

Thoratec Corporation

HEARTMATE® SUTURES NOT APPLIED
VENTED ELECTRIC (SNAP-VE)
LEFT VENTRICULAR ASSIST SYSTEM (LVAS)

Patient Handbook

Your guide to understanding the HeartMate SNAP-VE LVAS Heart Pump

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List of Emergency Contacts

It is very important that you keep a list of emergency contacts with you at all times in case something happens to you or your pump. Before you leave the hospital, fill in the list below. If, at any time, you think your pump is not working as it should, call your hospital contact person, or other emergency contact, as soon as possible.

HOSPITAL

Name of Hospital

Name of Hospital Contact Person

Hospital Address

Hospital (contact person) telephone number

DOCTOR

Doctor's Name

Address

Telephone number

AMBULANCE

Name

Address

Telephone number

EMERGENCY SERVICES

Make sure that dialing 911 works in your area.

Dial 911

Important Warnings

- Certain components of your SNAP-VE LVAS are NOT compatible with other HeartMate systems (such as the XVE system). Therefore, you should **only use SNAP-VE system components** while implanted with the SNAP-VE LVAS. Your hospital contact person will help you with this.
- If your Percutaneous Tube (the tube passing through your skin) gets kinked or blocked, your pump could stop.
 - Do NOT kink or block the tube.
 - Avoid dressings or tight clothing that could block or kink the tube.
- Make sure that water or fluid does NOT enter the Percutaneous Tube or Vent Filter, or your pump could stop.
 - Do NOT allow water or other fluids to enter the tube or Vent Filter.
 - NEVER place the Vent Filter, Controller, or Batteries in water.
 - NEVER swim or take a bath while implanted with the pump. Your doctor will let you know when you can shower. When you do shower, you must use the HeartMate Shower Kit and follow the instructions that come with the kit.
- Keep the Power Base Unit (PBU) away from water. If the PBU has contact with water, shower spray, or wet surfaces, the pump may stop, or you may receive a serious electric shock.
- At least one System Controller power lead must be connected to a power source (Batteries, PBU, or EPP) at all times. Disconnecting both Controller leads at the same time will cause the pump to stop.
- Loss of power will cause the pump to stop. Power must be restored as soon as possible. If power cannot be restored, immediately start hand pumping with the HeartMate Hand Pump.
- Plug the Power Base Unit (PBU) only into properly grounded (3-prong) outlets. Do NOT use an adapter for ungrounded wall outlets or you may receive a serious electric shock.
- Do NOT connect the Power Base Unit (PBU) to an outlet controlled by a wall switch, or the PBU may not work.
- Do NOT touch television or computer monitor screens. Television and computer monitor screens have strong static electricity. A strong static discharge can damage the electrical parts of the pump system and cause the pump to stop.

continued

Important Warnings continued

- Do NOT vacuum or engage in other activities that may generate static electricity. A strong static discharge can damage the electrical parts of the pump system and cause the pump to stop.
- Do NOT use this system if you are pregnant or likely to get pregnant while implanted with the pump. If you become pregnant, the growing baby may push on the pump and cause pump failure or serious bleeding, which could cause you or the baby to die.
- Never have magnetic resonance imaging (MRI) done while implanted with the pump. Doing so may injure you or cause the pump to stop.
- Never store the Hand Pump with the bulb in the collapsed position, or it may not work properly when needed.
- Your pump will stop if the Controller is disconnected from Percutaneous Tube. If this happens, reconnect the Controller and tube as quickly as possible to restart the pump.

Important Precautions

- **Always** have a back-up System Controller, spare Batteries and Hand Pump nearby **at all times** in case of emergency.
- During your regular doctor visits have a doctor or nurse check your Hand Pump to make sure it is in good working order.
- When connecting leads, do not force together connectors without proper alignment. Forcing together misaligned connectors may damage the connectors.
- Never use tools to tighten connections. Hand tighten only. Using tools may damage connectors and cause the pump to stop.
- To prevent deterioration or damage to Batteries:
 - Do NOT drop or subject Batteries to strong physical shock. Dropped Batteries should be replaced.
 - Do NOT leave or store Batteries in hot areas (car trunks, etc.), or Battery life will be shortened.
 - Do NOT directly connect the negative and positive Battery terminals.
 - Recharge used Batteries within twelve (12) hours or Battery life will be shortened.
- Do NOT use Batteries in temperatures below 15°F (-10°C) or above 105°F (40°C), or the Batteries may fail suddenly. If your Batteries stay below room temperature (68-72°F, 20-23°C) during use, they will run the pump for less time than usual. At the low end of the temperature range (15°F, -10°C), run time may be reduced by 50%.
- Use only the HeartMate Power Base Unit (PBU) to charge Batteries. Other battery chargers may damage Batteries.
- The use of expired or defective Batteries may reduce operating time or cause the pump to stop suddenly.
- Do NOT play contact sports or perform jumping activities while implanted with the pump. If you do, you could start bleeding or damage your pump.
- Disconnect all power sources (Batteries, PBU, or EPP) before connecting or disconnecting the Controller and Percutaneous Tube.

continued

Important Precautions continued

- To prevent deterioration or damage to the Emergency Power Pack (EPP):
 - Do NOT leave or store EPP in hot areas (car trunks, etc.), or Battery life will be shortened.
 - Do NOT use an EPP beyond its expiration date.
- Do NOT store or use the EPP in temperatures below 32°F (0°C) or above 122°F (50°C), or the EPP may fail suddenly. If your EPP stays below room temperature (68-72°F, 20-23°C) during use, it will run the pump for less than 24 hours. At the low end of the temperature range (32°F, 0°C), run time may be reduced by 50%.
- Dispose of an expired or used Emergency Power Pack (EPP) according to local, state, or federal regulations for battery disposal. Do NOT incinerate.
- Do NOT allow the connector ends of leads to get dirty or wet.
- Do NOT try to repair any of your LVAS equipment yourself. If equipment needs service, call your hospital contact person.
- Do NOT pull on or move the Percutaneous Tube passing through your skin. Pulling on or moving the tube could prolong the healing process or interrupt an already healed exit site. Pulling on or moving the tube also could increase your chances for getting a serious infection.
- If you notice a change in how your pump sounds, feels, or works, call your hospital contact person immediately.
- Your SNAP-VE LVAS uses lights and sounds to tell you how the system is operating. If you have sight or hearing problems you may need special additional care – ask your hospital contact person.

Introduction

Why You Should Read this Handbook

This *Patient Handbook* is provided to you by your doctor to help you learn more about your heart pump. This handbook tells you about the pump and how it works. It also reviews the routine activities you must perform so that you can be active and safe while living at home with the pump. Finally, this handbook explains what to do in an emergency situation. If you have any questions after reading this handbook, please ask your hospital contact person.

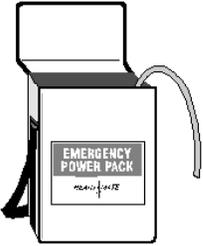
The table below lists the parts that make up your SNAP-VE LVAS and gives you a short description about each part. Each part is explained in more detail later in this handbook.

System Components

Sutures Not Applied-Vented Electric Left Ventricular Assist System (SNAP-VE LVAS)

<p>Pump</p>		<p>The pump moves blood from your heart to other parts of your body. The pump was implanted below your heart during surgery.</p>
<p>System Controller</p>		<p>The System Controller, or “Controller” for short, is a small computer that makes sure your pump is working correctly. It warns you with lights and sounds if there is a problem with the pump.</p>
<p>Power Base Unit (PBU)</p>		<p>The Power Base Unit (PBU) charges and tests Batteries. It also can be used to power your pump when you are not on Battery power.</p>
<p>Batteries and Battery Clips</p>		<p>Batteries and Battery clips are used to power the pump.</p>

System Components continued

<p>Power Base Unit (PBU) Cable</p>		<p>The PBU Cable connects the PBU to the Controller. Connections are made between white-to-white connectors and black-to-black connectors.</p>
<p>Hand Pump</p>		<p>The Hand Pump is emergency equipment. Use the Hand Pump to power the pump only if the pump stops working. See page 47 for instructions on using the Hand Pump.</p>
<p>Emergency Power Pack (EPP)</p>		<p>The EPP provides up to 24 hours of emergency power. The EPP can be used if there is a power outage in your home (for example, during an outage caused by a storm or severe weather). See page 36 for instructions on using the EPP.</p>
<p>Display Module</p>		<p>The Display Module displays information about pump performance, such as pump rate, stroke volume, and flow. The current operating mode and operational status also appear on the Display Module.</p>
<p>HeartWear™ Accessories</p>		<p>HeartWear™ accessories include: 1) holsters for carrying Batteries during Battery-powered operation; 2) Pocket Pak™ for carrying (around your waist) the System Controller, Batteries, Battery Clips and excess length of power leads, and the 3) Travel Case for carrying emergency or back up HeartMate equipment, such as spare Batteries and Hand Pump.</p>

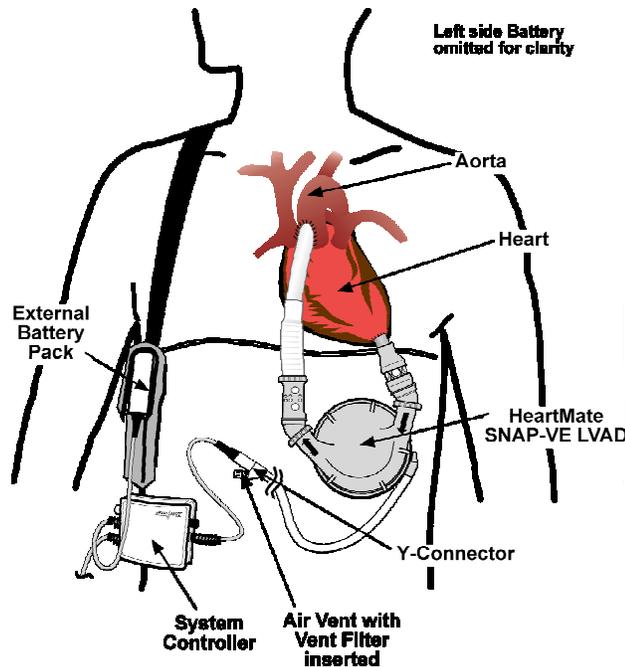
Understanding How Your Pump Works

Your Heart Pump

Your heart pump is called the HeartMate Sutures Not APplied-Vented Electric Left Ventricular Assist Device (SNAP-VE LVAD for short). The SNAP-VE LVAD helps your heart pump blood through your body. It is made mostly of titanium and weighs almost three (3) pounds. A small electric motor inside the SNAP-VE LVAD drives the pump.

