

# SMRT™ Power System

Model 6500

# stryker®

## Operations / Maintenance Manual



For parts or technical assistance:  
USA: 1-800-327-0770 (option 2)



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# Symbols and Definitions

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Warning, consult accompanying documentation



Alternating Current



Direct Current



Class II

**IPX0**

Ordinary Equipment

**IPX6**

Protection from Powerful Jets



Medical Equipment Classified by Canadian Standards Association in Accordance with UL 60601-1, and CAN/CSA C22.2 No. 601.1-M90, IEC 60601-1.



In accordance with **European Directive 2002/96/EC** on Waste Electrical and Electronic Equipment (**WEEE**), this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to your local distributor for return and/or collection systems available in your country.



The Rechargeable Battery Recycling Corporation (RBRC) is a non-profit, public service organization that promotes the recycling of portable rechargeable batteries. Batteries must be delivered to a battery collection site. Visit the RBRC website ([www.rbrc.org](http://www.rbrc.org)) to find a nearby collection site or call the phone number shown on the recycling symbol.



Manufacturer



Consult instructions for use

# Symbols and Definitions

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## WARNING/CAUTION/NOTE DEFINITION

The words WARNING, CAUTION and NOTE carry special meanings and should be carefully reviewed.

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### **WARNING**

Alerts the reader about a situation, which if not avoided, could result in death or serious injury. It may also describe potential serious adverse reactions and safety hazards.

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### **CAUTION**

Alerts the reader of a potentially hazardous situation, which if not avoided, may result in minor or moderate injury to the user or patient or damage to the equipment or other property. This includes special care necessary for the safe and effective use of the device and the care necessary to avoid damage to a device that may occur as a result of use or misuse.

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### **NOTE**

This provides special information to make maintenance easier or important instructions clearer.

# Introduction

This manual is designed to assist you with the operation and maintenance of the SMRT™ Power System. Read it thoroughly before using the equipment or beginning any maintenance on it.

## INTENDED USE OF PRODUCT

SMRT™ Paks are intended for use with Power-PRO™ XT, Power-PRO™ TL, and Power-PRO™ IT cots.

The SMRT™ Pak is intended for use with the SMRT™ Charger only.

## PRODUCT ILLUSTRATION

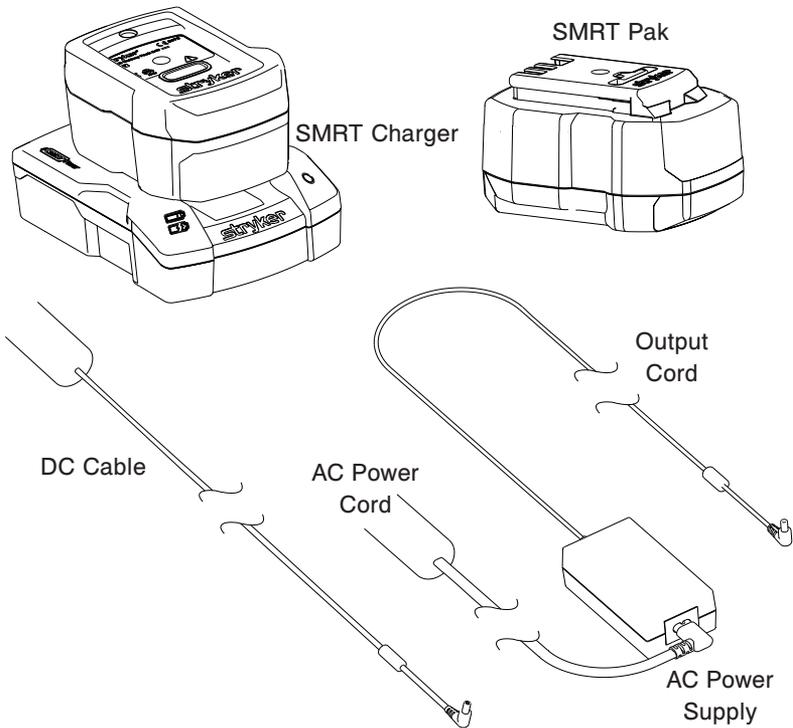


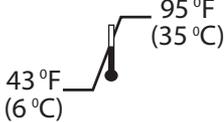
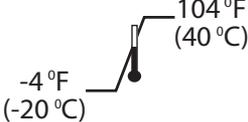
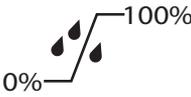
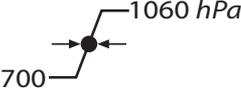
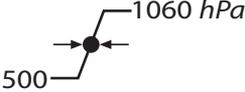
Figure 1: SMRT Power System

# Introduction

## SPECIFICATIONS

Model	SMRT Charger	SMRT Pak	AC Power Supply
<b>Electrical Input</b>	12V $\equiv$ 4.16 A	Not applicable	100-240V $\sim$ 1.20 A, 50/60Hz
<b>Electrical Output</b>	Open Circuit 40V $\equiv$ 1.20 A	24V $\equiv$	12V $\equiv$ 4.16 A
<b>Size</b>	2.375 in. [60.325 mm] height 5.125 in. [130.175 mm] width 7 in. [177.8 mm] length	3.25 in. [82.55 mm] height 4 in. [101.6 mm] width 5.75 in. [146.05 mm] length	1.61 in. [40.89 mm] height 2.56 in. [65.02 mm] width 4.72 in. [119.89 mm] length
<b>Weight</b>	1.3 lbs. [.59 kg]	3.8 lbs. [1.7 kg]	.61 lb. [.28 kg]
<b>Enclosure Protection</b>	IPX0	IPX6	IPX0
<b>Equipment Type</b>	Not applicable	Not applicable	 Class II

<b>Charger Duty Cycle</b>	Continuous Operation		
<b>Charger Approvals</b>	 MC160169	CSA International CAN/CSA-C22.2 No. 601.1-M90 UL 60601-1 IEC 60601-1	

Environmental Conditions	Operation and Charging	Storage and Transportation
<b>Temperature</b>		
<b>Relative Humidity</b>		
<b>Atmospheric Pressure</b>		

Specifications are approximate and may vary from unit to unit or as a result of power supply fluctuations. Stryker reserves the right to change specifications without notice.

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# Introduction

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## CONTACT INFORMATION

Contact Stryker Customer Service or Technical Support at (800) 327-0770 or (269) 324-6500.

Stryker Medical  
3800 E. Centre Avenue  
Portage, MI 49002  
USA

Please have the serial number of your Stryker product when calling Stryker Technical Support. Include the serial number in all written communication.

The serial number for the SMRT Charger is located on the bottom of the unit. The lot number for the SMRT Pak is located on the top of the SMRT Pak (above the red release button).

# Summary of Safety Precautions

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Carefully read and strictly follow the warnings and cautions listed on these pages. Service only by qualified personnel.

