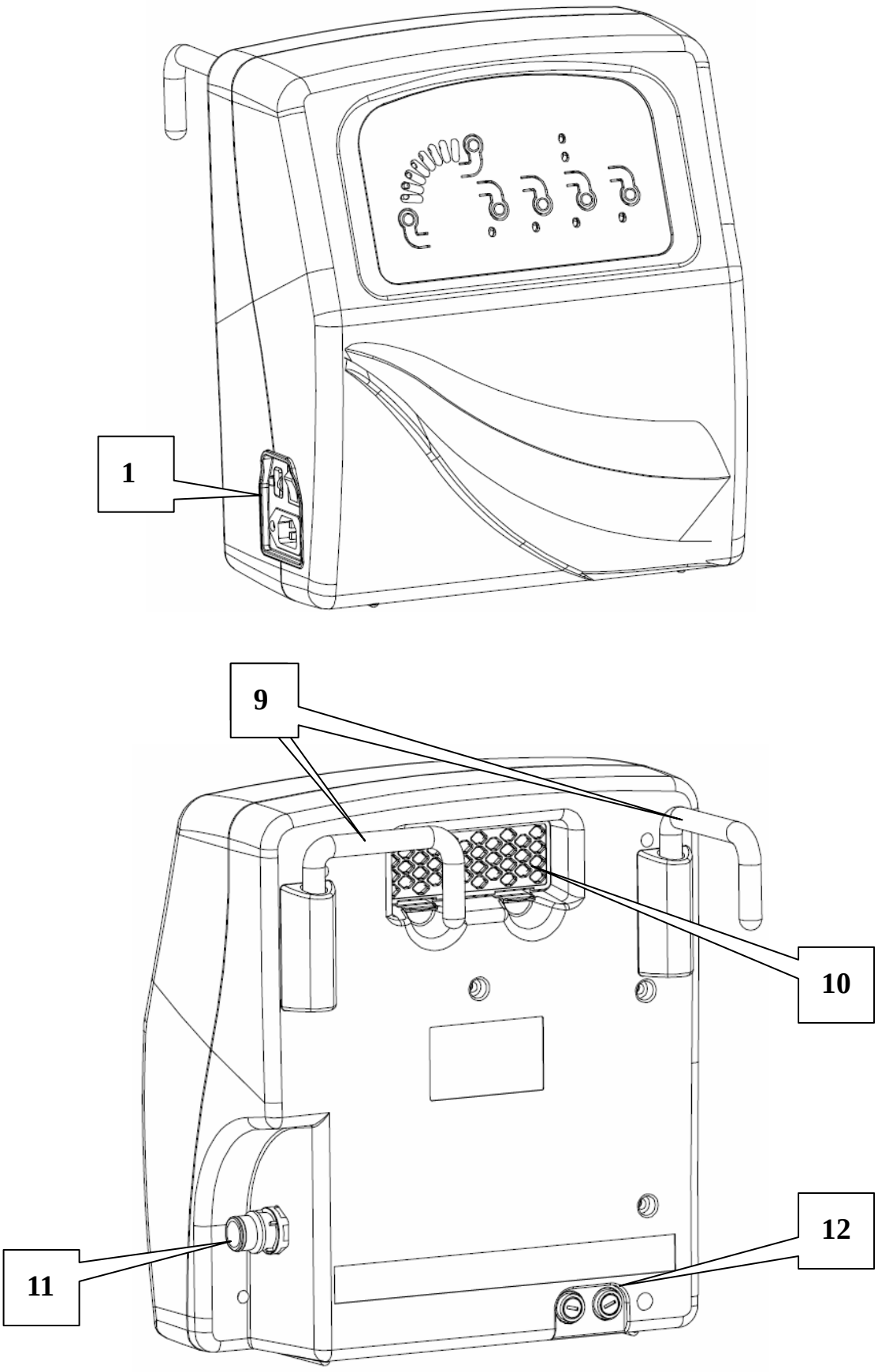
1. Mattress
2. Power Unit (Pump)

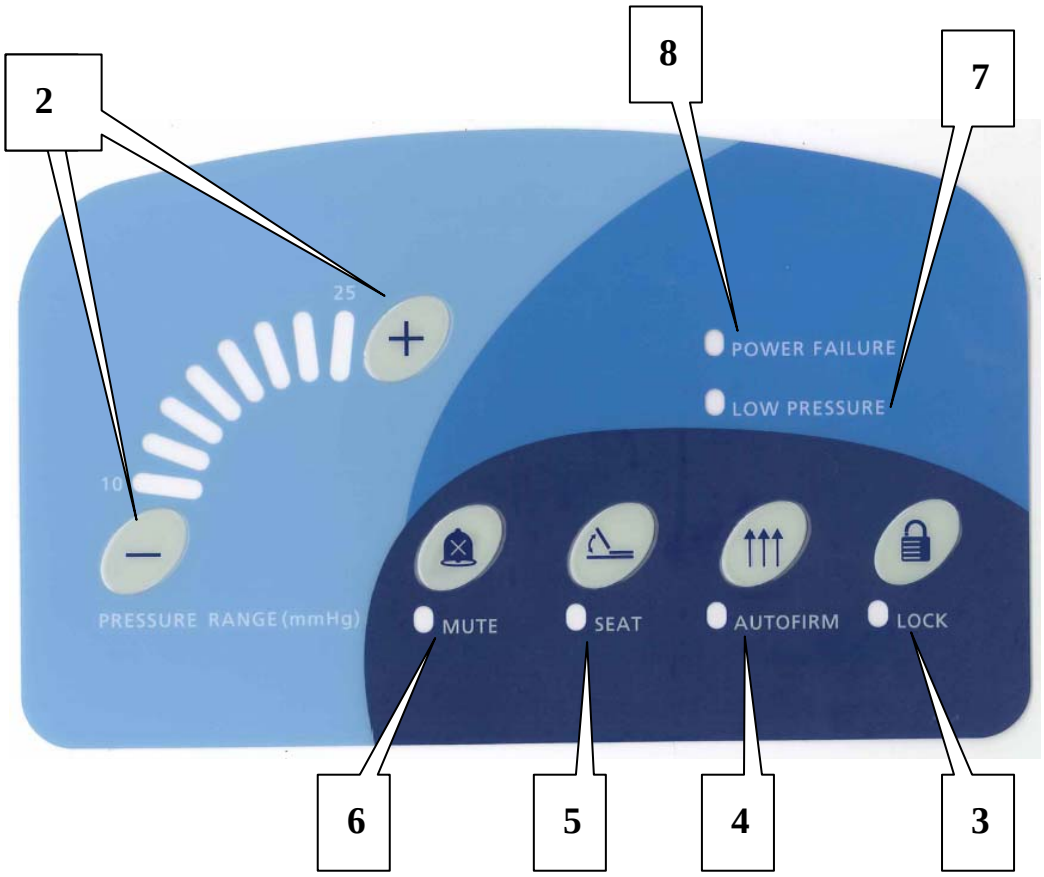
4-2. Mattress



No.	Item	Description	Remark
1	Connector	To connect to the pump.	
2	Cover	The cover sheet protects the cells against unexpected contamination, and makes cleaning of the mattress easier.	
3	Base	To secure the cells.	
4	cells	To support patient and perform therapy.	
5	straps	To secure the mattress to the moving parts of bed frame.	

