ALTERNATING PRESSURE PUMP AND MATTRESS

USER MANUAL

MODEL: ALTO

CODE: DLR-ALT-MAT

TABLE OF CONTENTS

INTRODUCTION

Thank you for purchasing this product. These instructions for use should be read carefully before operating the dynamic system and kept for future reference. Please ensure that you understand all instructions, if you have any questions concerning the operation or maintenance of the mattress, please contact your provider/supplier who will provide you with expert professional advice.

INTENDED ENVIRONMENT

Your dynamic system is intended for use in the following environments:

- A hospital where intensive/acute care is provided, and medical supervision is required, and monitoring provided.
- A long-term care area where medical supervision and monitoring is provided if necessary (e.g. nursing homes, rehabilitation facilities, geriatric facilities)
- A domestic area.

INTENDED USER GROUPS

The Alto mattress is intended to support a single patient who is up to 225kg in weight and 185cm in height. For those patients of a very low weight, typically less that 40kg and a physical size less than 146cm, clinical judgement is to be used to determine suitability. A lower (or upper) age limit is not defined as it depends on the physical size of the patient in relation to the proportions of the mattress and bed frame. The patient is not intended as a user for the control unit, as they only occupy the mattress.

INTENDED USE

The intended use of the mattress is to support the weight of the patient, as identified within the ‘Intended User Groups’ section, whilst sleeping or resting. The mattress is intended to:

- To help and reduce the incidence of pressure ulcers while optimizing patient comfort.
- For long term home care of patients suffering from pressure ulcers.

CONTRAINDICATIONS

Patient conditions for which the application of pressure relieving therapy on an alternating system is a contraindication are as follows:

- Cervical or skeletal traction.
- Unstable skeletal fractures.
- Unstable spinal cord injuries.
- Exceeds maximum patient weight of the system.
- Gross Oedema (Alternating mode only)
- The patient's wound cannot be in direct contact with the mattress.

Warning

- No servicing and maintenance can be performed while the product is in use.
- All the functions can be operated by patient.
- No maintenance except for cleaning can be performed by patient.

PRODUCT OVERVIEW

An air filled support surface is kept inflated by a compressor, housed within a control unit, where they are connected together via an umbilical tube.

The control unit is mains powered and it is expected to be permanently plugged into the mains when in use. Via the control unit the mattress can operate in the following modes:

- ALTERNATING MODE (default) – 2:1 (AB) alternating therapy.
- MAX INFLATE MODE – All air cells are inflated to the max setting for 20 minutes (can be manually cancelled).
- SEAT MODE – Can be used in conjunction with Alternating or Static modes.

After inflation, the control unit automatically sets the cell pressure to the default setting (80kg), but the comfort level can be adjusted by manually adjusting the cell pressure up or down. Should a fault occur (such as a power failure or loss of pressure) an audio & visual alert is triggered.

The support surface and control unit are intended to be positioned on compatible support platforms only.

FEATURES:

Control Unit:

- Provides an air supply to the mattress
- Rear bed hooks
- Accessible rear filter
- 1 in 2 alternating cycle
- Default 10 minute cycle time, with optional 15, 20 or 25 minute cycle times (select manually)
- 20 minute timed max inflate mode
- Transport Cap
- Adjustable comfort control
- Fault indicators with visual and audible alerts
- Touch panel with LED indicators
- Lockout facility for touch panel
- Static mode
- Max inflate mode
- Seat mode

Mattress:

- Cell on cell construction
- Bed platform securing straps
- 2 way stretch, vapour permeable & waterproof cover
- High frequency welded top cover
- 360° zip
- Covered feed pipes
- Cable management routing
- CPR Pull Tags

SAFETY

Warnings and Cautions:

Warnings in these instructions for use highlight hazards that if disregarded could lead to injury or death

Cautions in these instructions for use highlight potential hazards that if disregarded could lead to equipment damage or failure.

Risk Assessment:
Support platforms used with the mattress can vary greatly depending on the specific healthcare setting (i.e., hospitals, nursing homes, home care etc.) It is the responsibility of the care giver to carry out the necessary risk assessment to ensure suitable product compatibility and the safety of the patient.

Before a patient uses the dynamic system, a risk assessment must be performed on a patient by patient basis. The risk assessment should include but is not limited to:

- Product combinations (bed frame, mattress, side rails etc.)
- Extent of tissue damage (if any).
- Entrapment.
- Patient falls.
- Compatibility of the patient to the mattress size.
- Patients who have reduced capacities and are agitated and/or restless.
- Patients with burns.
- Unauthorised people with access to the controls.
- Small adults/children.

IMPORTANT SAFEGUARDS

When using electrical products, especially when children are present, basic safety precautions should always be followed, including the following:

Caution
To reduce the risk of electrocution:

- Always unplug this product immediately after use.
- Do not use while bathing.
- Do not place or store product where it can fall or be pulled into a tub or sink.
- Do not place in or drop into water or other liquids.
- Do not reach for a product that has fallen into water. Unplug immediately.