---

## **WARNING**

- When charging a SMRT Pak in an ambulance, locate the SMRT Charger in an enclosed cabinet and out of patient reach during transport.
  - To comply with established ambulance crash test standards, mount the SMRT Charger to the optional mounting bracket in an enclosed cabinet and out of patient reach during transport.
  - For ambulance installation, a certified mechanic that is familiar with ambulance requirements should install the optional mounting bracket and the SMRT Charger. Improper SMRT Charger installation may cause injury to the patient or operator and/or damage to the SMRT Charger or SMRT Pak.
  - Ensure that the mounting bracket is securely attached to the surface.
  - If the SMRT Pak is cracked or damaged, do not insert it into the SMRT Charger. Return damaged SMRT Paks to a service center for recycling.
  - To reduce the risk of electric shock, do not remove the SMRT Pak when the Power-PRO cot is activated.
  - Always wear rubber gloves when cleaning the SMRT Charger to reduce the risk of injury.
  - To avoid electrical hazards, always disconnect the SMRT Charger from the wall outlet before cleaning.
  - Do not spray fluid directly onto the SMRT Charger.
  - Do not power wash the SMRT Charger.
  - To reduce the risk of electric shock, do not immerse the SMRT Charger in liquid.
  - Do not use solvents, lubricants, or other chemicals to clean the SMRT Charger unless otherwise directed.
  - To reduce the risk of electric shock, do not allow water to collect on top of the SMRT Charger.
  - In addition to personal protective equipment (PPE), always wear insulative rubber gloves when cleaning the SMRT Pak to reduce the risk of injury.
  - While power washing, use any appropriate personal safety equipment (goggles, respirator, etc.) to avoid the risk of inhaling contagion. Use of power washing equipment can aerate contamination collected during the use of the cot.
  - To reduce the risk of injury, do not directly handle or make contact with the SMRT Pak terminals while cleaning.
  - Use only non-conductive materials to wipe the SMRT Pak clean.
-

# Summary of Safety Precautions

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## **WARNING (CONTINUED)**

- To reduce the risk of injury, do not directly handle or make contact with the SMRT Pak terminals while rinsing.
- Avoid excessive water exposure to the SMRT Pak terminals.
- To reduce the risk of electric shock, do not immerse the SMRT Pak in liquid.
- Do not use solvents, lubricants, or other chemicals to clean the SMRT Pak unless otherwise directed.
- Refer to the disinfectant's Material Safety Data Sheet (MSDS) to verify the pH range. Disinfectants with pH levels higher than 10.5 cause the SMRT Pak housing material to crack.
- Use only Stryker-approved parts. Other parts may result in increased electromagnetic emissions or decreased electromagnetic immunity of the system. Do not modify any parts. Failure to comply may result in injury.
- Always maintain the SMRT Charger in an area that is free of moisture and dust, and especially metallic or conductive materials including, but not limited to, steel wool, aluminum foil, grinding dust, or salt spray.
- Do not use this equipment in the presence of a mixture consisting of flammable anesthetic and air or oxygen or nitrous oxide.
- Take special precautions regarding electromagnetic compatibility (EMC) when using medical electrical equipment like the SMRT Charger. Install and place the SMRT Charger into service according to the EMC information in this manual. Portable and mobile RF communications equipment can affect the function of the SMRT Charger.
- Do not operate the SMRT Charger using a voltage inconsistent with the rating on the back of the unit.
- Always recharge SMRT Paks with SMRT Chargers. Failure to comply may result in injury.
- Always place and maintain the power cord such that it will not be damaged or cause a hazard.
- Never use a SMRT Charger that has a damaged housing, damaged power supply, or damaged power cord. Failure to comply may result in electric shock or fire. Before attempting any maintenance or cleaning, ALWAYS disconnect the power cord from the SMRT Charger to reduce the risk of electric shock. Never clean the SMRT Charger when it is connected to an electrical power source.
- To reduce the risk of electric shock, never attempt to open the SMRT Charger or SMRT Pak for any reason.
- Avoid direct contact with a wet SMRT Pak or SMRT Charger. Contact may cause injury to the patient or operator.

# Summary of Safety Precautions

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## WARNING (CONTINUED)

- Inspect SMRT Paks for damage before every use. Do not charge or use if there is any evidence of damage. During cleaning, moisture may enter a cracked housing and damage the electrical components or cause leaking or venting of battery electrolyte. This may result in chemical burns of skin and eyes.
  - Never incinerate the SMRT Pak, even if it is severely damaged, because the SMRT Pak can explode in a fire.
  - Never short-circuit the SMRT Pak by connecting the terminals with any conductive material.
- 

## CAUTION

- Only use the SMRT Pak and SMRT Charger as specified.
  - Place the electrical power cord where it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
  - Do not touch the SMRT Pak receptacle terminals with metal objects.
  - To reduce the risk of damage to the electrical plug and cord, grasp and pull the plug, not the cord when disconnecting the SMRT Charger.
  - Make sure that the SMRT Pak is fully charged prior to placing into service. An uncharged or depleted SMRT Pak may cause poor cot performance.
  - Remove the SMRT Pak if the Power-PRO cot is not going to be used for an extended period of time (over 1 week).
  - Remove the SMRT Pak before washing the Power-PRO cot. See [page 26](#) for cleaning instructions.
  - Dry the SMRT Paks before placing them in the SMRT Charger to avoid damage to the batteries or charger.
  - Replace a SMRT Pak in the Power-PRO cot at the first indication that it is losing power. Using a SMRT Pak until it is completely drained may cause permanent damage and will shorten the life and output of the SMRT Pak.
- 

## NOTE

- The cot indicator LED does not have to flash RED before removing and charging the SMRT Pak, however this is considered to be a “best practice.”
- For extended storage, the SMRT Pak should remain on the SMRT Charger to trickle charge and ensure that the SMRT Pak remains fully charged. The SMRT Charger keeps the SMRT Pak charged and ready for use.
- To maximize available battery power, only use SMRT Paks that have been fully charged within the last 48 hours.
- Fully charge the SMRT Pak for two hours before troubleshooting the Pak.

# General Inspection

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The condition of the SMRT Charger and SMRT Pak is the responsibility of the owner. Have a qualified service person use the following list and the operation instructions to check the SMRT Charger and SMRT Pak before the product is put into service.

Unpack the cartons and check all items for proper operation.

Item	Routine	Page
SMRT Charger and SMRT Pak	Unpack batteries and charger Charge SMRT Pak according to instructions	<a href="#">21</a>
AC Power Components	Check the AC power supply for any damage Check the AC power cord for any damage	N/A
DC Power Components	Check the DC cable for any damage	N/A
Accessories	Check the mounting bracket for any damage	N/A

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 **WARNING**

When charging a SMRT Pak in an ambulance, locate the SMRT Charger in an enclosed cabinet and out of patient reach during transport.

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# Compatibility Information

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## COT COMPATIBILITY

The Stryker SMRT Pak is designed to be compatible with the Power-PRO XT, Power-PRO TL, and Power-PRO IT cots. The 24 VDC Power-PRO system and the SMRT Pak is rated for 2.4 amp-hours of electric energy. A SMRT Pak that is in good working condition and is fully charged provides up to 15-20 “calls” with a 250 pound patient (actual results may vary).

Running the SMRT Pak repeatedly, without rest periods, can increase the temperature within the cells and reduce life. For example, lifting a heavy patient up and down several times in rapid succession can reduce the SMRT Pak life.

For best results, use the SMRT Pak on the Power-PRO cot until the cot indicator LED changes from GREEN to flashing RED.

**Note:** The cot indicator LED does not have to flash RED before removing and charging the SMRT Pak, however this is considered to be a “best practice.”

Once the SMRT Pak has been discharged, remove the SMRT Pak from the Power-PRO cot and replace it with a fully charged SMRT Pak.

## CHARGER COMPATIBILITY

The Stryker SMRT Pak is intended for use with the Stryker SMRT Charger only.