4-3. Pump





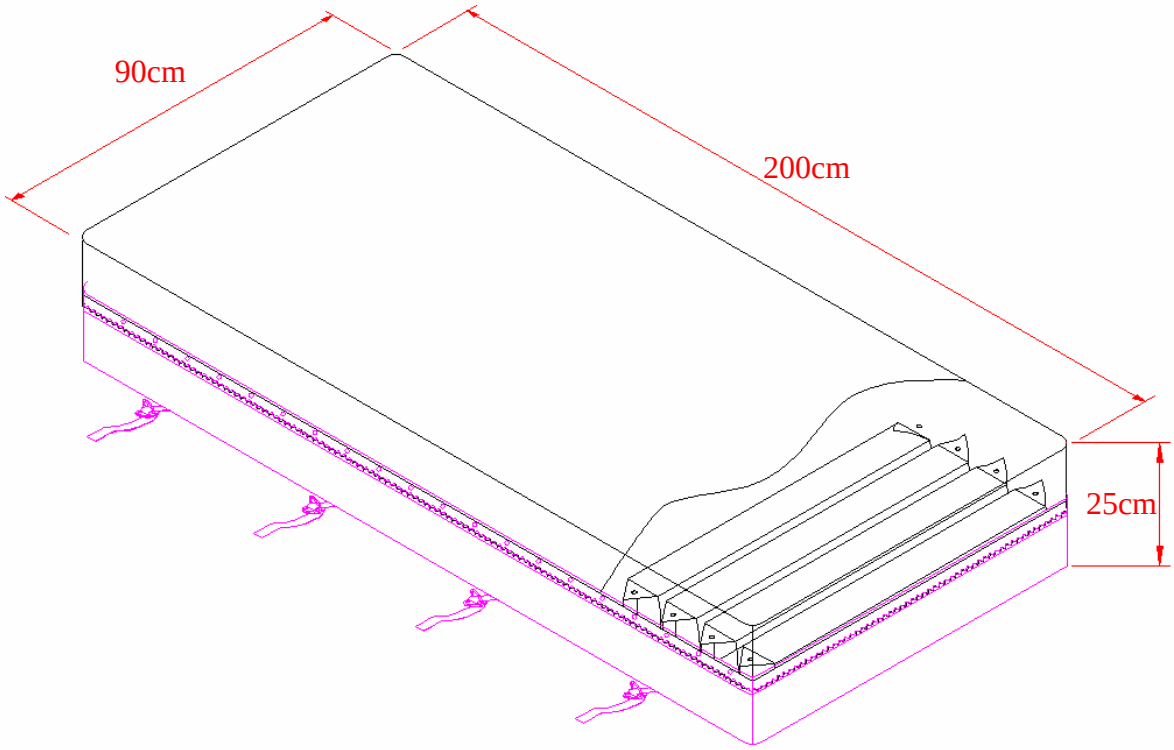
No.	Item	Description	Remark
1	Power Switch	To turn system on/off.	
2	Pressure Adjustment	To select pressure range.	
3	Panel Lock	The mattress will be fully inflated at the Maximum pump output.	
4	AutoFirm	Air pumping into the air mattress to reach the maximum pressure (45 mmHg) rapidly.	
5.	Seat Mode	Pressure set at + 5 mmHg and will not disengage automatically.	
6	Mute	To mute the alarm buzzer.	
7	Low Pressure Alarm	The alarm will turn on when the pressures drop below 12 mmHg.	
8	Power Failure Alarm	The alarm will turn on when the Power is fail	
9	Hooks	To mount to the footboard of a healthcare bed frame.	
10	Air Filter	To filter air to avoid the Pump stuffing.	

11	Connection	To connect to the mattress.	
12	Fuse	T2.5A，250VAC	

Caution: This product is used solely to provide pressure relief to patients by offering a variability in peak pressures so that no one area is subjected to constant high pressure. Therefore, please do not adapt it for any other purpose. There may be an up to 10% tolerance of air pressure output.

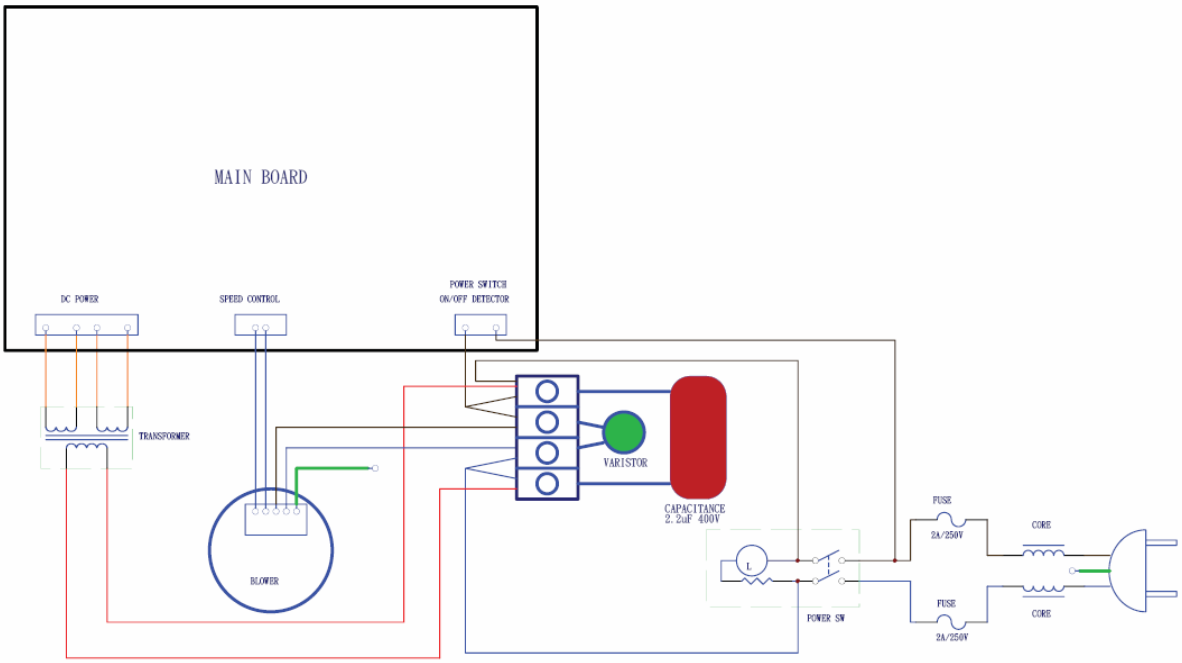
4-4. Technical Information

Mattress



Dimensions:	200cm×90cm×25cm
Cells	20
Material_Cover	Polyester PU Transfer
Cover color	Dark blue
Max. load	150Kgs.

Pump



Medical Equipment:	Class I ; IP21; AP/APG NO ; Type BF
Applied Part:	Air Mattress
Power Supply:	230VAC/50Hz, 2.5A, 400W
Fuse Rating:	T2.5A/250VAC
Air Output:	Over 1000 LPM
Pressure Range:	10mmHg ~ 25mmHg
Power Cord:	Power Cord Type : detachable Plug Type: VDE Grade : Medical, 2PIN Length : 4.5M
Dimensions:	27.2cm×17.1cm×31cm
Weight:	4.8 kg
Environment Requirement:	Operating Temperature 5~40℃ Storage Temperature -25 ~ 70℃ Operating Humidity 15 ~ 93% RH (non-condensing) Storage Humidity ≦ 93% RH (non-condensing)

5. Infection Control & Cleaning

5-1. Infection Control

To prevent cross-infection, the system must be routinely cleaned between patient uses. Infection Control and routine cleaning must be carried out in accordance with your local Health Department's Infection Control Policy.

5-2. Cleaning

In this section, the procedures to clean and decontaminate the pump & mattress will be described. It is important to follow these procedures before applying the system to patients. The cleaning task is required at least once a week to maintain personal hygiene.

