

MC² Power Systems User's Guide

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DIFFERENT. BETTER. UNMATCHED.

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Reader comments

Any comments or suggestions regarding this manual are welcomed and should be e-mailed to:

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- Stinger Medical, LLC assumes no responsibility for damage or injury from use of the MC² Power System not in accordance with the instructions provided in this manual.

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About This Document

Overview

The MC² Power System was designed specifically to meet the needs of point-of-care mobile solutions. This document contains all the essential information necessary to use and maintain the MC² Power System at its maximum potential. To ensure the current and future success of your power system, there are a few key points to keep in mind:

- Establish clinical protocols for plugging in the power system to charge whenever it is not in use to ensure uninterrupted clinical workflow.
- Use only Stinger Medical-approved peripherals with the power system.
- The MC² Power System has no user-serviceable internal parts.

Document Conventions

The following conventions are used throughout this document:

Convention	Description
Keyboard keys and function keys	Begin with an uppercase letter and appear in bold type, enclosed in brackets; for example, [Enter] or [F1] .
Key combinations	Are enclosed in brackets and appear in bold type If joined with a plus sign (+), press and hold the first and second key simultaneously; for example, Press [Ctrl+B] .
Execution buttons	Begin with uppercase letters and appear in bold type, for example, OK .
Menu names and options	Begin with uppercase letters and appear in bold type; for example, On the System Setup menu, click Restore Factory Profile .
Window names	Begin with uppercase letters and appear in bold type; for example, the Advanced Power Monitor Software Setup window is displayed.
Text variables	Are enclosed in angle brackets; for example, <drive name>.
Numeric variables	Are represented by a letter; for example, x.

In addition, the following special formats are used:

Format	Indicates...
Green text	a hyperlink to another section of this document or to a web site
Courier	text of a message displayed in a window
Courier bold	text that you must type in a window
Bold	a reference to a window or to an object in a window, such as a button, field, or column; also indicates emphasis on a critical instruction or step
<i>Italics</i>	a reference to another document; also indicates emphasis on certain words (Example: do <i>not</i> delete this file)

Intended Use

The Stinger Medical workstations and power systems are intended for the continuous non-invasive logging of patient data in hospitals, hospital-type facilities, and intra-hospital transport.

Note:

Hospital use typically covers such areas as general care floors, operating rooms, special procedure areas, intensive and critical care areas within the hospital-type facilities. Hospital-type facilities include physician office-based facilities, sleep labs, skilled nursing facilities, surgical centers, and sub-acute centers.

Intra-hospital transport includes transport of patient within the hospital or hospital-type facility.

Medical and non-medical apparatus such as vital signs monitors, computers, LCD monitors and bar-code scanners may be supplied by Stinger Medical or may be configured locally. The collateral standard for medical electrical systems, IEC 60601-1-1 Second Edition 2000-I2, provides requirements for integrating ITE, such as a printer or monitor, with medical equipment.

Information in this document has been carefully checked for accuracy; however, no guarantee is given to the correctness of its contents. This document is subject to change without notice. Stinger Medical provides this information as reference only.

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Product Safety Information













Safety Guidelines

The MC² Power System Series™ is designed to ensure both the highest level of product quality and safety for the user. To maintain both quality and safety, follow the guidelines and instructions in this manual.





- Use the power system only as intended.
- Do not place the power system near a window. Exposing the power system to rain, water, moisture, or constant, direct sunlight can severely damage it.
- To maintain your warranty, refer all servicing to Stinger Medical qualified personnel. The MC² Power System has no user-serviceable, internal parts.
- Do not cover or obstruct any venting holes on the power system.
- Store the power system within 10 to 30 degrees Celsius (50 to 86 degrees Fahrenheit). Storing the system outside the temperature range could result in permanent damage.
- Use and maintain the cord set provided with the unit.
- If any cord or cable is frayed or damaged, replace it immediately with another of the same type and rating as supplied by Stinger Medical.
- To clean the exterior of the power system, follow the UL 60601-1 standard for use in a hospital environment. See [“Cleaning Procedures”](#) for more information.
- Before cleaning the 26 Amp-Hour unit, disconnect the electronic and power enclosures from their power sources.
- Before cleaning the 35 Amp-Hour unit, disconnect the electronic enclosure from its power source.

Warning Labels and Symbols

Warning Symbols

Symbol	Description
	THIS SYMBOL ALERTS OF AN IMPENDING DANGER. Failure to follow instructions could result in personal injury and/or damage to the unit.
	USE A NONFLAMMABLE CLEANER WHEN CLEANING THE UNIT! Failure to do so can result in death, explosion, and/or fire.
	DO NOT LEAVE THE UNIT UNATTENDED AROUND CHILDREN! Failure to do so can result in injury, and/or death.
	CAUTION: THE POWER SYSTEM IS HEAVY. You must use proper lifting techniques. Failure to do so can result in injury.
	AVOID USING AN EXTENSION CORD WITH THE UNIT! If an extension cord must be used, ensure it is rated for the power capacity of the unit.
	THIS SYMBOL ALERTS OF IMPENDING ELECTRICAL HAZARD. Failure to follow instructions could result in personal injury, fire and/or death.
	DO NOT OPEN THE POWER SYSTEM! Unauthorized personnel opening the power system may cause injury and/or death. If the unit is not working properly, please contact the Stinger Medical C.A.R.E. department at 888-445-8970
	DO NOT USE THE UNIT IN/NEAR WATER OR OTHER LIQUIDS! If the unit becomes wet, unplug it immediately, wipe away any excess liquid and allow it to dry before use. Failure to do so may cause electric shock, damage to the unit, voiding of warranty, injury or death.
	DO NOT IMMERSE THE POWER SYSTEM IN WATER! This is an electrical hazard and can cause damage to the unit, void product warranty and could result in personal injury, fire and/or death.
	ALWAYS KEEP THE UNIT WELL VENTILATED! Do not block ventilation airways or insert items into the ventilation slots. Failure to do so can cause the power system to overheat and possibly cause fire, explosion, and/or death.
	"Off" (only for a part of EQUIPMENT) IEC Publication #417-5265
	"On" (only for a part of EQUIPMENT) IEC Publication #417-5264

Warning Labels

6/17/2005	MC² Power System™	
		ETL LISTED CONFORMS TO UL STD 60601-1 CERTIFIED TO CAN/CSA STD C22.2 NO. 601.1
Input: 120VAC 60 Hz  @ 1.6A	3075589	Serial #: L0505170131
Output:  VDC	Class1/Internally Powered Medical Equipment	
CHNL 1 AND/OR 3 - 12V, 14V, 15V, 16V, 17V, 18V, 19V, 20V, MAX @4.0 A MAX		
CHNL 2 AND/OR 4 - 3.3V, 5V, 7V, 9V, 12V MAX @4.0 A MAX		

	CAUTION	
⚡ RISK OF ELECTRIC SHOCK ⚡		
HAZARDOUS live parts inside this unit are energized even when the input AC power is disconnected. This unit is to be serviced ONLY BY AUTHORIZED PERSONNEL.		
		
Murfreesboro, Tennessee 888-909-8906 www.stingermedical.com		

EMI (Electromagnetic Interference) Information

Portable and mobile RF communications equipment can affect Medical Electrical Equipment. This equipment should not be used adjacent to or stacked with other equipment. If adjacent or stacked is necessary, this and other equipment should be observed to verify normal operation in the configuration in which it will be used.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio, television or Medical Electrical Equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference using one or more of the following measures: reorient or relocate the receiving antenna; increase the separation between the equipment and the receiver; connect the equipment into an outlet on a circuit different from that which the receiver is connected; consult the dealer or an experienced radio/television technician for help. The user must use shielded cables and connectors with this product. Any changes or modifications to this product not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. MC² Power System meets or exceeds FCC Class A limits for EMI.

