

# Serene

User's Manual

Care for a Healthy Life



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## **ALTERNATING PRESSURE REDISTRIBUTION SYSTEM**

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MODEL NO.: 9P-079040

Please read the manual before use

# IMPORTANT SAFEGUARDS

READ ALL INSTRUCTIONS BEFORE OPERATING THIS DEVICE.

**DANGER** - To reduce the risk of electrocution:

1. Always unplug this product immediately after using.
2. Do not use while bathing.
3. Do not place or store this product where it can fall or be pulled into a tub or sink.
4. Do not place in or drop into water or other liquid.
5. 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:

1. Evaluate patients for entrapment risk according to facility protocol and monitor patients appropriately.
2. Use this product according to the manual and medical professionals' instructions.
3. Close supervision is necessary when this product is used on or near children. Electrical burns or choking accident may result from a child swallowing a small part detached from the device.
4. Use this product only for its intended use as described in this manual. Do not use other mattress not recommended by the manufacturer.
5. 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.
6. Keep the cord away from heated surfaces.
7. Never block the air openings of this product or place it on a soft surface, such as a bed or couch, where their openings may be blocked. Keep the air opening free of lint, hair, and other similar particles.
8. Never drop or insert any object into any opening or hose.
9. Do not modify this equipment without authorization of the manufacturer.
10. Mattress covers have passed skin sensitization and skin irritation test. However, if you suspect that you may have had or are having an allergic reaction, please consult a physician immediately.
11. Do not leave long lengths of tubing around the top of your bed. It could lead to strangulation.
12. Connect this product to a properly grounded outlet only. See Grounding Instructions.

**CAUTION** -

1. If there is a possibility of electro-magnetic interference with mobile phones, please increase the distance (3.3m) between devices or turn off the mobile phone.

## SAVE THESE INSTRUCTIONS

### GROUNDING INSTRUCTIONS

**DANGER** - Improper use of the grounding plug can result in a risk of electric shock.

If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.

**NOTE** - If the repair or replacement of the cord is necessary, please contact a qualified electrician or serviceman. To reduce the risk of electric shock, do not modify the cord or plug in any way.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded.



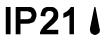











**NOTE, CAUTION AND WARNING STATEMENTS:**

**NOTE** - Indicate some tips.

**CAUTION** - Indicate correct operating or maintenance procedures in order to prevent damage to or destruction of the equipment or other property.

**WARNING** - Calls attention to a potential danger that requires correct procedures or practices in order to prevent personal injury.

SYMBOLS

	Authorised representative in the European community
	Manufacturer
	Protected against solid foreign objects of 12,5 mm and greater; Protection against vertically falling water drops
	Temperature limitation/temperature range
	Consult operating instructions for use.
	"BF" symbol, indicate this product is according to the degree of protecting against electric shock for type BF equipment
	Grounding terminal
	Attention, read the accompanying information carefully.
	Do Not Bleach
	Do Not Iron
	Tumble Dry, Normal, Low Heat
	Dry clean, Any Solvent Except Trichloroethylene
	Machine wash, regular / normal, 95 degrees C (203 degrees F)
	Disposal of Electrical & Electronic Equipment (WEEE): This product should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.

# 1. Introduction

This manual should be used for initial set up of the system and for reference purposes.

## 1.1 General Information



EN 60601-1  
EN 60601-1-2  
EN 55011 Class B  
IEC61000-3-2  
IEC 61000-3-3

### **EMC Warning Statement**

This equipment has been tested and found to comply with the limits for medical devices to the EN 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:


- Reorient or relocate the receiving device.
- Increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or field service technician for help.


## 1.2 Intended Use

This product is intended:

- to help and reduce the incidence of pressure ulcers while optimizing patient comfort.
- for long term home care of patients suffering from pressure ulcers.
- for pain management as prescribed by a physician.

The product can only be operated by personnels who are qualified to perform general nursing procedures and has received adequate training in knowledge of prevention and treatment of pressure ulcer.

