Duet

LAL Alternating Anti-Decubitus System

User Manual

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Content

Warning

- ❖ Connect the Master Control unit to a proper power source.
- ❖ Don’t use the system in the presence of any flammable gases. (such as Anesthetic Agents)
- ❖ Keep the pump and mattress away from open flame.
- ❖ Keep sharp objects away from the mattress.
- ❖ The device is not AP/APG protected.
- ❖ Do not place a heating device on or close to the mattress system.

⚠ Caution

- ❖ The Alternating System should always be used in accordance with your Institutions pressure care guidelines.
- ❖ Re-positioning of the patient is always recommended when using an alternating pressure air mattress (APAM).
- ❖ The Control unit can only be repaired by an authorized technician.
- ❖ Do not drop the control unit.
- ❖ Do not store the system in direct sunlight or extreme cold conditions
- ❖ Operation Temp: 15-35℃ (59-95°F) R.H. : 30-75 %

1. The Purpose of this Manual

This operation manual is mainly focused on the set up, cleaning and routine maintenance of the ***Duet LAL Alternating Anti-Decubitus System***. We recommend you keeping this manual handy to answer most of the question related to the system and please read the whole manual before setting up.

2. Product Description

The ***Duet LAL Alternating Anti-Decubitus System*** is a unique and innovative specialty mattress replacement unit. The system utilizes true low air loss technology with a high flow rate that provides pressure management for the treatment of pressure ulcers. It features continuous lateral rotation therapy in 40 degree, which gently turns the patient from side to side to significantly lower the risk of infection, pneumonia and other pulmonary complications – illnesses that significantly ad to patient care costs and length of stay.