Warning
To reduce the risk of burns, electrocution, fire, or injury to persons:

- A product should never be left unattended when plugged in.
- Close supervision is necessary when this product is used by, on, or near: children or people who lack capacities.
- Use this product only for its intended use as described in this manual.
- Do not use attachments not recommended by the manufacturer.
- Never operate this product if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water. Return the product to a service center for examination and repair.
- Keep the power supply cord away from heated surfaces.
- Never block the air openings of the product or place it on a soft surface, such as a bed or couch, where the air openings may be blocked. Ensure opening are free from debris that could cause blockages.
- Never drop or insert any object into any opening or hose.
- Do not use outdoors or operate where aerosol (spray) products are being used.
- Connect this product to a properly grounded outlet only.
- Do not play with the product to prevent strangulation due to supply cord and air hose of product.

If a serious incident occurs in relation to the product, reports should be forwarded to Drive DeVilbiss Healthcare Ltd and the local competent authority.

INDICATIONS

To assist as part of an overall program of care when active load distribution through mechanical means is required.

SYSTEM LOADS

Mattress maximum patient weight: 225kg (35.5st)

TRAINING

If these instructions for use are not deemed sufficient and the need for additional training is required, please contact your distributor who will be able to: define the intention and outcomes of any necessary training, who should attend, its duration and any potential costs involved.

PATIENT BRIEFING

The professional user is to ensure the patient is sufficiently briefed in regard to the performance of the system, actions to take in the event of a change in its performance, safe use of the support surface and environmental considerations that may need to be taken.

FIRE WARNING

In order to reduce the risk of fire:

- DO NOT SMOKE – Smoking will contaminate the product and is NOT permitted around or on the support surface. This is a common cause of fatal fires. A cigarette could burn a hole in the support surface and cause damage. Patient clothing, bed sheets and other items may be combustible and could catch fire. Failure to observe this warning could result in severe fire, property damage, physical injury or death.
- DO NOT – use candles on or around the system.
- DO – keep heaters away from the support surface.
- Follow all manufacturers' instructions and warnings.
- It is advised that a full fire risk assessment is carried out prior to using this equipment.
- In case of fire, exit and call the emergency services.
- The use of other materials in combination with the mattress can degrade the fire performance.

BIOCIDES

Ultra-fresh™ antimicrobial agent is fully encapsulated in the mattress cover to help control microbial deterioration and to help extend the life of the covers. The active ingredient is 3-iodo-2-proponyl butyl carbamate. There are no special handling requirements. The product does not contain any nano-materials and all components are latex free.

Ultra-fresh™ is a trademark of Thomson Research Associates, Inc.

GENERAL WARNINGS

- The system is to be installed and put into service in accordance with the information provided in these instructions or use.
- The system is typically not suitable for child use, if it is to be used for child occupancy ensure a risk assessment has been undertaken taking into account the proportions of the child and dimensions of the system.
- Misused electrical equipment can be hazardous.
- Exposure of the control unit to any liquid while it is plugged in could result in a severe electrical hazard.
- The control unit is a precision electronic product. Use care when handling or transporting it. Dropping or other sudden impacts may result in damage to the unit.
- Do not open the control unit – risk of electrical shock.
- Repairs and service are to be conducted by suitably trained personnel. If the control unit is not functioning properly, or has been damaged, unplug the unit and take it out of service immediately.
- Modification of the mattress or control box is not allowed – A hazard could be introduced.
- Occupants and users of this equipment must never smoke in close proximity to the control unit, mattress or bedding being used with it – risk of fire.
- Accessories that have not been approved or designed for use with the system are not to be used.
- The control unit shall not be used in the presence of flammable gasses or used in oxygen rich environments – risk of explosion/fire.
- Control unit functions must be locked out when a patient is left unattended.
- If children, adults who lack capacity or even pets pose a potential risk of intentional or unintentional tampering with the control unit its suitability for use is to be considered during the initial patient/product risk assessment.
- The control unit shall not be used in the presence of flammable gasses or used in oxygen rich environments – risk of explosion/fire.
- Control unit functions must be locked out when a patient is left unattended.

- If children, adults who lack capacity or even pets pose a potential risk of intentional or unintentional tampering with the control unit its suitability for use is to be considered during the initial patient/product risk assessment.
- The support surface is for single occupancy use. Additional weight could damage the mattress or affect the performance of the mattress system.
- Minimise articles (e.g. bedding) between the support surface and patient, and secure the sheets loosely so as not to affect product functionality.
- Perform regular patient skin checks – any tissue deterioration may require equipment reallocation and/or a re-assessment of the care being provided.
- Incompatible support platforms (e.g. bed frame or mattress) can create safety/stability hazards.

