Direct Healthcare
Group

Advancing Movement & Health®

Dyna-Form®
Mercury Advance

Service Manual

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Direct Healthcare
Services

Dyna-Form®
Mercury Advance

The **Dyna-Form® Mercury Advance** is a pressure relieving mattress suitable for use with patients at **VERY HIGH RISK** of pressure ulcer damage.

Offering high levels of patient comfort, this unique system has the facility to “step up” to that of a dynamic mattress when clinically required. Similarly, the mattress’s function can be downgraded as the patient’s condition improves.

These features make it particularly beneficial for use within the patient’s home or palliative care environment and help reduce logistic and decontamination costs. The clinical benefits of a single system are equally applicable to those of a modern hospital setting. A higher maximum weight capacity, up to 40 stone / 254kg, allows the product to meet the modern challenges of those heavier clients. All component parts are interchangeable and replaceable, maximising product life and reducing environmental impact.

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Intelligent® Pressure Care Management | Making a Measurable Difference

1. Introduction

The Mattress consists of a foam head cell and series of 14 transverse air cells, each containing a unique foam profiled insert, which are in turn held within a foam U Core, all protected by a vapour permeable waterproof cover. The single head end cell and the formers consist of foam only. The transverse cells are arranged into alternate pairs of A and B cells which are filled and emptied in sequence.

In Static Mode, the mattress attains the pressure reducing properties of the Dyna-Form Mercury static foam mattress (details available on request), whilst in Alternating Mode the mattress is able to offer similar properties to a pressure relieving dynamic system.

The digital Control Unit controls a Control Unit that allows air to flow into, or out of the air cells as required according to the operating mode selected. It also maintains the air pressure within the mattress at the required level and controls the action of the audible/visual Audible Warning system in the event of mains supply failure or over or under inflation pressure. A CPR Valve located at the Control Unit end of the umbilical hose permits the rapid deflation of the Mattress in an emergency.

2. Indications/Contraindications for Use

2.1 Intended Use

Mercury Advance is a mattress replacement system designed to offer pressure relief and prevention of pressure sores to patients spending the majority of their time in bed.

The intended patient population is for individuals aged between Paediatric – Geriatric with a body weight >10kg.

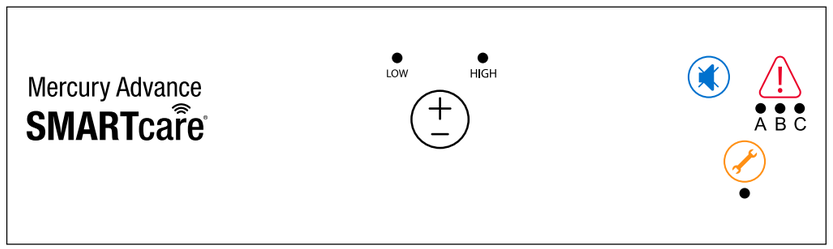
2.2 Contraindications

The Mercury Advance Mattress System should not be used for patients with unstable fractures, gross oedema, burns or intolerance to motion.

3. Quick Reference Guide (Frequently used functions)

This is a quick reference guide for the **Dyna-Form Mercury Advance System**

Product Code MAT1210001



Power Switch Audible Warning Reset

The power switch simply switches the mains power to the Control Unit on and off.

When the Control Unit detects an Audible Warning condition, this can be silenced (see page 5) and re-set by switching the Control Unit off and then back on again.

CPR Valve

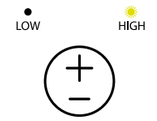
Please ensure that the CPR connector is always placed fully home, prior to inflating the mattress. NB: The mattress will NOT inflate properly should this not be the case.

The CPR connector is only to be used in the event of a clinical emergency for priority use. However, disconnecting this function will cleverly deflate air rapidly from the mattress in readiness for transport / static mode.

LED Mode Settings

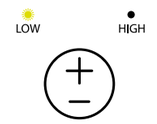
This symbol when illuminated (The green indicator light) is used to indicate that the equipment is on or ready for use.

When a patient requires a true dynamic function or indeed more pressure in the cells, as they may be uncomfortable or feel as though the support surface is too soft or unstable, then please select a “High” setting (pressure 26mmHg). This must only be used by a trained clinician as often too high pressures can further agitate certain patient conditions.



Power On / Off
True Dynamic /Firmer Setting

When a patient requires less pressure in the cells, as they may be uncomfortable or indeed hyper sensitive to cell movement or indeed if the patient is still reddening further, then please select a “Low” setting (pressure 18mmHg). This must only be used by a trained clinician.



Low / Comfort Pressure Setting

This function is used to silence the Audible Warning. The LED will remain lit if the Audible Warning has been silenced previously, however a fault is still detected. Refer to the power switch in order to re-set fully. If the Audible Warning continues to sound repeatedly, along with an illuminated light, then an engineer must be called.

Silence Audible Warning

This symbol indicates an “Audible Warning Failure”.
Please see troubleshooting guide below for how to re-set.

Audible Warning Failure

This symbol when illuminated indicates a Service is required.
DHG recommends a service every 8760 hours of operation (one continuous year running).