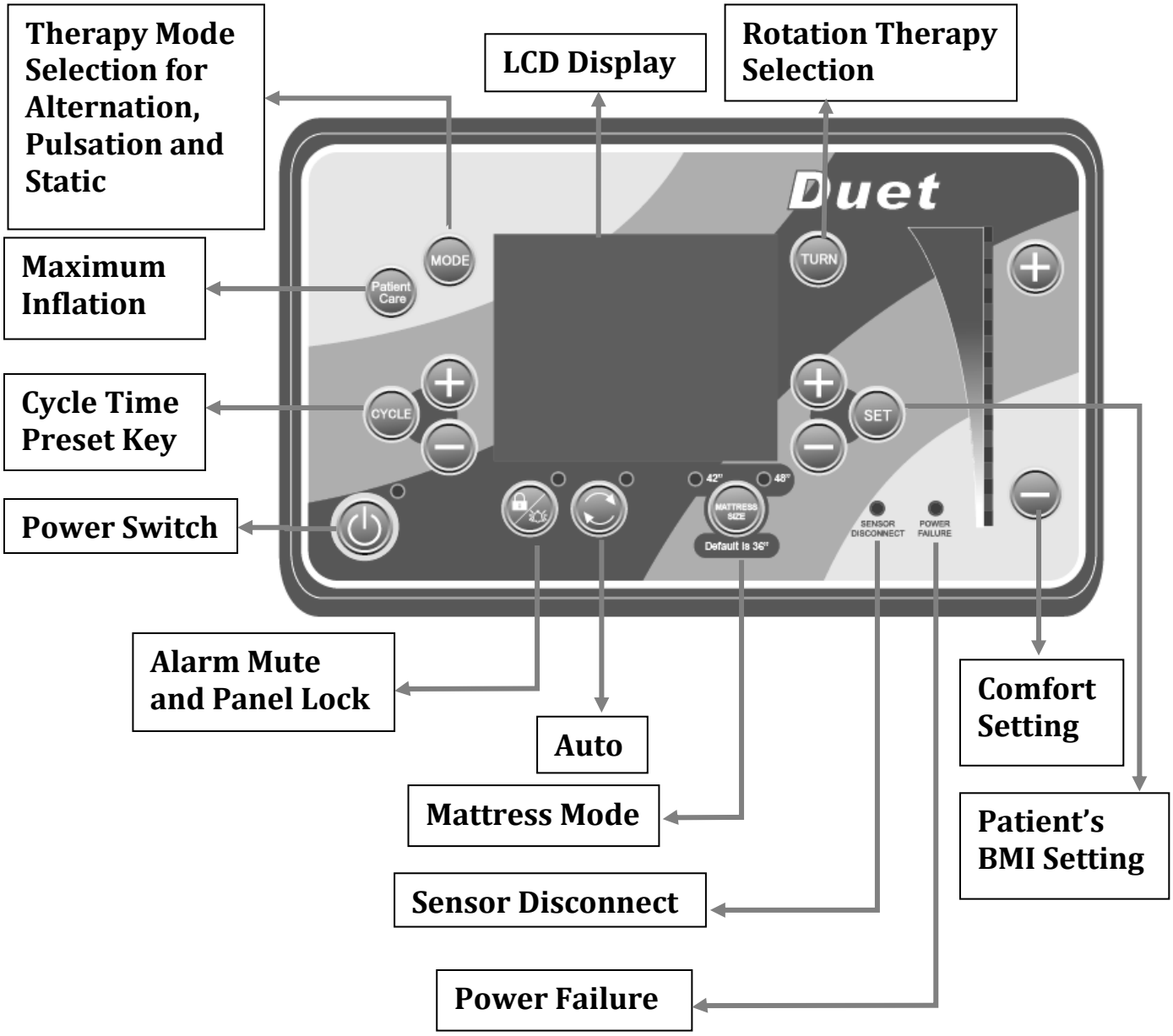
The Duet Features

- User-friendly controls
- Large LCD display on each function status
- Rapid CPR deflation
- Patient Care mode provides quick maximum inflation within seconds to help transfers and nursing procedures
- Incorporate sensor technology with Auto mode to constantly monitoring the mattress pressure based on inputting patient's height and weight
- Lock out function avoids tampering with settings
- Fowler mode gives added support to help prevent bottoming out while patient is in sitting position
- Highly vapor permeable and oversized pliable quilted nylon top cover providing low shear, friction and moisture protection
- Low Air Loss, Pulsation, Alternation, Static and Lateral Rotation for outstanding pressure redistribution outcomes
- 2" convoluted foam base for addition safety support Recommended maximum safe working load as following:

  ➢36": 350lbs
  ➢42": 500lbs
  ➢48": 600lbs

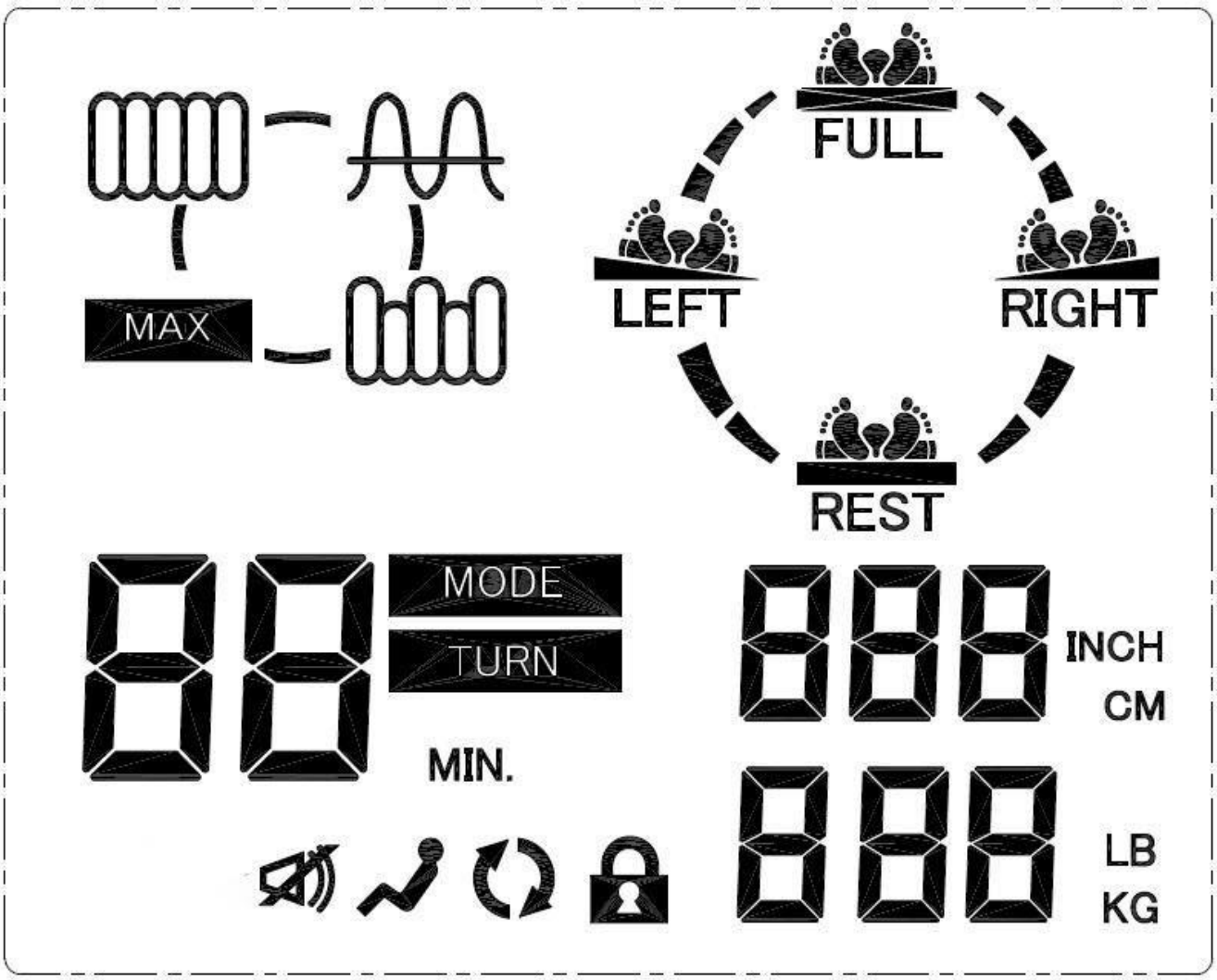
Intended Users

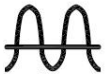
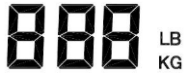
- Healthcare professionals or caregivers who are at least fifteen years old, with the ability to read and understand English and Westernized Arabic Numerals.
- This device should not be operated by patients.



⚠ Caution

Alternating pressure therapy is not recommended to patient who has serious pain or pain-sensitive symptom. In this case, we recommend the application of foam mattress which can be found in ***PRIUS Healthcare USA*** product range.



LCD Display introduction							
	LOCK		STATIC		FULL TURN		ALTERNATION CYCLE TIME
	MUTE		PULSATION		LEFT TURN		TURNING CYCLE TIME
	FOWLER		ALTERNATION		RIGHT TURN		HEIGHT
	AUTO		PATIENT CARE		NO TURNING FUNCTION		WEIGHT

3. Technical Data

Master Control Unit

Model No.	FC-PHR0027
Model Name	Duet
Size (inch) LxWxH	12.2“ x 6.7“ x 13.2“
Weight	14.3lbs
Cycle Time (min)	3 ~ 95 minutes
Min Operating Pressure	8 +/- 5mmHg
Max Operating Pressure	33 +/- 5mmHg
Rated Voltage	AC 110-120V
Max Current	5 Amp
Fuse Rating	T5AH 250V
Rated Frequency	60 Hz
Classification	Class I, Type BF Not AP/APG type 
Mode of Operation	Continuous
Environment (Temperature)	Operation: 15℃ to 35℃ (59℉ to 95°F)
	Storage:5℃ to 60℃ (41°F to 140℉)
Environment (Humidity)	Operation: 30% to 75% non-condensing
	Storage: 30% to 90% non-condensing
Standard	IEC 60601-1 CAN/CSA C22.2 No. 60601-1 IEC 60601-1-2

Mattress Replacement

Model No	FM-PHR0009(36“) FM-PHR0044(42“) FM-PHR0045(48“)
Size (inch)	36”(W)x80”(L)x10”(H) 42“ (W)x80”(L)x10”(H) 48“ (W)x80”(L)x10”(H)
Weight (lbs)	39.6
Cells Number	18 cells
Cells Material	Nylon coated with PU
Cover Material	Nylon woven fabric w/ PU coating finish
Base Material	Woven Polyester fabric w/ PVC backing

Symbol Definition

	Refer to Accompanying Documents
	Waste Disposal
	Type BF Applied Part
	Alternating Current
	Caution
	Keep Dry

4. Operation Instruction

1. Power On/Stand-By

Plug the power cord to the socket and switch on the power at control panel, the orange LED will illuminate, it means Stand-By. Press the button Power On/Stand-By button, the LED light will turn to green, and the control unit will start to operate.