Your heart pump is implanted below your heart and is attached to your heart and ascending aorta (the large blood vessel that carries blood from your heart to the rest of your body) (see **Figure 1**). Blood from your heart flows into the SNAP-VE LVAD and then is pumped into the ascending aorta and through your body. You will hear and feel the pump motor working – this is normal.

Figure 1



As you can see in **Figure 1**, a tube passes through your skin; it is called the Percutaneous Tube. The outside of the tube is covered with a special material designed to let skin cells grow into it. This helps the tube exit site to heal, which helps reduce the risk of infection.

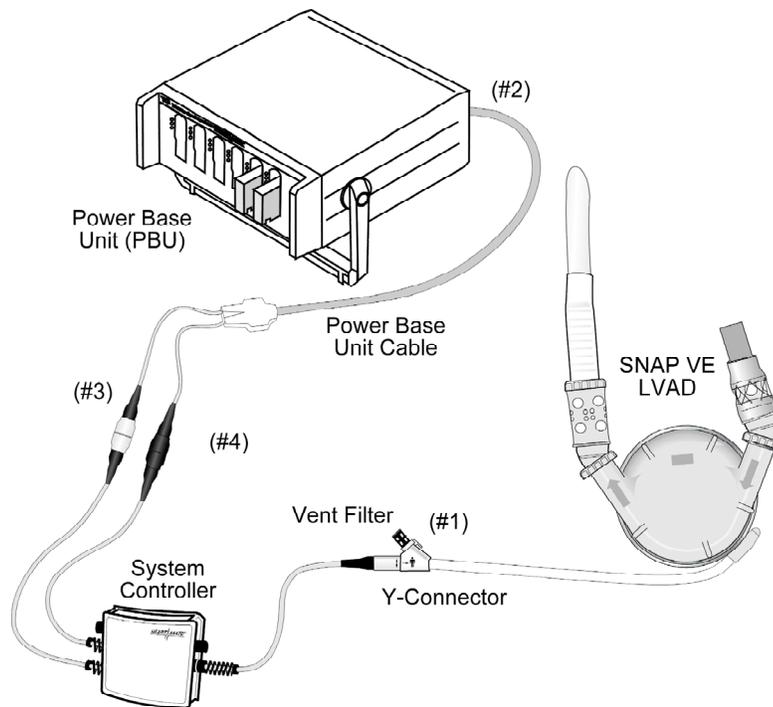
You will need to keep the tube exit site very clean and dry to help avoid infection (see the “Caring for the Exit Site” page 44).

Your Heart Pump continued

The inside of the Percutaneous Tube contains: **1)** an electrical lead and **2)** an airline.

The **electrical lead** supplies power to the pump. The electrical lead connects to the Controller and to one of the pump's power sources (either Batteries, PBU, or EPP). The Controller is usually worn on a belt at the waist. When connected to Batteries, the two Batteries may be worn in "holsters" under the arms (**Figure 1**), or in a specially designed Pocket Pak™. The Controller also may be connected to the PBU (that is plugged into a wall outlet) (**Figure 2**) to power the pump when you're sleeping or charging your Batteries.

Figure 2



The **airline** allows air to flow in and out of the pump motor chamber with each beat. A Y-Connector is at the end of the airline, and a Vent Filter attaches to the Y-Connector (**Figure 2**). The filter helps keep dust or dirt out of the airline. The filter must be changed once a week, or if it gets dirty or wet (see the "Changing the Vent Filter" page 39).

It is very important to **NOT** allow any portion of the Percutaneous Tube to become kinked or clogged. It is also very important that you do not let fluid get into the tube or filter. If the filter becomes clogged or if the tube becomes kinked or gets fluid in it, the pump may stop working.

Your Heart Pump continued

WARNING !

If your Percutaneous Tube (the tube passing through your skin) gets kinked or blocked, or if fluid enters the tube, your pump could stop.

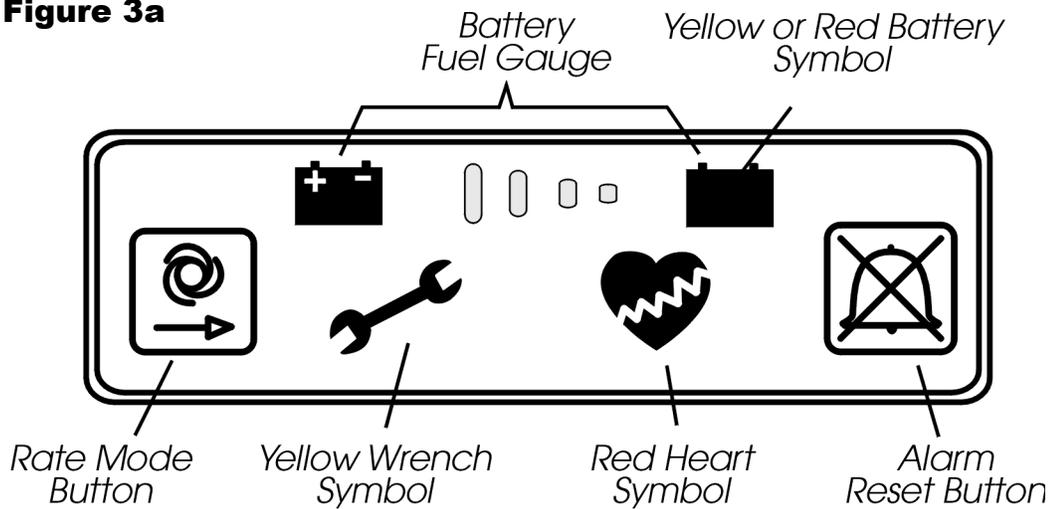
- Do NOT kink or block the tube.
- Avoid bandages or tight clothing that could block or kink the tube.
- Do NOT allow water or other fluid to enter the tube.
- NEVER swim or take a bath while implanted with the pump.

The System Controller

The System Controller is a small computer that controls how your pump works and makes sure that the pump is working correctly. The Controller is connected to both the pump and an external power supply (either Batteries, PBU, or EPP). The System Controller is usually worn on a belt at the waist.

The System Controller warns you if there is a problem with your pump or with the pump’s power supply. Warning lights are on the top of the Controller (**Figure 3a**). The warning lights, buttons, and the Battery Fuel Gauge (all found on the top of the System Controller) are described in the following pages.

Figure 3a

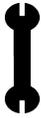


CAUTION !

The HeartMate system uses lights and sounds to tell you how it is operating. You may be at a higher risk of injury if you have difficulty hearing or seeing. If you have hearing or sight problems you may need special additional care – ask your hospital contact person.

The System Controller continued

Controller Warning Lights and Sounds

WARNING LIGHTS & SOUNDS	MEANING	WHAT YOU SHOULD DO
<p>Red Heart STEADY AUDIO TONE</p> 	<p>Hazardous condition exists - Pump has stopped or is not pumping as it should.</p>	<ol style="list-style-type: none"> 1. Make sure the Controller is connected to <i>both</i> the pump <i>and</i> power source (Batteries, PBU, EPP). 2. Prepare to hand pump. 3. Call Emergency Services (Dial 911) immediately. <i>Turn to page 45; follow emergency procedures.</i>
<p>Yellow Wrench Once-per-second BEEP</p> 	<p>Loose cable connection or minor problem.</p>	<ol style="list-style-type: none"> 1. Check cable connections. 2. If connected to Batteries, change to new set. <p>OR</p> <ol style="list-style-type: none"> 2. If connected to the PBU, switch to Batteries. 3. Check System Controller Battery Module and change module if necessary (see page 17). 4. Change Controller. 5. If YELLOW WRENCH remains lit, call your hospital contact person.
<p>Red Battery STEADY AUDIO TONE</p> 	<p>Less than 5 minutes of Battery power remain. <i>Controller will automatically switch to Power Saver Mode (see page 26).</i></p>	<p>Replace used Batteries with fully charged Batteries or switch to PBU or EPP.</p>
<p>Yellow Battery Once-per-second BEEP</p> 	<p>Less than 15 minutes of Battery power remain.</p>	<p>Replace used Batteries with fully charged Batteries or switch to PBU or EPP.</p>
<p>Steady Audio Tone (but <i>no</i> visual warning light)</p>	<p>System Controller is not receiving power.</p>	<ol style="list-style-type: none"> 1. Make sure both power leads are connected to power source (Batteries, PBU, or EPP). 2. If STEADY AUDIO TONE continues, call Emergency Services (Dial 911) immediately. <i>Turn to page 45; follow emergency procedures.</i>
<p>Red Heart and Yellow Wrench</p> 	<p>System Controller is not connected to tube. OR More than one alarm is happening at the same time.</p>	<ol style="list-style-type: none"> 1. Check connections between pump and Controller. 2. Prepare to hand pump. 3. Call Emergency Services (Dial 911) immediately. <i>Turn to page 45; follow emergency procedures.</i>