Mattress

- ▶Brush off or wipe down all surfaces of the cover sheet with soap and water before wetting with any liquid disinfectant.
- ▶Any obvious blood spots should be wet thoroughly with an 1:9 Hypochlorite solution (1 part bleach to 9 parts water) and allow drying for at least 10 minutes. Then blot with a clean, damp cloth.
- ▶Unzip the top cover from the mattress.
- ▶Brush or wipe down all surfaces with soap and water before applying any liquid disinfectant.
- ▶Covers are immersed and soaked in disinfectant.
- ▶After pre-soaking, the cover is rinsed through a regular cycle in a washer with no soap then laundered with mild detergent (wash temperature 93°F, rinse temperature 78°F or on the coldest setting).
- ▶Covers are aerated until they are fully dry. (Drying temperature range 90-120°F or on the coldest setting.)
- ▶The air cells are unsnapped from one side and are sprayed on all sides with a disinfectant. Let it sit for the required incubation time and wipe down with a clean cloth. (Be sure to disconnect all the air cells, one by one, and spray the disinfectant on all sides, including all the connecting tubes and hoses. Let it sit for least 10 minutes.)
- ▶If there is a base after you remove all the air cells, the base has to be sprayed down with disinfectant, inside and out. Let it sit for the required incubation time and wipe down with a cloth.
- ▶Repeat the process with the tubing set, spray, incubate, and then wipe clean.
- ▶The carrying bag should be turned inside out and completely wiped down using the disinfectant solution.
- ▶Allow the mattress to thoroughly air dry. Once the inside is dry, turn it back: wipe down the outside of the bag with disinfectant.

▶Dry the mattress in a SUNLESS area after cleaning.

Pump

▶DO NOT immerse or soak the pump.

▶Check for external damage and move the pump to the cleaning area.

▶Place the pump on a work surface and spray or wipe the outside of the case with ordinary cleaning solution.

▶DO NOT spray any cleaning solution directly on the surface of the pump.

▶DO NOT use a Hypocarbonate or Phenolic based cleaning solution as this may cause damage to the case. Allow the solution to incubate for 10 minutes or accordingly as stated by the cleaning product used.

▶Wipe case with a clean cloth. Make sure all areas are clean (top and bottom, right & left).

▶Spray cloth with cleaning solution and clean faceplate. DO NOT allow excess cleaning solution on faceplate or control panel. (Damage will occur if solution gets inside the pump.)

▶Allow surface to thoroughly dry after cleaning.

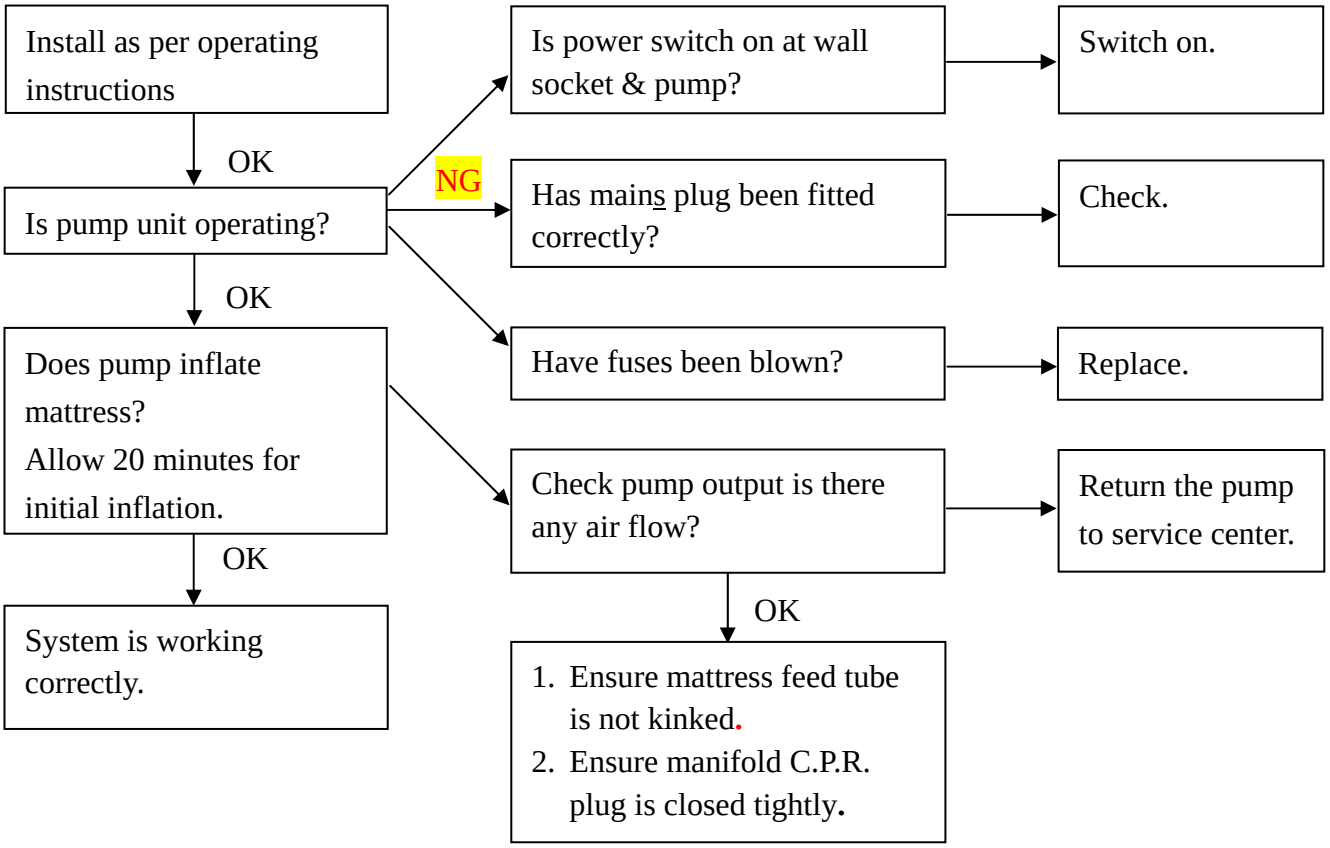
▶After the pump is thoroughly cleaned and dried, proceed to plug in the pump and test to see if it runs normally.

▶Unplug the pump and store with proper identification tag.

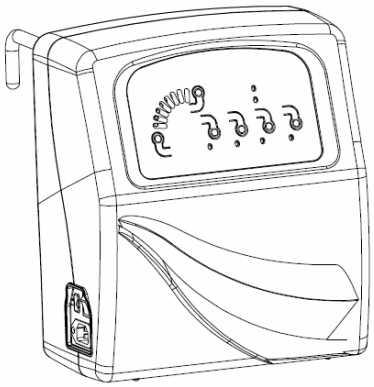
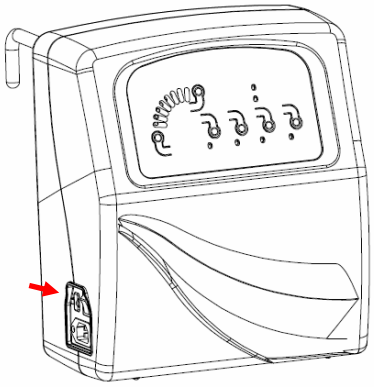
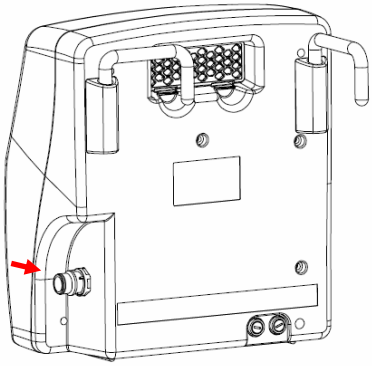
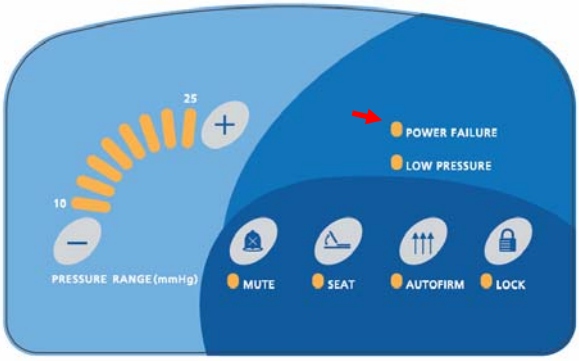
6. Equipment Maintenance