Service Indicator

Note: Please ensure (when available) that all securing straps on the base of the mattress are secured onto the MOVING PARTS of the bed frame.

For shut down procedure, see 4.2 Control Unit section.

4. Warnings and Cautions

General Information (Caution) (Warning)

- There are no special skills required to operate the system.
- The Medical Professional is responsible for applying his/her best medical judgment when using the system.
- The electricity supply is of the type indicated on the Control Unit.
- Check the mains lead is free from damage and is positioned so as not to cause an obstruction, or injury. E.g. Strangulation of a child or trip hazard.
- Ensure the mains lead cannot become trapped or crushed, e.g. by raising or lowering of the bed or bed rails or any other moving object.
- The Control Unit must only be used with a suitably approved power cord and plug set as supplied by DHG.
- The system is not to be used in the presence of flammable anaesthetics.
- Suitable for continuous use.
- Not suitable for sterilisation.
- Do not position the Control Unit to make it difficult to disconnect the power supply or plug.
- Do not place the Mattress on or close to a source of heat.
- Do not use with hot water bottles or electric blankets.
- Ensure the Control Unit is not exposed to:
  1. Excessive heat sources e.g. fires, radiators etc.
  2. Water, particularly immersion.
- DHG strongly advise against smoking whilst the Control Unit is in use. This is to prevent accidental secondary ignition of items which may be flammable e.g. bed linen. The materials used in the manufacture of the Mercury Advance System comply with the required fire safety regulations.
- Do not use sharp objects on or near the mattress system as this will cause damage.
- Do not store in damp conditions.
- Do not use in an oxygen enriched environment.
- Not suitable for use in an Outdoor Environment.
- Intended for both Home Healthcare and Professional Healthcare environments.
- Do not connect to any other medical device or equipment.
- Correct fuse rating MUST be used. Failure to do so could result in the risk of a fire.
- The System should be cleaned after use or between patients. Refer to Cleaning section.
- All internal and external hoses must be free of twists, kinks. The external hose should also be properly connected and positioned so that the risk of obstruction or injury is eliminated.
- Do not use bleach, phenols. Chlorine based products which exceed 1000ppm. Solvents or alcohol based cleaners.
- All the above warnings and cautions together with safety considerations should be observed at ALL times during its use.
- Select correct setting ‘Hi’ or ‘Low’ as required. Care should be taken not to accidentally change settings once set. This may affect the desired requirement of the therapy. This could also be caused by pets, pests or children.
- This device does not emit radiation.

5. Installation

5.1 Mattress (This is the applied part type BF)

Place the Dyna-Form Mercury Advance Mattress directly on to the bed platform ensuring that the Blue multi-stretch waterproof cover is on top and that the umbilical hose is located at the left-hand corner at the foot end of the bed. Note: The umbilical hose can be located inside the cover under the “Open Here for Air Inlet” printed in the bottom left hand corner of the mattress.

Cover the Mattress with a loose-fitting sheet.

Static Mattress Use

The Dyna-Form Mercury Advance Mattress can be used as a pressure reducing mattress for patients at High Risk of pressure ulcer damage without the need to attach the Control Unit.

Alternating Mattress Use

If / When required, the Dyna-Form Mercury Advance Mattress can be used as an alternating mattress system by attaching the Dyna-Form Mercury Advance Control Unit system.
No other system should be attached to the mattress as the design settings and internal air pressure properties of the Dyna-Form Mercury Advance Control Unit) are specific to this mattress only.

The Dyna-Form Mercury Advance is a replacement mattress system and should NOT be placed on top of any existing mattress.

The startup time from static to dynamic mode is immediate.

5.2 Control Unit

Hang the Control Unit onto the footboard. The mounting hooks swivel to suit the thickness of the footboard or rail. Connecting the Umbilical Hose to the Control Unit , place the supplied 3-pin electrical plug into the wall outlet and switch on:

(a) Open the zip located at the bottom left hand side of the mattress and pull out the Blue Umbilical hose.

(b) Attach the Blue Umbilical Hose to the Control Unit by connecting the air connector at the end of the Umbilical Hose to the air inlet connector at the bottom left hand side of the

Control Unit. Ensure that the Red CPR Release button is located on top of the Air Inlet connector after connection is complete.

(c) Re-close the zip as far as possible without clamping the Blue Umbilical Hose to ensure the mattress and air cells are sealed within the cover.

(d) Shut down is the reverse of items a, b & c above.

6. Operation

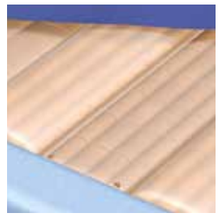
Attach the supplied mains cable to the Control Unit by inserting the “kettle” type connector into the recess located on the left-hand side of the Control Unit. The mains cable has been designed specifically as a removable part to aid in easy replacement should it become damaged in use.

Power cables not supplied by Direct Healthcare Group are not recommended for use with this Control Unit.

The mains plug should be turned off and removed from wall socket as a means of isolation.

Plug the mains cable into a suitable 230v mains socket and switch on the Control Unit using the on/off switch.