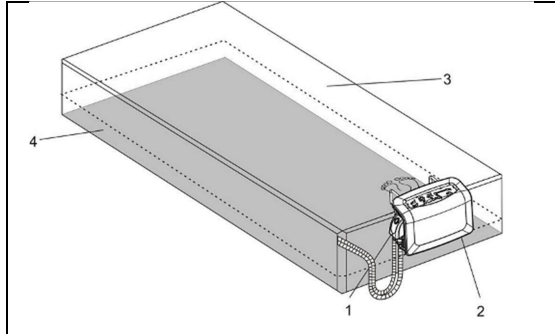
 **NOTE:** Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

 **NOTE:** L'équipement ne peut être utilisé s'il y a risque de mélange d'un anesthésique inflammable avec l'air ou l'oxygène ou oxyde nitreux.

## 2. Product Description

### 2.1 Pump & Mattress System

1. Quick Connector for CPR
2. Pump Unit
3. Mattress
4. Mattress Foam Pocket



**⚠ NOTE: An underlying mattress such foam must be used with Serene system.**

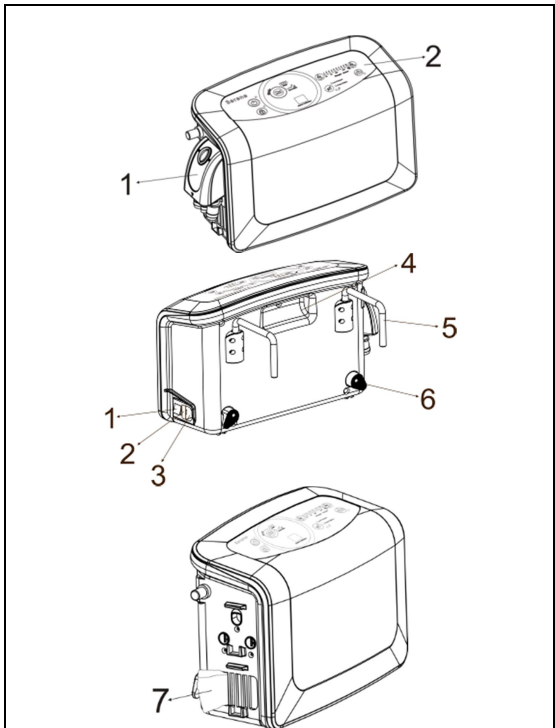
### 2.2 Pump Unit

#### Front

1. Quick Connector
2. Front Panel

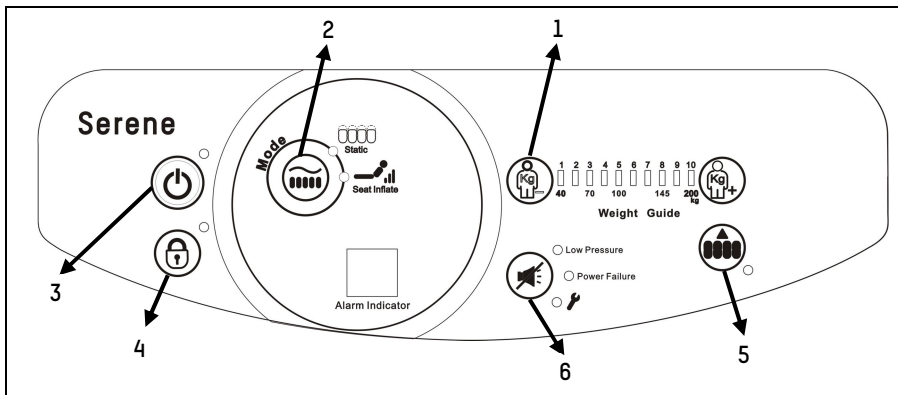
#### Rear

1. Power Switch
2. Power Socket
3. Fuses
4. Integrated Handle
5. Mounting Bracket
6. Pump Bumper
7. Air Filter







### 2.3 Front Panel



#### 1. Comfort Setting

The "Comfort Setting" controls the air pressure output. When the firmness is increased (  ), the output pressure will increase and vice versa (  ) for decreasing air pressure. A hand check is needed to determine if patient is bottoming out. When a patients condition has significantly changed reassess appropriateness of product and comfort setting level

**⚠ NOTE:** Every time the mattress is initialized (inflated), it will automatically go to "Max Firm" mode to hasten inflation. Once the system is ready to use, the system will go to Static mode automatically.