# Charger Installation

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## INSTALLING THE SMRT CHARGER

When installing the SMRT Charger:

- Locate the SMRT Charger in an environmentally controlled location that is free of excessive dust and moisture.
- Locate the SMRT Charger in an area that is kept within a constant temperature range. An allowable temperature range is 43°F to 95°F (6°C to 35°C). The optimal temperature range is 65°F to 75°F (18°C to 24°C).
- Position the SMRT Charger where it can be readily accessed.
- Locate and maintain the power supply and power cords to minimize the risk of damage and inadvertent disconnections.

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### **WARNING**

To comply with established ambulance crash test standards, mount the SMRT Charger to the optional mounting bracket in an enclosed cabinet and out of patient reach during transport.

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To mount the SMRT Charger to a horizontal or vertical surface, follow the steps on [page 16](#) to install the optional mounting bracket.

## ELECTRICAL POWER INSTALLATION REQUIREMENTS

When configuring the electrical power source for SMRT Charger installation, reference the following electrical power requirements to ensure reliable and effective operation.

Power Type	Operational Voltage Range	Frequency	Maximum Current Draw	Standby Current Draw	Low Voltage Shut Off
AC	100-240 VAC	50/60 Hz	1.20 A	0.05 A	N/A
DC	12.5-16.0 VDC	N/A	4.16 A	0.20 A	10 VDC

# Charger Installation

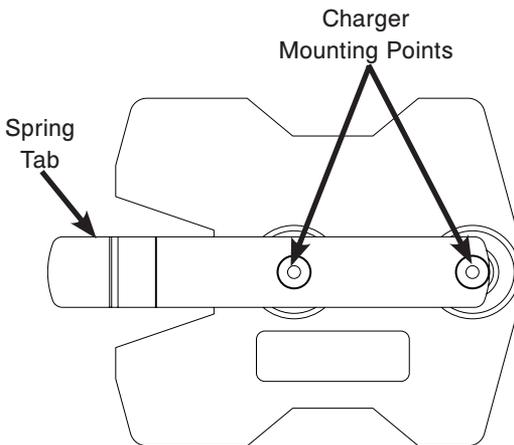
## INSTALLING THE OPTIONAL MOUNTING BRACKET

### WARNING

- For ambulance installation, a certified mechanic that is familiar with ambulance requirements should install the optional mounting bracket and the SMRT Charger. Improper SMRT Charger installation may cause injury to the patient or operator and/or damage to the SMRT Charger or SMRT Pak.
- When charging a SMRT Pak in an ambulance, locate the SMRT Charger in an enclosed cabinet and out of patient reach during transport.

To install the optional mounting bracket (Figure 2):

1. Use the SMRT Charger mounting bracket as a template to mark the location of the mounting holes at the area where the mounting bracket will be installed.



**Figure 2: Mounting Bracket**

# Charger Installation

## INSTALLING THE OPTIONAL MOUNTING BRACKET (CONTINUED)

2. Position the mounting bracket, by making sure that the:
  - Spring tab is located at the rear of the SMRT Charger.  
**Note:** When mounting the bracket to a vertical surface, the spring tab should be horizontal with the spring tab pointing to the left as shown in Figure 2 on [page 16](#).
  - Power cord easily plugs into the rear of the SMRT Charger.
  - SMRT Charger slides from front to back to engage the bracket after mounting.
  - Bracket is installed correctly for the ambulance or station location:

Location	Considerations
Ambulance	<ul style="list-style-type: none"><li>• Secure the bracket to a horizontal structural support surface or shelf using size #10, grade 5 screws minimum (not supplied).</li><li>• Make sure that the selected mounting surface is strong enough to securely hold the SMRT Charger and SMRT Pak during transport.</li><li>• Locate the bracket in an enclosed cabinet and out of patient reach during transport.</li><li>• Allow for easy SMRT Pak installation and removal.</li><li>• Locate the power supply within reach of the power cord.</li></ul>
Station	<ul style="list-style-type: none"><li>• Secure the bracket to a horizontal or vertical structural support surface using size #10, grade 5 screws minimum (not supplied).</li><li>• For vertical installation, position the mounting bracket, so the spring tab is directly below the mounting screws to ensure that the SMRT Pak remains supported by the SMRT Charger even if the release button is accidentally pressed.</li><li>• Allow for easy SMRT Pak installation and removal.</li><li>• Locate the power supply within reach of the power cord.</li></ul>

### WARNING

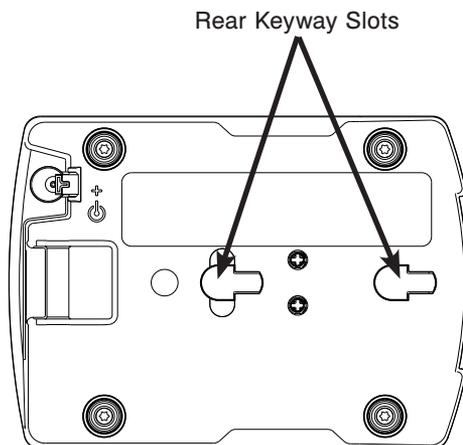
Ensure that the mounting bracket is securely attached to the surface.

# Charger Installation

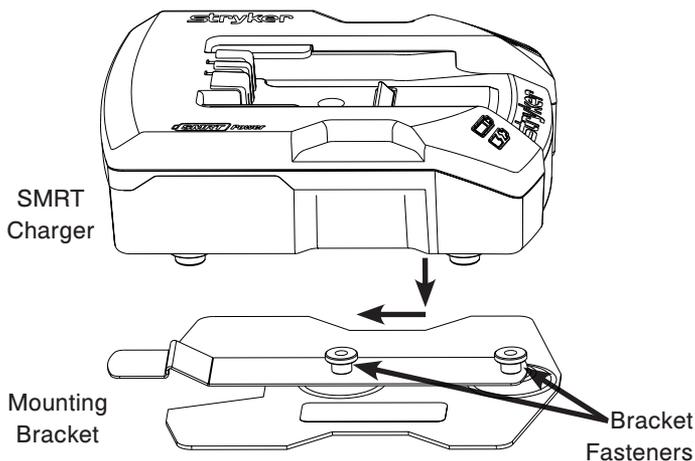
## INSTALLING THE CHARGER ONTO THE OPTIONAL MOUNTING BRACKET

To install the SMRT Charger onto the optional mounting bracket:

1. Align the rear keyway slots (Figure 3) onto the bracket fasteners (Figure 4).
2. Slide the SMRT Charger in until it locks into the mounting bracket as shown in Figure 4. Make sure that the SMRT Charger is fully engaged and secured onto the bracket.



**Figure 3: Charger Rear Keyway Slots**



**Figure 4: Installing the Charger**

# Charger Features

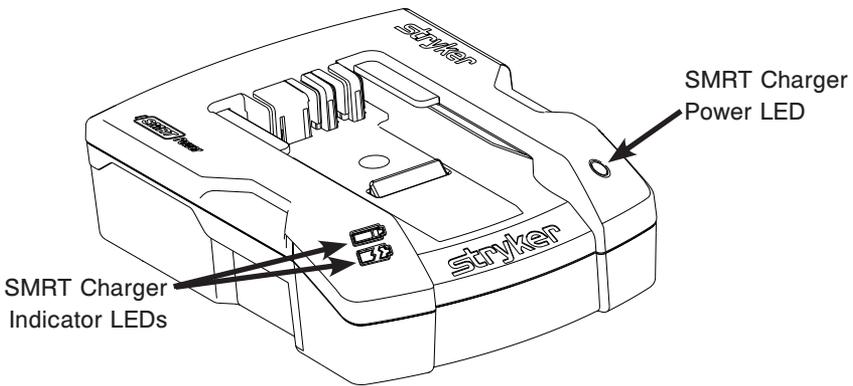


Figure 5: Charger Features

- **Power connection** - Use this outlet to connect or disconnect the SMRT Charger from the appropriate power source as shown in Figure 6 on [page 20](#).
- **SMRT Charger power LED** - The GREEN power LED provides charger status information. If the LED is illuminated, then the SMRT Charger has power.
- **SMRT Charger indicator LEDs** - The GREEN and AMBER charger indicator LEDs provide SMRT Pak status information. The LEDs may be in a steady or flashing state based on the condition of the SMRT Charger or SMRT Pak.