continued

The System Controller continued

Controller Switches

SWITCH	PURPOSE	HOW TO USE
<p>Rate Mode</p> 	<p>Allows you to change between Fixed Rate Mode and Auto Rate Mode. In Fixed Rate Mode, the pump works at a constant beat rate set by your doctor. In Auto Rate Mode the pump works faster or slower depending on your activity.</p>	<ol style="list-style-type: none"> 1. Push Rate Mode Button. One (1) beep means you are in Fixed Rate Mode. 2. Push Rate Mode Button again. Two (2) beeps mean you are in Auto Rate mode.
<p>Rate Mode</p> 	<p>Starts the Controller Self-Test.</p>	<p>Push <i>and hold</i> Rate Mode Button for three (3) seconds to start Self-Test.</p> <p>See page 14 for Self-Test procedure.</p>
<p>Alarm Reset</p> 	<p>Allows you to silence the YELLOW WRENCH alarm for 5 minutes and RED HEART alarm for 2 minutes.</p> <p>If you are attached to the Power Base Unit (PBU) when the Controller alarm sounds, the PBU also will alarm. You can silence both the Controller and PBU by pressing the Alarm Reset Button on the Controller.</p>	<p>Push Alarm Reset Button.</p>
<p>Alarm Reset</p> 	<p>Check for (approximate) available Battery power using the Battery Fuel Gauge.</p>	<p>Push <i>and hold</i> Alarm Reset Button and look to see how many green lights are showing on Battery Fuel Gauge (see page 13).</p>

The System Controller continued

Battery Fuel Gauge

BATTERY FUEL GAUGE LIGHTS	MEANING	WHAT YOU SHOULD DO
<p>One (1) Green Light on Fuel Gauge</p> 	<p>Less than 25% of Battery power available (Batteries are less than a quarter charged).</p>	<p>Replace used Batteries with fully charged Batteries (see page 23) or switch to another power source (PBU or EPP).</p>
<p>Two (2) Green Lights</p> 	<p>Between 50% - 25% of Battery power available (Batteries are half charged).</p>	<p>No Action Needed.</p>
<p>Three (3) Green Lights</p> 	<p>Between 75% - 50% of Battery power available (Batteries are three quarters charged).</p>	<p>No Action Needed.</p>
<p>Four (4) Green Lights</p> 	<p>Between 100% - 75% of Battery power available (Batteries fully charged).</p>	<p>No Action Needed.</p>

The System Controller continued

Controller Self-Test

Every day you should do a Controller Self-Test to make sure that your Controller is working properly. The Self-Test takes about 15 seconds. During the Self-Test your pump will continue to run, but at a slightly lower rate. You may feel a change in beat rate; this is normal. However, for your comfort, we recommend that you sit down during the Self-Test. Place the Controller where you can easily push the buttons and see the lights during the test.

How to Perform a Controller Self-Test

- 1 To start the Self-Test, press and hold the Rate Mode Button for three (3) seconds. *The YELLOW WRENCH, RED HEART, RED BATTERY, and fuel gauge lights will come on and a STEADY AUDIO TONE will sound.*
- 2 After three (3) seconds, release the Rate Mode Button. *All warning lights will remain lit and the alarm will continue to sound for three (3) seconds. Next, all of the warning lights will turn off – except for the YELLOW WRENCH. Then, all of the warning lights will turn back on (within 5 seconds or less) and will stay on for another five (5) seconds. The alarm will continue to sound for the entire time.*
- 3a If all the warning lights and alarms operate as described above and then turn off after five (5) seconds, the Controller has passed the Self-Test.
- OR
- 3b If the RED BATTERY continues to flash, the Controller Battery Module may need to be replaced. Go to page 17 for instruction on changing the Controller Battery Module, or call your hospital contact person.
 -  **Note:** If the problem is a low Controller Battery Module, the flashing RED BATTERY will stay on until the Battery Module is changed and Self-Test is redone.
- 4 If there is a problem with the System Controller (if the Controller fails the Self-Test), the YELLOW WRENCH will remain lit and the once-per-second BEEP will sound. Repeat the Self-Test to confirm the problem. If the Controller fails the second test, call your hospital contact person.

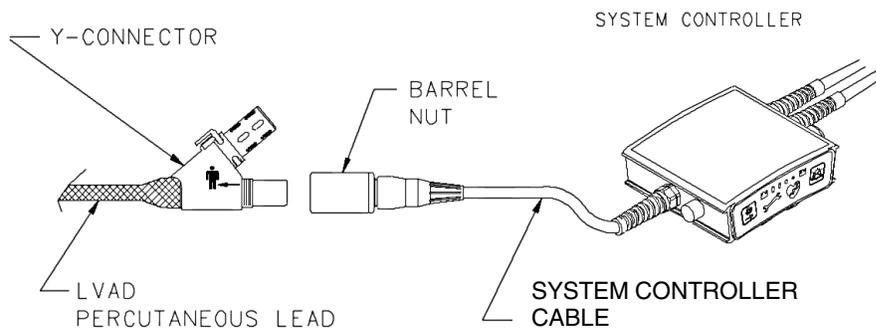
EXTREMELY IMPORTANT

Problems with the System Controller can cause the pump to operate in **Basal Rate Mode** (at a fixed rate of about 40 beats per minute). If this happens, **replace your Controller immediately** (see directions on following page), **then call your hospital contact person.** You **MUST** tell your hospital contact person about any problems that cause your pump to operate in Basal Rate Mode, even if changing the Controller appears to fix the problem.

The System Controller continued

How to Change the System Controller

- 1 Place new System Controller within easy reach. Have Hand Pump nearby.
- 2 Sit or lie down.
- 3 Disconnect System Controller from power source (Batteries, PBU, or EPP).
Your Controller will alarm and your pump will stop.
- 4 Disconnect the Percutaneous Tube from the current System Controller:
 - a) Turn the white barrel nut (located next to the Y-Connector) in the “OFF” direction until the connection is loosened.
 - b) Hold the Y-Connector in one hand; and, with the other hand, pull the white barrel nut (attached to the Controller cable) in the opposite direction.



- 5 Connect the Percutaneous Tube to the new System Controller:
 - a) Align the pins inside the barrel nut of the Controller cable with the sockets of the Percutaneous Tube connector (near the Y-Connector), so that pins will go into the sockets.
 - b) Once aligned, push the pins into the sockets.
 - c) Hand-tighten the white barrel nut by turning it in the “ON” direction.
 - d) Make sure the nut fits snugly against the Y-Connector (there should be no gap). However, hand-tighten only. Do NOT use tools to tighten connections. Using tools may damage the connectors.

The new Controller will alarm if the Controller Battery Module is in place. This is normal and should stop after step 6 (next page).

continued

The System Controller continued

How to Change the System Controller

- 6 Connect the new System Controller to a power source (Batteries, PBU, or EPP). *Your pump will restart and alarm will stop.*
- 7 If the pump does not restart, disconnect Controller from power source and call for medical assistance; then immediately begin hand pumping (See “How to Hand Pump” page 47).

WARNING !

When the Controller is disconnected from the tube passing through your skin, the pump will stop. The Controller and power must be reconnected as quickly as possible to restart the pump.

CAUTION !

Disconnect all power sources (Batteries, PBU or EPP), before connecting or disconnecting the Controller from the pump.

Changing the System Controller Battery Module

When the Self-Test shows that the System Controller Battery Module is low (blinking RED BATTERY at end of the Self-Test), the Battery Module needs to be replaced.

- 1 Obtain a new System Controller Battery Module.
- 2 Examine the new Battery Module. Make sure that the orange O-ring is undamaged and in place. Do NOT use the Battery Module if the O-ring is damaged or missing.
 **Note:** The orange O-ring is around the bottom of the module.
- 3 Examine the new Battery Module for signs of damage, such as cracks or chips. Do NOT use the Battery Module if it looks damaged.
 **Note:** Battery Modules can be damaged by dropping or hitting them. Therefore, handle Battery Modules carefully. Never insert a damaged module into the System Controller socket. Inserting a damaged module could introduce foreign matter (such as Battery Module casing) and prevent proper contact between the Battery Module and socket.
- 4 Unscrew (counter-clockwise) the current Battery Module from the bottom of the System Controller and discard it. If necessary, you may use a coin or other similar flat object to unscrew the Battery Module.
- 5 Once inspected, insert the new Controller Battery Module (see **Figure 3b**) into the System Controller socket.
 **Note:** The YELLOW WRENCH will flash (until the end of the test).
- 6 Tighten (clockwise) the new Controller Battery Module until the orange O-ring is no longer visible.
 **Note:** Do NOT use tools, a coin, or any other similar flat object to insert or tighten the Battery Module. Do NOT over-tighten – HAND TIGHTEN ONLY.
- 7 Start the Controller Self-Test by pressing and holding the Rate Mode Button for five (5) seconds (see “How to Perform a Controller Self-Test,” page 14). *The RED BATTERY should now be off.*
 **Note:** The YELLOW WRENCH should stop flashing after the Self-Test.

continued

Changing the System Controller Battery Module

- 8 At the end of the Self Test, if the YELLOW WRENCH continues flashing after the new Controller Battery Module is inserted, examine the Battery Module and make sure that it is screwed in all the way.
- 9 If the Battery Module is screwed in all the way and the YELLOW WRENCH still continues flashing, remove the Battery Module and inspect the socket for dirt or other foreign matter that may be preventing the Battery Module from contacting the base of the socket.
 **Note:** As mentioned on the previous page, a Battery Module may be easily damaged. If a Battery Module is damaged (even if the damage is not obvious or visible to you), inserting the damaged Battery Module into the Controller socket could introduce foreign matter (such as Battery Module casing) and prevent proper contact between the Battery Module and socket.
- 10 If dirt or foreign matter is present in socket, gently shake Controller to clean out socket –do NOT insert cloth, cotton swabs, or other materials/items into the socket.
- 11 After cleaning the socket, reinsert the Controller Battery Module. If the YELLOW WRENCH continues flashing after the Self Test (possibly indicating poor contact between Battery Module and socket), discard this Battery Module and repeat Steps 2 – 11 with a new Battery Module.