Obtaining Optimum Performance

- Plug your MC² Power System into an AC power source (wall outlet) for charging whenever not in use or unattended.
- Stinger Medical recommends establishing a protocol for end users requiring the power system be plugged into an AC power source whenever not in use or unattended.
- Perform regular preventative maintenance. Failure to do so will void warranty.
- Limit current output to 4 amps per channel.
- Do not open power system enclosure – there are no user-serviceable parts inside. Opening enclosure will void product warranty.

Chapter 1: Quick Setup

Note:

The quick setup information in this chapter pertains to both the 26 Amp-Hour and 35 Amp-Hour units.

Use the references in the following table to obtain further information about your unit to assist you during the set up process:

MC2 Power System	See page
26 Amp-Hour Unit	
Identifying the Power System	5
Preparing for Operation	6
User-Selectable Switch Settings	9
35 Amp-Hour Unit	
Identifying the Power System	11
Preparing for Operation	13
User-Selectable Switch Settings	15

If the power system unit was sent alone:

1. Unpack the power system unit and check for any physical damage.
2. For the MC² Power System Series 26 Amp-Hour units, connect and secure the electronic and battery enclosure together. For the MC² Power System Series 35 Amp-Hour units, the Power Output Disconnect Switch (depicted below) must be in the 'ON' position:



Power output disconnect switch location

3. Verify that all LED indicators for each power output channel are ON.

- 4 Output voltages are normally pre-configured to power on the intended device(s) prior to shipping. Check the user-selectable switch settings to verify that the correct voltage has been set for each power output channel.
- 5 Locate the power output plastic cover on the back side of the base. Remove the power output plastic cover and slide the power system unit into base of the cart. Secure the power system unit with the two security pins located on both sides of the base (Fig 1):

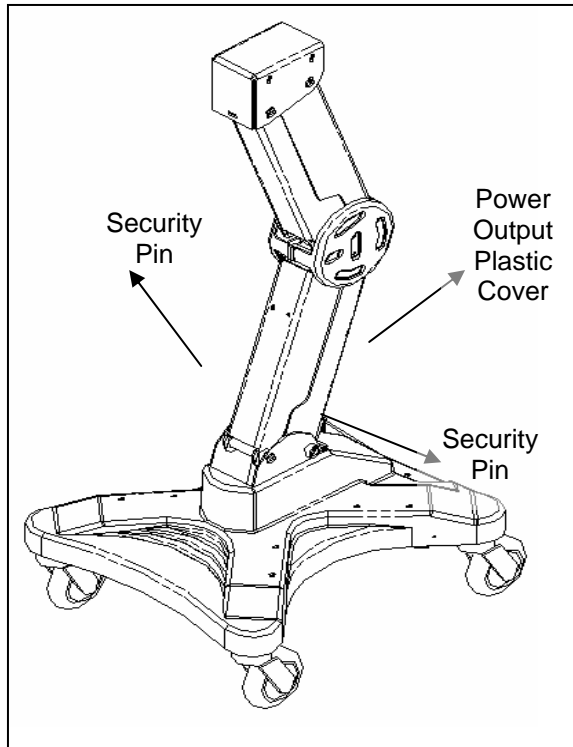


Fig 1: Location of plastic cover and pins

- 6 Check all existing power and data cables on the cart for any visible defects.
- 7 Connect each power cable to the configured power output channel for the intended device. Laptop computers are usually connected to the Power Output 1 located on the far left-hand side.
- 8 If available, connect the USB and fuel gauge cables to the power system unit.
- 9 Plug in the power system unit to charge and verify that one or more LED indicators on the fuel gauge is working properly.
- 10 Assemble and secure the power output plastic cover onto the cart.
- 11 Plug in the power system unit to charge prior to use. For optimal charging performance, charge the unit with no devices ON.
- 12 Check fuel gauge to verify that the LED indicators for both 'AC Present' and 'Charging' are ON.
- 13 The power system unit is ready for use when LED indicator for 'Charged' is ON.
- 14 Connect the correct power cable to each device. Verify that the correct power cable is being used for the intended device since each power output can be configured to different voltages.

15 Power ON device(s).**If power system unit was sent with a workstation:**

- 1** Check the power system unit and workstation for any physical damage.
- 2** For the MC² Power System Series 35 Amp-Hour units, the Power Output Disconnect Switch must be in the 'ON' position.
- 3** Verify that all LED indicators for each power output channel are ON.
- 4** Output voltages and power cables are normally pre-configured to power on the intended device(s) prior to shipping. Check the user-selectable switch settings to verify that the correct voltage has been set for each power output channel.
- 5** Locate the power output plastic cover on the back side of the base. Remove the power output plastic cover and verify that all cables have no physical defects and are properly secured to each power output channel (Fig 2):

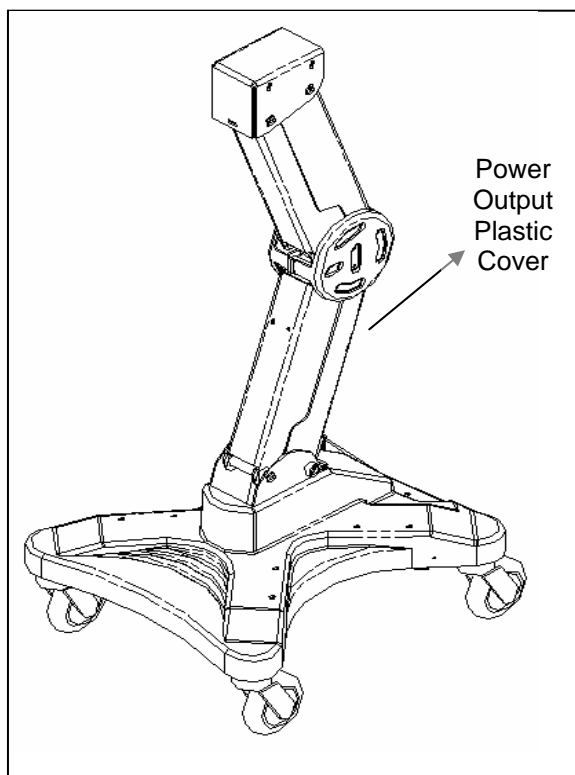


Fig 2: Location of plastic cover

- 6** Plug in the power system unit to charge and verify that one or more LED indicators on the fuel gauge is working properly.
- 7** Assemble and secure the power output plastic cover onto the cart.
- 8** Plug in the power system unit to charge prior to use. For optimal charging performance, charge the unit with no devices ON.
- 9** Check fuel gauge to verify that the LED indicators for both 'AC Present' and 'Charging' are ON.
- 10** The power system unit is ready for use when LED indicator for 'Charged' is ON.

- 11** Connect the correct power cable to each device. Verify that the correct power cable is being used for the intended device since each power output can be configured to different voltages.
- 12** Power ON device(s).