SMRT Charger Indicator LED	Status
GREEN (flashing)	SMRT Charger is charging the SMRT Pak. The optimum charge time is two hours.
GREEN (solid)	SMRT Pak is fully charged and ready for use.
AMBER (flashing)	SMRT Pak temperature delay. The SMRT Charger is waiting for the SMRT Pak to reach an allowable temperature range of 43°F to 95°F (6°C to 35°C).
AMBER (solid)	SMRT Pak error. See <a href="#">page 29</a> for additional troubleshooting information.

# Charger Operation

## POWERING THE CHARGER

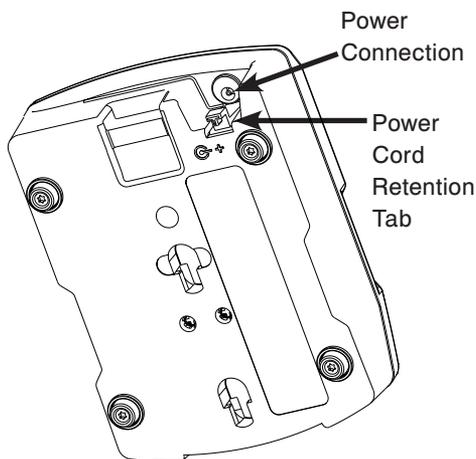
### CAUTION

- Place the electrical power cord where it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- Do not touch the SMRT Pak receptacle terminals with metal objects.

To power the SMRT Charger:

1. Locate the power connection on the back of the SMRT Charger (Figure 6).
2. Push the power cord retention tab in to insert the power cord outlet connector into the SMRT Charger power connection.
3. Plug the power adaptor end of the power cord into the power source.

It is a best practice to use a clean, uninterruptible power source. The SMRT Charger continuously illuminates a solid GREEN power LED when it is properly connected to a power supply.



**Figure 6: Powering the Charger**

Use only Stryker-approved parts to power the SMRT Charger. For a list of Stryker-approved parts, see [page 32](#).

## DISCONNECTING THE CHARGER

### CAUTION

To reduce the risk of damage to the electrical plug and cord, grasp and pull the plug, not the cord when disconnecting the SMRT Charger.

To disconnect the SMRT Charger, unplug the power cord from the AC or DC power source.

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# Charger Operation

## CHARGING THE BATTERY

### Note:

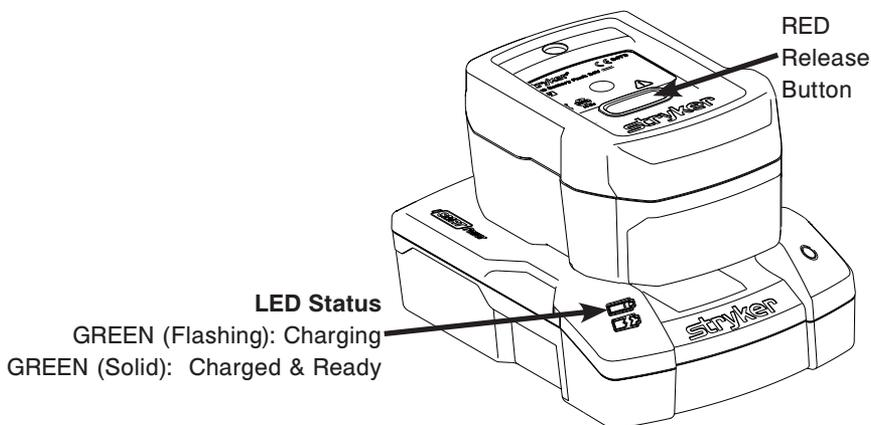
- For extended storage, the SMRT Pak should remain on the SMRT Charger to trickle charge and ensure that the SMRT Pak remains fully charged. The SMRT Charger keeps the SMRT Pak charged and ready for use.
- The SMRT Pak should be at room temperature, within the allowable temperature charge range of 43°F to 95°F (6°C to 35°C). Charging the SMRT Pak outside of this recommended temperature range reduces SMRT Pak life and extends charge time.

### WARNING

If the SMRT Pak is cracked or damaged, do not insert it into the SMRT Charger. Return damaged SMRT Paks to a service center for recycling.

To charge the SMRT Pak:

1. Insert a clean, dry SMRT Pak into the SMRT Charger. Make sure that the SMRT Pak is properly seated. The SMRT Pak locks into the SMRT Charger.
2. The SMRT Charger indicator LED will flash GREEN while charging. The optimum charge time is two hours.
3. When the SMRT Pak is fully charged and ready, the charger indicator LED turns to solid GREEN, as shown in Figure 7.
4. Press the RED release button (Figure 7) and slide the SMRT Pak to release the fully charged and ready SMRT Pak from the SMRT Charger.



**Figure 7: SMRT Charger GREEN Indicator LED**

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# Charger Operation

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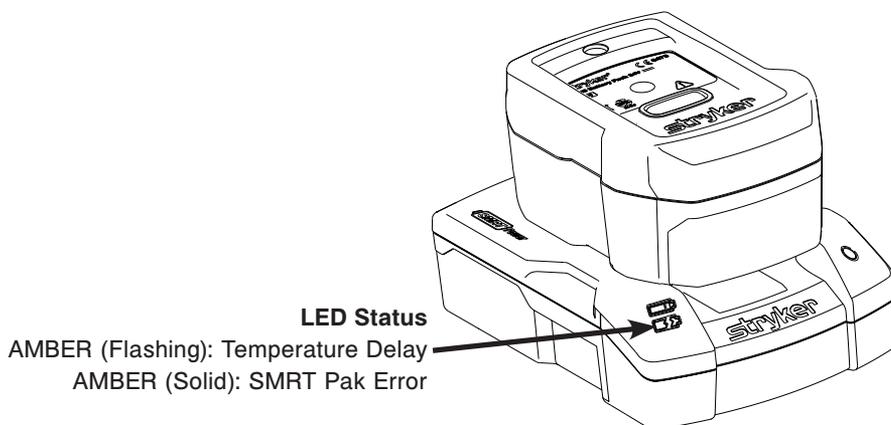
The AMBER indicator LED as shown in Figure 8 also provides battery status information.

## SMRT PAK TEMPERATURE DELAY

A flashing AMBER indicator LED indicates a SMRT Pak temperature delay. The SMRT Charger is waiting for the SMRT Pak to reach an allowable temperature range of 43°F to 95°F (6°C to 35°C).

## SMRT PAK ERROR

A solid AMBER indicator LED indicates a SMRT Pak error. See [page 29](#) for additional troubleshooting information.