Figure 3b



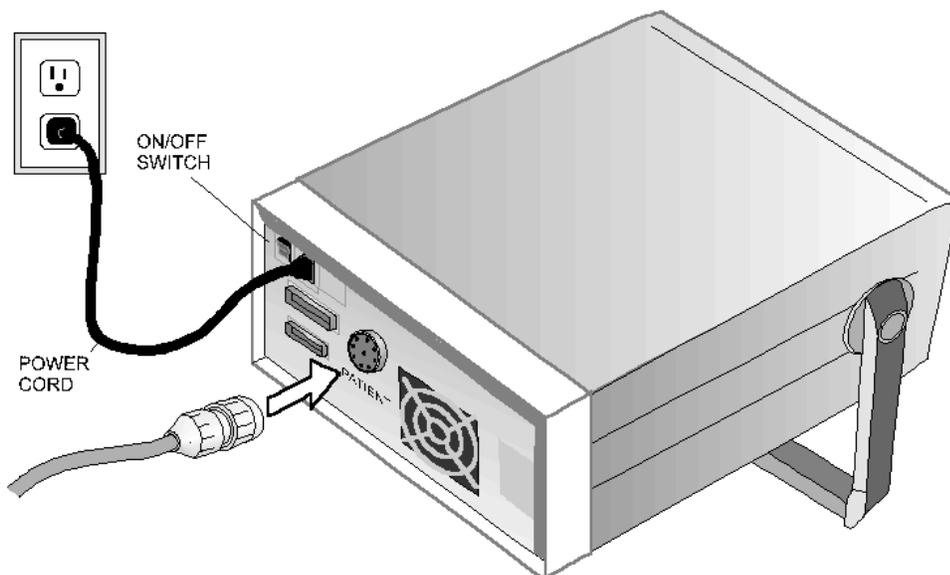
The Power Base Unit (PBU)

The PBU has two (2) functions: It **1)** charges and tests your Batteries and, **2)** acts as a power source for your pump when Batteries are not available.

How to Set Up the PBU

- 1** Place the PBU on a flat, sturdy surface, such as a table.
- 2** Plug the PBU power cord into a 3-prong wall outlet. Do NOT use an adapter or a wall outlet controlled by a light switch.
- 3** Turn the ON/OFF switch on the back of the unit to the ON (I) position (Figure 4).

Figure 4



- 4** Plug the PBU Cable into the socket labeled “Patient.”
- 5** Attach the **white** Controller connectors to the **white** PBU Cable connectors; then attach the **black** Controller connector to the **black** PBU Cable connector.

 **Note:** Always connect white-to-white and black-to-black.

The Power Base Unit (PBU) continued

WARNING !

- Plug the PBU ONLY into properly grounded (3-prong) outlets. Do NOT use an adapter for ungrounded wall outlets or you may receive a serious electric shock.
- Do NOT connect the PBU to an outlet controlled by a wall switch or the PBU may not work.
- Keep the Power Base Unit (PBU) away from water. If the PBU has contact with water, shower spray or wet surfaces, the pump may stop or you may receive a serious electric shock.

CAUTION !

Do NOT let connector ends get dirty or wet.

HeartMate Batteries

Two (2) fully charged Batteries provide about 6½ hours of support under “normal” conditions (such as reading a book, casual walking). The Batteries will last for less time as your activity increases. *For example, if you exercise or have increased emotional stress, you will get up to 25% less time on each pair of Batteries.*

While on Battery power, you must have at least two (2) additional fully charged Batteries with you, in case you need to change Batteries. Used Batteries should be placed into the Power Base Unit (PBU) for recharging as soon as possible.

When you receive a new Battery, it must be charged before it can be used. Before you charge the Battery, write the date that you first charge it on the Battery’s white label. You can use a new Battery for up to one year from its initial charge date.

On each Battery label you will find several safety symbols and the Battery’s expiration date. NEVER use a Battery after its expiration date.

To prevent reduced Battery performance, Battery terminals and the interior metal contacts of Battery Clips should be cleaned once a week with an alcohol-moistened swab or lint-free cloth.

CAUTION !

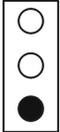
- To prevent deterioration or damage to Batteries:
 - Do NOT drop or subject Batteries to strong physical shock. Dropped Batteries should be replaced.
 - Do NOT leave or store Batteries in hot areas (car trunks, etc.), or Battery life will be shortened.
 - Do NOT directly connect the negative and positive Battery terminals.
 - Recharge used Batteries within 12 hours or Battery life will be shortened.
- Do NOT use Batteries in temperatures below 15°F (-10°C) or above 105°F (40°C), or Batteries may fail suddenly. If your Batteries stay below typical room temperature (68-72°F, 20-23°C) during use, they will run the pump for less time than usual. At the low end of the temperature range (15°F, -10°C), run time will be reduced by 50%.
- Using expired or defective Batteries may reduce Battery operating time or may cause abrupt loss of pump function. Do NOT use expired or defective Batteries.

Charging HeartMate Batteries

The Power Base Unit (PBU) is the only product you should use to recharge your HeartMate Batteries. Using any other battery charger may damage the Batteries.

How to Charge the Batteries

- 1 Handle Batteries so that you avoid touching the exposed metal terminals.
- 2 Slide the Battery into a slot of the PBU, metal facing up.
The yellow light will come on for about 30 seconds while the Battery is tested.
- 3 After testing, one of the three (3) lights will come on (green, yellow, or red), depending on the status of the Battery (see table below).

LIGHT	MEANING
Green 	Fully charged Battery; ready for use.
Yellow 	Battery being charged; NOT ready for use.
Red 	Defective Battery, DO NOT USE.

When a Battery is placed into the PBU, the PBU performs an electrical check of the Battery before recharging starts.

If the Battery fails the electrical check, the **red light** will come on.

 **Note:** Sometimes the test will produce a red light if the Battery is not placed into the slot properly. If a Battery fails its first test, slide it into a different slot and test again. If the Battery fails the second test, then it is defective and must be replaced. Do NOT use defective Batteries.

Charging HeartMate Batteries continued

How to Charge the Batteries

If the Battery passes the test, the **yellow light** will come on and the Battery will begin to recharge.

When the Battery is fully recharged, the **green light** will come on indicating that the Battery is now ready for use.

 **Note:** Batteries will not be damaged if left in the PBU after charging.

The PBU can charge up to six (6) Batteries at one time. Battery recharging can take up to eight (8) hours, depending on how depleted the Batteries are at the start of recharging.

CAUTION !

Use **ONLY** the HeartMate Power Base Unit (PBU) to charge Batteries. Other battery chargers may damage the Batteries.

 **Note:** Dirty Battery terminals may prevent proper charging. Battery terminals should be cleaned once a week with an alcohol-moistened swab or lint-free cloth.

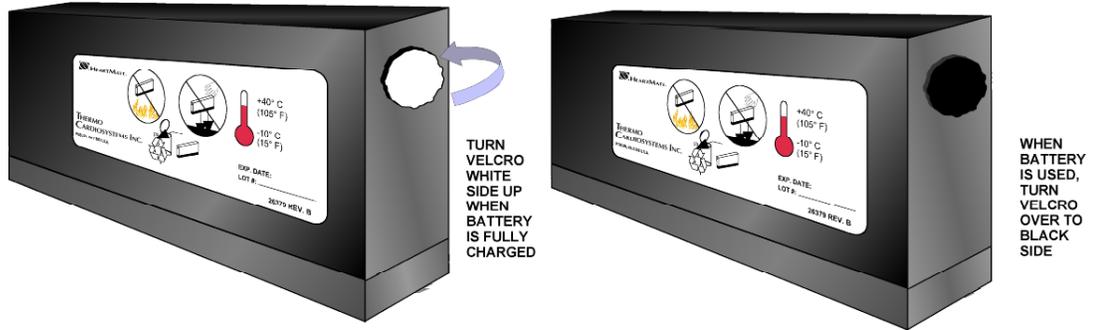
For your convenience, round Velcro® indicators are included with your Batteries. Use them to help remind you which Batteries are charged and which are not. *For example, when a Battery is fully charged, attach the round indicator to the Battery with the white side up; and when a Battery is used and needs recharging, turn the indicator over so that the black side is up (Figure 5).*

White = Charged; ready for use.

Black = Used and charging. Do NOT use until fully charged.