2. Mode Selection

Under normal operating, press mode button switches to select therapies. Each mode needs manual switch. Please must have healthcare professionals or caregivers to check the setting every two hours.

2.1 Static Mode

The system will only provide low air loss therapy.

2.2 Alternate Mode

The system will provide 3-1 altternation. Press "CYCLE" button and adjust the alternation cycle time by pressing the +/- button. The cycle can be set from 3 to 95 minutes.

2.3 Pulsation Mode

The system will provide pulsation pressure-relieving therapy.

3. Patient Care

3.1 Patient Care provides quick maximum inflation within seconds to help transfers and nursing procedures.

3.2 Press the Patient Care button for fast inflation.

3.3 When the mattress is fully inflated, the caregiver can transfer the patient onto the mattress.

3.4 Press Patient Care button again to return previous setting.

3.5 When Patient Care function is activated for over 30 minutes, the system will default back to previous setting automatically.

4. Turning Function

4.1 Press the TURN button to select from LEFT/RIGHT/FULL TURN to enable rotation pressure-relieving therapy.

4.2 Press CYCLE button to set for rotation cycle time from 3 to 95 minutes and hold postion “Hd“.

4.3 Hold function is only engaged in Left and Right Turn

5. Auto Function

5.1 When Auto Function is activated, control unit is automatically optimizing patient’s comfort setting base on patient’s BMI input. The BMI setting is the guideline and the proper adjustment of the pressure level will be applied according to individual patient.

5.2 Press SET button, when both the height and weight indication flash, press +/- to adjust the metric or imperial unit.

5.3 Press SET button, when the height indication flash, press +/- to adjust the height of the patient.

5.4 Press SET button, when the weight indication flash, press +/- to adjust the weight of the patient.

5.5 Press SET to exit menu when finish.

6. Alarm and Lock Button

Alarm: Press 1 time to mute the audio alarm. Lock: The pump will automatically lock on after 2 minutes without operation. To unlock, press the button for 3 seconds. To manually lock the pump, press again for 3 seconds.

7. Mattress Size

The default mattress size is 36". Press the button to change when operating on 42" or 48" mattress.

8. CPR

The air hose connectors can be disconnected from the controller to release the air quickly when in an emergency situation where CPR is to be performed.

9. Fowler mode

While the patient is in sitting position over 30 degrees, the fowler mode will be activated automatically.

10. Comfort Level Setting

Press the +/- to adjust the comfort level. The following steps are the suggested pressure level settings when the mattress in alternation mode only.

- Make sure the mattress is already fully inflated and connected to the control unit.
- With the patient on the bed, healthcare professionals or caregivers press the SET button to set auto detect function and find the best matching level based on the user weight and height.
- Suggested comfort level can be adjusted according to patients‘ requirements with no less or more than 2 levels based on the auto detected level setting.
- Suggested weight for 36“ mattress is no more than 350 lbs; 42“ mattress is no more than 500 lbs and 48“ mattress is no more than 600 lbs.
- Suggeseted cycle time is no more than 15 minutes

Please be aware that once patients have any uncomfortable feelings or symptoms, patients must notify healthcare professionals or caregivers to change product settings suit for patients’ condition.

5. Cleaning

The Mattress

The mattress should be cleaned on weekly basis using a soft damp cloth and mild detergent.
If top cover or bottom cover become grossly soiled, put on clean gloves, plastic gown and eye protection before removing top and bottom covers and disposing according to standard hospital procedures for contaminated waste and replace with clean covers. The mattress should check and clean each time before use or once a week.
Covers can be washed and thermally disinfected in a washing machine by following instruction: **(Never use phenol based cleaning solutions)**.