PRODUCT FUNCTIONS

Pump

The alternating air pump mainly consists of one air pump, a motor, and a PCB pressure regulator. It has two air output terminals connecting to the mattress by two air hoses. The functions of the pump are described below, please refer to the figures of the pump.

Power Switch (1)

- The switch is at the right side of the pump.
- Turn ON/OFF the power and press Power Button (10) on the panel, the pump will start/stop operation.
- A green LED illuminates to indicate that the pump is working.

Press Cycle Time (2)

- The cycle time can be selected from the panel.
- The cycle time value options are 10, 15, 20, or 25 minutes. A green LED will illuminate to indicate the selected cycle time setting.

Press Pressure Range (3)

- 20mmHg~55mmHg is offered from the panel, providing different pressure values for patients of differing weights with a simple press of the + or - Buttons.
- A green LED will illuminate to indicate the selected weight.
- Weight settings from 40 – 225kg.

Alert Mute (4)

- The audible/visible alert turns on when the pressure is low, power failure or alternate failure occurs. A red LED will illuminate to indicate a failure.
- To mute the audible alert, press the Mute button. The visible alert indicator will flash until the problem is solved.
- Re-press the Mute button to reactivate the alert.

Alternate Mode (5)

- Press to set the air mattress in alternate therapy mode. A green LED will illuminate to show the alternating mode has been activated.

Static Mode (6)

- Press to set the air mattress in static therapy mode, an orange LED will illuminate to show static mode has been activated.
- The function will revert to alternating mode after 20 minutes.

Max Inflate (7)

- Press to set the air mattress to quick inflation mode.
- Under Max Inflate mode, pressure will remain at the maximum value of 55mmHg. An orange LED will illuminate to show Max Inflate mode has been activated.
- The function will revert to alternating mode after 20 minutes.

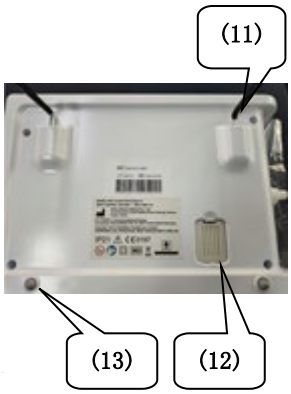
Seat Mode (8)

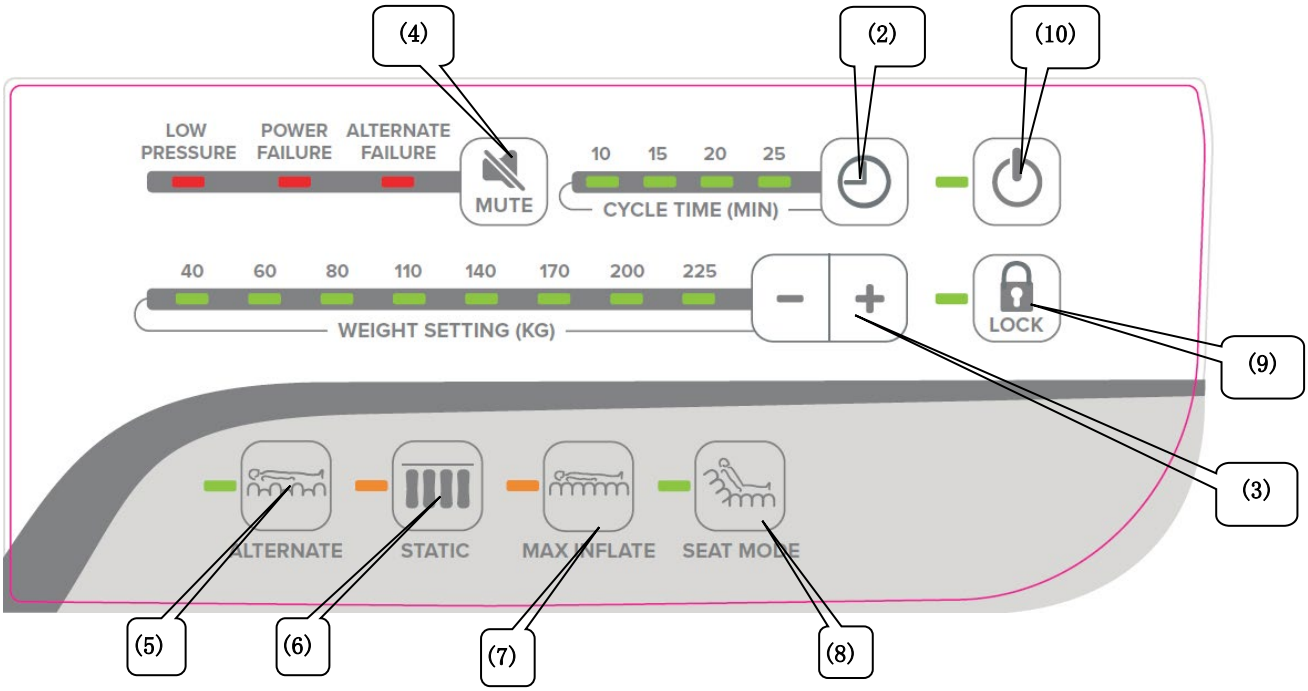
- Press to set the air mattress to ‘Seat Mode + Alternating’ mode or ‘Seat Mode + Static’ mode. Seat Mode will increase the pressure value in the mattress system by 5mmHg, which facilitates seating. A green LED will illuminate to show Seat Mode has been activated.
- Note that while in Max Inflate mode, the Seat Mode button cannot be used.