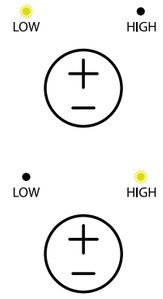
After the Control Unit has been turned on both the “High “and the “Low” lights will flash together intermittently until the Control Unit has attained its initial operating pressure. Once the Control Unit has attained its initial operating pressure the “Low” light will stay on constantly and the mattress is ready for use.



6.1 Low / High Settings

The Dyna-Form Mercury Advance Mattress, in Alternating Mode, has two pressure settings. The initial setting that the control unit will revert to upon set up is “Low”. The “Low” comfort setting is ideal for the lighter patient or those who feel discomfort when on a normal alternating air type mattresses system. However, for patients with existing pressure damage or those at Very High Risk, it is recommended that dependant on the clinical judgement of the clinician, the “High” setting is activated by pressing the +/- button once, which is located on top of the Control Unit.

In “High” Mode the Control Unit attains more of the characteristics of an alternating air mattress system whilst still utilising the advantages of the static foam inserts. Repeatedly pressing the ‘mode’ button enables the Low & High modes to be selected in turn.



6.2 CPR Deflation

The CPR system consists of a manually operated button located on the Air Inlet connector attached to the Control Unit. By pressing the Red Button, which will release the connector locking system, the user can remove the connector unit which will deflate the mattress air system back to that of a static foam mattress.

Note: After a short period as the Mattress deflates the ‘Low Pressure’ Audible Warning is activated and can be cancelled by switching the Control Unit off.

6.3 Troubleshooting

For assistance (if needed) in setting up, using or maintaining the Mercury Advance System, or to report unexpected operation or events, please contact Direct Healthcare Group on the contact details on the reverse of this manual.

7. Audible/Visual Indicators

Warning conditions are indicated by a flashing red display accompanied by an Audible Warning. In each case the user should respond by turning the Control Unit’s switch off and investigating the cause.

7.1 High Pressure Warning

This condition could be caused, for example by a kinked Umbilical Hose or visitors, and others, sitting suddenly on the Mattress.

7.2 Low Pressure Warning

This condition could be caused, for example, by incorrect fitting of the air inlet connector, opening of the CPR Valve or a leak in the Mattress due to a cut or puncture.

7.3 Mains Failure Warning

This condition may be caused, for example if Mains power is lost.

7.4 Alternating Mode Failure (no alternation)

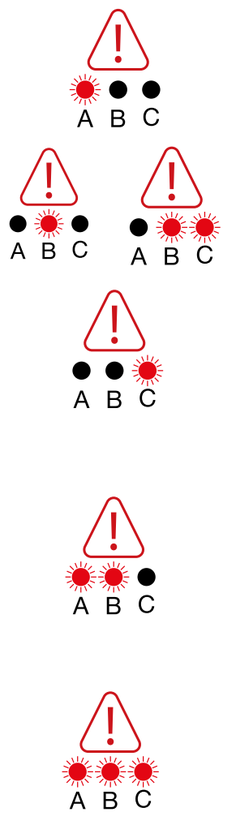
This will be indicated by a warning LED on A and B and an Audible Warning.

1. Reset the warning – turn off Power and press the Audible Warning mute button.
2. Disconnect the air hoses to reduce pressure – reconnect when pressure has decreased.

7.5 Initialising Failure

This will be indicated by a warning LED on A, B and C and an Audible Warning.

1. Press the Audible Warning mute button to silence the Audible Warning.
2. Check the power cable is firmly plugged into the mains outlet and the Control Unit; and check the mains power is switched on.
3. Check the Control Unit fuse (1 AMP) – fuses can be released using a screwdriver to push and turn.



8. Transportation

To change the location of the mattress, remove the Umbilical Cord and allow the mattress to return to its Static Mattress form. Switch off the Control Unit using the on/off switch and disconnect the electrical supply cable from the mains socket. The mattress can now be moved to a new location where it must immediately be reconnected to the mains electrical supply and the Control Unit switched back on. Once the Mattress has been refilled, the ‘Alternating’ mode will automatically revert back to the Low setting and should be reselected to High should this be desired by the clinician.

Warning: The Mattress will not ‘alternate’ when disconnected from Control Unit and /or the mains electrical. Also, refer to environmental conditions section at rear of this manual.

9. Cleaning & Maintenance Procedures

9.1 Cleaning Procedures

Warning: Before cleaning the System make sure that the Control Unit is disconnected from the mains electricity supply.

Do not immerse the Control Unit in water or other fluids.

Do not autoclave, nor use phenol for cleaning.

Do wash hands before commencing the cleaning process.

Wear appropriate protective clothing such as gloves, apron and a mask.

Ensure all work surfaces are cleaned before and after contact with the Mattress.