Industrial	Break washes	Cold	10 minutes
	Main washes	60℃ (140℉)	6 minutes
	Main washes	70℃ (158℉)	10 minutes
	Extraction		2 minutes
	Cold Rinses		
	Extraction		5 minutes
Domestic	Pre-wash	Cold	
	Main Wash	70℃ (158°F)	10 minutes
	Extraction		2 minutes
	Cold Rinses		
	Extraction		5 minutes

Tumble Drying or Tunnel Drying is not recommended.
Mattress Cells can be wiped over with a solution of sodium hypochlorite1000ppm or any other non-phenolic germicidal solution.

The Master Control Unit

⚠ Caution

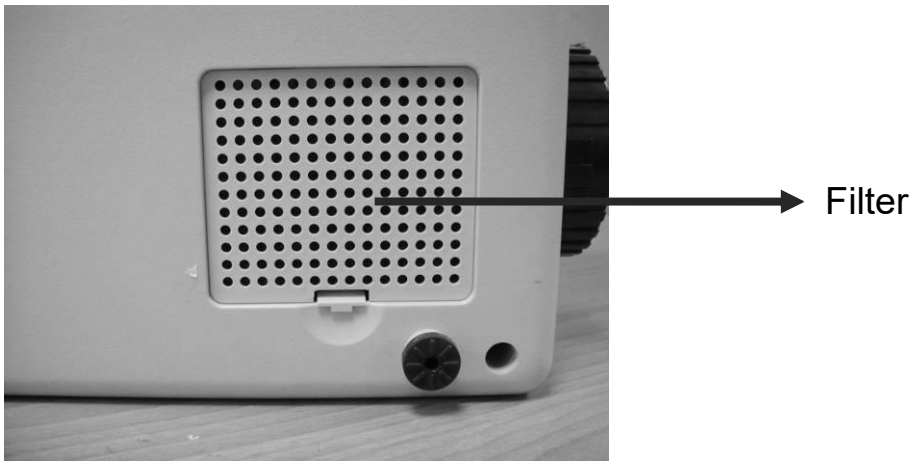
SWITCH OFF THE ELECTRICAL SUPPLY TO THE PUMP AND DISCONNECT THE POWER CORD FROM THE MAIN SUPPLY BEFORE CLEANING AND INSPECTION

The pump unit should also be cleaned weekly by using a soft damp cloth and mild detergent.
The pump casing is manufactured from ABS plastic and if the case is soiled, the pump can be wiped down with a sodium hypochlorite solution to dilution of 1000ppm or any EPA- approved hospital grade disinfectant. **(Do not use phenol based cleaning solution)**.

The air filter should also be cleaned and checked as often as possible at a minimum once in every six months. Air Filter can be removed by pinching center of the filter and pulling outward from the back of the control unit.

Replace Air Filter

1. Remove air filter and replace it with a new filter.
2. Use a soft bristle to remove dust and difficult dried-on soil.



NOTE:

1. Do not use phenol based cleaning solutions.
2. Switch off the electrical supply to the pump and disconnect the power cord from the main supply before cleaning and inspection

Waste Disposal

This Product has been supplied by an environmentally conscious manufacturer that complies with the WEEE. This product may contain substances that could be harmful to the environment if disposed of in places that are not approved by your state, local or federal laws. Please be environmentally responsible and recycle this product through your recycling facility at its end of life.

6. Storage and Care

Master Control Unit:

- Check the power cord and plug for abrasions or excessive wear.
- Plug in the unit and verify air flows from the units hose connection ports.
- Place in plastic bag for storage.

Mattress:

- Check the air manifold for kinks or breaks. Replace if necessary.
- Twist open the CPR plug at the head of the mattress and disconnect the air feed tubes. All of the air will be expelled. Starting from head end of the mattress, roll the mattress towards the foot of the bed. Use the base mounting straps to secure.
- Place in plastic bag of storage.

It is recommended the following guidelines are used whenever this system is being stored or transported another location:

Temperature limitations:	5℃ ~ 60℃
Relative Humidity:	30% to 90%

7. Maintenance & Troubleshooting

Daily maintenance is not required. This equipment is intended to be serviced by qualified, authorized technical personnel. In case of minor troubleshooting issues, please refer to the following Troubleshooting table. Caregivers should check on the patient and the control unit setting once in every two hours.