Lock Button (9)

- Press to lock or unlock the panel. A green LED will illuminate to show the lock function has been activated.
- The system will automatically lock out function after 5 minutes of inactivity.
- To manually lock and unlock the pump controls, press and hold the Lock Button for 3 seconds.

1. Power switch
2. Pressure cycle time
3. Pressure range
4. Alert Mute
5. Alternate
6. Static Mode
7. Max Inflate
8. Seat Mode
9. Lock button
10. Power button
11. Integral Hanging Hooks
12. Filter Cover
13. 2 × Pads for pump stability and minimize vibration





Accessory - Mattress (Type BF applied part)

The pump comes with cell type mattress of different materials (Nylon PVC, Nylon TPU or PU), provided optionally with the pump.

Please refer to the specifications section for details.

▼

CLASSIFICATION

- Class II Medical electrical equipment (Protection against electric shock).
- Type BF Applied Part (The mattress is an applied part).
- Ingress Protection Rated – IP21.
- Continuous operation.

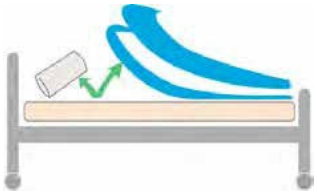
Caution

- The mains plug is used as the isolation means from mains, do not position the product to make it difficult to operate this disconnection device.

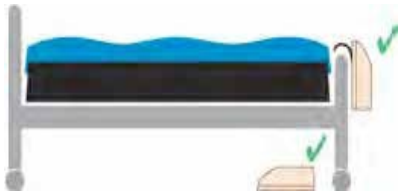
INSTALLATION

The following describes the procedures for setting up the system for the first time.

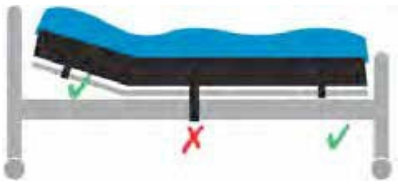
a) Remove all covers, sheets and mattress from the bed.



b) On a standard bed, position Mattress Replacement on top of bed, printed top cover facing upwards and air hoses towards the base of the bed. Attach to the bed by securing the adjustable straps under each end of your bed. Ensure buckles are securely fastened and straps are pulled tight.



c）On a profiling bed, secure the side straps around the moveable sections of the bed base. **DO NOT SECURE TO SIDE RAILS OR STATIC PARTS OF THE BED - STRAPS WILL TEAR OFF OR DAMAGE TO THE BED MAY BE SEEN.**

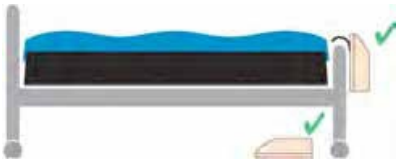


d) Confirm there are no sharp objects in the immediate area which may risk damage to the Mattress.

Important: Check that the attachment of the Mattress does not interfere with the movement or operation of the bed.

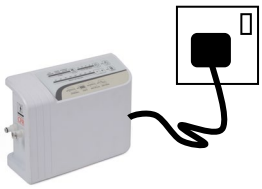
Pump Unit Activation

a) Position Control Unit by hanging hooks over foot board of the bed or place unit on the floor under the bed.



b) Attach the air hoses using the quick connector to the Control Unit. Ensure air hoses do not kink between mattress, bed frame and Pump Unit.

c) Plug the power cord into an earthed electrical outlet.



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

d) Connect the mattress and switch the power button on. Allow up to 40 minutes for full inflation.

e) Once ready, the low-pressure light will go out - lay the patient on the bed and select the appropriate comfort level.

Perform a “bottom out” test to ensure that patient is properly suspended. Slide your hand under the top cover along a deflated cell in the sacral (bottom) area. Secure sheets loosely enough to ensure they do not interfere with cell alternation.

OPERATING INSTRUCTIONS

NOTE: Always read the operating instructions before use.

General

This product is designed to provide maximum comfort to patients. Make sure that you operate this product in a proper way optimizing its value. Here we provide some general information that you should be aware of.