**Figure 8: SMRT Charger AMBER Indicator LED**

# Battery Operation

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## BATTERY CONSIDERATIONS

- Fully charge all SMRT Paks prior to use.
- Replace a discharged SMRT Pak with a fully charged and ready SMRT Pak.
- Remove the SMRT Pak from the Power-PRO cot or SMRT Charger before cleaning.
- The SMRT Pak is sealed and can be power washed separately. See [page 26](#) for cleaning instructions.

## REPLACING THE BATTERY

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### WARNING

To reduce the risk of electric shock, do not remove the SMRT Pak when the Power-PRO cot is activated.

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The Power-PRO cot indicator LED flashes RED when the SMRT Pak needs to be recharged or replaced. However, the SMRT Pak can be removed and charged at anytime. The SMRT Charger properly manages charging regardless of the SMRT Pak charge state.

The SMRT Pak can remain on the Power-PRO cot between service calls for up to one week or until the cot indicator LED flashes RED.

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### CAUTION

Make sure that the SMRT Pak is fully charged prior to placing it into service. An uncharged or depleted SMRT Pak may cause poor cot performance.

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The Power-PRO cot indicator LED is solid GREEN when the SMRT Pak is fully charged or has adequately charged battery power.

## STORING THE BATTERY

All batteries lose charge during storage or periods of inactivity. A SMRT Pak can lose up to 30 percent of its charge within 48 hours after being removed from the SMRT Charger. Stored SMRT Paks should be used and fully charged every three months to maintain top performance.

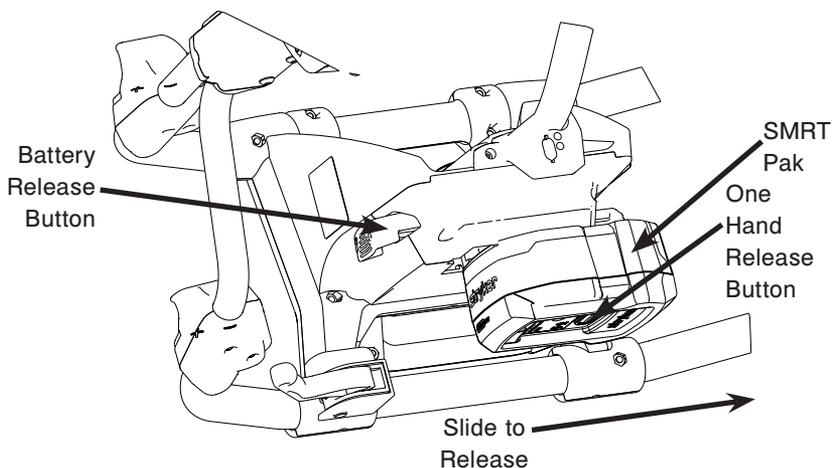
# Battery Operation

## REMOVING THE BATTERY FROM THE COT

To remove the SMRT Pak from the Power-PRO cot:

1. Press the RED one hand release button or push the battery release button to release the SMRT Pak from the cot as shown in Figure 9.
2. Slide the released SMRT Pak out of the enclosure.

## REINSTALLING OR REPLACING THE BATTERY



**Figure 9: SMRT Pak Removal and Replacement**

**Note:** To maximize available battery power, only use SMRT Paks that have been fully charged within the last 48 hours.

To reinstall or replace the SMRT Pak into the Power-PRO cot:

1. Align the tabs in the battery enclosure.
2. Push the SMRT Pak into the enclosure until the latch clicks into place.
  - The cot indicator LED is solid GREEN if the SMRT Pak is fully charged and ready.
  - The cot indicator LED flashes RED if the SMRT Pak needs to be recharged or replaced.

# Cleaning

---

## RECOMMENDED CLEANERS

In general, when used in those concentrations recommended by the manufacturer, either phenolic type or quaternary (**excluding Virex® TB**) type disinfectants can be used. Iodophor type disinfectants are not recommended for use because staining may result.

Suggested cleaners include:

- Quaternary Cleaners (active ingredient - ammonium chloride)
- Phenolic Cleaners (active ingredient - o-phenylphenol)
- Chlorinated Bleach Solution (5.25% - less than 1 part bleach to 100 parts water)

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### CAUTION

DO NOT USE **Virex® TB** TO CLEAN THE SMRT CHARGER OR SMRT PAK.

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## CLEANING THE CHARGER

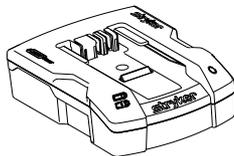
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### WARNING

- Always wear rubber gloves when cleaning the SMRT Charger to reduce the risk of injury.
  - To avoid electrical hazards, always disconnect the SMRT Charger from the wall outlet before cleaning.
  - Do not spray fluid directly onto the SMRT Charger.
  - Do not power wash the SMRT Charger.
  - To reduce the risk of electric shock, do not immerse the SMRT Charger in liquid.
  - Do not use solvents, lubricants, or other chemicals to clean the SMRT Charger unless otherwise directed.
  - To reduce the risk of electric shock, do not allow water to collect on top of the SMRT Charger.
- 

To clean the SMRT Charger:

1. Disconnect the SMRT Charger from the wall outlet to avoid electrical hazards during cleaning.
2. Wipe the surfaces of the SMRT Charger with a soft cloth dampened with a non-abrasive, hospital disinfectant (see the Recommended Cleaners list).
3. Wipe with a cloth moistened with clean water to remove any cleaning chemicals or residue.
4. Dry thoroughly before placing the SMRT Charger back into service.



**Figure 10: SMRT Charger**

[Return To Table of Contents](#)

# Cleaning

---

## CLEANING THE BATTERY

---

### **WARNING**

- In addition to personal protective equipment (PPE), always wear insulative rubber gloves when cleaning the SMRT Pak to reduce the risk of injury.
  - While power washing, use any appropriate personal safety equipment (goggles, respirator, etc.) to avoid the risk of inhaling contagion. Use of power washing equipment can aerate contamination collected during the use of the cot.
- 

The SMRT Pak is designed to be power washable. The preferred method for power washing the SMRT Pak is with the standard hospital surgical cart washer or hand held wand unit.

---

### **CAUTION**

- DO NOT STEAM CLEAN OR ULTRASONICALLY CLEAN THE SMRT PAK.
  - Maximum water temperature should not exceed 180°F/82°C.
  - Maximum air dry temperature (cart washers) is 240°F/115°C.
  - Maximum water pressure should not exceed 1500 psi/130.5 bar. If a hand held wand is being used to wash the unit, the pressure nozzle must be kept a minimum of 24 inches (61 cm) from the SMRT Pak.
-

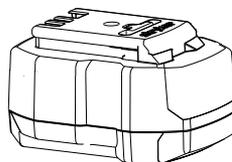
# Cleaning

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## CLEANING THE BATTERY (CONTINUED)

To clean the SMRT Pak:

1. Remove the SMRT Pak from the Power-PRO cot or SMRT Charger.
2. Inspect the SMRT Pak housing for any cracks or damage.
3. Clean the SMRT Pak with a hospital grade disinfectant with a pH range of 6.5 to 10.5. See the Recommended Cleaners list on [page 25](#).



**Figure 11: SMRT Pak**

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### **WARNING**

- To reduce the risk of injury, do not directly handle or make contact with the SMRT Pak terminals while cleaning.
  - Use only non-conductive materials to wipe the SMRT Pak clean.
- 
4. Rinse the SMRT Pak thoroughly with clean water to remove any cleaning chemicals or residue. Position the SMRT Pak as shown in Figure 11 to avoid water from pooling near the terminals.