Charging HeartMate Batteries continued

Figure 5

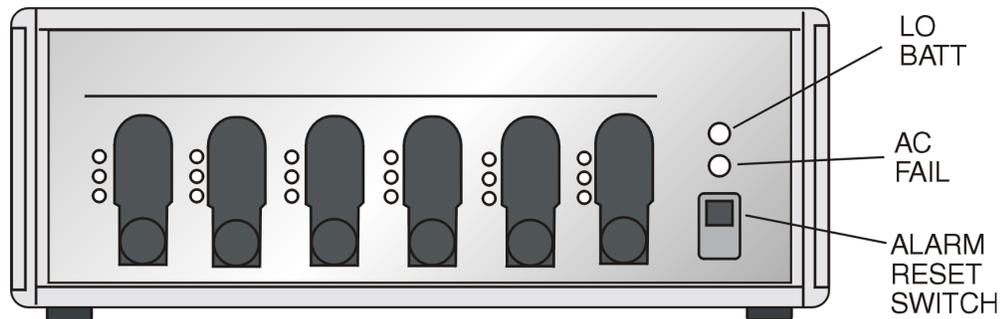


Power Base Unit (PBU) Warning Lights & Sounds

WARNING LIGHTS & SOUNDS	MEANING/FUNCTION	WHAT YOU SHOULD DO
AC FAIL STEADY AUDIO TONE	External power to PBU is off. The PBU's internal battery will power the pump for up to 45 minutes.  Note: PBU will NOT recharge Batteries during AC FAIL warning.	<ol style="list-style-type: none"> 1. Change power sources. <i>For example, switch from PBU to Batteries (or from Batteries to PBU).</i> 2. If all Batteries are used up before electrical power is restored, use either the Emergency Power Pack (EPP) (see page 36) or prepare to start hand pumping (see page 47).
LO BATT STEADY AUDIO TONE	PBU internal battery is almost used up.  Note: This alarm cannot be silenced.	<ol style="list-style-type: none"> 1. Change power sources. <i>For example, switch from PBU to Batteries (or from Batteries to PBU).</i> 2. If all Batteries are used up before electric power is restored, use either the Emergency Power Pack (EPP) (see page 36) or prepare to start hand pumping (see page 47).
ALARM RESET	Used to silence the PBU AC FAIL alarm.	Press the PBU Alarm Reset Switch (Figure 6). The AC FAIL alarm will be silenced and will not come back on. You cannot silence this alarm by pressing the Controller's Alarm Reset Button.

 **Note:** The PBU duplicates alarms from the Controller. You can silence System Controller alarms duplicated by the PBU by pressing the Controller's Alarm Reset Button.

Figure 6



Power Saver Mode (Fixed Rate of 50 Beats Per Minute)

If your Batteries have less than five (5) minutes of power available, your pump will automatically begin pumping in Power Saver Mode at a fixed rate of about 50 beats per minutes. When in Power Saver Mode, the RED BATTERY warning light on your Controller will come on and the Controller will sound a STEADY AUDIO TONE.

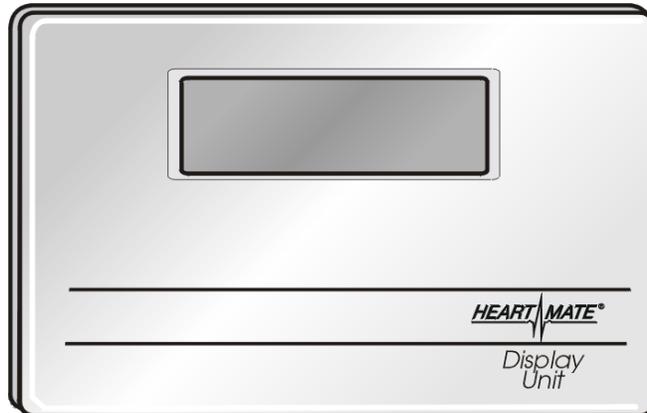
To return the pump to its normal beat rate (and silence the alarm), switch to new, fully charged Batteries or switch to the PBU.

 **Note:** If changing power sources does not correct the situation, it may be necessary to replace the Controller or PBU Cable. Call your hospital contact person for instructions. In the meantime, begin hand pumping if the pump stops working.

Display Module

You must be connected to the Power Base Unit (PBU) to use the Display Module (**Figure 7a**). The Display Module reports data from the System Controller through the PBU. The Display Module displays pump rate, stroke volume and flow data, as well as the current operating mode and operational status of the system.

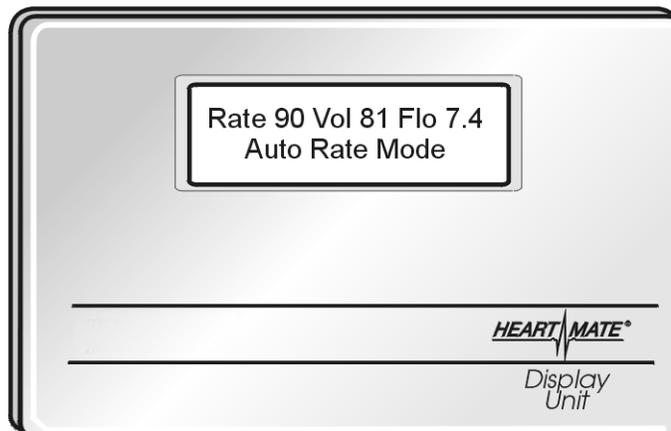
Figure 7a



How to Set-Up the Display Module

- 1 Plug the Display Module Cable into the socket labeled “Display” located in the back of the PBU.
- 2 The Display Module screen will immediately begin displaying the following (**Figure 7b**):
 - **Pump Rate** in beats per minutes (bpm).
 - **Stroke Volume** in milliliters (ml).
 - **Flow** in liters per minute (lpm).
 - **Current Pumping Mode** (Fixed Rate Mode or Auto Rate Mode).

Figure 7b



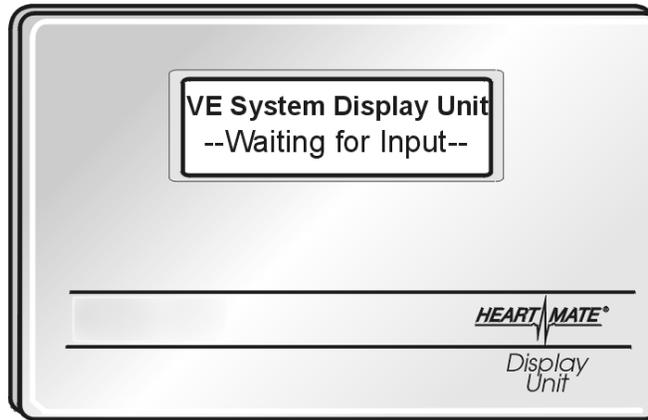
continued

Display Module continued

When an alarm is activated, the alarm status will be displayed in place of the current pumping mode. A list of all alarm messages can be found on the following page.

The following screen (**Figure 7c**) will appear on the Display Module if you are NOT attached to the PBU (but only when the Display Module is plugged into the PBU):

Figure 7c



continued

Display Module continued**Display Module Alarm Messages**

ALARM MESSAGES	MEANING	DISPLAY MODULE WARNING LIGHTS & SOUNDS	WHAT YOU SHOULD DO
LOW RATE X minutes	Pump has stopped or is not pumping as it should.	RED HEART with STEADY AUDIO TONE	<ol style="list-style-type: none"> 1. Make sure that Controller is connected to pump and PBU cable is connected to PBU. 2. Change to fully-charged Batteries. 3. Call Emergency Services (dial 911) immediately. 4. Turn to page 45 and follow emergency procedures. 5. Prepare to hand pump.
LOW STROKE VOL X minutes			
LOW FLOW X minutes			
LOW VOLTAGE	Less than 5 minutes of Battery power remain.	RED BATTERY with STEADY AUDIO TONE.	Switch from PBU to fully charged Batteries or to the EPP.
LOW STROKE VOLUME Advisory	Pump is not pumping as it should.	Appears as Advisory on Display Module ONLY.	Call your hospital contact person.
LOW FLOW Advisory	Pump is not filling as it should.	Appears as Advisory on Display Module ONLY.	Call your hospital contact person.
LOW VOLTAGE Advisory	Controller is not getting enough power.	YELLOW BATTERY	Change to fully charged Batteries.
Controller Malfunction	Controller is not working as it should.	YELLOW WRENCH with once-per-second BEEP.	Change Controller (see page 15).
Power Limit Advisory	Pump is using too much power.	YELLOW WRENCH with once-per-second BEEP.	Call your hospital contact person.

continued

ALARM MESSAGES	MEANING	DISPLAY MODULE WARNING LIGHTS & SOUNDS	WHAT YOU SHOULD DO
Controller Battery Module Low	System Controller Battery Module is low; needs to be replaced.	Flashing YELLOW BATTERY.	Replace small Controller Battery Module (see page 17). After replacing, run Controller Self-Test to clear alarm message.
Rate Control Fault	Pump is not running at correct rate.	YELLOW WRENCH with once-per-second Beep.	Call your hospital contact person.
Power Cable Disconnected	System Controller power cable disconnected.	YELLOW WRENCH with once-per-second BEEP.	Connect Controller power cable to the PBU; or connect PBU Cable to the back of the PBU.

Switching Power Sources

How to Switch from Batteries to the Power Base Unit (PBU)

- 1 Make sure PBU is plugged in and turned on and that the PBU Cable is attached to the “Patient” socket on the back of the PBU.
- 2 Place black and white PBU connectors within easy reach.
- 3 Remove Batteries from their holsters or Pocket Pak™.
 **Note:** Press Battery Release Button on Battery Clip to remove Battery (**Figure 8**).
- 4 Unscrew **white** connector from the first Battery Clip. *An alarm will sound.*

WARNING !

At least one Controller lead must be connected to a power source (Battery, PBU, or EPP) at all times. Disconnecting both Controller leads at the same time will cause the pump to stop.

- 5 Put aside Battery and Battery Clip.
- 6 Connect the **white** PBU Cable connector to the **white** Controller connector.
The alarm will stop.

CAUTION !

- When connecting leads, do NOT force together connectors without proper alignment. Forcing together misaligned connectors may damage the connectors.
- Never use tools to tighten connections. Hand tighten only. Using tools may damage the connectors.
- Do NOT allow the connector ends to get dirty or wet.