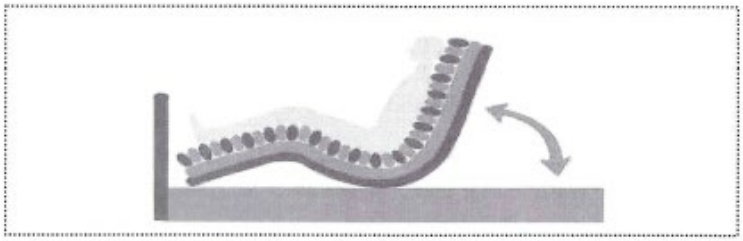
For products:

- DO NOT use another pump with different specifications.
- DO NOT change any component by yourself. If there is need for replacement or repair, always contact your local dealer.

For patients:

When the pressure has been adjusted to a desired level of firmness, the patient can then lie on the mattress.

A firm surface will make it easier for the patient to transfer or reposition. Make use of the static mode function for this feature. To sit a patient up in bed, press the Seat Button to increase the pressure to have better support on sacrum area.



Hand check:

Check if the pressure is properly adjusted by sliding one hand between the air mattress and bed frame to feel the patient’s sacral area.

Users should be able to feel the space in between, and the acceptable range is approximately 25 to 40 mm (1” to 1-1/2”).

NOTE: Please follow instructions below for detailed operating procedure of each type.

Step 1 Turn on the power, A beep sound will begin the operation.

Step 2 The pump will enter Static mode when the power is turned on. First it will inflate the mattress to 10-15mmHg and then enter Alternating mode.

If 10-15mmHg cannot be reached within 30 minutes, the unit will stay in static mode and keep inflating. If 10-15mmHg still cannot be reached within 40 minutes, the alert will sound and its LED will illuminate.

Press the Alert Mute button to mute the alert. The alert LED will continue flashing.
Press the Alert Mute button again to re-enable the audible alert.

Step 3 The alternating cycle time and pressure level are set at 10 minutes and 30mmHg initially. Select from the touch panel to adjust the cycle time and pressure level to the patient's specific requirements.

NOTE:
Press the static mode button from the touch panel to provide a firm surface that makes it easier for the patient to transfer or reposition. The static mode can support the patient by keeping the mattress from bottoming out when the patient is in a sitting position. The static mode will revert to alternating mode after 20 minutes.

Press the Max Inflate button to automatically inflate the mattress to the maximum level (55mmHg) for about 20 minutes. The pressure will return to a previously set level after 20 minutes.

Step 4 During normal operation, the unit will monitor pressure. If the mattress pressure is lower than the set pressure, the pump will automatically inflate the mattress to the set level and then stop. The alert will sound and its LED will illuminate to alert the operator of a low pressure condition.

1) In case there is a bad connection of tubing or any air leakage from the mattress, this will result in a low-pressure condition, and it will activate the alert within 1 min.
2) If there should be power failure, for example caused by power cord unplugged or power off when pump is working, the audible alert will be activate and the Power Failure indicator will flash. When power is returned, the pump will automatically return to its normal function.
3) In case of abnormalities in Alternating mode, or Alternating mode being unable to function, the audible alert will be activated and the Alternating mode failure indicator will flash.

Press the Alert Mute button to mute the alert. The alert LED will continue flashing.
Press the Alert Mute button again to re-enable the audible alert.

NOTE:
For suitable pressure, please refer to the hand check procedure.

CPR FUNCTION

When there is an emergency requirement to perform CPR on the patient, pull the CPR tags at the foot section of the mattress to release the air quickly from the mattress.

The CPR tags are located at the foot end left-hand side of the mattress. Ensure the CPR tags/stoppers are properly reconnected after they have been pulled.

PRESSURE SET UP

Users can adjust the pressure level of the air mattress to a desired firmness by themselves or according to the suggestion from a health care professional.

NOTE:

It is recommended that Max Inflate mode is activated, using the Max Inflate button on the panel when the mattress is first inflated. Users can then easily adjust the air mattress to a desired firmness according to the patient's weight and comfort.

LOW PRESSURE WARNING

When abnormal pressure occurs, the Low-Pressure indicator will come on. For some types of pumps, the alert will be activated to alert of a low-pressure condition. Check if the connections are secure and correctly installed according to the relevant instructions.

NOTE:

If the pressure is consistently low, open the zipper and confirm that all the tubes are properly connected. Then check for any noticeable leakage in any of the tubes. If necessary, contact your local dealer to replace any damaged tubes.

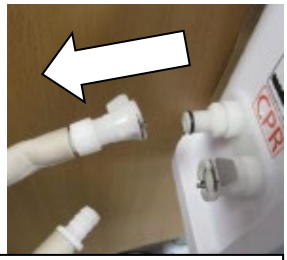
DISCONNECT DEVICE

To fully disengage the power to the unit, please disconnect the power cord from the control unit.

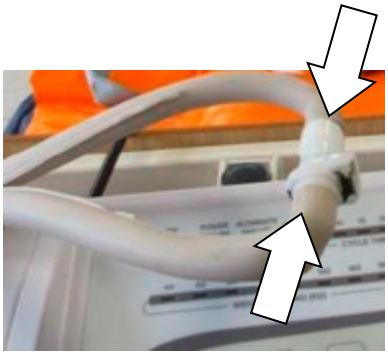
TRANSPORT MODE

If required, the mattress male and female connectors can be disconnected from the control unit and joined together. This will equalize the cells.