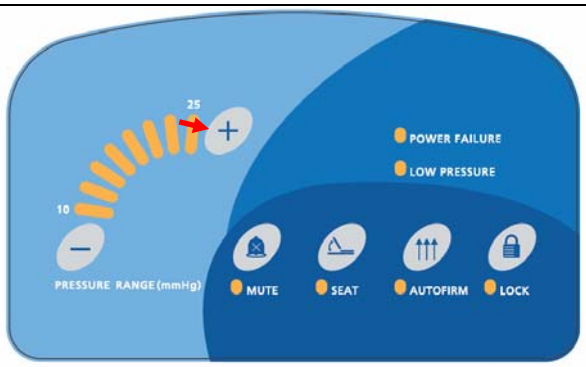
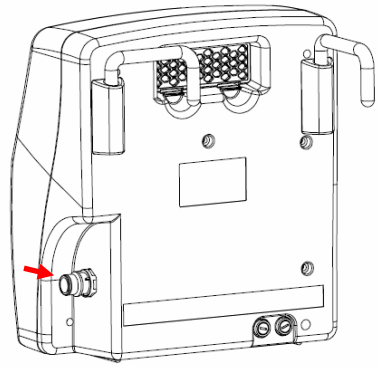
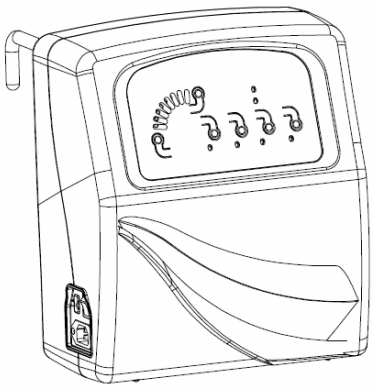
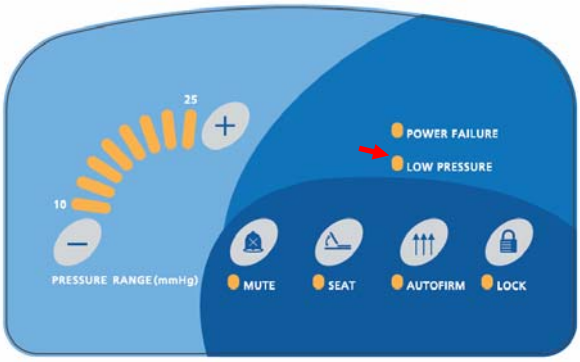
6-1 General

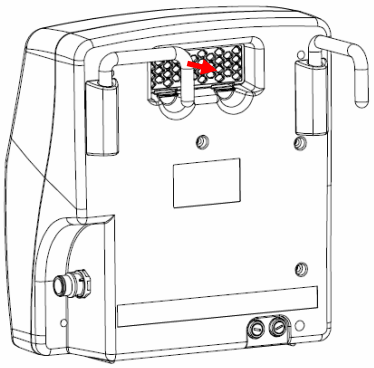
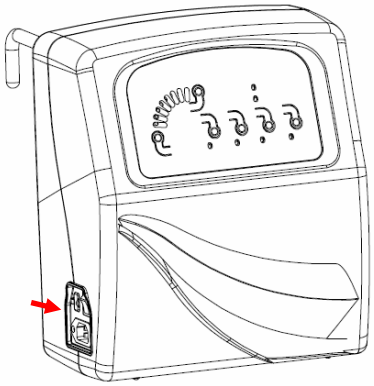
Fault Finding Guide