**⚠ NOTE:** The Weight Guide indicated on Comfort Level is reference for pressure setting. Always consult Professionals for the appropriate setting. Check if the pressure is suitable for the patient by sliding one hand beneath the air cells at the level of the patient's buttocks. Always leave at least 1" inch space between patient and the cell to prevent bottoming out.

## 2. Therapy Modes

### A. Static

All of the air cells are equally inflated at lower pressures to redistribute body mass over a greater surface area at a constant low pressure.

### B. Seat Inflate

The Seat Inflation features additional supports to the patient during head raise position to prevent bottoming out.

**⚠ NOTE:** When patient in head raised position, or only parts of the body are lying in mattress, it is recommended to always use Seat Inflate mode and readjust the pressure setting accordingly to prevent possible bottoming out.

## 3. On/off

Press On to turn on the unit. Press Off to turn off/standby the unit.

**⚠ NOTE:** The power switch on the side of pump must be turned on.

## 4. Panel Lock

Should the panel remain untouched for 5 minutes, the panel lock feature will lock the panel with green LED light on to prevent accident from changing the setting during normal operation. To unlock, simply by pressing the Panel Lock button for 3 seconds.

## 5. Max Firm

The system will go into Max Firm mode automatically when the power switch is turned on. This insures the pump reaches its maximum operating pressure. Once the max pressure level is reached, the pump will automatically switch into the previous selected comfort level in **STATIC** mode, or the user can press the **THERAPY** button to return to the previous mode. User can also use this function as full mattress inflation during patient ingress/egress or normal nursing procedure for better support. There is a 20 minutes time-out function to return to previous selected therapy setting.

## 6. Alarm Mute




Press alarm mute button to temporary suspend the alarm. Should the situation not resolved within 3 minutes, the low pressure and tech support alarm shall resume to notify the caregiver.

### A. Low Pressure Indicator

When the mattress quick connector is disconnected or mattress pressure is lower than target pressure for an abnormal period of time, low pressure LED will continuously lights up with buzzer activated. Once the low pressure problem is fixed, the control unit resumes operation in the previously set mode.

The Alarm Indicator shows low pressure failure mode. Use the error code when reporting system failures.

 **NOTE:** The low pressure indicator will not be detected if air cells of mattress are with small breakage.

### B. Power Failure Alarm

During power failure situation, the Power Failure LED light will light on with buzzer. Press the mute button to disable both buzzer and LED.