Remove Cover



Un-plug Connectors



Join Connectors Together

Warning

- The mattress will remain inflated for a maximum of 24 hours only – Return the system to the mains supply as soon as is practical.
- Whilst unplugged the alternating mode will not be operational, pressure relief will not be provided.

ENVIRONMENT REQUIREMENTS

Operating Conditions

- Ambient Temperature: +5℃~+40℃
- Relative Humidity: 15%~90%, non-condensing
- Atmospheric pressure: 700hPa to 1060hPa

Storage and shipping conditions

- Ambient temperature: -25℃~+70℃
- Relative Humidity: 10%~90%, non-condensing
- Atmospheric pressure: 700hPa to 1060hPa

HANDLING AND STORAGE

- Lay the mattress out flat and upside down.
- Roll from the foot end towards the head end; the foot-end strap can then be stretched around the rolled mattress to prevent unrolling.
- Do not fold, crease or stack the mattress.

CLEANING GUIDELINES

Infection control and routine cleaning must be carried out in accordance with your local infection control policy or regulatory body.

Control Unit

- Check for external damage – If damaged take the control unit out of use.
- All surfaces to be wiped down with a disposable soft cloth moistened with a mild detergent and diluted in warm water (40°C).
- The control unit is be cleaned by starting with the cleanest parts of it and systematically moving to the dirtiest parts. Extra care should be taken around areas where excess dirt or dust may gather.
- The cloth should be changed during the cleaning process if it becomes soiled.
- Wipe down with a clean cloth moistened with clean water to remove detergent residue.
- If there are blood spillages or bodily fluids present wipe surfaces down with 0.1% Chlorine solution (1,000 ppm).
- Wipe down with a clean cloth moistened with water.
- Dry off with a paper towel - Always ensure the cleaned surfaces are allowed to fully dry before putting back into use.

Mattress

Before attempting to clean the top cover is to be checked for physical signs of damage that may lead to strike-through (ingress of fluid through cover). This is achieved by unzipping the top cover and looking for signs of staining to the white underside. Any evidence of strike-through (and / or cover damage) will require a new cover to be fitted to the mattress.

- Wipe down with a clean cloth moistened with a mild detergent and diluted in warm water (40˚C).
- Rinse with cold clean water and a clean cloth and allow to fully dry before use.

Decontamination:

- Mop up any fluid with paper towels.
- Wipe cover down using cold clean water.
- Wipe down with a 0.1% Chlorine solution (1,000ppm) in cold water, where necessary a 1% Chlorine solution (10,000ppm) is to be used instead.
- Rinse down with cold clean water using a clean cloth.
- Dry off with paper towels - Always ensure the cleaned surfaces are allowed to fully dry before putting back into use.

DISPOSAL OF PARTS

When the electrical system has come to the end of its life, contact your provider to arrange for collection, alternatively follow local recycling and WEEE (Waste Electrical and Electronic Equipment) policies.

The control unit used with the mattress system is not to be disposed of in general municipal waste. Some of the electrical components could be harmful to the environment and where viable the components can be recovered and reused/recycled.

The metal and plastic components used in both the mattress and control unit are also to be separated and disposed of following local recycling policy as these can also be recovered and reused/recycled.

Warning

- The mattress system is to be decontaminated before disposal to avoid risk of cross contamination.

MAINTENANCE

General

- Check the power cord and plug to see if there are abrasions or excessive wear.
- Check the mattress cover for signs of wear or damage. Ensure the mattress cover and tubes are connected correctly.
- Plug in the pump unit and check the airflow from the hose connection port. The airflow should alternate between ports every half-cycle time.
- Check the air hoses to see if there are any kinks or breaks. For replacements, please contact your local agent or dealer.
- Make sure the mattress tube is well connected.
- Check the pump unit and make sure both power indicators are off when the switch is turned off.

Low pressure

Examine if there is any air leakage between the pump and the mattress connections or from the air mattress tubes:

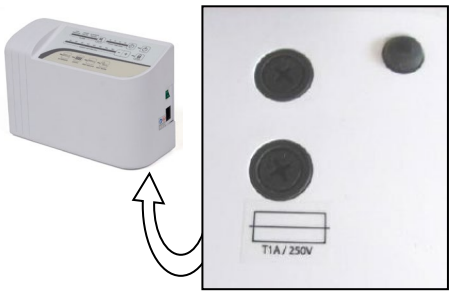
- Check connectors between the air mattress and pump. If there is any disconnection,

please reconnect it.

- Check the CPR Valves. Ensure their outlets are sealed.
- Check the air-connecting tubes. Ensure each single cell is not broken.
- Set the pressure at Max Inflate mode. Keep the tubes fully inflated and inspect for air leakage.
- Check if there is any air leakage from cells. Ensure no leakage occurs. If any leakage occurs, please contact your local agent or dealer.