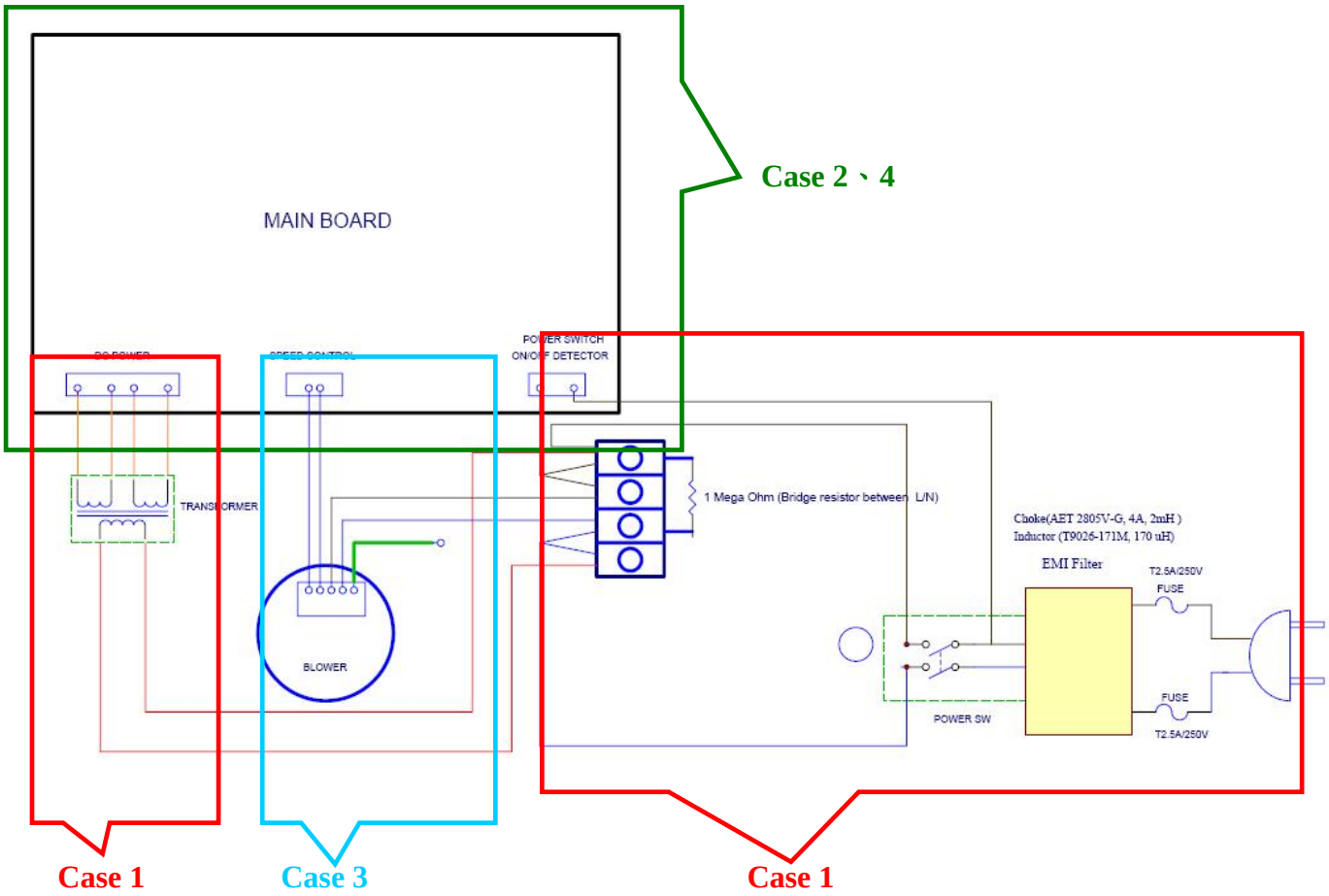
6-2. Pump Check Step By Step

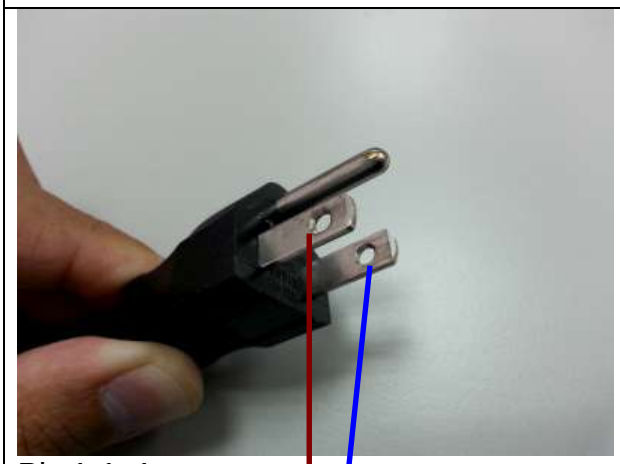
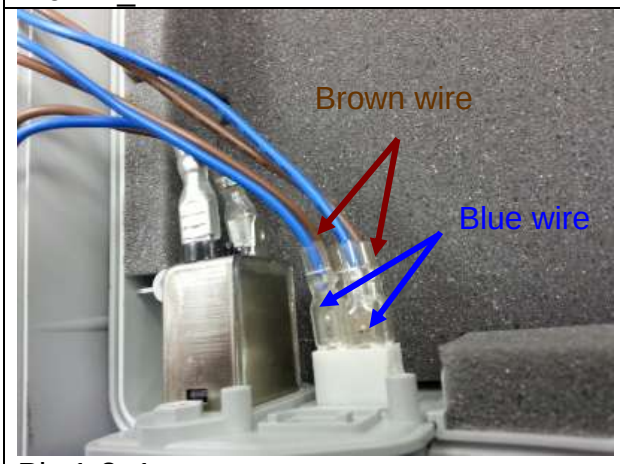
Step 1 : To check outer appearance.	CONTENT
	Checking method: Visual inspection of external casing looking for signs of damage. Trouble shooting: If the outer appearance of the casing is damaged or is wet, disconnect the pump from the mains supply and then proceed to wipe clean before continuing with further inspection.
Step 2 : To check power	**CONTENT**
  	Checking method: After turning on the power switch, the switch LED is turned on with a “beep” sound. The outlet will inflate . If the pump have no power the power failure LED and alarm will be turned on. Trouble shooting: ● The unit isn’t turned on: Case 1 (No power) ● Without a “beep” sound: Case 2 (The buzzer is abnormal) ● The outlet doesn’t inflate . Case 3 (The blower is abnormal)

Step 3: To check the output.	CONTENT
 	Checking method: Set the pump on maximum pressure and check airflow in the outlet of pump. Trouble shooting: ● There doesn't appear to be sufficient airflow from the pump outlet. Case 3 (The blower is abnormal) Case 5 (The supplying pressure is abnormal)
Step 4: To check the LED of panel.	**CONTENT**
	Checking method: Press all the buttons, one by one, to check the LED's are functioning correctly. Trouble shooting: ● LED isn't turned on: Case 4 (The button and LED are abnormal) Note: The alarm mute LED won't be turned on unless the low pressure alarm is on.
Step 5: To check low pressure alarm	**CONTENT**
	Checking method: After turning on the power switch, the low pressure LED and alarm will be turned on in 5 minutes. To silence the buzzer press the "mute" button. Trouble shooting: ● No "beep" sound: Case 2 (The buzzer is abnormal) ● The mute button can't disable buzzer: Case 4 (The button function is abnormal) ● Low pressure alarm is abnormal: Case 5 (The pressure is abnormal)

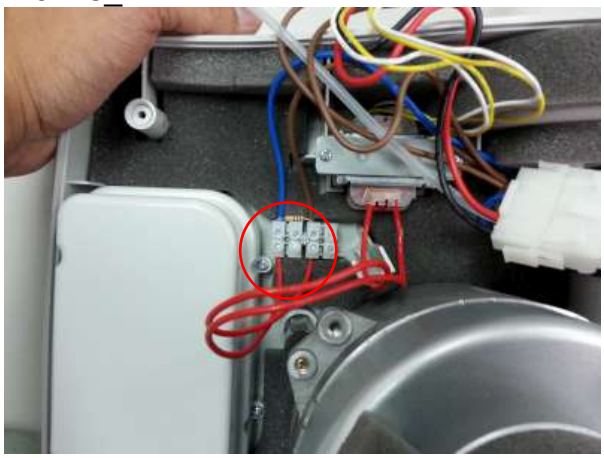
Step 6: To check the air filter	CONTENT
 	Checking method: 1. Open the lid where indicated by the red arrow. 2. Remove the air filter to see if it is clean or not on both sides. Trouble shooting: ● Replace the air filter if it is dirty. Note: It is recommended that you inspect/replace your air filter on a regular basis.
Step 7: Noisy Pump	**CONTENT**
	Checking method: To turn off the power and gently shake the pump to check for loose components inside the unit. Trouble shooting: ● Mechanisms loose: Case 6 (Noise) ● The volume of operating is too noisy. Case 6 (Noise)

6-3 Pump Trouble shooting

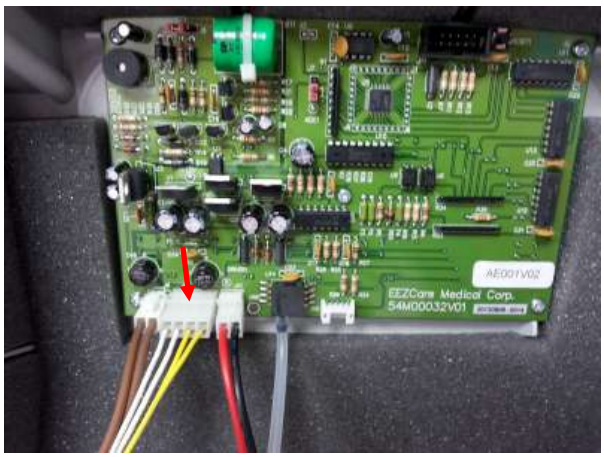


Instruction	Case 1： No power.
 Pic 1-1_1  Pic 1-1_2	1-1 Possible cause: Power plug is open-circuited. Checking method: ● Using multi-meter to check the power cord is short-circuited or not. To check the neutral wire and live wire is short-circuited Solution: To check or replace the power cord、fuse、choke as necessary. (Power cord_54B14048;Fuse_ 54C00002 Choke_ 54T00004)
 Pic 1-2_1	1-2 Possible cause: Power switch is damaged. Checking method: ● Using multi-meter to check the switch function is fine or not. To check the blue wire is open-circuited or short-circuited when turns the switch on and off. On the other hand, the brown wire is the same. Solution: Replace power switch unit as necessary (Power switch_ 54A07001)

Pic 1-3_1



Pic 1-3-2



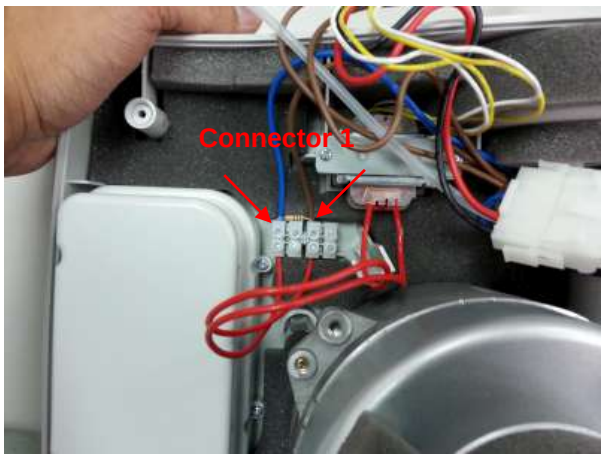
Pic 1-3_3

1-3
Possible cause: Power connector is disconnected.