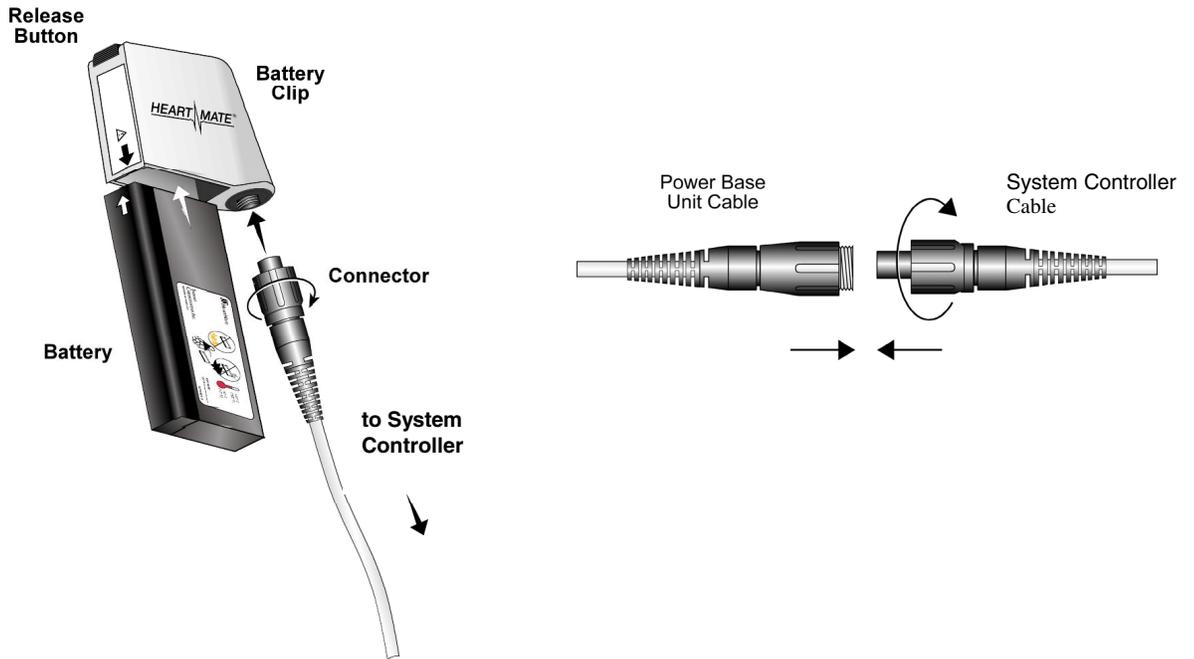
- 7 Unscrew **black** connector from the second Battery Clip. *An alarm will sound.*
- 8 Put aside Battery and Battery Clip.
- 9 Connect the **black** PBU Cable connector the **black** Controller connector. *The alarm will stop.*

 **Note:** Always connect white-to-white and black-to-black connectors.

Switching Power Sources continued

How to Switch from Batteries to the Power Base Unit

Figure 8



- 10 Turn over the Velcro dots on the Batteries so that the black sides are up (to show that the Batteries need to be charged).
- 11 Place Batteries into the PBU for recharging.
- 12 Store Battery Clips in a safe, clean place for future use.

Switching Power Sources continued

How to Switch from PBU to Batteries

- 1 Place two (2) Battery Clips, two (2) fully charged Batteries, and the white and black Power Base Unit (PBU) connectors within easy reach.
- 2 Place one fully charged Battery into each Battery Clip by aligning the arrows on the Battery and Battery Clip and pushing until you feel a “click” (**Figure 10**).
- 3 Unscrew the **white** Controller/PBU connectors. *An alarm will sound.*

WARNING !

At least one Controller lead must be connected to a power source (Battery, PBU, or EPP) at all times. Disconnecting both Controller leads at the same time will cause the pump to stop.

- 4 Put aside the PBU Connector, and then connect the **white** Battery Clip connector to the **white** Controller connector. *The alarm will stop.*

CAUTION !

- When connecting leads, do NOT force together connectors without proper alignment. Forcing together misaligned connectors may damage the connectors.
- Never use tools to tighten connections. Hand tighten only. Using tools may damage the connectors.
- Do NOT allow the connector ends to get dirty or wet.

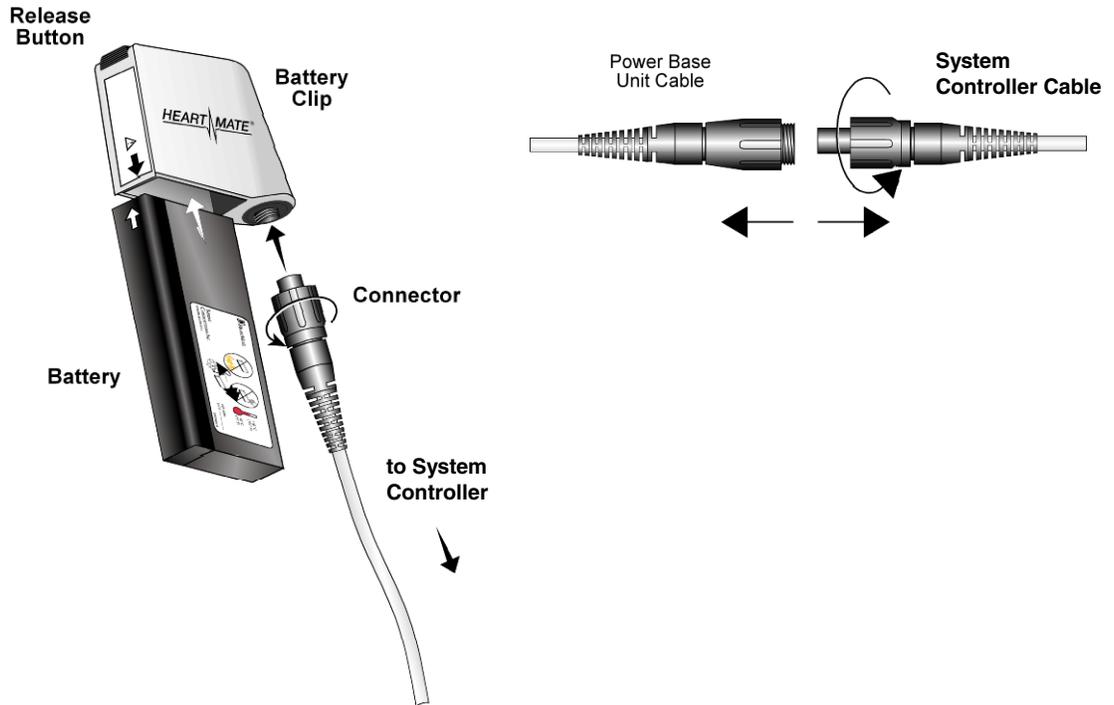
- 5 Unscrew the **black** Controller/PBU connectors. *An alarm will sound.*
- 6 Put aside the PBU connector. Connect the Battery Clip connector to the **black** Controller connector. *The alarm will stop.*
- 7 Place Battery Clips and Batteries into your holsters or Pocket Pak™.

continued

Switching Power Sources continued

How to Switch from PBU to Batteries

Figure 9



- 8 Store the PBU connectors in clean, safe place for future use.
- 9 Place at least two (2) fully charged Batteries into your Travel Case in case the first set runs low.

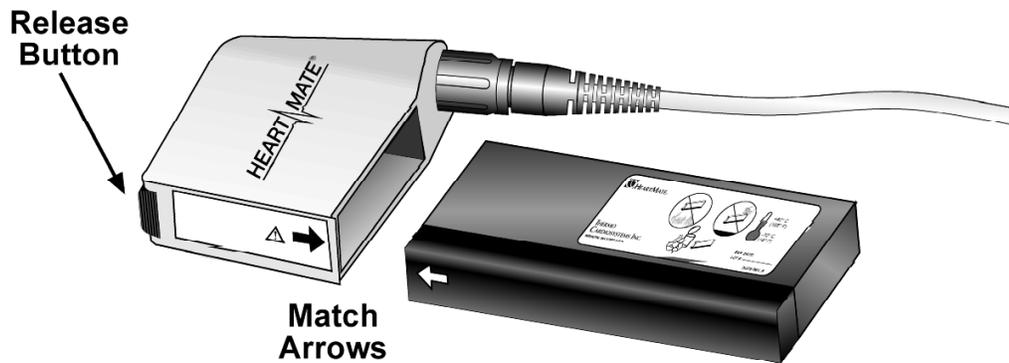
Changing Batteries

When your Batteries have about 15 minutes of power left, a YELLOW BATTERY symbol on the Controller will come on and a once-per-second BEEP will sound. This advisory means that you must change your Batteries.

How to Change the Batteries

- 1 Remove the Battery Clips and used Batteries from your holsters or Pocket Pak™.
- 2 Remove spare (fully-charged) Batteries from your Travel Case or from the PBU.
 - ✎ **Note:** Press the Battery Clip release button to remove the Battery from the Battery Clip.
- 3 Pull the first Battery out of the first Battery Clip. *An alarm will sound.*
- 4 Obtain a new Battery; then match the arrows on the new Battery and the Battery Clip.

Figure 10



- 5 Slide the new, fully charged Battery into the Battery Clip. *The alarm will stop.*
- 6 Repeat steps 2 – 5 with the second Battery/Battery Clip.
- 7 Turn over the Velcro dots on the used Batteries so that the black sides are up (to show that the Batteries need to be charged).
- 8 Place used Batteries into PBU for recharging.
- 9 Place new, fully-charged Batteries and Battery Clips into your holsters or Pocket Pak in case the first set runs low.