Statement: Power supply cord and Fuse may be replaced by SERVICE PERSONNEL.

1) Turn off the power and unplug the power supply cord.
2) Unscrew the sleeve from the fuse holder on the bottom enclosure of the pump, replace the fuse inside of the sleeve with same specification of fuse, screw the sleeve back to fuse holder.
3) Fuse rating: T1AL 250V



Fuse Holders Shown

WARNING

The mattress should be vacated prior to any maintenance being performed on this product.

No modification of this equipment is allowed.

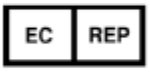
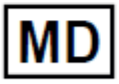
Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

Statement: LAY OPERATOR or LAY RESPONSIBLE ORGANIZATION should contact the MANUFACTURER or the MANUFACTURER'S representative for assistance in setting up, using or maintaining the product and to report unexpected operation or events.

TROUBLESHOOTING

Problems		Reasons	Maintenance
Mattress fails to inflate or does not inflate completely.	Pump issue	1.Pump does not work.	1. After powered on, check if visible LED light turns on. If not, please check the below issues: 1.1 Check if power cord is plugged into appropriate voltage AC outlet. 1.2 Check if fuse is loose or burned out, make sure the fuse is connected or replace with a new fuse. 1.3 Open the pump and see if wires inside are connected properly, make sure they are not loose. 1.4 Change lower PCB.
		2.Air pressure from pump is too low.	1. Check if air pressure and air flow (100mmHg, 8.0L) are high enough from the compressor, if not then replace with new compressor. 2. Check if there is air leakage from the exchanger, if yes then replace with new exchanger. 3. Check if silicone tube inside the pump is connected properly.
	Mattress issue	1. Quick connector on mattress does not connect well with pump. 2. Air tube connected to T/L connector and air valve is loose, CPR connector is not capped. 3. One way valve is broken. 4. Air cell is leaking.	1. Make sure quick connector on mattress is connected well with pump. 2. Make sure T/L connector and air valve is connected, or CPR connector is capped well. 3. Change one way valve. 4. Change air cell.
Mattress has pillow function, but air cells fail to inflate.		1. One-way valve is assembled reversely.	1. Assemble the one-way valve in correct direction.
Pump is working but synchronous motor does not work; thus mattress does not alternate, and alternate failure alert is activated.		1. Synchronous motor is out of order. 2. Wires inside synchronous motor are not connected properly. 3. Lower PCB is out of order.	1. Change synchronous motor 2. Make sure wires are connected properly. 3. Change the lower PCB.
Pump and motor keep working, but cycle time is incorrect. The alternate failure alert is activated.		1. Micro switch on the exchanger is out of order. 2. Lower PCB is out of order.	1. Change the micro switch. 2. Change the lower PCB.
When powered on, compressor stop after working some time; but the exchanger keep rotary.		1. Pressure detector is out of order.	1. Change the lower PCB.
Mattress pressure is low but alert is not activated.		1. Pressure detector is out of order.	1. Change the lower PCB.
Push button on panel is not operated well, and LED indicator does not light up.		1. Push button is not operated well. 2. LED is out of order.	1.Change the upper PCB.
Mattress pressure is too high or too low.		1. Pressure sensor is out of order.	1. Change the lower PCB.
Power failure alert can’t be activated after power failure.		1. Battery is out of order.	1. Change the lower PCB.

SYMBOLS

	Warning Beware of potential hazard
	Caution Beware of potential product damage
	Refer to instructions for use - Recommended Failure to read the instructions for use could introduce a hazard
	Refer to instructions for use - Mandatory Failure to read the instructions for use could introduce a hazard
	Lot number
	Date of manufacture
	Manufacturer
	Authorized representative in the European Community
	Serial number
	Catalogue number
	Medical device
	No Smoking
	Class II electrical device The user/occupant is protected by at least two layers of insulation between the current carrying parts (e.g. control box and mains cable) and the metal accessible parts – If damage is noticed to any electrical component, turn off at the mains and contact your provider or Drive DeVilbiss Healthcare Ltd. immediately.
	CE certification

Type BF applied part

Applied Part: The parts of the bed that come into physical contact with the user/occupant in order for the bed to carry out its intended function (refer to section 16.2 for a list of applied parts).

Type BF: Applied parts which are electrically isolated from earth and other parts of the medical equipment - Complying with specific requirements for protection against electric shock to EN 60601-1.