Chapter 2: 26 Amp-Hour Series

Identifying The Power System

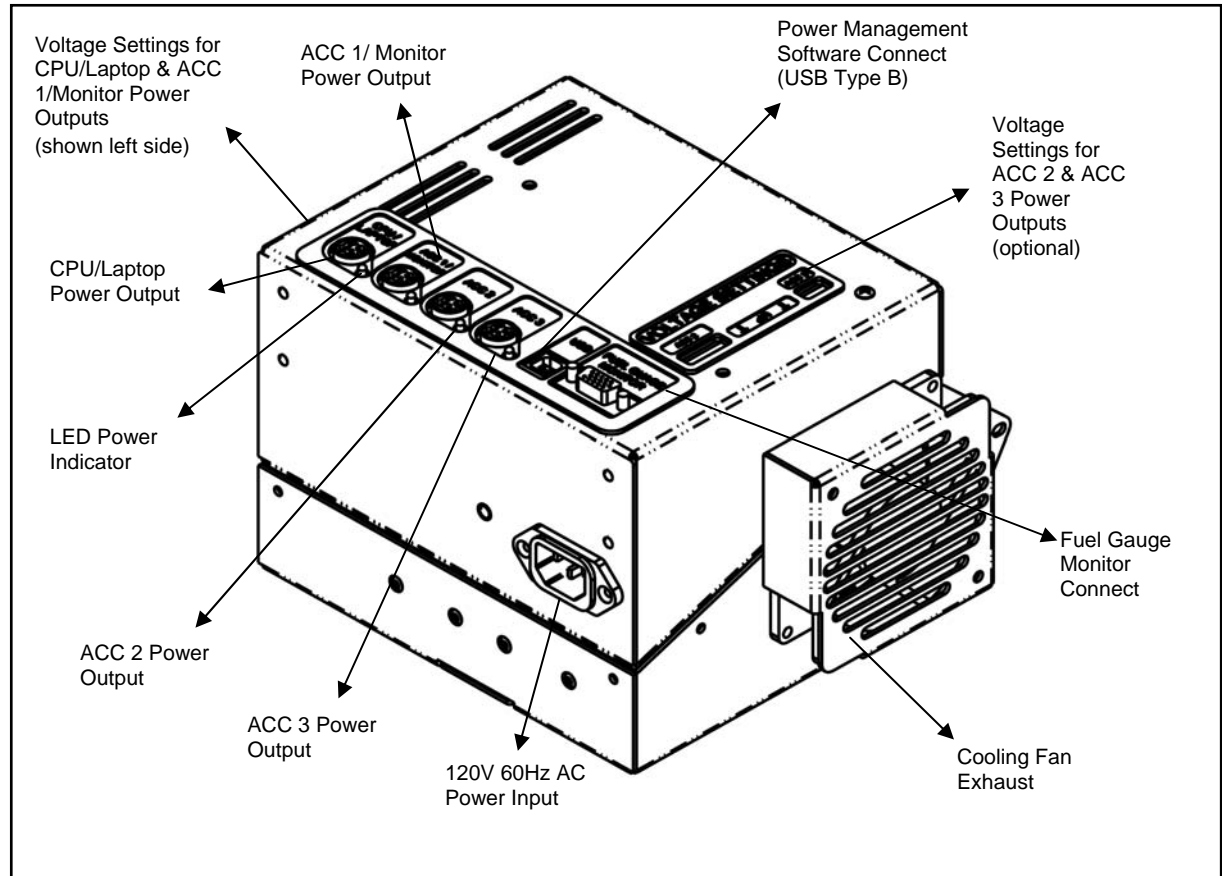


Fig 6: Identifying the Electronic Enclosure

Notes:

- 'ACC' is an abbreviation for 'Accessory'.
- Sticker for voltage settings ACC 2 and ACC 3 will not be present if only two outputs are purchased.
- LED for ACC 2 and ACC 3 will not be functional if only two outputs are purchased.

Preparing For Operation

Parts Listing (Fig 7)

- (1) Electronic Enclosure (A)
 - (1) Battery Enclosure (B)
 - (1) Cord Set (Fig 10 and 11)
- 1 Unpack the unit carefully and inspect it for damage. There will be two parts - Electronic Enclosure and Battery Enclosure. **WARNING:** Battery enclosure is HEAVY!

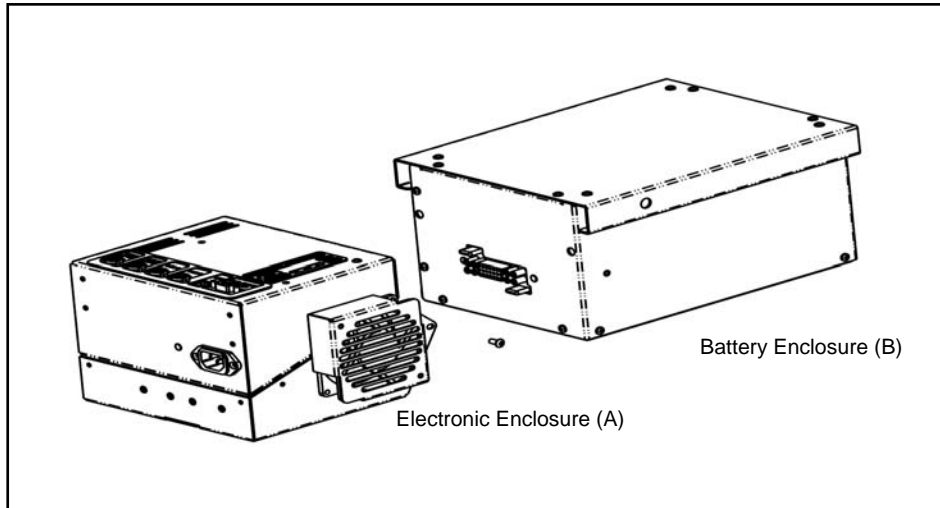


Fig 7: MC² Power System Parts

- 2 Connect electronic enclosure (A) and battery enclosure (B) at docking connector (Fig 8).

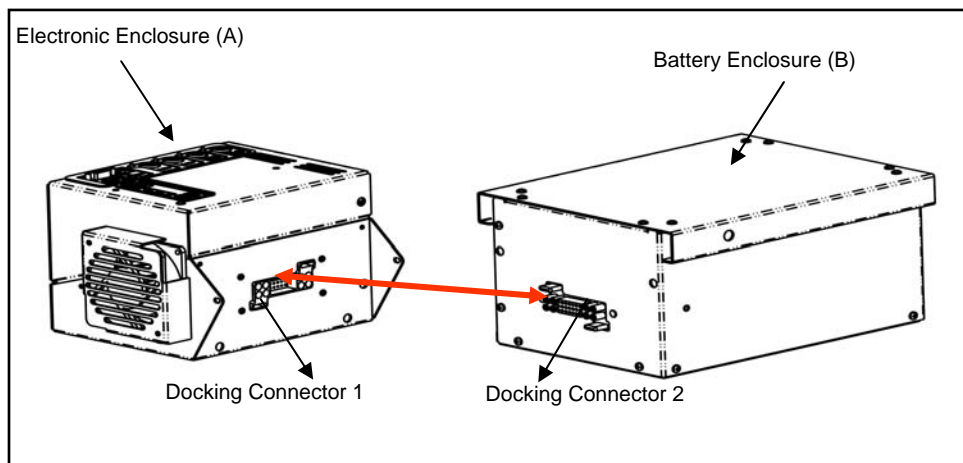


Fig 8: Docking Connection

- 3 Install security screws (C) with security wrench (included).