Using The Emergency Power Pack (EPP)

The EPP is a large, single-use battery to be used if you lose all electrical power (for example, during a power loss caused by a storm or severe weather). Each EPP provides about 24 hours of support under “normal” conditions (eg, reading a book, casual walking). The EPP will last for less time if your activity increases. *For example, if you exercise or have increased emotional stress, the EPP will last for less time.*

Each EPP is labeled with an expiration date. Do NOT use an expired EPP.

 **Note:** Before using your EPP for emergency power, you should first use all of your charged Batteries to power the pump. In this way, the EPP is saved until absolutely necessary; for example, if the power outage outlasts your supply of charged Batteries or longer than 24 hours.

How to Use the EPP

- 1 Open the top of the EPP and read the instructions inside.
- 2 Plug the cable provided with the EPP into the cable receptacle located on top of the EPP.
- 3 Unscrew the **white** Controller connector from the Battery or PBU. *An alarm will sound.*
- 4 Connect the **white** Controller connector to the **white** EPP connector. *The alarm will stop.*
- 5 Unscrew the **black** Controller connector from the Battery or PBU. *An alarm will sound.*
- 6 Connect the **black** Controller connector to the black EPP connector. *The alarm will stop.*
- 7 You are now connected to the EPP.
- 8 Contact your hospital contact person or local emergency service provider to make other arrangements for powering the pump if the power outage is expected to last longer than 24 hours.

continued

Using The Emergency Power Pack (EPP) continued

How to Use the EPP

9a If you use the EPP longer than three (3) hours, the EPP must be replaced.

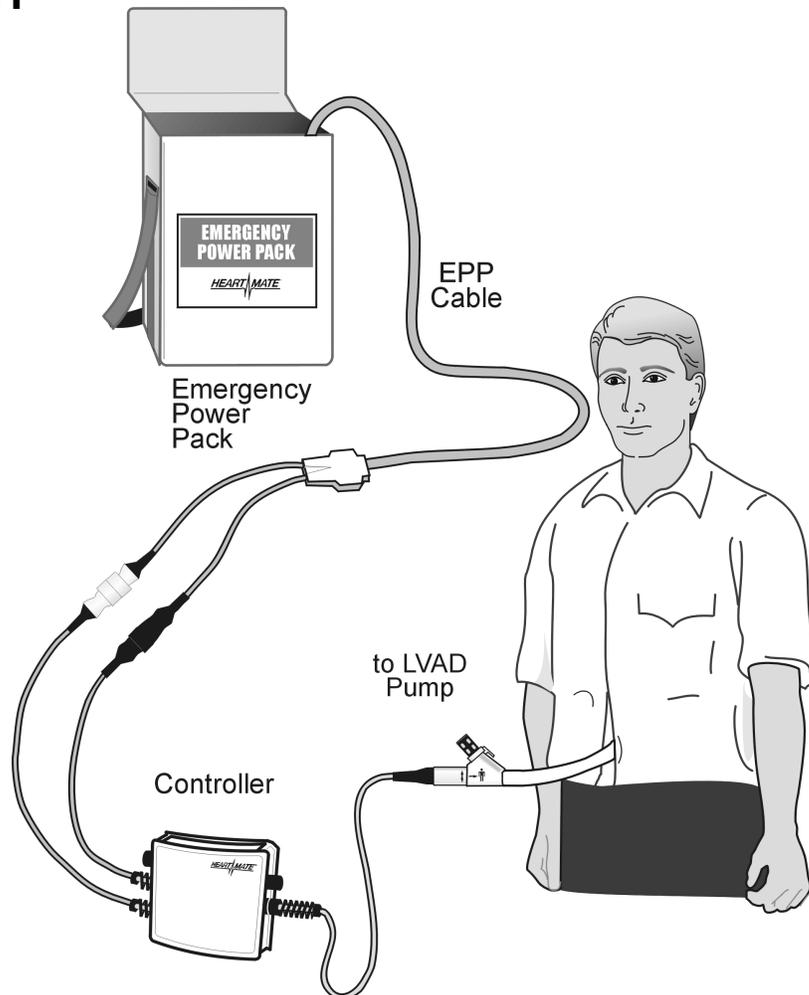
 **Note:** Discard of used EPP according to local, state or federal laws and regulations for battery disposal.

OR

9b If you use the EPP for less than three (3) hours, record how long you used the EPP on the EPP Usage Log included in the EPP.

 **Note:** The EPP may be used again, but only until the total time used equals a maximum of three (3) hours. *For example, you could use the EPP for 1½ hours the first time, ½ hour the second time, and 1 hour the third time (for a total of three hours) before having to replace it.*

Figure 11



Using The Emergency Power Pack (EPP) continued

WARNING !

- At least one Controller lead must be connected to a Battery or the Power Base Unit (PBU) at all times. Disconnecting both Controller leads at the same time will cause your pump to stop.
- Loss of power will cause the pump to stop. Power must be restored as soon as possible. If power cannot be restored, immediately start hand pumping with the Hand Pump.

CAUTION !

- When connecting cables, do NOT force together connectors without proper alignment. Forcing together misaligned connectors may damage the connectors.
- Never use tools to tighten connectors. Hand-tighten only. Using tools may damage the connectors.
- Do NOT let connector ends get dirty or wet.
- To prevent deterioration or damage to the EPP:
 - Do NOT leave or store EPP in hot areas (car trunks, etc.) or EPP life will be shortened.
 - Do NOT use EPP beyond its expiration date.
- Do NOT store or use the EPP in temperatures below 32° F (0° C) or above 122° F (50° C), or it may fail suddenly. If your EPP stays below room temperature (68-72° F, 20-23° C) during use, it will run the pump for less than 24 hours. At the low end of the temperature range (32° F, 0° C), run time will be reduced by 50%.
- Dispose of expired or used EPP according to local, state or federal laws and regulations for battery disposal. Do NOT incinerate.

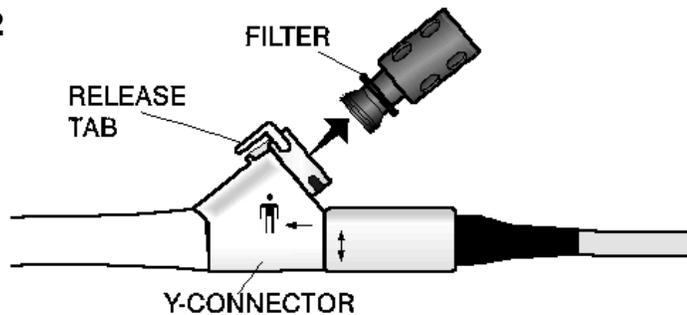
Changing the Vent Filter

The Vent Filter is found at the end of the Y-Connector. The filter should be changed once a week so that it does not become dirty or clogged. To change the filter, follow the steps below.

How to Change the Vent Filter

- 1 Place the new Vent Filter within easy reach.
- 2 Hold the Y-Connector in one hand; and, with your thumb, press the Vent Filter release tab.
- 3 Remove and discard the old filter.
- 4 Push the new filter into place (it will snap into position).
- 5 Gently pull on the filter to make sure that it is secure.

Figure 12



WARNING !

If your Percutaneous Tube (the tube passing through your skin) gets kinked or blocked, your pump could stop.

- Do NOT kink or block the tube.
- Avoid bandages or tight clothing that could block or kink the tube.

continued

Changing the Vent Filter

WARNING !

Make sure water does NOT enter the Percutaneous Tube or Vent Filter, or your pump could stop.

- Do NOT allow water or other fluid to enter the tube or Vent Filter.
- NEVER swim or take a bath while implanted with the pump.
- NEVER place the Vent Filter, Controller, or Batteries in water. Your doctor will let you know when you can shower. When you do shower, you must use the HeartMate Shower Kit.

Living With Your Heart Pump

Activities of Daily Living

Your HeartMate SNAP-VE LVAS was designed to let you stay active. Because each person is different, be sure to talk to your hospital contact person about your usual daily activities, or about changes in your daily activity level or routine. Any time you have questions or concerns, call your hospital contact person.

WARNING !

- Do NOT touch television or computer monitor screens. Television and computer monitor screens have strong static electricity. A strong static discharge can damage the electrical parts of the system and cause the pump to stop.
- Do NOT vacuum or engage in activities that generate static electricity. A strong static discharge can damage the electrical parts of the system and cause the pump to stop.
- Never have Magnetic Resonance Imaging (MRI) done while implanted with the HeartMate XVE Pump. Doing so may cause injury and could stop the pump.

CAUTION !

- Do NOT play contact sports or perform jumping activities while implanted with the pump. If you do, you could start bleeding or damage your pump.
- Your SNAP-VE LVAS uses lights and sounds to tell you how the system is operating. You may be at a higher risk of injury if you have difficulty hearing or seeing. If you have hearing or sight problems you may need special additional care – ask your hospital contact person.
- Always have a back-up Controller, spare Batteries, and a Hand Pump nearby at all times in case of emergency.
- During your regular doctor visits, have a doctor or nurse check your Hand Pump to make sure it is in good working order.
- NEVER take a bath or swim while implanted with the pump.
- Do NOT try to repair any of your SNAP-VE LVAS equipment yourself. If your equipment needs service, call your hospital contact person.
- Call your doctor immediately if you notice a change in how your pumps sounds, feels, or works.

Sleeping

You must ALWAYS be attached to the Power Base Unit (PBU) when sleeping. This is extremely important because you may not hear the Controller's low battery alarms if you fall asleep while connected to Battery power.

Try not to pull on or move the tube while sleeping. For example, do not allow the tube or cable to become entangled in clothing or blankets during sleep. To help reduce tube movement, you can wrap an elastic bandage lightly around your thigh, with the cables crossing through one of the layers; or, you may use the HeartMate Night Belt, which attaches the Controller to your thigh. If a Night Belt is used, place the Controller into the Night Belt pocket and then securely fit the belt to your thigh, with the belt pocket facing away out.