9.1.1 Cleaning the Mattress

1. Cleaning should take place before and after use, and between patients.
2. With cover left on the Mattress disconnect the Mattress from the Control Unit.
3. Clean the surface of the wash down table with Hypochlorite solution or equivalent disinfectant.
4. Wash Mattress top using hot water (60 degrees C) containing detergent – dry with a paper towel.
5. Use a Hypochlorite solution 1,000 parts per million available chlorine. For heavy contamination use a Hypochlorite solutions 10,000 parts per million available chlorine. Please ensure thorough rinsing after cleaning.
6. Using suitable brush, hot water, detergent or Hypochlorite solution, clean Umbilical Hose and CPR Valve. Dry with paper towel.
7. If required, the Mattress Cover may be removed and machine-washed at a temperature of 80 degrees C, for not less than 10 minutes. The individual Air Cells can be wiped down with established disinfectants.
8. To avoid shrinkage of the coverline dry in an indoor clean environment or tumble dry on a low heat setting not exceeding 40 degrees C and not for longer than 10 minutes. Covers must be thoroughly dried before re-fitting to the mattress.

9.1.2 Cleaning the Control Unit

The Control Unit can be cleaned by wiping with a cloth dampened with a detergent solution with the above recommended DiffX dissolved within a spray bottle filled with 500ml of warm water. Also, refer to symbol chart.

9.2 Identification of the Control Unit (Serial Number)

The Control Unit is identified by serial number and GS1 compliant barcoding using both 128 and 2D bar code identifiers.

Both product code and manufacture date are shown on the identification label.

The above Control Unit serial number is MA15090002 and manufacture date is 02 day of 09 month of year 2015.

9.3 Checking the System

1. Plug in the mattress to the Control Unit.
2. Plug in the mains cable to the IEC inlet and switch on the power.
3. The LED indication LOW and HIGH pressure will flash during start up.
4. The Control Unit will run until the mattress is inflated to the pre-set pressure setting (LOW).
5. The LED indicating the setting (LOW) will be lit.
6. The system is ready to use.
7. The system is designed so the Control Unit sets the pressure as required and will run for short periods of time to maintain the required pressure or alter it when moving from LOW to HIGH.

9.3.1 Control Unit Pressure readings

Using a calibrated manometer or similar device, connect the Control Unit and ensure that air pressure outputs are within the below guidelines. Please note readings must be obtained in mmHG.

Pump Type	Minimum	Maximum
Mercury Advance V2	18	26

A small variance of +/- 2mmHG from the prescribed pressures is permissible. Any variance significantly in excess of this would constitute a failure of the test conditions.

9.4 Service Light Reset Procedure

The service Light will illuminate after 8760 running hours (One year of continuous operation) to indicate the control unit requires an annual Service.

1. **To reset, press and hold +- button simultaneously with the mute sound button. This will reset the running hours for the control unit and de illuminate the service light.**

If you have applied a service kit as part of your preventative maintenance program before the light has illuminated follow the below process.

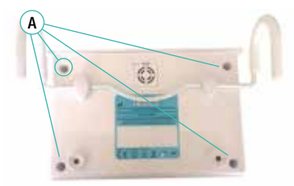
1. **Switch on the control unit holding the +- button simultaneously with the mute sound button, Keep both buttons pressed for 5 seconds with power applied.**

9.5 The components

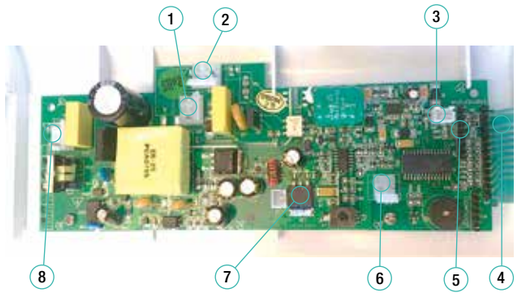
The main components in the Mercury Advance Control Unit.

9.5.1 Opening the Control Unit.

To remove the front of the enclosure,first unscrew the four corner screws (Marked (A)).

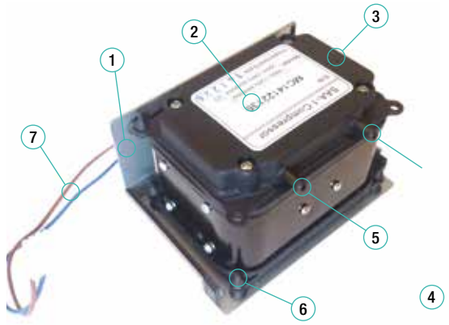


9.5.2 PCBA



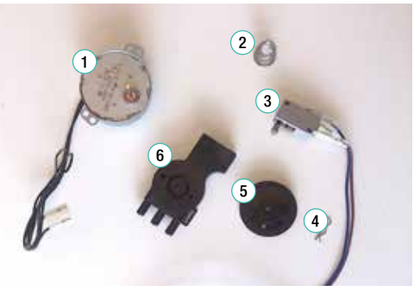
1. Connector for Compressor
2. Connector for Rotor valve motor
3. Connector for Micro switch (Brown/blue)
4. Connector for Membrane
5. Connector for Software download (for manufacturer only)
6. Connector for (red/black) from Power input
7. Pressure sensor
8. Connector for Power in (brown/blue)

9.5.3 The compressor



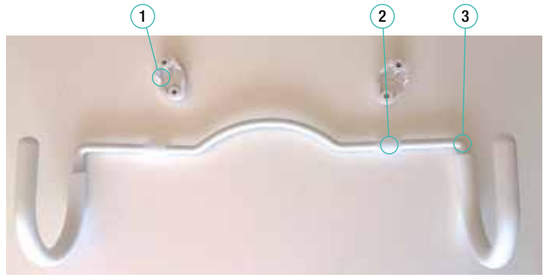
1. Attachment plate
2. Label
3. Silencer
4. Air outlet
5. Air inlet
6. Rubber suspension
7. Compressor power cable (Brown/blue)