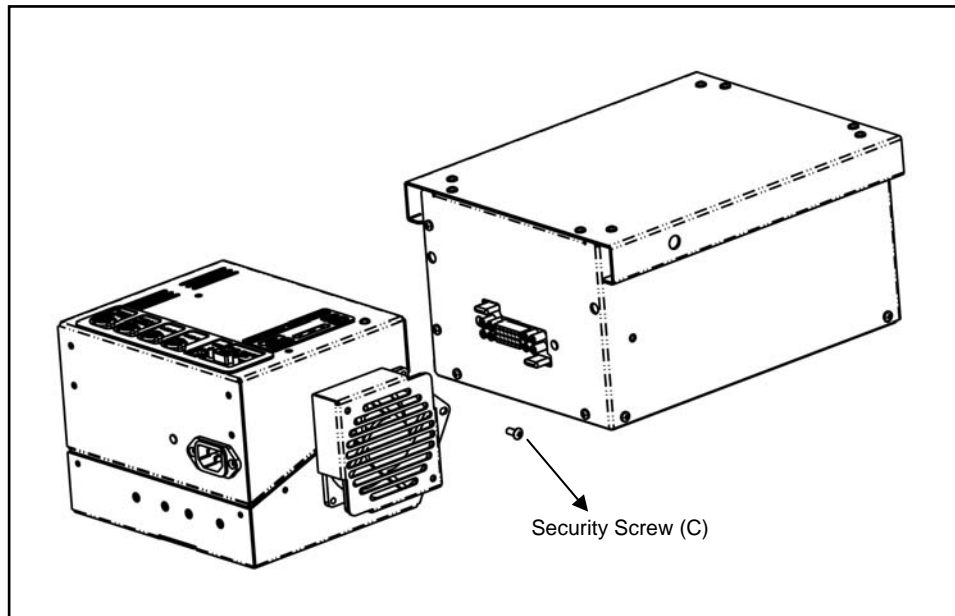


Fig 9: Security Screw Installation

- 4 Confirm the green LED power indicators light up beside the outputs.

Note:

Number of LEDs to light up will vary based upon the number of outputs purchased.

- 5 Charge your MC² Power System using a Stinger Medical supplied cord set (Fig 10 and 11) for 24 hours prior to use. For more information, see ["Charging the Power System"](#).



Fig 10: Curly Cord



Fig 11: Cord Reel

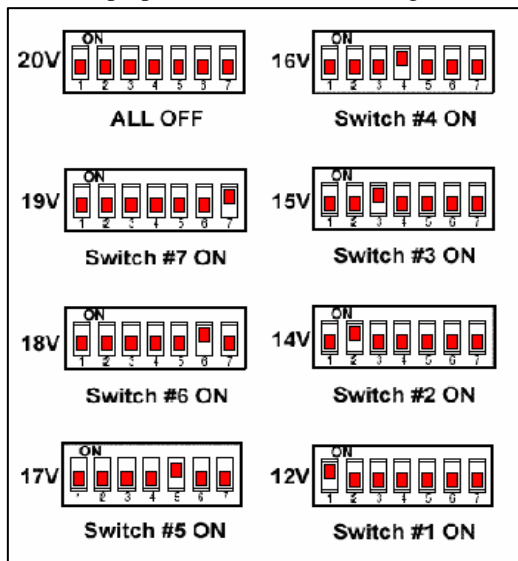
- 6 Confirm the 'Charging' indicator on the fuel gauge is ON. For more information, see ["Identifying Fuel Gauge Indicators"](#).
- 7 Your Power System is ready for use when the 'Charged' indicator is ON.

User-Selectable Switch Settings

Voltage Settings Orientation

- The diagram below shows each switch location and which output it controls.
- The output voltage can be set by user between 12–20V on outputs 'CPU/Laptop' and 'ACC 2 (optional)' and between 3.3 – 12V on outputs 'ACC 1/Monitor' and 'ACC 3 (optional)'.
- All outputs have a maximum continuous current of 4 amps.
- User-selectable switches are located on the top and side of the electronic enclosure (Fig 12).
- **Power outlets are intended for workstation mounted equipment ONLY.**

CPU/Laptop & ACC 2 Power Settings



ACC 1/Monitor & ACC 3 Power Settings

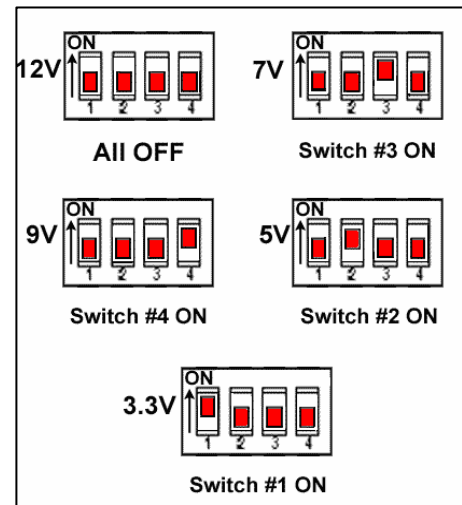
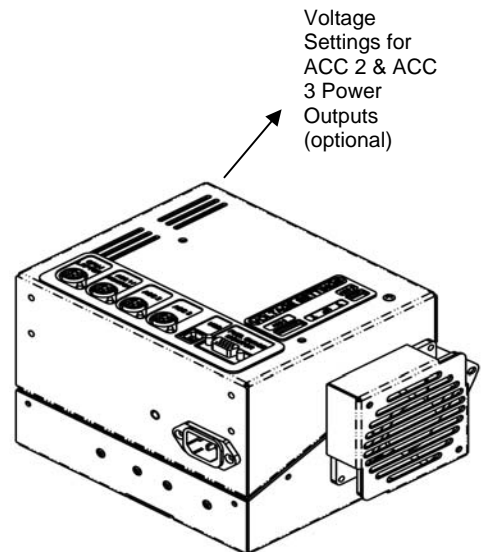
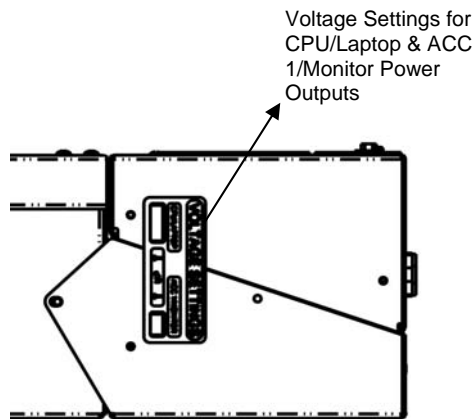