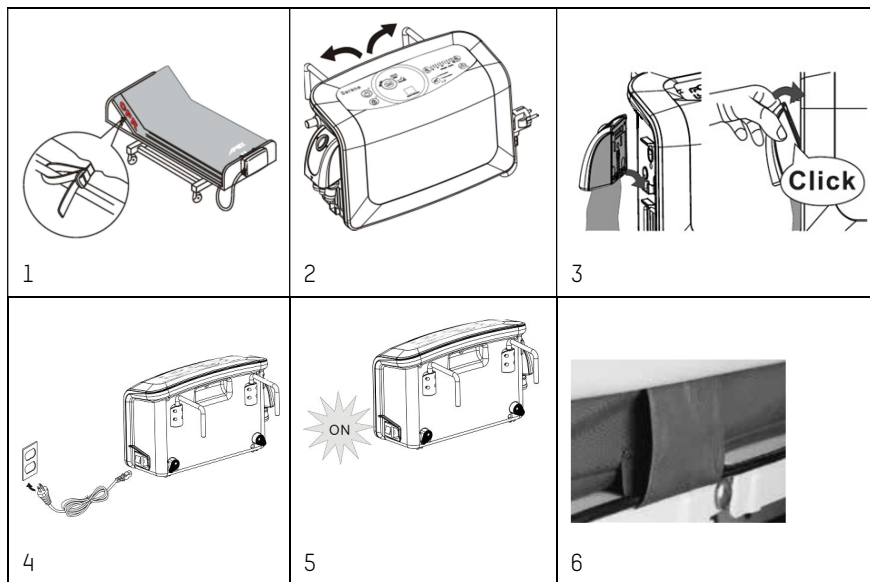
### C. Service Alarm



The filter required regular inspection and clean to ensure the system is functioning properly. When the system is up and running for 3 months, the Service Alarm LED will lights up and flashes to remind of filter inspection. Please relace or clean the filter, or contact your local dealer or service technician for servie assistance.

Once the filter is relaced or cleaned, pressure MUTE button for 5 sec to reset the meter for next service reminder.

### 3. Installation



Unpacking the box to inspect for any damage, which may have occurred during shipment. If there are any damages, please contact your dealer immediately.


1. Place the mattress on top of the bed frame. Please note for the foot end. There are securing straps on the base of the mattress. Secure the mattress firmly by fixing the straps to the bed frame, ensure that moving sections of the bed are still free to move.


**⚠ WARNING:** The Serene mattress must be applied on a underlying mattress or to insert an foam into the pocket of bottoming cover.

2. Hang the pump onto bed rail (foot-end), and adjust hangers to best upright position of the pump.

**⚠ NOTE:** Do not place the pump on the floor.

3. Connect the Quick Connector from air mattress to the pump unit. Make sure the connector is in the right position as the inserted diagram below. When a "click" sound is felt or heard, the connection is completed and secured.

 **NOTE:** The pump is only operable when the Quick Connector is connected to the system.

 **NOTE:** Check and ensure the air hoses are not kinked or tucked under mattress.


4. Plug the power cord into electrical outlet.

 **NOTE:**

1. Make sure the pump unit is suitable for the local power voltage.
2. The plug is also served to disconnect the device. Do not position the equipment so that it is difficult to disconnect the device.

 **NOTE:**

1. S'assure que la pompe est compatible au voltage local ou disponible.
2. L'appareil est également muni d'une fiche de connexion à l'électricité.

 **CAUTION:** The pump can only be applied to the mattress recommended by the manufacturer. Do not use it for any other purpose.

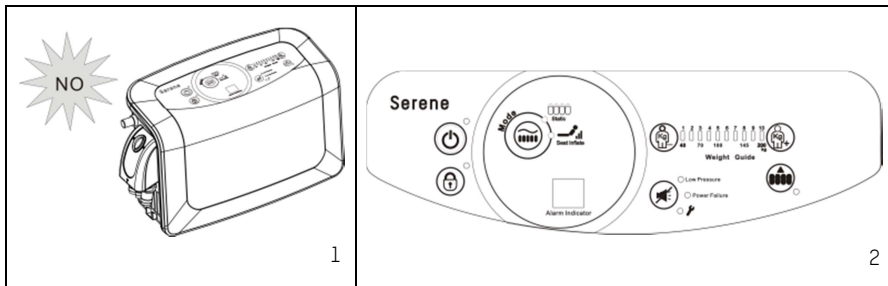
5. Then turn the main power switch to ON position.
6. After installation, the extra length of the power cord, if any, should be neatly arranged to avoid any tripping accidents. The EQUIPMENT should be firmly placed at position where users/doctors can access easily.

### **Grounding:**

Before any connection to the output connectors is made, the unit shall be connected to a protective earth conductor via the three-core main cable; the mains plug shall be inserted only into a socket outlet provided with a protective earth contact.


The protective action shall not be negated by the user of an extension cord without protective conductor.