9.5.4 Rotor valve with motor



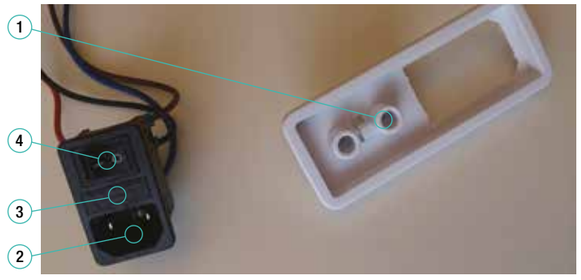
1. Rotor valve motor
2. Spring
3. Micro switch
4. Lock pin
5. Rotor valve cap
6. Rotor valve body

9.5.5 The hooks



1. Hinge Lock
2. Friction Tube
3. Hook

9.5.6 Air inlet/power outlet

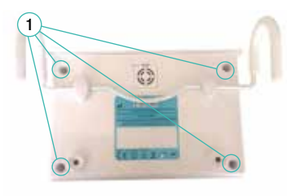


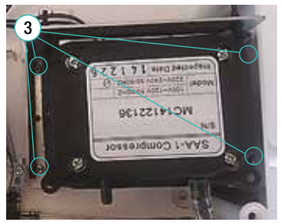
1. Air outlet
2. Power inlet
3. Fuse holder
4. ON/OFF

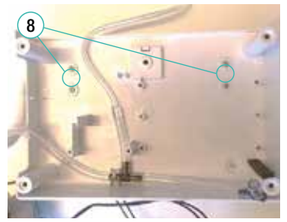
9.6 Taking the System Apart

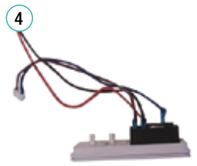
The Control Unit is designed so almost all components can be removed without disassembling other parts.

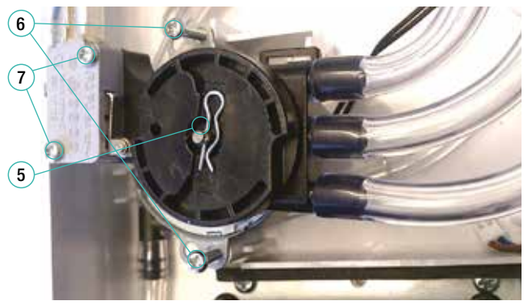
1. Open the housing by removing the 4 screws from the rear case.
2. Remove PCBA by disconnecting the cables and unscrewing the 2 screws.
3. Remove the compressor by unscrewing 6 screws and disconnect the power cable from the PCBA and the air tube on the compressor.
4. Remove the air out/power in part by disconnecting the air tubes and the cables from the PCBA.
5. Remove the rotor valve by pulling out the locking pin from the motor axes and removing the air tubes from the rotor valve.
6. Remove the rotor valve motor by unscrewing the 2 screws.
7. Remove the micro switch by unscrewing the 2 screws.
8. Removing the hooks requires the compressors to be removed first. Remove the four screws on the inside of the back part of the housing and then release the attachment part for the hooks from the outside of the housing.





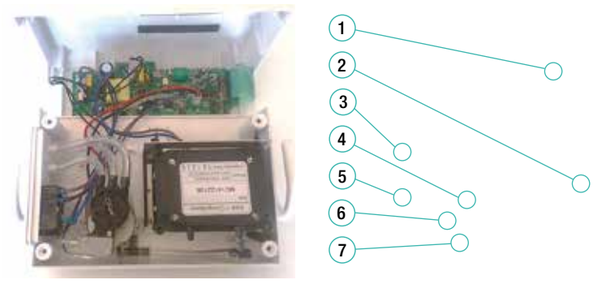






9.7 System Layout

1. Control PCBA
2. Compressor
3. Air Outlets
4. Rotor valve
5. IEC Power Inlet
6. Rotor valve motor
7. Micro switch



9.8 Maintenance

Change the air filter: Remove air filter holder by pressing the plastic catch downwards and lifting the air filter holder up. Take out the filter and put in a new one and put the filter holder back.

Warning – Only qualified technicians trained or formally approved by Direct Healthcare Group Ltd. in the operation and maintenance of Direct Healthcare Group products may carry out maintenance, modification or repair work on the equipment. Unqualified personnel attempting to work on Direct Healthcare Group Control Units risk serious injury to themselves and others and possibly death by electrocution. Inlet fuse NOT to be replaced by operator or patient,
to be replaced by service personnel only. Warning –
Do not modify this equipment without authorisation of Direct Healthcare Group.

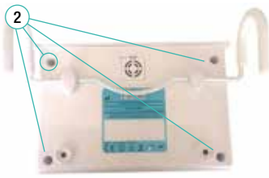
9.9 Servicing

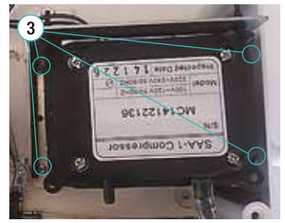
The Control Unit has a light that when illuminated indicates a Service is required.