Fig 12: Location of User-selectable Switches



Chapter 3: 35 Amp-Hour Series

Identifying The Power System

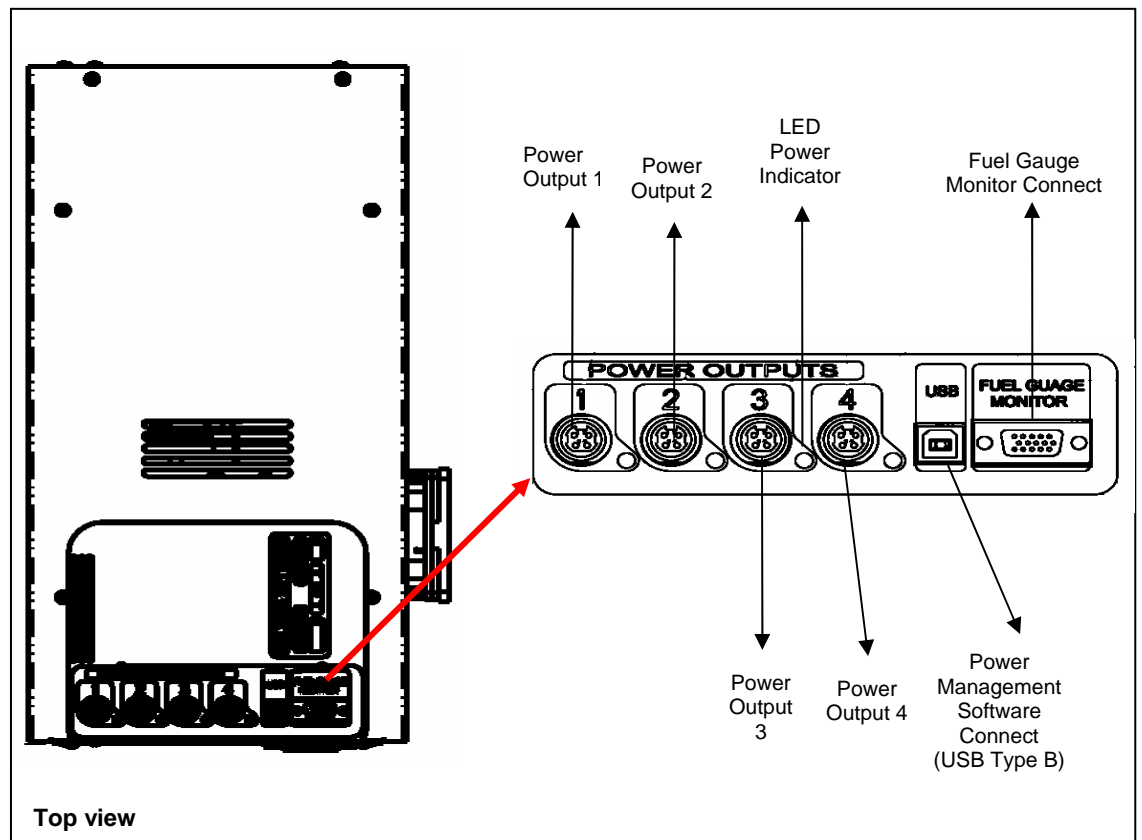


Fig 13: Power Output Port Connectors

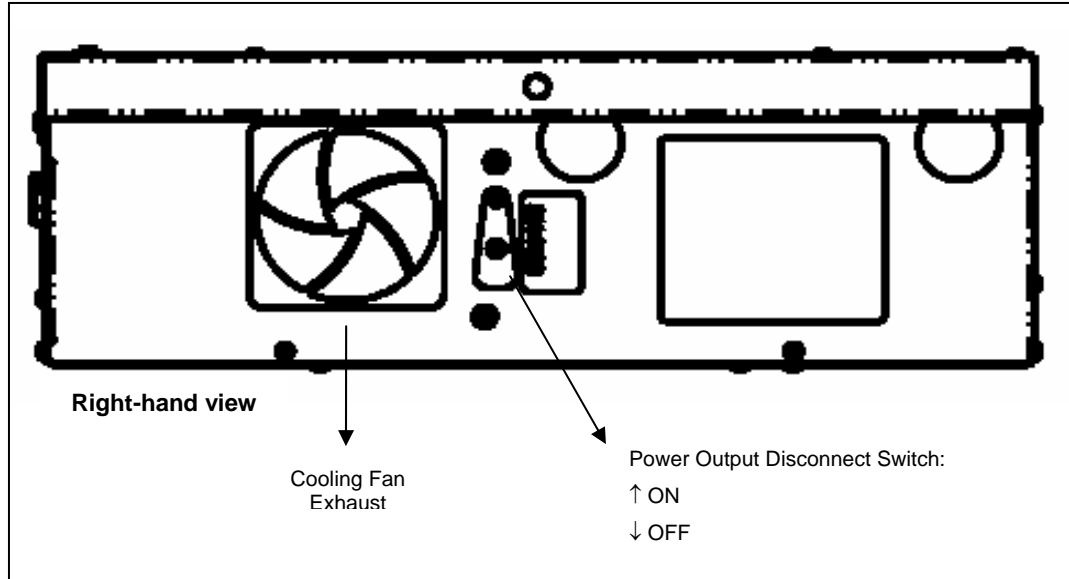


Fig 14: Fan and Power Output Disconnect Switch

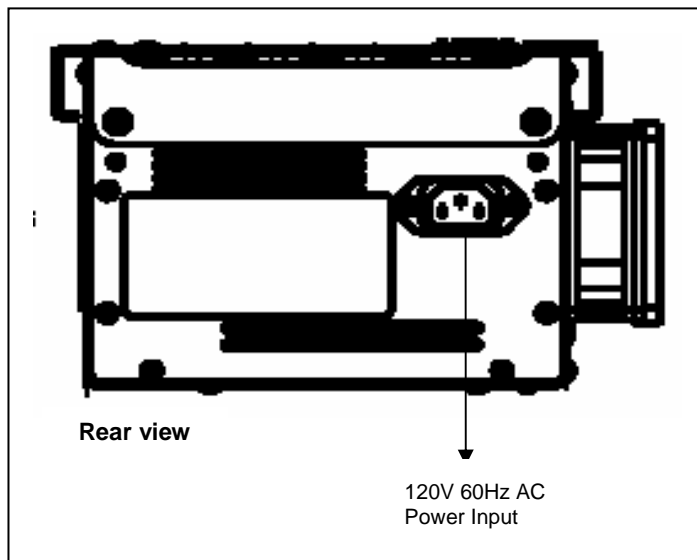


Fig 15: AC Power Input

Preparing For Operation

Parts Listing

- (1) Power system unit (Fig 16)
- (1) Cord Set (Fig 17 and 18)

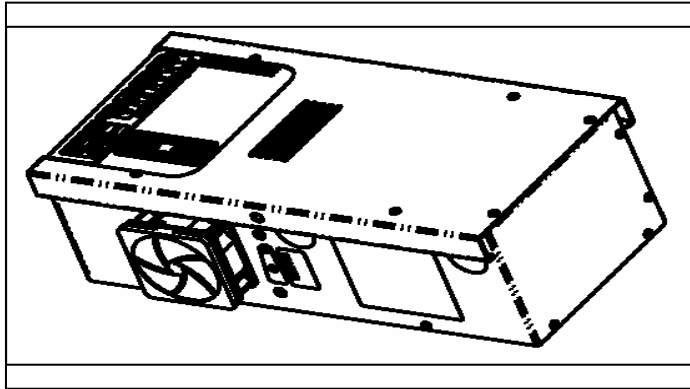


Fig 16: MC2 Power System Series 35 Amp-Hour

1. Unpack components carefully, inspecting for damage. **WARNING:** Power System is HEAVY!
2. Confirm that the Power Output Disconnect Switch is in the 'ON' position. For more information, see "[Identifying the Power System.](#)" Verify that the green LED power indicators light up beside the outputs.

Note:

The number of LEDs to light up will vary based upon the number of outputs purchased.

3. Charge your MC² Power System using a Stinger Medical supplied cord set (Fig 17 and 18) for 24 hours prior to use. For more information, see "[Charging the Power System.](#)"



Fig 17: Curly cord



Fig 18: Cord reel

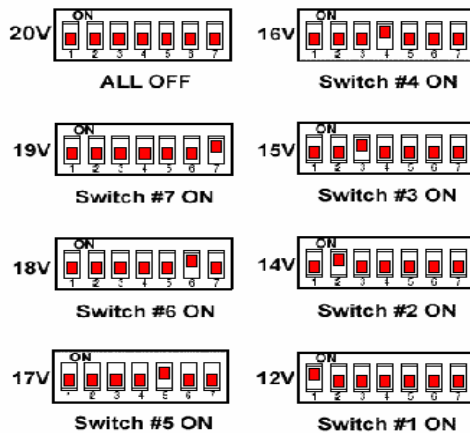
- 4 Confirm the 'Charging' indicator on the fuel gauge is ON (see "Identifying Fuel Gauge Indicators").
- 5 Your Power System is ready for use when the 'Charged' indicator is ON.