## 4. Operation

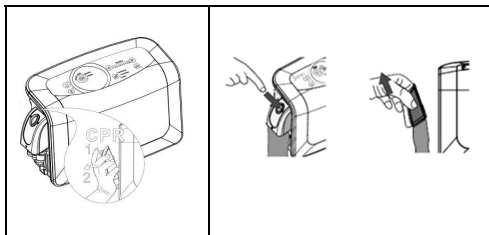


**⚠ NOTE:** Always read the operating instruction before use.

### 4.1 General Operation

1. Switch on the main power switch found from the side of the pump and press  on the control panel to turn on the power.
2. The system will automatically go into “Max Firm” mode for a few minutes of inflation.
3. Every time when mattress is first setup for use, It will be forced to execute Maxfirm for the quickest inflation. The low-pressure indicator (yellow LED) will light up when the mattress is not fully inflated at initial inflation. If the appropriate pressure is reached, the low-pressure indicator (yellow LED) will go off.
4. When the initial inflation (Max Firm process) is completed, the system will automatically enter into Static mode
5. According to the weight and height of the patient, adjust the pressure setting to the most suitable level without bottoming out.

### 4.2 CPR



When CPR needs to be performed, click on the release button on Quick Connector and quickly detach the connector from the system to release air.

## 5. Cleaning

It is important to follow the cleaning procedures to avoid cross contamination. Be sure to clean the surface in a dry and dust free environment. Wipe down the pump unit with a damp cloth pre-soaked with a mild detergent. Avoid contact with dust and proximity to dusty areas. Make sure that any cleaning agents you use will not harm or corrode the plastic casing on the pump unit. If your doctor or medical facilities have other special cleaning instruction, please follow the professional instruction.

**⚠ CAUTION:** Do not immerse or soak pump unit in liquids.

**⚠ WARNING:** Do not remove the housing of the pump to avoid the electrical shock. All disassembly or repair should be done by professional technicians.

**⚠ CAUTION:** The pump does not need oil lubrication; please do not disassemble the system.

Cover Material : Silver+ Stretch	
Cover Material : Stretch	


Wipe-down the mattress unit with a damp cloth pre-soaked with warm water containing a mild detergent, or chlorine bleach followed by an approved intermediate level disinfectant. Also the mattress top cover can be completely removed for laundry with water temperature up to 95°C; however, it is recommended that the user still check with local policy to determine the time/ temperature ratio required to achieve thermal disinfection. The cover may also be cleaned using sodium hypochlorite diluted in water. After cleaning, please avoid dust and proximity to dusty areas and all parts should be air dried thoroughly before use.

**⚠ CAUTION:** Do not use phenolic based products for cleaning.

**⚠ CAUTION:** After cleaning, dry the mattress without direct exposure of sunlight.

## 6. Storage

1. To quickly deflate the mattress for storage, click on the release button on the Quick Connector
2. Roll from the foot end towards the head end with CPR valve open, and make sure the tubing is not kinked.
3. Foot-end strap can then be stretched around the rolled mattress to prevent unrolling. Fasten the buckle strap to secure the packed mattress.
4. The power cord could be wrapped around the pump bumper on the back of pump, pack the pump with protective package.
5. Place the whole system into the carrying bag.

 **NOTE:** Do not kink, crease or stack the mattresses and do not store the system in direct sunlight, high temperature or moisture area.

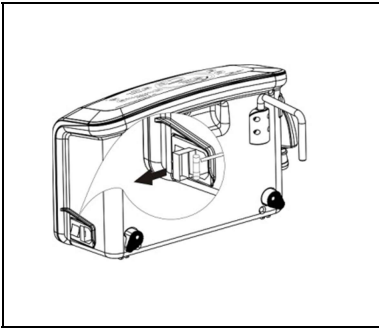


## 7. Maintenance

### 7.1 General

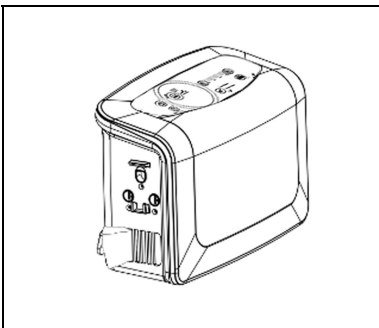
1. Check main power cord and plug if there are abrasions or excessive wears.
2. Check mattress cover for signs of wear or damage. Ensure mattress cover and tubes are stubbed together correctly.
3. Check the air hoses for any kink or break. For replacement, please contact your local dealers.