Checking method:

- To check the power connector is fine or not.
- Use a multi-meter to check whether the power circuit has short-circuited. When power is turned on, check whether all the blue and brown wires are short-circuited or not.

Solution: Re-assemble as necessary



Pic 1-4_1

1-4
Possible cause: Transformer is damaged.

Checking method:

- Turn on the power switch and use the multi-meter to check the input voltage (connector1: AC230V)、output voltage (connector2 : AC8V(PIN1、2)、AC12V(PIN3、4)).

Solution: Replace Transformer as necessary (Transformer_54D17010)

Pic 1-4_2

Pic 1-5_1

1-5
Possible cause: Main PCB is defective.

Checking method:
After eliminating1-1~1-4, the cause is the main PCB defective.

Solution: Replace main PCB unit as necessary (Main PCB_ BU211901)

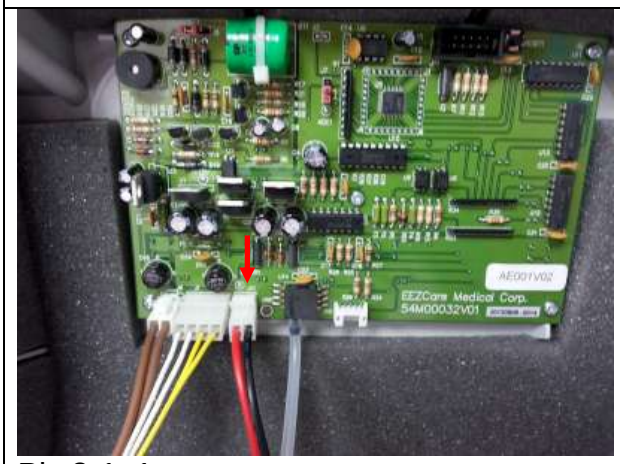
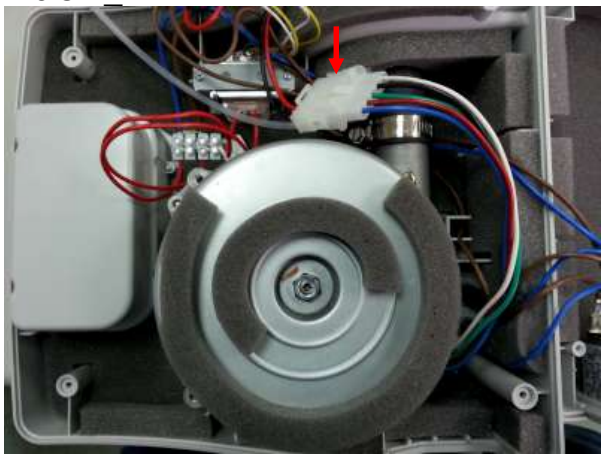
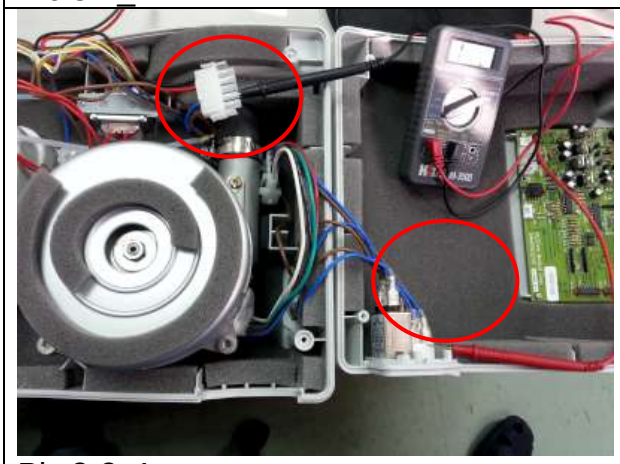
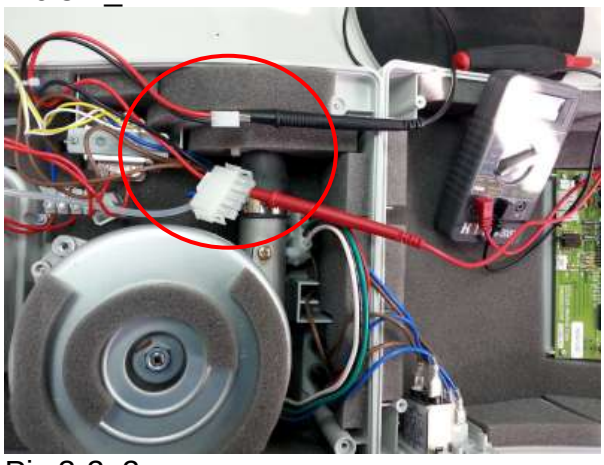
Instruction	Case 2 : The buzzer is abnormal

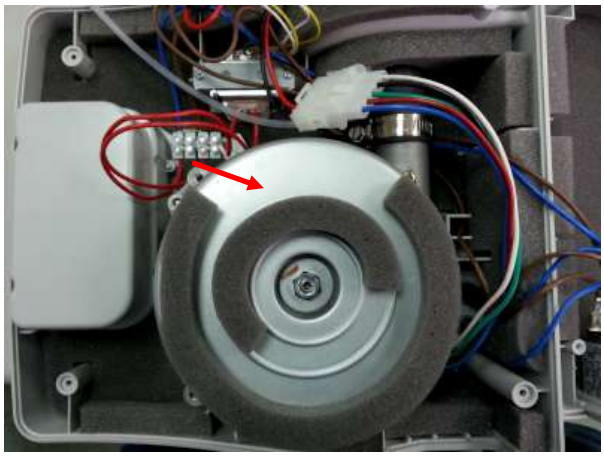
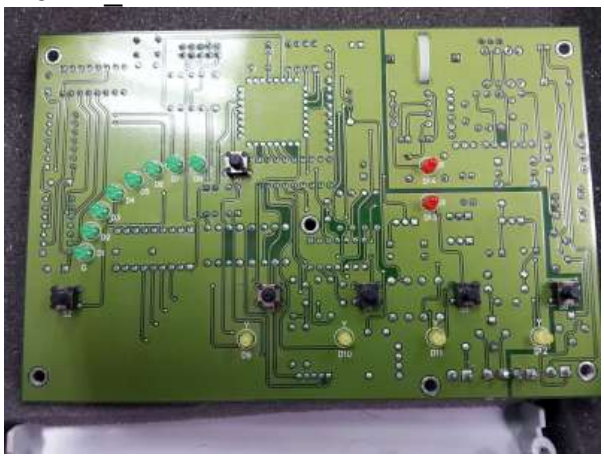
Pic 2-1_1

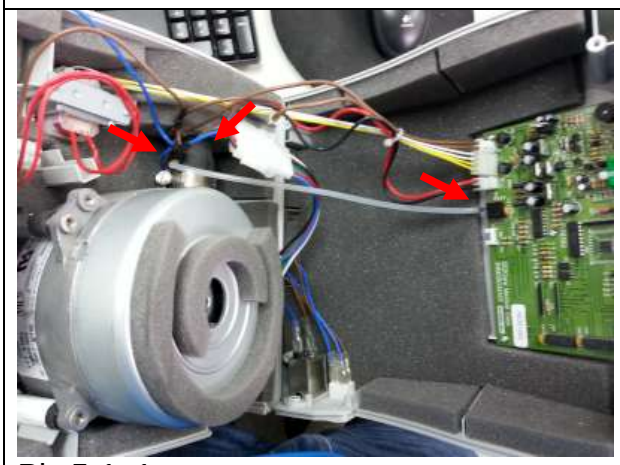
2-1
Possible cause: Main PCB is defective.