Symptom	Inspection Procedures	Possible Solution
Air is pumping out from the control unit but the mattress is not inflating.	1. Is the power source correct? Improper voltage may cause the pump to function abnormally and damage the control unit. 2. Is there any kinking tube? 3. Is there any air leakage from air cells? 4. Is there any air leakage from air tube between mattress and control unit? 5. Has the air tube connector been connected properly?	1. Use power regulator 2. Adjust the air tubes to enable smooth air flow. 3. Replace with new air cells. 4. Replace with new air tubes. 5. Re-connect the air tubes. 6. Refer to service if problem persist.
The control unit is not functioning.	1. Check the power cord and the power voltage 2. Check the fuse.	1. Use a power regulator. 2. Replace with a new fuse 3. Refer to service if problem persist.
Some of the air cells are not properly inflated.	1. Is the connection between air cells and the manifold kinked? 2. Is there any air leakage from the air cells?	1. Check for any kinking between air cells and manifold. 2. Replace new air cell if faulty. 3. Refer to service if problem persist.
Sensor is disconnected.	1. Check the sensor pad to see if the sensor pad connect properly? 2. Check the sensor pad to see if there is any damage or broken on the sensor pad.	1. Connect the sensor pad to the properly 2. Replace a new sensor pad 3. Refer to service if problem persist.

8. EMC Related Notifications

Guidance and manufacturer's declaration – electromagnetic emissions		
The Duet control unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Duet control unit should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The Duet control unit 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 Duet control unit 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 Duet control unit			
The Duet control unit is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Duet control unit can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Duet control unit 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 $d = 1{,}2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1{,}2\sqrt{P}$	**800 MHz to 2,5 GHz** $d = 2{,}3\sqrt{P}$
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 metres (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 Duet control unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Duet control unit 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	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 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	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ±2 kV line(s) to earth	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 % *UT* (>95 % dip in *UT*) for 0,5 cycle 40 % *UT* (60 % dip in *UT*) for 5 cycles 70 % *UT* (30 % dip in *UT*) for 25 cycles <5 % *UT* (>95 % dip in *UT*) for 5 sec	<5 % *UT* (>95 % dip in *UT*) for 0,5 cycle 40 % *UT* (60 % dip in *UT*) for 5 cycles 70 % *UT* (30 % dip in *UT*) for 25 cycles <5 % *UT* (>95 % dip in *UT*) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Duet control unit requires continued operation during power mains interruptions, it is recommended that the Duet control unit be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) 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 *UT* is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – electromagnetic immunity

The Duet control unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Duet control unit is responsible for making sure 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 Duet control unit, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	**Recommended separation distance** $d = 1{,}2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	$d = 1{,}2\sqrt{P}$ 80 MHz to 800 MHz $d = 2{,}3\sqrt{P}$ 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 metres (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 Duet control unit is used exceeds the applicable RF compliance level above, the Duet control unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Duet control unit.

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

9. Expected Service Life

The Duet control unit has an expected service life of five years. To maintain the condition of the pump, have the pump serviced regularly according to the schedule recommended by Prius Healthcare. Do NOT use unapproved accessories or attempt to modify, disassemble or otherwise misuse the ***Duet LAL Alternating Anti-Decubitus System***.

10.Warranty

- Prius Healthcare Products guarantees that this equipment is free from defects in material and workmanship. Our obligation under this warranty is limited to the repair of equipment returned to the service address given below, transportation charges prepaid, within 12 months after delivery to the original purchaser for all equipment.
- We agree to service / adjust any equipment returned, and to replace or repair any part, which is proven to be defective at no charge.
- This warranty excludes equipment damage through shipping, tampering, improper maintenance, careless, accident, negligence or misuse, or products which have been altered, repaired or dismantled other than with the manufacture's written authorization and by its approved procedures and by properly qualified technicians.
- In no event shall Prius Healthcare Products be liable for any direct, indirect of consequential damages or losses resulting from the use of equipment.

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