Direct Healthcare Group recommend that the control unit be serviced annually from installation. The service light will illuminate after 8760 hours of operation (one year of continuous operation) as a guideline for preventative maintenance. The unit contains serviceable parts and should only be carried out by persons as described in section 8.1. For Service, maintenance and any questions regarding this please contact DHG.

9.9.1 Compressor Maintenance

1. Ensure power cable is disconnected.
2. Open the housing by removing the 4 screws from the rear case.
3. Remove the compressor by unscrewing 6 screws and disconnect the power cable from the PCBA and the air tube on the compressor.
4. Remove the compressor from the attachment plate, which will require cutting the 6 rubber suspensions.





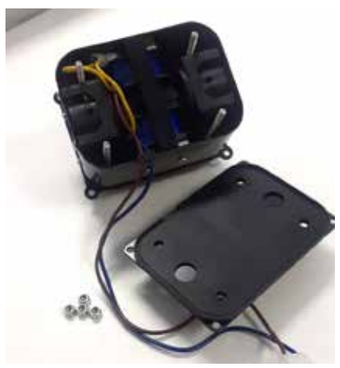
5 Release the magnet by firstly unscrewing 4 (7mm ny-loc) and remove the compressor back plate and seal.

6 To remove the shuttle, loosen the compressor screws by approximately 25mm to release the compressor lid and seal, followed by 8 screws either side of the compressor casing.

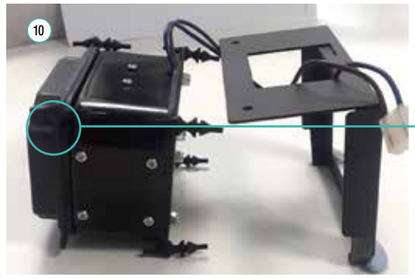
7 Remove both valve bodies, unscrew and remove the diaphragms.

8 Replace the diaphragms, ensuring the location nipples are seated correctly in the housing. Confirm the diaphragm runs smooth around the housing.

9 The compressor can now be assembled. **Attention:** ensure no leads are pinched and seal is intact.



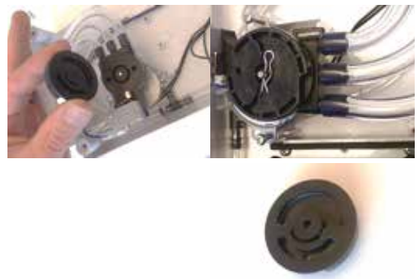
10 Reattach the compressor to the attachment plate, using 6 new suspensions.



9.9.2 Rotor Valve Maintenance

The Control Unit has a light that when illuminated indicates a Service is required. Open the housing by remove the 4 screws from the bottom part.

Grease the rotor valve: Press down the cap of the rotor valve release the lock pin. Lift of the cap and put a thin layer of grease (Silicone grease dow Corning Molykote PG21, 613000103) on the bottom side of the cap. Assemble back again.



9.9.3 Fuse

Check the fuse: Check the fuse and if required add a spare in the holder for the fuse in the fuse holder.

10. Troubleshooting

Warning / Fault	Cause	Solution
Control Unit does not operate; no display lights illuminate	The Control Unit may not be attached to a power source or a fuse may need replacing.	1. Check the Control Unit is connected to mains power outlet with the correct voltage. 2. Check the Control Unit is switched on. Switch off and unplug the unit before restarting. 3. Check the mains plug fuse (5 AMP) then check both Control Unit fuses (1 AMP) – fuses can be released using a screwdriver to push and turn. ⚠ Do not try to open the Control Unit. Opening the unit could cause personal injury or equipment damage. ⚠ Ensure the replacement of fuses is carried out accordance with local legislation.
Warning LED C + Audible Warning 	Mains failure / Other See above, plus:	1. Check the Control Unit is connected to mains power outlet with the correct voltage. 2. Check the Control Unit is switched on. Switch off and unplug the unit before restarting. 3. Check the mains plug fuse (5 AMP) then check both Control Unit fuses (1 AMP) – fuses can be released using a screwdriver to push and turn. ⚠ Do not try to open the Control Unit. Opening the unit could cause personal injury or equipment damage. ⚠ Ensure the replacement of fuses is carried out accordance with local legislation.
Warning LED B + Audible Warning 	Pressure too low	1. Reset the warning – turn off power and press the Audible Warning mute button. 2. Check that the CPR connector is firmly attached to the Control Unit (located on the left of the Control Unit case) Check all air hoses along the inside of the mattress – each should be firmly connected. Check each air cell is securely attached to its connecting air pipe. 3. Check all cells, pipes and hoses for any air leakage. 4. Check that the air filter cover is correctly secured and the air filter is clean. 5. Switch on power.
Warning LED B+C + Audible Warning 	Pressure too low / Air pipe kinked	1. Check Blue external umbilical air pipe that is between mattress and CPR connector is not kinked. twisted or damaged. 2. Check all air hoses along the inside of the mattress – each should be firmly connected. 3. Check each air cell is securely attached to its connecting air pipe.
Warning LED A + Audible Warning 	Pressure too high	1. Reset the warning – turn off power and press the Audible Warning button. 2. Disconnect the air hoses to reduce pressure, reconnect when pressure has decreased. 3. Check for twists in the air hoses between Mattress and Control Unit.
Warning LED A+B + Audible Warning 	Alternating Mode Failure (no alternation)	1. Reset the warning – turn off Power and press the Audible Warning mute button. 2. Disconnect the air hoses to reduce pressure – reconnect when pressure has decreased.
Warning LED A,B+C + Audible Warning 	Initialising Failure	1. Press the Audible Warning mute button to silence the Audible Warning. 2. Check all air hoses along the inside of the mattress – each should be firmly connected. Check each air cell is securely attached to its connecting air pipe. 3. Check that the CPR connector is firmly attached to the Control Unit (located on left of control unit casing).