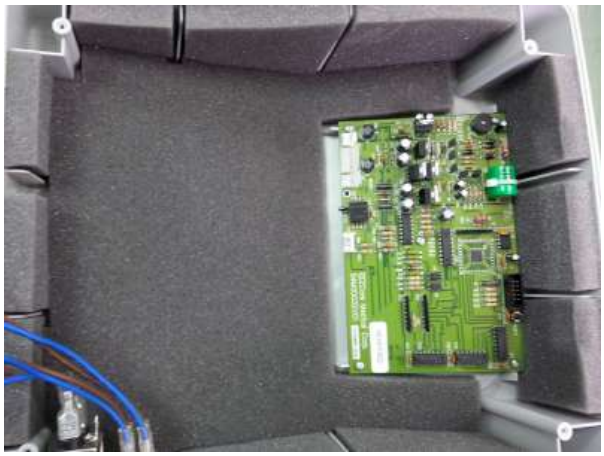
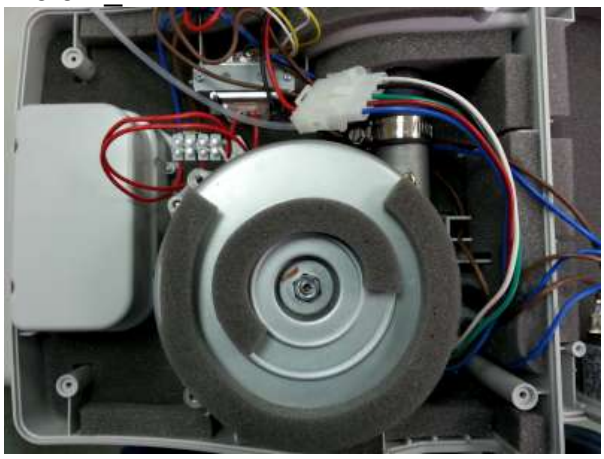
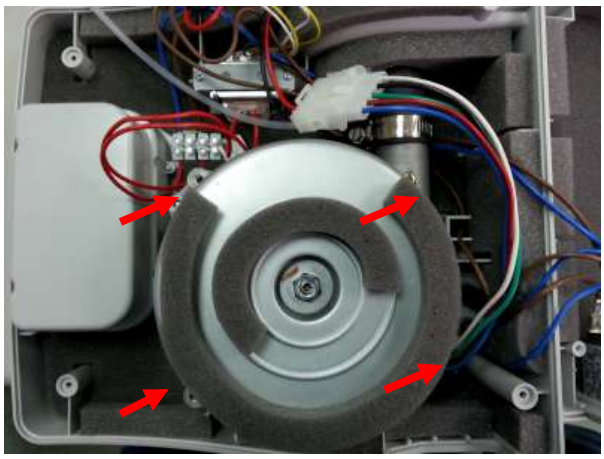
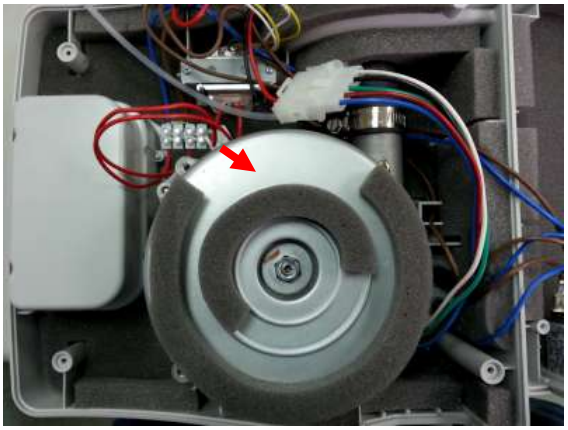
Checking method: After eliminating Case 1, the cause is the main PCB damage.

Solution: Replace main PCB unit as necessary. (Main PCB_ BU211901)

Instruction	Case 3 : The blower is abnormal.
 Pic 3-1_1  Pic 3-1_2	3-1 Possible cause: Connection is Loose . Checking method: Check the connection is secured or not. Solution: Re-assemble and make sure it is secured.
 Pic 3-2_1  Pic 3-2_2	3-2 Possible cause: Cable is damaged. Checking method: Use a multi-meter to check whether the cable is fine. ● To check the blue and brown wire is fine (Pic 5-2_1). ● To check the red and black wire is fine (Pic 5-2_3). Solution: Replace cable as necessary. (Cable:54K00005)

 Pic 3-3_1	3-3 Possible cause: Main PCB is defective. Checking method: To check the output voltage (230VAC). Solution: Replace main PCB unit as necessary. (Main PCB_ BU211901)
 Pic 3-4_1	3-4 Possible cause: Blower is damaged. Checking method: After eliminating 5-1~5-3, the outcome is the blower is damaged. Solution: Replace blower as necessary. (Compressor_BG211426)
Instruction	Case 4 The button and LED are abnormal.
 Pic 4-1_1  Pic 4-1_2	4-1 Possible cause: Front cover or PCB is defective. Checking method: ● Check the front cover is fine or not. ● Check the PCB is fine or not. Solution: 1. Replace front cover as necessary. (Panel PCB_54M000472) 2. Replace PCB as necessary. (Enclosure cover_51C33008)

 Pic 4-2_1	4-2 Possible cause: Main PCB is defective. Checking method: After eliminating 6-1~6-2, the outcome is the main PCB is defective. Solution: Replace main PCB unit as necessary. (Main PCB_ BU211901)
Instruction	Case 5 The pressure is abnormal
 Pic 5-1_1	5-1 Possible cause: Tube is loosened or bended. Checking method: ● Check for loose tubing. ● Check for kinks in the tubing and free as necessary. Solution: Re-assemble and inspect.
 Pic 5-2_1	5-2 Possible cause: Tiny particles of dust and dirt are restricting air flow through the filter . Checking method: Check whether the filter pad is clean or dirty. Solution: Replace air filter pad as necessary. (Filter pad_57A15001)