---

### **WARNING**

- To reduce the risk of injury, do not directly handle or make contact with the SMRT Pak terminals while rinsing.
  - Avoid excessive water exposure to the SMRT Pak terminals.
- 
5. Dry thoroughly before inserting the SMRT Pak into a Power-PRO cot or SMRT Charger.

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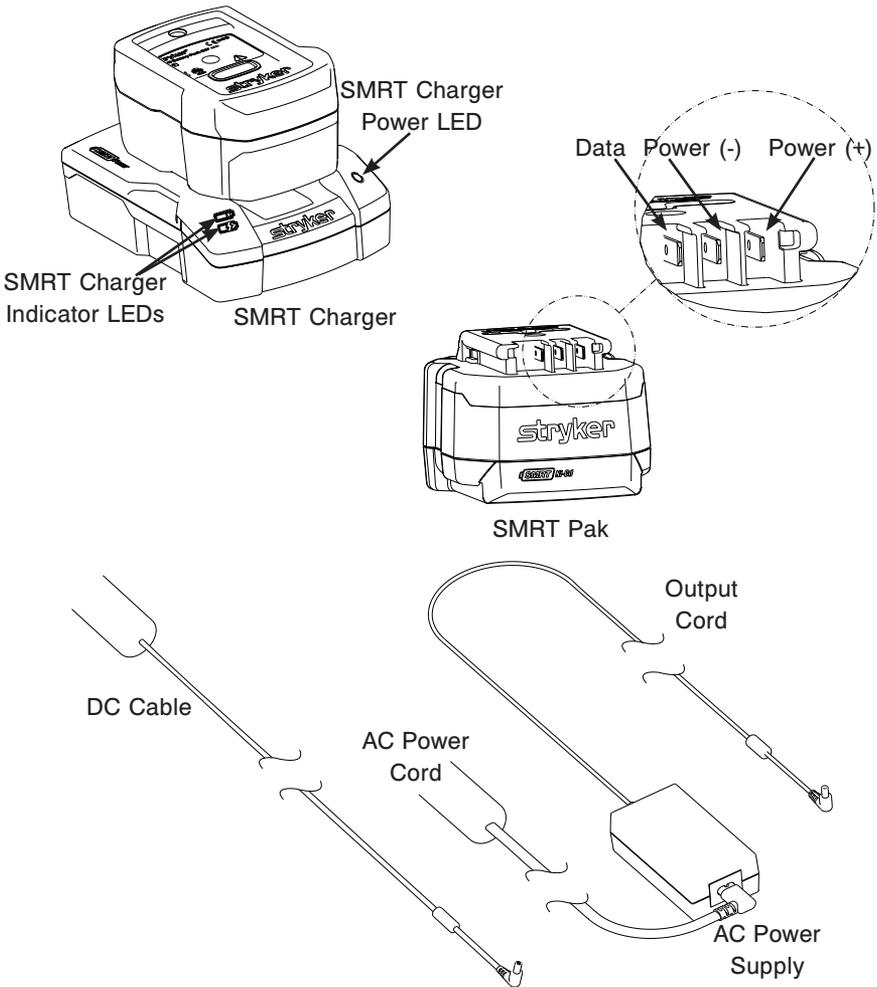
### **WARNING**

- To reduce the risk of electric shock, do not immerse the SMRT Pak in liquid.
  - Do not use solvents, lubricants, or other chemicals to clean the SMRT Pak unless otherwise directed.
  - Refer to the disinfectant's Material Safety Data Sheet (MSDS) to verify the pH range. Disinfectants with pH levels higher than 10.5 cause the SMRT Pak housing material to crack.
-

# Troubleshooting

## SMRT POWER SYSTEM COMPONENT LOCATOR

Refer to the SMRT Power System components as shown in Figure 12 while troubleshooting the system. See [page 29](#) for troubleshooting details.



**Figure 12: SMRT Power System Components**

If assistance is needed at anytime during troubleshooting, contact a service technician at (800) 327-0770 or (269) 324-6500.

# Troubleshooting

## SMRT CHARGER TROUBLESHOOTING

Problem/Failure	Recommended Action
SMRT Charger power LED is not illuminated	<ol style="list-style-type: none"> <li>1. Verify that the AC power supply or DC cable is connected properly.               <ol style="list-style-type: none"> <li>A. If using an AC power supply, make sure that the:                   <ol style="list-style-type: none"> <li>a. AC power cord is plugged into a wall outlet and the wall outlet has AC power.</li> <li>b. AC power cord is plugged into the power supply.</li> <li>c. AC power supply output cord is plugged into the charger.</li> </ol> </li> <li>B. If using a DC cable, make sure that the:                   <ol style="list-style-type: none"> <li>a. DC cable is plugged into a power source with 12.5 - 16 VDC.                       <p><b>Note:</b> The DC power supply output cord adaptor LED should be illuminated.</p> </li> <li>b. Power cord adaptor internal fuse has continuity. If not, replace the fuse (see <a href="#">page 33</a>).</li> <li>c. DC cable is plugged into the charger.</li> </ol> </li> </ol> </li> <li>2. Check for 12.5 - 16 VDC at the power supply output cord that plugs into the charger.               <ol style="list-style-type: none"> <li>A. If 12.5 - 16 VDC is not present, replace the power supply assembly.</li> <li>B. If 12.5 - 16 VDC is present, replace the charger.</li> </ol> </li> </ol>
SMRT Charger will not charge the Pak	<ol style="list-style-type: none"> <li>1. Verify that the charger power LED is illuminated.               <ol style="list-style-type: none"> <li>A. If not, see the "SMRT Charger power LED is not illuminated" section.</li> </ol> </li> <li>2. Verify that the charger indicator LEDs flash when the charger is first powered.               <ol style="list-style-type: none"> <li>A. If the LEDs flash at start up, go to step 3.</li> <li>B. If the LEDs do not flash at start up, replace the charger.</li> </ol> </li> <li>3. Reinsert the Pak on the charger and check the charger indicator LEDs for the status of the Pak:               <ol style="list-style-type: none"> <li>A. Solid amber = a Pak error. See Pak Troubleshooting on <a href="#">page 31</a>.</li> <li>B. Flashing amber = a temperature delay. Allow the Pak time to get to normal operating temperature. Reinstall the Pak and recheck step 3.</li> <li>C. Solid green = See Pak Troubleshooting on <a href="#">page 31</a>.</li> </ol> </li> </ol>

# Troubleshooting

---

## SMRT CHARGER TROUBLESHOOTING (CONTINUED)

Problem/Failure	Recommended Action
The SMRT Charger indicator LEDs are NOT illuminated when the Pak is inserted	<ol style="list-style-type: none"><li>1. Unplug the charger, wait five seconds, and plug the charger back into the wall outlet.</li><li>2. Verify that the charger power LED is illuminated.<ol style="list-style-type: none"><li>A. If not, see the “SMRT Charger power LED is not illuminated” section.</li></ol></li><li>3. Verify that the Pak is fully inserted into the charger.<ol style="list-style-type: none"><li>A. If not, reinsert the Pak fully, listen for an audible click and verify the charger indicator LEDs.</li></ol></li><li>4. Try another Pak to identify any Pak issues.<p><b>Note:</b> Separate and label Paks during troubleshooting.</p><ol style="list-style-type: none"><li>A. If the charger indicator LEDs do not illuminate, replace the charger.</li><li>B. If the charger indicator LEDs illuminate, replace the original Pak.</li></ol></li></ol>