### 7.2 Fuse Replacement



1. Disconnect the plug from mains power when a blown fuse is suspected.
2. Use a proper tool to remove the cover of the fuse holder.
3. Insert a new fuse of the correct rating in, and replace the fuse holder back to correct position. The fuse should be rated as T3.15A /250V type.

### 7.3 Air Filter Replacement



1. Replace the air filter located at the side of pump.
2. The filter is reusable and can be washed gently with a mild detergent and water. Air dry the filter before use.
3. Check and replace air filter regularly if environment is dirty.

## 7.4 Rechargeable Battery

1. The rechargeable battery is designed to support power failure alarm. To check if the rechargeable battery has been drained out, unplug the power cord and see if the Power Failure indicator will light up along with buzzer last for a few minutes.
2. If the Power Failure Alarm is unable to work or the battery might need to be replaced (approximate life expectancy 6 months), please contact your dealer or notify the technician for replacement.

## 8. Expected Service Life

The products are intended to offer safe and reliable operation when use or installed according to the instructions provided by Apex Medical. Apex Medical recommends that the system be inspected and serviced by authorized technicians if there are any signs of wear or concerns with device function and indication on products. Otherwise, service and inspection of the devices generally should not be required.

## 9. Trouble Shooting

### Q1 Power is not ON

- Check if the plug is connected to mains.
- Check for a blown fuse.

### Q2 Low Pressure Alarm is on

- Check if the Quick Connector is tightly secured.
  - Check if all tubing connections along mattress are secured.
  - Check if the air hoses are kinked or broken
- When the low pressure alarm is activated, the alarm indication code is indicating in which mode the situation occurred.
- E1: System in normal operation  
E2: System is just turned on and in initial inflation.

### Q3 Power Failure Alarm is on

- Check if the power is suddenly shut down.
- Check if the power cord is connected properly.

### Q4 Patient is bottoming out

- Pressure setting might be inadequate for the patient, adjust comfort range 1 to 2 levels higher and wait for a few minutes for best comfort.

### Q5 Mattress form is loose

- Check if all the snap buttons or straps of mattress are all securely fastened.
- Check if the mattress is fixed to the bed frame by straps.

### Q6 Service light is on

- This indicates that the system is up and running for 3 months and needs filter inspection.
- Inspect the filter to clean or replace a new one.

If the above information does not solve your problems, please contact your local agent directly. They might require a technician to take care the problem.

## 10. Technical specification

<b>PUMP</b>		
Power Supply (Note: See rating label on the product)		AC 220-240V, 50/60 Hz, 3A
Fuse Rating		T3.15AL 250V
Dimension (L x W x H)		34 x 16.3 x 23.5 (cm) or 13.4" x 6.4" x 9.3"
Weight		5 kg or 11.02 lb
Classification		Class I, Type BF, IP21 Applied Part: Air Mattress Not suitable for use in the presence of a flammable anesthetic mixture (No AP or APG protection)
<b>ENVIRONMENTAL INFORMATION</b>		
Environment	Temperature	Operation: 10° C to 33° C (50° F to 91° F) Storage: -15° C to 50° C (5° F to 122° F) Shipping: -15° C to 70° C (5° F to 158° F)
	Humidity	Operation: 10% to 90% non-condensing Storage: 10% to 90% non-condensing Shipping: 10 % to 90% non-condensing
	Operating Altitude	2000 m (Maximum)
<b>MATTRESS</b>		
Model		8" Mattress Replacement
Dimension (L x W x H)		200 x 90 x 20.3cm / 78.7" x 35.4" x 8"
Weight		7.5 kgs / 16.5 lbs
Maximum Weight Capacity		200 kgs / 440 lbs

**⚠ NOTE :**

1. Consult the distributor or EU representative for further technical documents.
2. The specification is also suitable for other areas operating with same power supply.
3. Mattress dimension and weight is measured without foam cushion
4. The manufacturer reserves the right to modify the specification without notice.