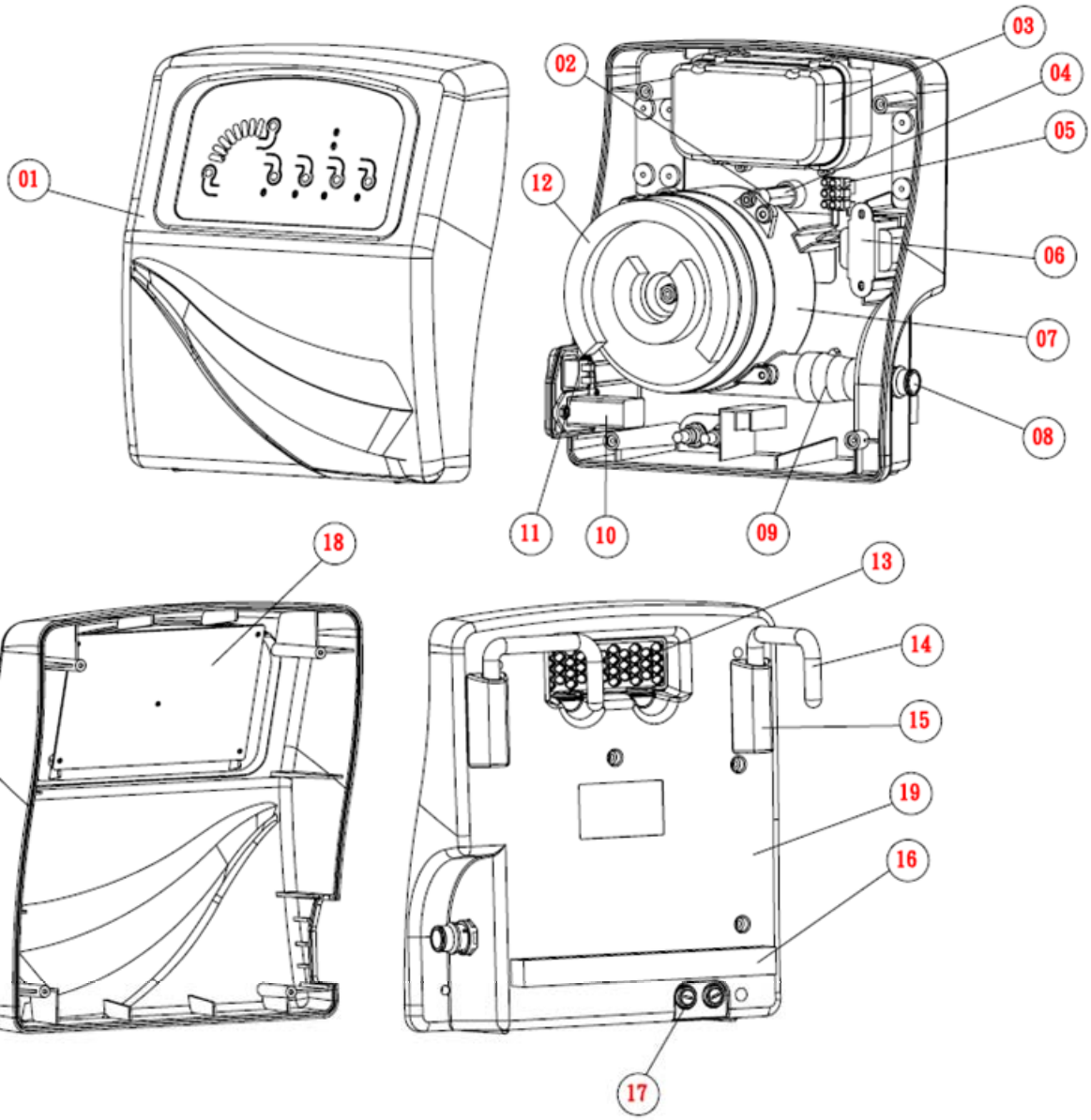
Instruction	Case 6 Noise.
 Pic 6-1_1  Pic 6-1_2	6-1 Possible cause: Inner foam cushion is loose. Checking method: Check the inner foam cushion is loose or not. Solution: Re-assemble and inspect.
 Pic 6-2_1	6-2 Possible cause: Compressor is not secured. Checking method: Check whether the compressor is adequately secured to the casing or not. Solution: Re-assemble and inspect.
 Pic6-3_1	6-3 Possible cause: Blower is noisy. Checking method: Check whether the Blower is noisy or not and inspect the internal components. Solution: Replace Blower as necessary. (Compressor_BG211426)

7. Test Equipment

Multi-meter、Electrical Screw Driver。

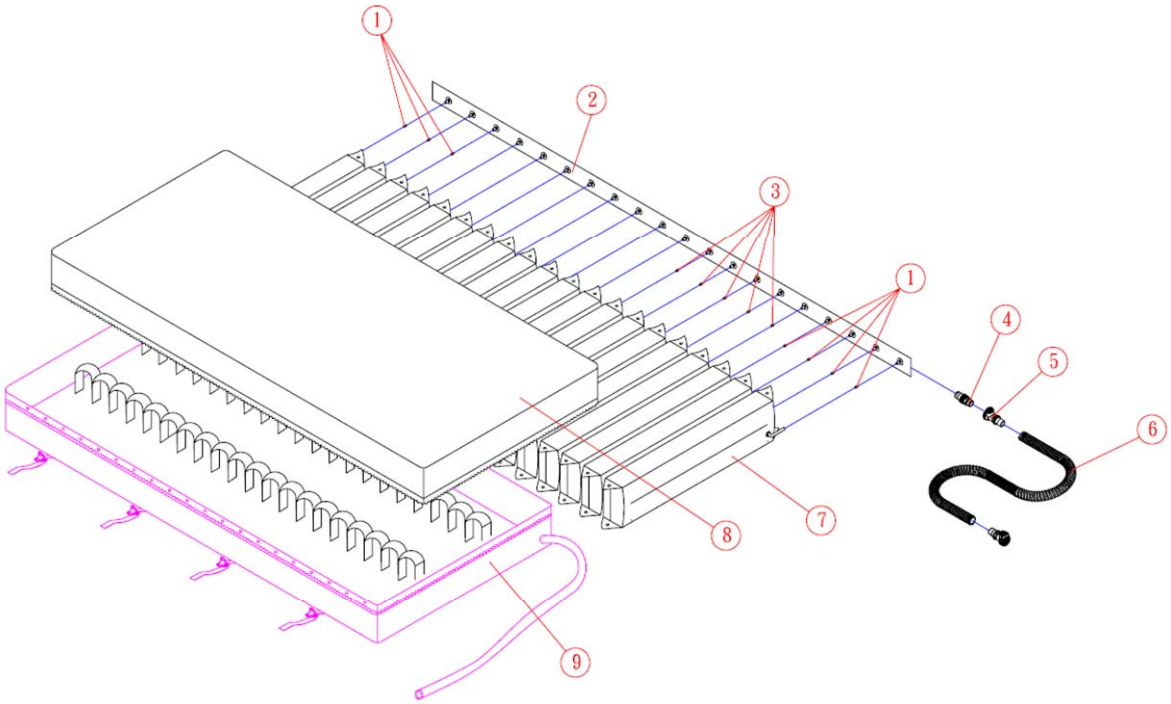
8. Parts List

8-1. Pump



NO	PARTS NAME	Q'ty	Unit	PARTS CODE
01	Enclosure cover	1	SET	BM213375
02	Rubber-to-metal mounting	3	PC	52C14004
03	Filter housing	1	PC	51M33006
04	Aluminum post	3	PC	53E00007
05	Terminal block	1	PC	54F00001
06	Transformer	1	PC	54D17013
07	Blower	1	PC	54E00009
08	Connector	1	SET	BC412304
09	Air horse	1	PC	53A14020
10	Power cord connector	1	PC	54N14008
11	Power switch	1	PC	54A07001
12	Foam cushion	1	PC	52D23005
13	Filter cap	1	PC	51M33005
14	Hook	2	PC	53B14009
15	Hook cover	2	PC	51J00023
16	Foam foot cushion	1	PC	52D14010
17-1	Fuse holder+ Blue wire	1	PC	54C10003
17-2	Fuse holder+ Brown wire	1	PC	54C36003
17-3	Fuse	2	PC	54C00004
18	PCB	1	SET	BU211601
19	Enclosure base	1	SET	BAD03301

8-2. Mattress



NO	PARTS NAME	Q'ty	Unit	PARTS CODE
01	Stoper (∮ 1.6)	7	PC	20F14001
02	Side Tube	1	SET	AS820504
03	Stoper (∮ 2.0)	5	PC	20F00001
04	Q.R Connector-male	1	PC	BC412303
05	Q.R Connector-female	2	PC	BC412301
06	Spiral Tube	1	PC	16E10801
07	Cell	20	SET	AB810505
08	Cover	1	SET	AG811110
09	Base	1	SET	ADAB2302

MANUFACTURER INFORMATION

NOTE!!

The aforementioned specifications are also applicable to those areas operating with the same power supply range.

AP/APG NO indicates the device is NOT suitable for use in the presence of flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Type BF symbol indicates the degree of protection against electric shock.

Instructions or reference information for repair of equipment parts are provided by the manufacturer, please contact your local dealer for further information.

Direct Healthcare Services
Unit 8-10 Withey Court
Western Industrial Estate
Caerphilly
CF83 1BF

TEL: + 44 (0)845 459 9831
FAX: + 44 (0)845 459 9832

WEB: www.directhealthcareservices.co.uk
Email: info@directhealthcareservices.co.uk

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