# Troubleshooting

## SMRT PAK TROUBLESHOOTING

**Note:** Fully charge the SMRT Pak for two hours before troubleshooting the Pak.

Problem/Failure	Recommended Action
<p>A fully charged SMRT Pak does not provide sufficient power for cot operation</p>	<ol style="list-style-type: none"> <li>1. Fully charge the SMRT Pak for two hours.               <ol style="list-style-type: none"> <li>A. If the charger indicator LED is solid green indicating a fully charged and ready Pak, go to step 2.</li> <li>B. If the charger indicator LED is solid amber indicating a Pak error, replace the Pak.</li> </ol> </li> <li>2. Immediately following a full charge, remove the Pak from the charger and check the voltage at the power terminals on the Pak (see Figure 12 on <a href="#">page 28</a>) for 26 VDC minimum.               <ol style="list-style-type: none"> <li>A. If the Pak has 26 VDC minimum, go to step 3.</li> <li>B. If the VDC is less than 26 VDC, replace the Pak.</li> </ol> </li> <li>3. Wait exactly one hour and charge the Pak again.               <ol style="list-style-type: none"> <li>A. If the charger indicator LED turns solid green (indicating a fully charged and ready Pak) in less than one minute, call Tech Support.</li> <li>B. If the charger indicator LED flashes green for longer than one minute, replace the Pak.</li> </ol> </li> </ol>
<p>Charger indicates a SMRT Pak error (amber LED), but the Pak performs well on the cot</p>	<ol style="list-style-type: none"> <li>1. Fully discharge the SMRT Pak by powering a cot until the cot indicator LED flashes red.</li> <li>2. Recharge the Pak.               <ol style="list-style-type: none"> <li>A. If the charger indicator LED is solid green indicating a fully charged and ready Pak, then the Pak is ready for use.</li> <li>B. If the charger indicator LED is solid amber indicating a Pak error, call Tech Support.</li> </ol> </li> </ol>
<p>Charger indicates a temperature delay (flashing amber LED), but the Pak is within the normal operating temperature range</p>	<ol style="list-style-type: none"> <li>1. Remove the SMRT Pak from the charger and allow the Pak to cool for at least four hours at room temperature.</li> <li>2. Insert the Pak onto the charger.               <ol style="list-style-type: none"> <li>A. If the charger indicator LED is flashing green, then the Pak is charging.</li> <li>B. If the charger indicator LED is flashing amber indicating a temperature delay, replace the Pak.</li> </ol> </li> </ol>

# Quick Reference Replacement Parts List

## WARNING

Use only Stryker-approved parts. Other parts may result in increased electromagnetic emissions or decreased electromagnetic immunity of the system. Do not modify any parts. Failure to comply may result in injury.

DESCRIPTION	PART NUMBER
SMRT Charger	6500-201-010
SMRT Pak	6500-700-046
SMRT Charger Mounting Bracket (optional)	6500-201-100
Power Components - AC	
Charger Power Supply	6500-201-148
North America Power Cord	6500-201-149
Europe Power Cord	6500-201-150
United Kingdom Power Cord	6500-201-151
Australia Power Cord	6500-201-153
Power Components - DC	
12 VDC Cable, Automotive	6500-201-147
12-24V Cable, DIN Plug	6500-201-152
SMRT Power Kit (includes 1 SMRT Charger, 2 SMRT Paks, and 1 power cord)	
SMRT Power Kit - 12 VDC, Domestic	6500-700-040
SMRT Power Kit - 120 VAC, Domestic	6500-700-041
SMRT Power Kit - 12 VDC, (DIN), International	6500-700-042
SMRT Power Kit - 240 VAC, United Kingdom, International	6500-700-043
SMRT Power Kit - 240 VAC, Europe, International	6500-700-044
SMRT Power Kit - 240 VAC, Australia, International	6500-700-045

Contact your Stryker sales representative for a complete list of additional parts.

# Service Information

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## 12 VDC AUTOMOTIVE CABLE FUSE REPLACEMENT

### Tools Required:

- None

### Procedure:

1. Unplug the adaptor cable from the source and the charger.
2. Unscrew the tip on the source end and remove the fuse as shown in Figure 13.  
**Note:** The source tip and the fuse tension spring are loose and could be dropped.
3. Install the new 10A 250V fuse into the source end of the adaptor cable and screw the tip back on.
4. Plug both ends back in to the source and the charger.
5. Test the charger for functionality before returning to service.

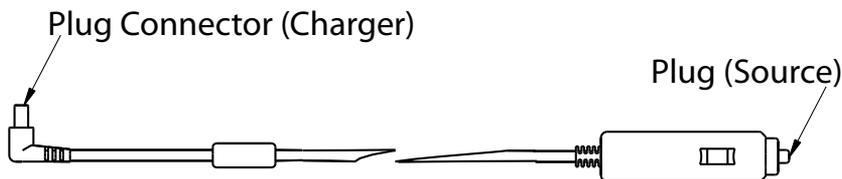


Figure 13: 12 VDC Automotive Cable

# Preventative Maintenance

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## MAINTENANCE INTERVALS

The following schedule is intended as a general guide to maintenance. Factors such as weather, terrain, geographical location, and individual usage will alter the required maintenance schedule.

Routine	Interval
Inspect the SMRT Charger and parts for cuts in the cord, bent pins or contacts and/or cracks in the housing.	Before first and every use.
Inspect the SMRT Pak housing and terminal area for cracks or damage.	Before first and every use.

## STORAGE AND HANDLING

To ensure the longevity, performance, and safety of this equipment, use the original packaging materials when storing or transporting this equipment.

Stored SMRT Paks should be used and fully charged every three months to maintain top performance.

## Best Practices

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- Fully charge all SMRT Paks prior to use.
- Replace the discharged battery with a fully charged and ready SMRT Pak.
- When charging a SMRT Pak in an ambulance, locate the SMRT Charger in an enclosed cabinet and out of patient reach during transport.
- Locate the SMRT Charger in an area that is kept within a constant temperature range. An allowable temperature range is 43°F to 95°F (6°C to 35°C). The optimal temperature range is 65°F to 75°F (18°C to 24°C).
- Remove the SMRT Pak from the Power-PRO cot or SMRT Charger before cleaning.
- The SMRT Pak is sealed and can be power washed. See [page 26](#) for cleaning instructions.
- Do not submerge the SMRT Pak for any reason.

**For assistance with any questions regarding your Power-PRO equipment, consult your Account Manager or call Stryker at 1-800-784 4336 (Option 2).**

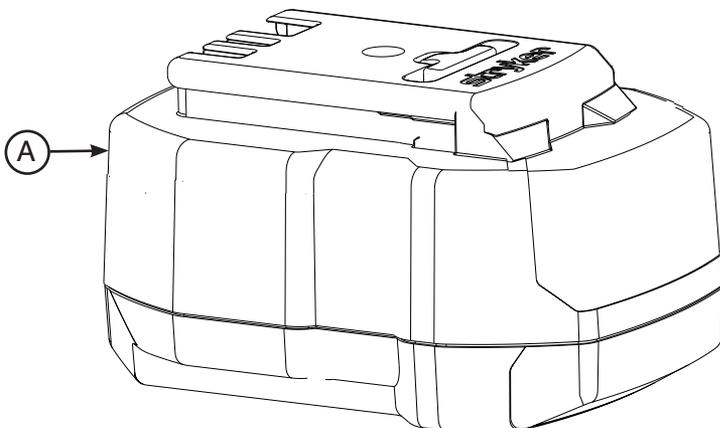
# Frequently Asked Questions (FAQs)