# 11. Appendix A: EMC Information

## Guidance and Manufacturer’s Declaration- Electromagnetic Emissions:

This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment-Guidance
RF emissions CISPR 11	Group1	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
Harmonic emissions IEC61000-3-2	Class A	
Voltage fluctuations / Flicker emissions IEC61000-3-3	Complies	



Warning:

1. The device should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the device should be observed to verify normal operation in the configuration in which it will be used.
2. Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.
3. Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the PUMP, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

## Guidance and Manufacturer’s Declaration- Electromagnetic Immunity:

This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Basic EMC standard	Immunity Test Levels		Compliance Levels	Electromagnetic Environment-Guidance
	Professional healthcare facility environment	HOME HEALTHCARE ENVIRONMENT		
Electrostatic Discharge(ESD) IEC61000-4-2	±8kV contact ±15kV air		±8kV contact ±15kV 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 IEC61000-4-4	±2kV for power supply line ±1kV for input/output line		±2kV for power supply line ±1kV for input/output line	Mains power quality should be that of atypical commercial or hospital environment
Surge IEC61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s)	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of atypical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<p>&lt;5 % U<sub>T</sub> (&gt;95 % dip in UT) for 0,5 cycle</p> <p>40 % U<sub>T</sub> (60 % dip in UT) for 5 cycles</p> <p>70 % U<sub>T</sub> (30 % dip in UT) for 25/30 cycles</p> <p>&lt;5 % U<sub>T</sub> (&gt;95 % dip in UT) for 250/300 cycles</p>		230V	Mains power quality should be that of a typical commercial or hospital environment. If the user of this device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC61000-4-8	30 A/m	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.
Conducted RF IEC 61000-4-6	3 Vrms 0,15 MHz – 80 MHz 6 Vrms in ISM bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz	3 Vrms 0,15 MHz – 80 MHz 6 Vrms in ISM and amateur radio bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz	6Vrms	Portable and mobile RF communications equipment should be used no closer to any part of this device, including cables, than there commended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF EM Fields IEC61000-4-3	3 V/m 80 MHz to 2.7 GHz 80 % AM at 1 kHz	10 V/m 80 MHz to 2,7 GHz 80 % AM at 1 kHz	3V/m	Recommended separation distance $d = 2.0\sqrt{P}$ 150kHz to 80MHz $d = 2.0\sqrt{P}$ 80MHz to 800MHz $d = 4.0\sqrt{P}$ 800 MHz to 2.7GHz

			<p>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).<sup>b</sup></p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency ranged.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p><b>NOTE 1:</b> U<sub>r</sub> is the a.c. mains voltage prior to the application of the test level</p> <p><b>NOTE 2:</b> At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p><b>NOTE 3:</b> These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people</p>			
<p>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.</p> <p>b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

**Recommended separation distances between portable and mobile RF communications equipment and this device:**

This device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and this 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 $d = 2.0\sqrt{P}$	80 MHz to 800 MHz $d = 2.0\sqrt{P}$	800 MHz to 2,7 GHz $d = 4.0\sqrt{P}$
0.01	0.2	0.2	0.4
0.1	0.63	0.63	1.26
1	2	1	4
10	6.3	6.3	12.6
100	20	20	40

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.

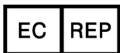
**Note 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.











**Apex Medical S.L.**  
Elcano 9, 6ª planta  
48008 Bilbao. Vizcaya. Spain



**Apex Medical Corp.**  
No.9, Min Sheng St., Tu-Cheng,  
New Taipei City, 23679, Taiwan

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