User-Selectable Switch Settings

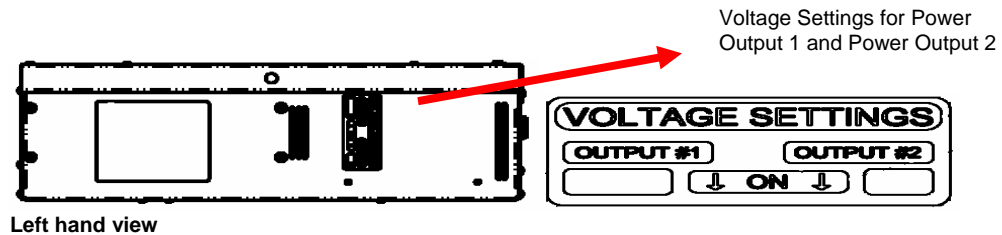
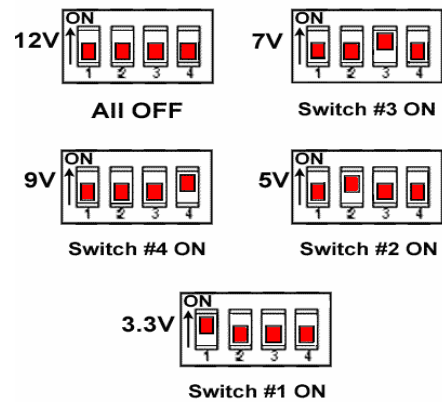
Voltage Settings Orientation

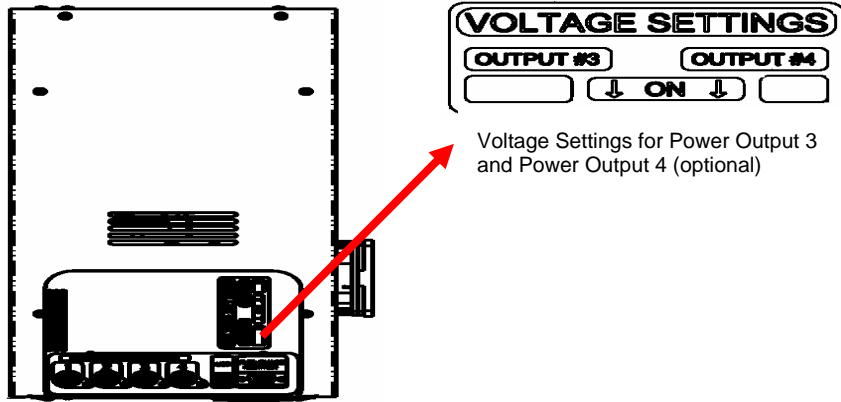
- The diagram below illustrates each switch location and which output it controls.
- The output voltage can be set by user between 12–20V on Power Output 1 and Power Output 3 and between 3.3 – 12V on Power Output 2 and Power Output 4.
- All outputs have a maximum continuous current of 4 amps.
- User-selectable switches are located on the top and left hand side of the power system enclosure.
- **Power outlets are intended for workstation mounted equipment ONLY.**

Power Output 1 and 3 Power Settings



Power Output 2 and 4 Power Settings



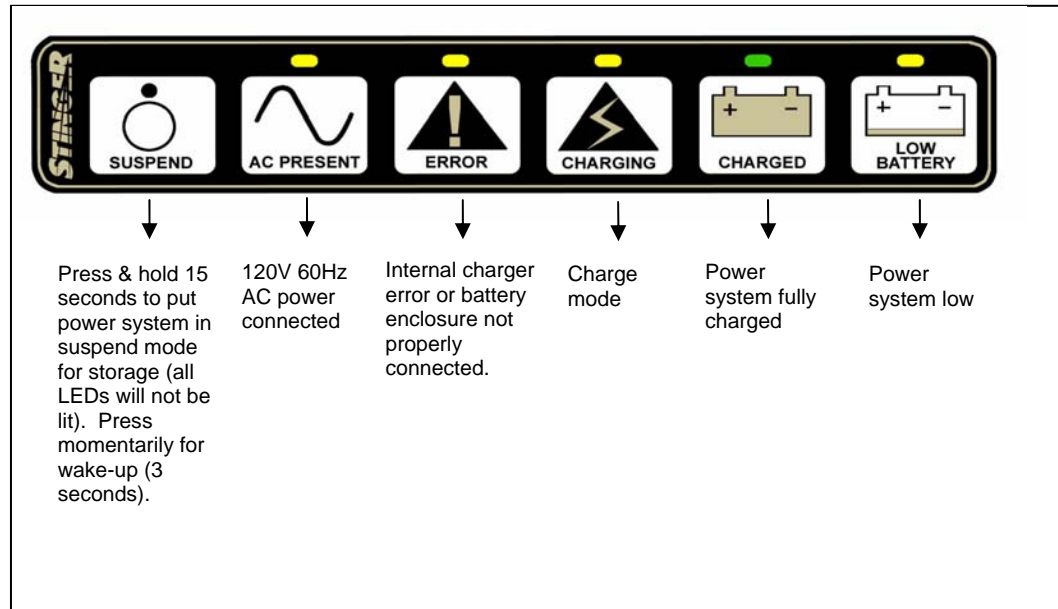


Top view

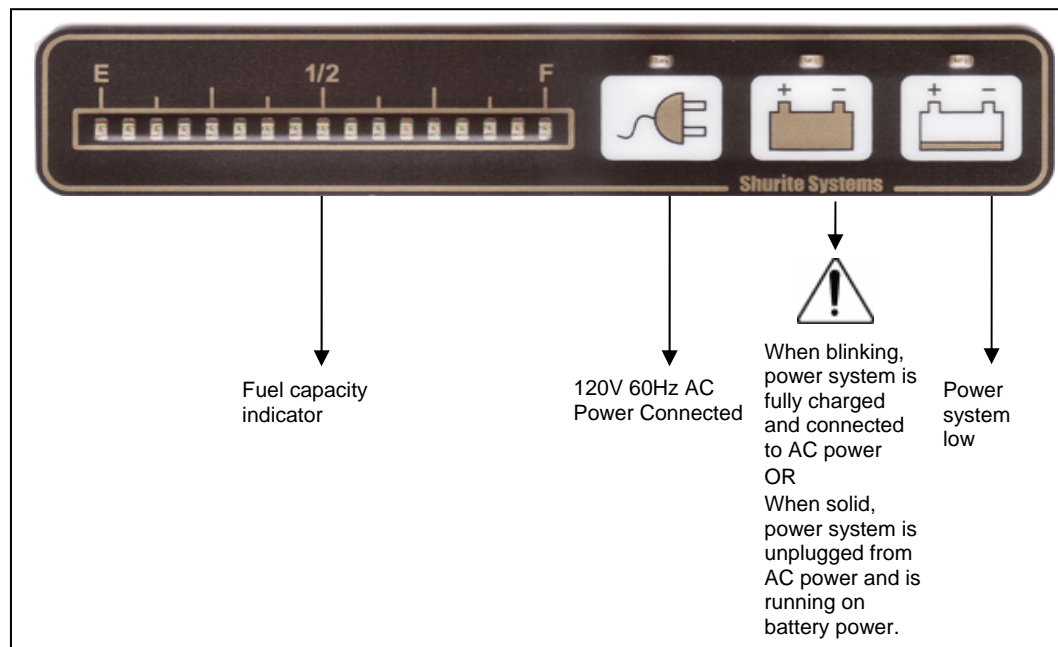
Voltage Settings for Power Output 3 and Power Output 4 (optional)

Chapter 4: Identifying Fuel Gauge Indicators

Basic



Advanced



Note:

An alarm sounds when the system is fully discharged. To silence alarm, plug in the unit to charge it.