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- *Can I leave the SMRT Pak on the SMRT Charger for long periods of time?*  
**YES**, the SMRT Charger will keep the SMRT Pak charged and ready for use.
- *Can I leave the SMRT Pak on the Power-PRO cot between service calls?*  
**YES**, keep the SMRT Pak on the Power-PRO for up to one week, unless the cot indicator LED flashes RED.
- *Can I change out and charge the SMRT Pak before the Power-PRO cot indicator LED flashes RED?*  
**YES**, the SMRT Charger properly manages charging, regardless of the SMRT Pak charge state.
- *Will the SMRT Pak discharge during storage?*  
**YES**, all batteries lose charge during storage. A SMRT Pak loses 30% of its charge within 48 hours after removal from the charger. Stored SMRT Paks should be used and fully charged every 3 months to maintain top performance.
- *Can I use the AC/DC power supply with my ambulance inverter?*  
**YES**, have a qualified technician verify that the power supply is appropriate for the service requirements.
- *Can I use medical cleaning products on the SMRT Paks?*  
**YES**, the SMRT Power System is compatible with all Stryker approved cleaning products. Remove the SMRT Pak from the Power-PRO cot or SMRT Charger before cleaning. See [page 26](#) for cleaning instructions.
- *Will water spray have any adverse effect on SMRT Pak performance?*  
**NO**, the SMRT Pak is sealed and therefore resistant to water spray and rain. Do not submerge the SMRT Pak for any reason.
- *Will the SMRT Paks work on any other equipment?*  
**NO**, the SMRT Power System components only work with specified Stryker EMS equipment. See [page 14](#) for compatibility information.
- *Is it best to “condition” the SMRT Paks by fully discharging them?*  
**NO**, SMRT Paks are maintained by the SMRT Charger and “conditioning” is not required for SMRT Pak maintenance and performance.

# Recycling Passport

Part Number: 6500-101-010 (Reference Only)



Item	Recycling/Material Code	Important Information
A	6500-101-140 (Battery PCB)	NiCd

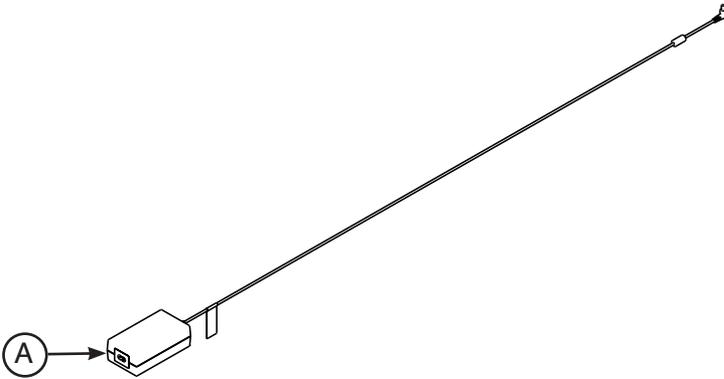


The Rechargeable Battery Recycling Corporation (RBRC) is a non-profit, public service organization that promotes the recycling of portable rechargeable batteries. Batteries must be delivered to a battery collection site. Visit the RBRC website ([www.rbrc.org](http://www.rbrc.org)) to find a nearby collection site or call the phone number shown on the recycling symbol.

# Recycling Passport

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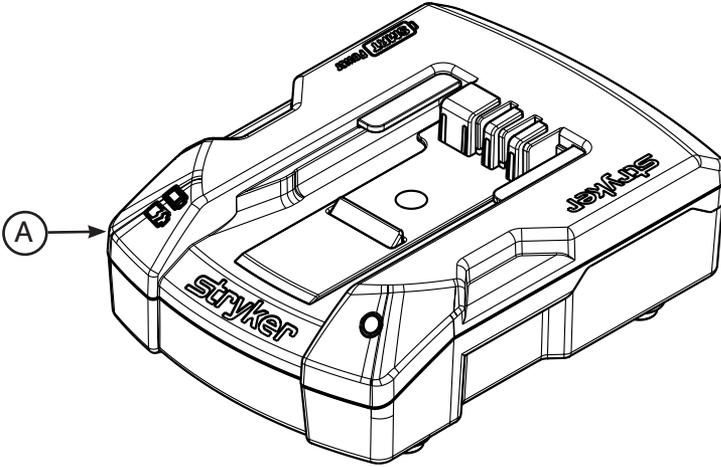
Part Number: 6500-201-148 (Reference Only)



Item	Recycling/Material Code	Important Information
A	6500-201-248 (Power Supply)	

# Recycling Passport

Part Number: 6500-201-010 (Reference Only)



Item	Recycling/Material Code	Important Information
A	6500-201-140 (Charger PCB)	

# EMC Information

## Guidance and manufacturer's declaration - electromagnetic emissions

The SMRT Charger is intended for use in the electromagnetic environment specified below. The customer or the user of the SMRT Charger should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The SMRT Charger 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 A	The SMRT Charger is suitable for use in all establishments other than 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	

## Guidance and manufacturer's declaration - electromagnetic immunity

The SMRT Charger is intended for use in the electromagnetic environment specified below. The customer or the user of the SMRT Charger should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz	<p>Portable and mobile RF communications equipment should be used no closer to any part of the SMRT Charger, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p style="text-align: center;">Recommended separation distance</p> $d = 1.17 \sqrt{P}$ <p style="text-align: center;">80 MHz to 800 MHz</p> $d = 2.33 \sqrt{P}$ <p style="text-align: center;">800 MHz to 2.5 GHz</p> <p>Where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m)</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> <div style="text-align: center;">  </div>
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.5 GHz	

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.

# EMC Information

## SPECIFICATIONS (CONTINUED)

<b>Guidance and manufacturer's declaration - electromagnetic immunity</b>			
The SMRT Charger is intended for use in the electromagnetic environment specified below. The customer or the user of the SMRT Charger should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
Electrostatic discharge (ESD)  IEC 61000-4-2	±6 kV contact  ±8 kV air	±2, 4, 6 kV contact  ±2, 4, 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 differential mode  ±2 kV common mode	±1 kV differential mode  ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines  IEC 61000-4-11	<5% $U_T$ (>95% dip in $U_T$ ) for 0,5 cycle  40% $U_T$ (60% dip in $U_T$ ) for 5 cycles  70% $U_T$ (30% dip in $U_T$ ) for 25 cycles  <5% $U_T$ (>95% dip in $U_T$ ) for 5 seconds	95% Reduction (10 ms)  60% Reduction (100 ms)  30% Reduction (500 ms)  95% Reduction (5 sec)	Mains power quality should be that of a typical commercial or hospital environment. If the user of the SMRT Charger requires continued operation during power mains interruptions, it is recommended that the SMRT Charger 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 at 50 Hz CRT 1A/m	Power frequency magnetic fields should be at levels characteristics of a typical location in a typical commercial or hospital environment.
NOTE: $U_T$ is the alternating current mains voltage prior to application of the test level.			

# EMC Information

## SPECIFICATIONS (CONTINUED)

<b>Recommended separation distances between portable and mobile RF communications equipment and the SMRT Charger</b>			
The SMRT Charger is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the SMRT Charger can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the SMRT Charger 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 $d=1.17\sqrt{P}$	80 MHz to 800 MHz $d=1.17\sqrt{P}$	800 MHz to 2.5 GHz $d=2.33\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			



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