11. Replacement Pump Parts

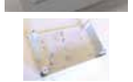
Image	Part Number	Description	Qty. per box
	SP021001	Motor for Rotor Valve	1
	SP021002	Compressor Bracket (Metal)	1
	SP021003	Rubber Suspension for Compressor	6
	SP021004	CU Compressor 220V	1
	SP021005	Valve Cover	1
	SP021006	Valve Base	1
	SP021007	R.V Spring Analog	1
	SP021008	R-Clip 1mm D20mm LR	1
	SP021009	Inlet Switch	5
	SP021010	1A/250V Fuse (Slow Blow Type)	10
	SP021011	PCBA	1
	SP151001	PCBA - Bari	1
	SP012004	Top Case	1
	SP021013	Bottom Case	1
	SP131024	Diaphragm	2
	SP021015	Stand Rubber 4244 N.R.H	2
	SP021016	3 Pin Cable (Switch to PCB)	5
	SP021017	2 Pin Cable (Switch to PCB)	5
	SP021018	Pressure Sensor Tube	5
	SP021019	Connector Tee Nylon PA66 Black	5
	SP021020	Tube PVC Clear 4.5x8 PVC	1

Image	Part Number	Description	Qty. per box
	SP021021	Tube PU 3x5 PU	1
	SP021022	Cap Sponge Filter	5
	SP021023	Sponge Filter	5
	SP021024	Membrane	1
	SP012003	Membrane - Bari	1
	SP021025	Screw-Motor	10
	SP021026	Screw-PCBA	10
	SP021027	Screw-Hook	10
	SP021028	Screw-Compressor	10
	SP021029	Screw-Housing	10
	SP021030	Metal Hook	1
	SP021031	Hook “Friction Tube”	2
	SP021032	Hook Ends	2
	SP021033	Hinge Lock	2
	SP021034	Water Sealing	10
	SP021035	Main Cable (220V UK)	1
	SP025001	CPR Connection with Tube	1
	SP021053	CPR Seal	2
	SP021037	3m CPR Tube	3m
	SP025003	CPR Connector	1
	SP021036	Annual Service Kit	1

12. Technical Specification

Declaration – electromagnetic emissions - for all ME EQUIPMENT and ME SYSTEMS

Guidance and manufacturer's declaration – electromagnetic emission

The MAT1210001 is intended for use in the electromagnetic environment specified below.

The customer or the user of the system should ensure that it is used in such an environment.

Emission test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class B	The system is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

12. Technical Specification

Declaration – electromagnetic immunity

Guidance and manufacturer's declaration – electromagnetic immunity

The MAT1210001 is intended for use in the electromagnetic environment specified below.

The customer or the user of the system should ensure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output line(s)	±2 kV for power supply lines ±1 kV for input/output line(s)	Mains power quality should be that of a typical commercial or hospital environment.
Surge Immunity Test IEC 61000-4-5	± 1 kV line(s) to line(s)	±1 kV differential mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Voltage Dips $\%U_T$ 30 60 >95 Voltage Interruption $\%U_T$ >95	Period (Cycles) 25 5 0.5 Seconds 5	Voltage Dips $\%U_T$ 30 60 >95 Voltage Interruption $\%U_T$ >95	Period (Cycles) 25 5 0.5 Seconds 5	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Span system requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or a battery.
Power frequency (50Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE U_T is the a.c. mains voltage prior to application of the test level.

12. Technical Specification

Declaration – electromagnetic immunity – for ME EQUIPMENT and ME SYSTEMS that are not LIFE-SUPPORTING

Guidance and manufacturer's declaration – electromagnetic immunity

The MAT1210001 is intended for use in the electromagnetic environment specified below.