Do not iron

Tumble dry on low heat

Machine wash at 95°C

Do not dry clean

Drip Dry

Keep out of direct sunlight

Maximum patient weight
(mattress)

Maximum patient weight
(cushion)

Safe working load

Mattress

CPR

CPR Release

TECHNICAL SPECIFICATIONS

Pump	
Item:	Alto
Input Rating:	220-240V, 50Hz, Max.1A
Air Output:	9 liter/min
Pressure Range:	20 mm Hg – 55 mmHg
Weight Settings:	40 – 225 kg
Cycle Time:	10/15/20/25 min
Mode:	Max Inflate mode, Alternating/Static/Seat Mode
Alert:	Low pressure, Power failure, Alternating failure
Size:	31cm(L) x 12.5cm(W) x 21cm(H)
Weight:	2.5 kg
Fuse Rating:	1A
IP Rating:	IP21
Class:	II Electrical

Mattress	
Size:	203cm(L) x 90cm(W) x 20cm(H)
Maximum Weight Capacity:	225 kg
Air cells:	Nylon with TPU coating
	20 Air Cells (3 Static Head Cells + 17 Alternating/Dynamic Cells)
Top cover:	Bi-elastic PU Coating with 2 X 180° zip
Base:	Durable Nylon / PVC 70D

Cover complies to BS 7175:1989 – Medium Hazard

EMC GUIDANCE

This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, as this unit can be affected by portable and mobile RF communications equipment.

Caution:

- Do not use a mobile phone or other devices that emit electromagnetic fields, near the unit. This may result in incorrect operation of the unit.
- This unit has been thoroughly tested and inspected to assure proper performance and operation.
- This machine should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, this machine should be observed to verify normal operation in the configuration in which it will be used.

Guidance and manufacturer's declaration – electromagnetic emissions		
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The device 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 emissions CISPR 11	Class B	The device 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	

Recommended separation distances between portable and mobile RF communications equipment and the device			
The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device 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 $d=1.2\times P^{1/2}$	**80 MHz to 800 MHz** $d=1.2\times P^{1/2}$	**800 MHz to 2,5 GHz** $d=2.3\times P^{1/2}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23
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.			

Guidance and manufacturer's declaration – electromagnetic immunity			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure 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	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1 kV for Input/output lines	±2kV for power supply lines ±1kV for interconnecting cable	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV line to line	Mains power quality should be that of a typical commercial or hospital environment.
interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U T (>95% dip in U T .) for 0.5 cycle 40 % U T (60% dip in U T) for 5 cycles 70% U T (30% dip in U T) for 25 cycles <5% U T (>95 % dip in U T) for 5 sec	<5 % U T (>95% dip in U T .) for 0.5 cycle 40 % U T (60% dip in U T) for 5 cycles 70% U T (30% dip in U T) for 25 cycles <5% U T (>95 % dip in U T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the model Scorpio be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 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.			

Guidance and manufacturer's declaration – electromagnetic immunity			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands	$d=[3,5/V_1]\times P^{1/2}$
Radiated RF IEC 61000-4-3	10 V/m 80 MHz to 2.7 GHz **385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014)**	10 V/m 80 MHz to 2.7GHz **385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014)**	$d=1.2\times P^{1/2}$ *80 MHz to 800 MHz* $d=2.3\times P^{1/2}$ *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: 
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 device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the device. [b]Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

EXPECTED SERVICE LIFE: 2 years.

WARRANTY

This product will perform in accordance with its specification and will remain free from defects in material and workmanship when used under normal conditions for a period of 1 year (full parts and labour) from the date of purchase. If purchased from an authorised dealer or international distributor, the product is warranted for 1 year parts only. NO OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. IN NO EVENT WILL THE SUPPLIER. BE LIABLE FOR PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES, OR FOR AN AMOUNT IN EXCESS OF THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT OR PRODUCTS.

Proof of purchase must be presented with any claim. Except as provided herein, this warranty will not apply to any products that have been (a) damaged by lightning, water, or power surges, (b) neglected, altered, abused, or used for a purpose other than the purpose for which they were designed, (c) repaired by you or any other party without prior written authorisation, (d) used in conjunction with a third party product or products not approved in advance (e) damaged or failed by or attributes to acts of God, (f) damaged, caused by failure to follow instructions,or (g) otherwise used in a manner inconsistent with any instructions provided. The warranty explicitly exempts consumable items.

This warranty contains the entire agreement between you and the supplier with respect to any warranty matters, and supersedes any and all other written or oral statements, representations or agreements relating to the subject matter of this warranty.

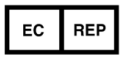
In the event of a product defect during the warranty period you should contact your supplier or its subsidiary companies, authorised dealers or international distributors who will at their option unless otherwise provided by law; a) correct the defect by product repair within the terms of the warranty b) replace the product with one of the same or similar design or c) refund the purchase price. All replaced parts and products on which a refund is made become the property of the supplier. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This limited 1 year warranty gives you specific legal rights and you may also have other rights.

The supplier has a policy of continual product improvement and reserves the right to amend specifications covered in this document.

NOTES

Airflo (xiamen) Medical Co., Ltd.
1F, 3F, 4F, No. 6, East Haijing Road, Haicang Xiamen, Fujian, China



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Original instructions
INSTRUC/ALTO rev4, 2022/03