Be sure to follow these important sleep guidelines!

- Plan to sleep only when connected to the PBU.
- Prior to sleep, inspect all electrical connections to make sure they are secure.
- Do NOT sleep on your stomach – most HeartMate patients are more comfortable sleeping on their back.
- During sleep, keep the Vent Filter free from items (such as clothing or blankets) that might restrict air flow.
- Keep a Hand Pump and a back-up System Controller near you when sleeping.

Showering

When your exit site is healed, you will probably be allowed to shower. Your doctor will let you know when you can shower. When you do shower, the HeartMate Shower Kit must be used to protect the Controller and Vent Filter from getting wet. The exit site must be kept as dry as possible when showering. Keeping the exit site dry helps avoid infections.

Be sure to **follow the directions in the HeartMate Shower Kit** when you shower.

WARNING !

- NEVER place the Vent Filter, Controller or Batteries in water.
- Do NOT take a shower without your doctor's approval.
- Use the HeartMate Shower Kit (read the Shower Kit directions first) when you do shower.
- When you shower, make sure that water does NOT enter the Percutaneous Tube or Vent Filter, or your pump may stop suddenly.
- Keep the Power Base Unit (PBU) away from water. If the PBU has contact with water, shower spray, or wet surfaces, the pump may stop.

CAUTION !

NEVER take a bath or swim while implanted with the pump.

Caring for the Exit Site (where the tube passes through your skin)

It is very important to keep the area where the Percutaneous Tube passes through your skin clean and dry at all times. While you are in the hospital, a nurse will take care of the exit site. When you return home, you will be responsible for caring for the site.

Before leaving the hospital, you will be taught how to take care of the exit site. You will learn how to change the dressing (bandage), clean the site, and check for signs of infection, such as redness or swelling.

If you have any concerns about your exit site, or notice any changes (even if the site is not painful), call your doctor right away.

CAUTION !

Try not to pull or move the tube passing through your skin. Pulling on or moving the tube could prolong the healing process or interrupt an already healed exit site.

CAUTION !

NEVER take a bath or swim while implanted with the pump.

Pump Replacement

Exactly how long it takes before your pump needs to be replaced depends on several factors, including how much help your heart needs and how long the pump stays in your body.

When it is time for your pump to be replaced, you will need to have another operation, similar to the implant surgery you had for your first pump. Before your pump is replaced, ask your doctor or hospital contact person to explain the procedure and potential complications.

Handling Emergencies

What Is An Emergency?

An “emergency” exists whenever the heart pump cannot pump enough blood at the proper rate. Examples of situations that might affect how the pump works include (but are not limited to) the following:

- Loss of power to the pump.
- Broken wires or a blocked tube.
- Damage to the pump motor.
- Fluid in the Percutaneous Tube or Vent Filter.

If the system is not working as it should, the Controller will sound an alarm (see the “Controller Warning Lights and Sounds,” page 11).

Call your doctor immediately if you notice a sudden change in how your pump works, feels, or sounds (even if there is no alarm).

How to Handle an Emergency

It is important to stay **calm** during an emergency! Remember - Most pump problems are **easy to solve**.

When the Pump is Running

If a problem happens while your pump is running, you should...

- 1 Check all cable connections.
- 2 Reconnect any loose or disconnected cables.
- 3 Call your doctor or hospital contact if reconnecting the cables does not fix the problem.

What Is An Emergency? continued

When the Pump has Stopped (Red Heart Alarm)

- 1 Check the Percutaneous Tube to make sure it is not kinked. If tube is kinked, unkink it.
- 2 Check the Vent Filter to make sure it is not blocked. If Vent Filter is blocked, remove obstruction.
- 3 If the RED HEART Alarm continues (even if Percutaneous Tube is not kinked and the Vent Filter is not blocked) call your hospital contact person or dial 911.
 **Note:** Dial 911 immediately if you cannot restart the pump so that help will be on its way while you are hand pumping.
- 4 Prepare to hand pump (see page 47).

What Is An Emergency? continued

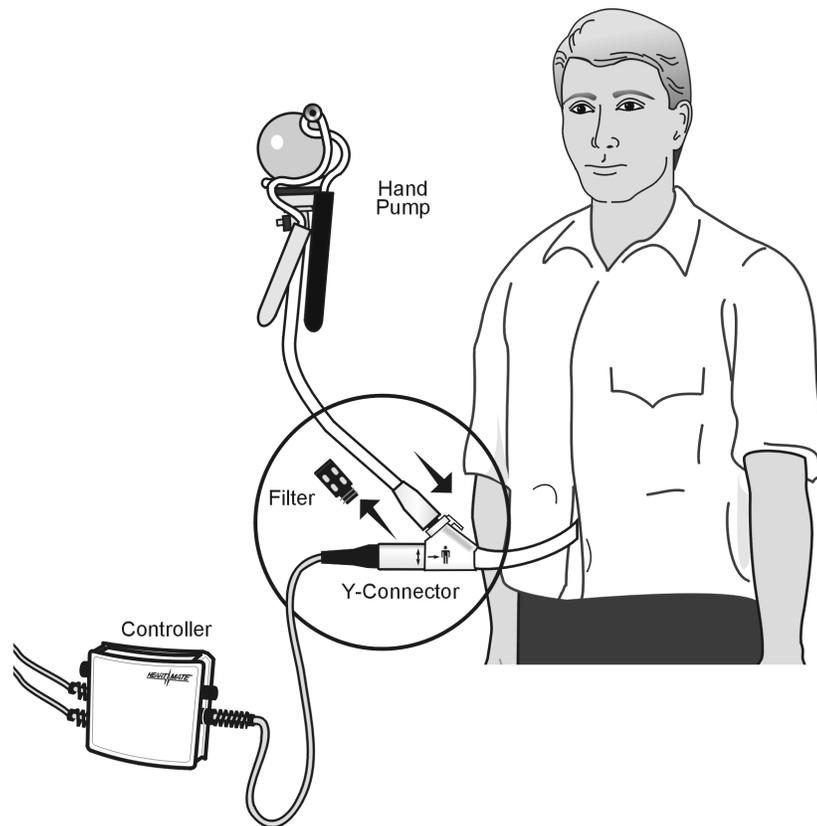
How to Hand Pump

- 1 Disconnect System Controller from power source (Batteries, PBU or EPP).

 **Note:** ALWAYS disconnect the System Controller from its power source before hand pumping. The Controller will sound a STEADY AUDIO TONE after it is disconnected from power. To silence the alarm, remove the Battery Module from the bottom of the System Controller.

- 2 Remove Vent Filter and connect Hand Pump to the Vent Port of the Y-Connector (**Figure 13**).

Figure 13



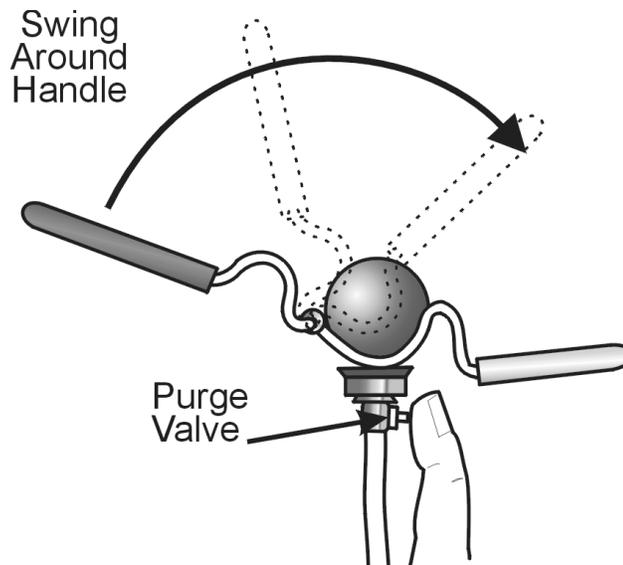
continued

What Is an Emergency continued

How to Hand Pump

- 3 Press down and hold the white purge valve on the Hand Pump (**Figure 14**).

Figure 14



- 4 Collapse the bulb using your thumb.
- 5 Release white purge valve.
- 6 Release bulb.
- 7 Wait about ten (10) seconds, then press the white purge valve again and let the bulb inflate.
- 8 Begin hand pumping by bringing together pump handles and releasing them at a rate of 60 – 80 pumps a minute.
 -  **Note:** Do NOT exceed 90 beats per minute. Work the handles to the full stroke of the bulb; allowing the bulb to inflate fully after each cycle.
- 9 Continue hand pumping until help arrives or unless told by your doctor to restart your pump.
 -  **Note:** Make sure that the bulb inflates completely between cycles. If it does not, depress and hold the white purge vent for 10 seconds; then release the purge valve and resume pumping.

continued

What Is an Emergency? continued

How to Hand Pump

- 10 If your doctor tells you to try restarting your pump, you should...
 - a) Switch to a different power source than you were using before.
For example, if you were using your Batteries when the problem started, switch to PBU power.
 - b) Change the Controller (see “How to Change the Controller,” page 15).
- 11 If switching power sources and changing the Controller does not fix the problem, reconnect the Hand Pump and begin hand pumping again.
- 12 Keep hand pumping until help arrives.

WARNING !

Never store the Hand Pump with the bulb in the collapsed position or it may not work properly when needed.

CAUTION !

During your regular doctor visits have a doctor or nurse check your Hand Pump to make sure it is in good working order.

Authorized European Union Representative

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Safety Testing and Classification



Medical electric equipment
With respect to electric shock,
fire, mechanical and other
specified hazards only in
accordance with
UL 2601-1 and CAN/CSA C22.2
No. 601.1 7D72