The customer or the user of the system should ensure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000- 4-6	3 Vr_{ms} 150 kHz to 80 MHz	3 Vr_{ms}	Portable and mobile RF communications equipment should be used no closer to any part of the CT515, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter Recommended separation distance $d = 1.167\sqrt{P}$ $d = 1.167\sqrt{P}$ 80 MHz to 800 MHz $d = 2.333\sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	3 V/m (Professional Healthcare Environment) 10 V/m (Home Healthcare Environment) 80 MHz at 2.7 GHz	10 V/m	

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Span system is used exceeds the applicable RF compliance level above, the system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the system.

b. Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

12. Technical Specification

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for ME EQUIPMENT or ME SYSTEM that are not LIFE – SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the MAT1210001 Alternating Control Unit

The MAT1210001 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled.
The customer or the user of the system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 KHz to 80 MHz $d = 1.167\sqrt{P}$	80 MHz to 800 MHz $d = 1.167\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.333\sqrt{P}$
0.01	0.117	0.117	0.233
0.1	0.369	0.369	0.738
1	1.167	1.167	2.333
10	3.689	3.689	7.379
100	11.667	11.667	23.333

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

13. Technical Data

13.1 Control Unit

Serial Number ..... As per label on rear of Control Unit
Electrical Supply. ..... 220 – 240 volts, 50 Hz
Power Consumption ..... 10 watts
Fuses TA1H 250V
Protection against shock ..... Class 2
Noise Level ..... Approx. 30 dB (A)
Dimensions ..... 245 x 160 x 95 mm
Weight ..... 1.7 kg
Service Interval ..... 12 months / 8760 hours
Expected life ..... 5 years
Shelf life of parts ..... 5 years

13.2 Mattress

Serial Number ..... Label on inside of mattress cover
Number of Air Cells ..... 14 Air Cells / 1 Static Foam Cell
Dimensions ..... 1980 x 880 x 150mm (Nominal)
Weight 13.4kg
Expected life of Mattress ..... 5 years
Shelf life of Mattress parts ..... 5 years

14. Optimum Conditions

(Applies to Mattress and Control Unit)

14.1 Environment Conditions for Use

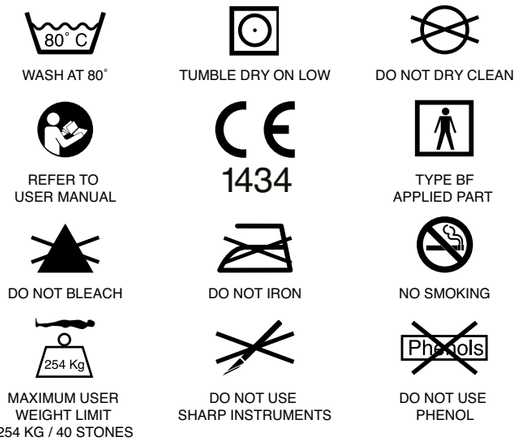
Transport ..... -25˚C – +70˚C
Storage ..... -25˚C – +70˚C
Usage ..... +5˚C – +40˚C
Humidity ..... 10% – 93%
Atmospheric Pressure ..... 700hPa – 1060hPa
Operational Altitude ..... ≤ 2000m

14.2 Exposure

Exposure to direct sunlight, dust, lint and general debris is not considered to be an issue with the Mercury Advance System.

15. Symbols Guide

Mattress Symbols



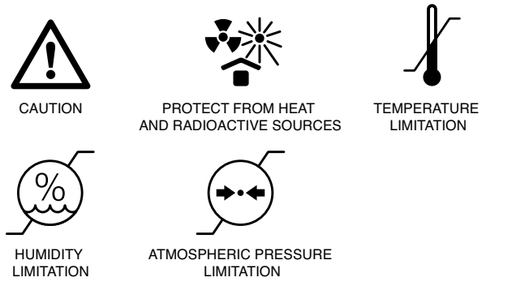
WARNING

THIS IS A STATEMENT THAT ALERTS THE USER TO THE POSSIBILITY OF SERIOUS INJURY OR OTHERWISE ADVERSE REACTIONS WITH THE USE OR MISUSE OF THE DEVICE

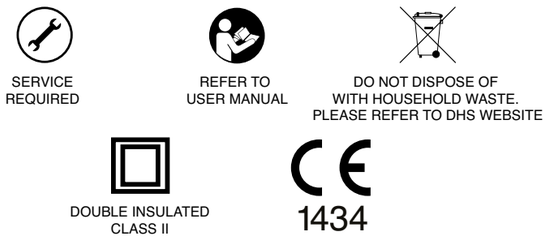
CAUTION

THIS IS A STATEMENT THAT ALERTS THE USER TO THE POSSIBILITY OF A PROBLEM WITH THE SYSTEM ASSOCIATED WITH ITS USE OR MISUSE

General Symbols



Control Unit Symbols



IP21

IP: INGRESS PROTECTION
2: PROTECTION AGAINST FINGERS OR OTHER OBJECT NOT GREATER THAN 80MM IN LENGTH AND 12MM IN DIAMETER
1: PROTECTION FROM VERTICALLY DRIPPING WATER

16. Detachable/Removable Parts

1. Mattress (Detached from the Control Unit by removing the CPR connector). Part No. MAT1210061 (or variants of for the size)
2. Electric power cable. (Removed from the Control Unit by pulling the cable away from the mains inlet on the side of the Control Unit). Part No. SP021035

N.B. The battery is an integral part of the PCB and is not removable or changeable.

Caution

Use of detachable parts not listed is not recommended by Direct Healthcare Group.

17. Disposal

Please refer to DHG website for recommendations and responsibilities for disposal within the UK WEEE guidelines.

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