Chapter 5: Charging the Power System

Note:

Where the integrity of the external PROTECTIVE EARTH CONDUCTOR arrangement is in doubt, EQUIPMENT shall be operated from its INTERNAL ELECTRICAL POWER SOURCE.

Power System Charging

In order to charge the power system, plug it in to a 120V 60Hz AC power source using a Stinger Medical supplied cord set.

Note:

The MC² Power System Series 35 Amp-Hour unit is required to have the Power Output Disconnect Switch in the ON position. For more information, see the ["Power Disconnect Output Switch Location"](#) illustration.

Charge Time

Charge times vary depending on the usage of the power system. Typically, as a power system is used, the capacity of the power system diminishes.

Charge time	Capacity of charge
6 hours with no load	100%

Optimal power system life occurs when unit is fully charged every cycle. For more information, see ["Identifying Fuel Gauge Indicators."](#)

Power System Discharging

The power system begins discharging when it is disconnected from the AC power source and powering a peripheral device(s). After the power system reaches its maximum runtime potential, it will disable power to its outputs. The MC² Power System Advanced Monitoring System will communicate to the host computer and perform an orderly shutdown of the Microsoft® Windows® Operating System unless the user plugs in the power system for charging (Fig 19).

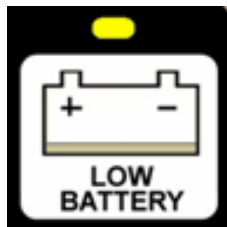


Fig 19: Low battery indicator

Circuit Protection

The MC² Power System is thermally protected and self-resetting. For more information, see “[No Output Reset Procedure](#).” The cooling fan maintains a constant ambient temperature inside the electrical enclosure.

Deep Discharge Protection

Deep discharge of the power system will significantly reduce its cycle life. After the power to the load is disabled, the internal circuitry goes into suspend mode to prevent the power system from reaching a level of deep discharge. To reduce this risk, the MC² Power System will shut down and cut off the output voltage.

Chapter 6: Power System Management Software

Setting Up the Power Management Software

- **None** – no USB cable provided – disregard this section.
- **Advanced** - available at time of purchase only – USB cable included.
- *System Requirements: Operates ONLY on Windows XP and 2000.*

Installation Note:

If the local computer has any type of anti-spyware or firewall application installed, then you may receive a pop-up notice. To complete the installation process, enable the program to be allowed to resume.

Installing the Advanced Power Monitor Software

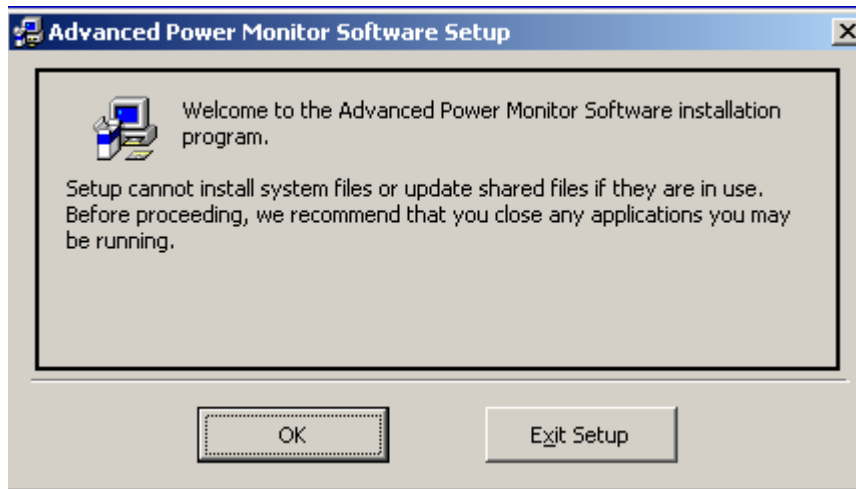
Note:

The Advanced Power Management Software is available for use with both the 26 Amp-Hour and 35 Amp-Hour units.

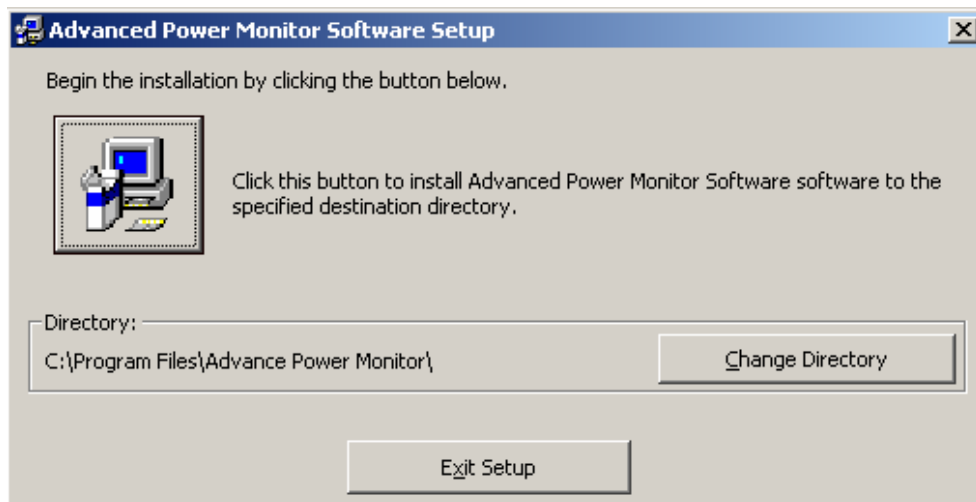
The Advanced Monitoring software does not offer the ability to perform an auto-run of the software installation. Manual installation of the software is required to load the application and the USB driver.

- 1 Navigate to the CD-ROM drive or the disk folder location where the installation files reside.
- 2 Double-click the **setup.exe** file. The following window is displayed:

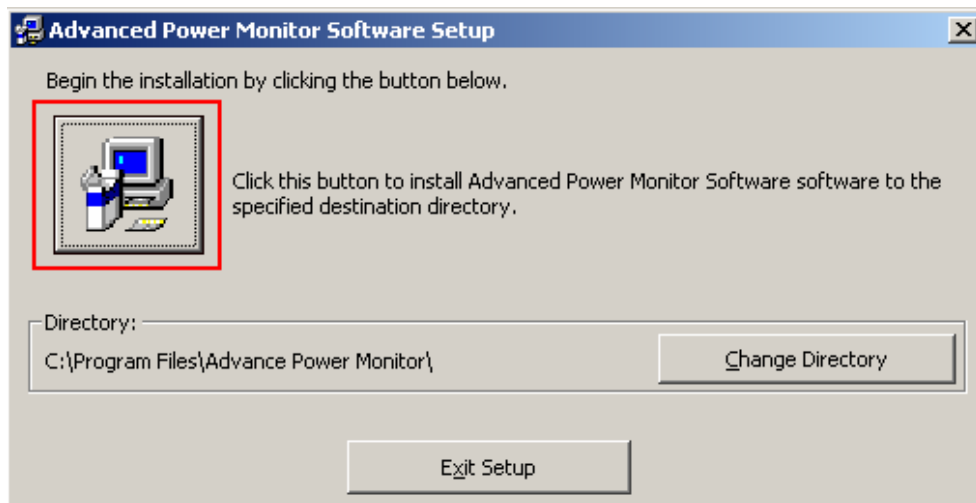
The following window is displayed:



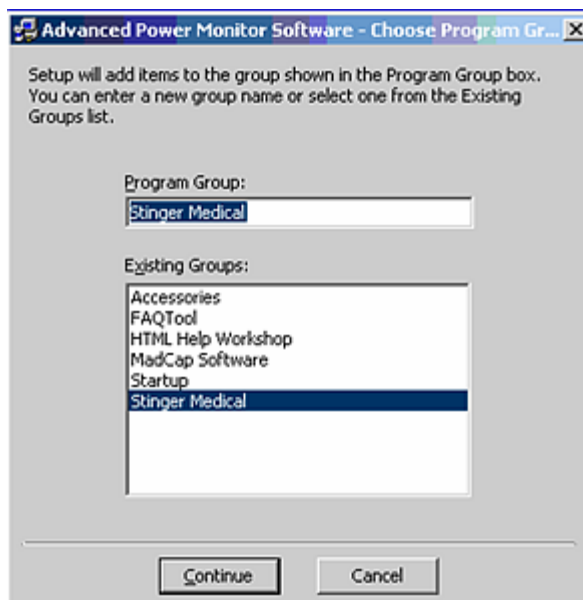
- 3 Click **OK**. The following window is displayed:



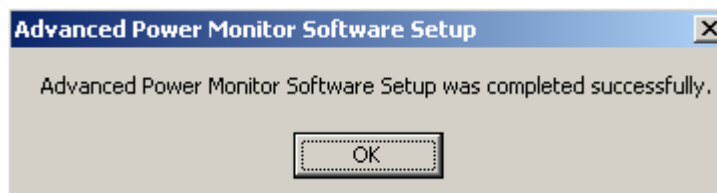
- Click the installation button to begin installing the software:



The following window is displayed:



- Accept the default Program Group, and then click **Continue**.
- The installation is complete when the following window is displayed:



- Click **OK**.

Configuring Advanced Power Monitor Access Options

Creating a desktop icon to start the Advanced Power Monitor application

- 1 From the **Start** menu, point to **All Programs**, and then click **Stinger Medical**.
- 2 Right-click **Advanced Power Monitor**, and then click **Copy**.
- 3 Access the Windows desktop.
- 4 Right-click an empty location on the Windows desktop, and then click **Paste**.

Automatically starting the Advanced Power Monitor application

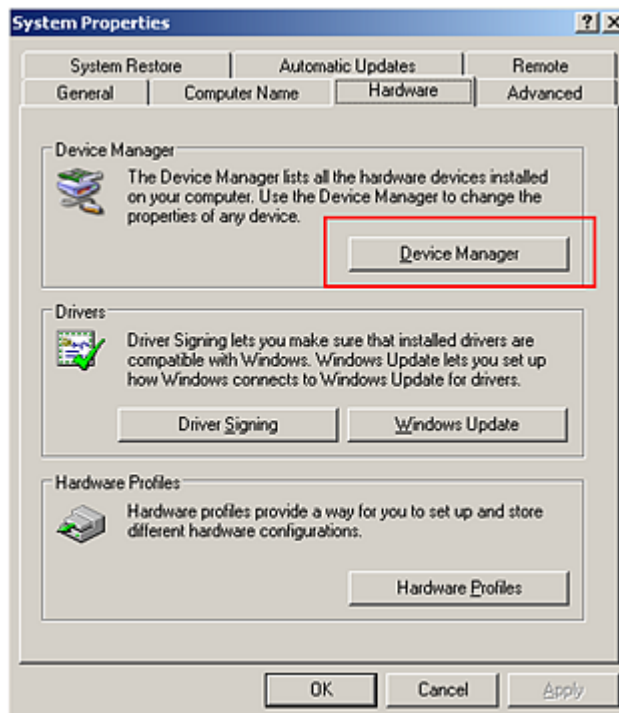
Perform the following steps to copy the Advanced Power Monitor application into the Startup folder of each user on the computer:

- 1 From the **Start** menu, point to **All Programs**, and then click **Stinger Medical**.
- 2 Right-click **Advanced Power Monitor**, and then click **Copy**.
- 3 From the Windows desktop, double-click **My Computer**.
- 4 Double-click **Local Disk (C:)**.
- 5 Double-click **Documents and Settings**.
- 6 Double-click **All Users**.
- 7 Double-click **Start Menu**.
- 8 Double-click **Programs**.
- 9 Double-click **Startup**.
- 10 Right-click in the **Startup** folder, and then click **Paste**.
- 11 Close all open windows.

Configuring COM Ports

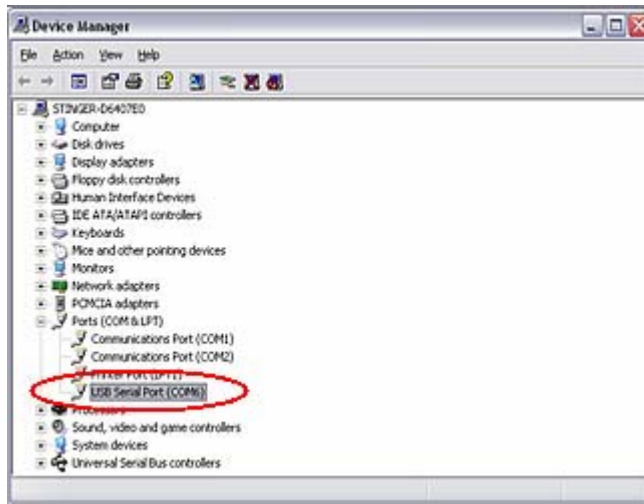
The Advanced Power Monitor software does not automatically determine which COM port has been set for the communication between the computer and power system. The user will have to manually determine what COM port has been assigned and manually set it in the Advanced Power Monitor software by performing the following steps:

- 1 From the **Start** menu, point to **Settings**, and then click **Control Panel**.
- 2 Double-click **System**.
- 3 Click the **Hardware** tab.
- 4 Click **Device Manager**, depicted as follows:

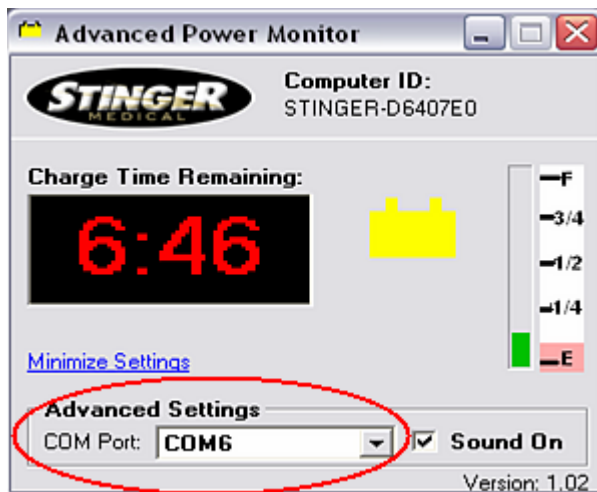


- 5 Click the plus sign (+) by **Ports (COM & LPT)**.

- 6 Note the COM port assigned to the **USB Serial Port**, depicted as follows:



- 7 Launch the Advanced Power Monitor application.
 8 Click **Advanced Settings**.
 9 Click the down arrow in the **COM Port** field in **Advanced Settings**:

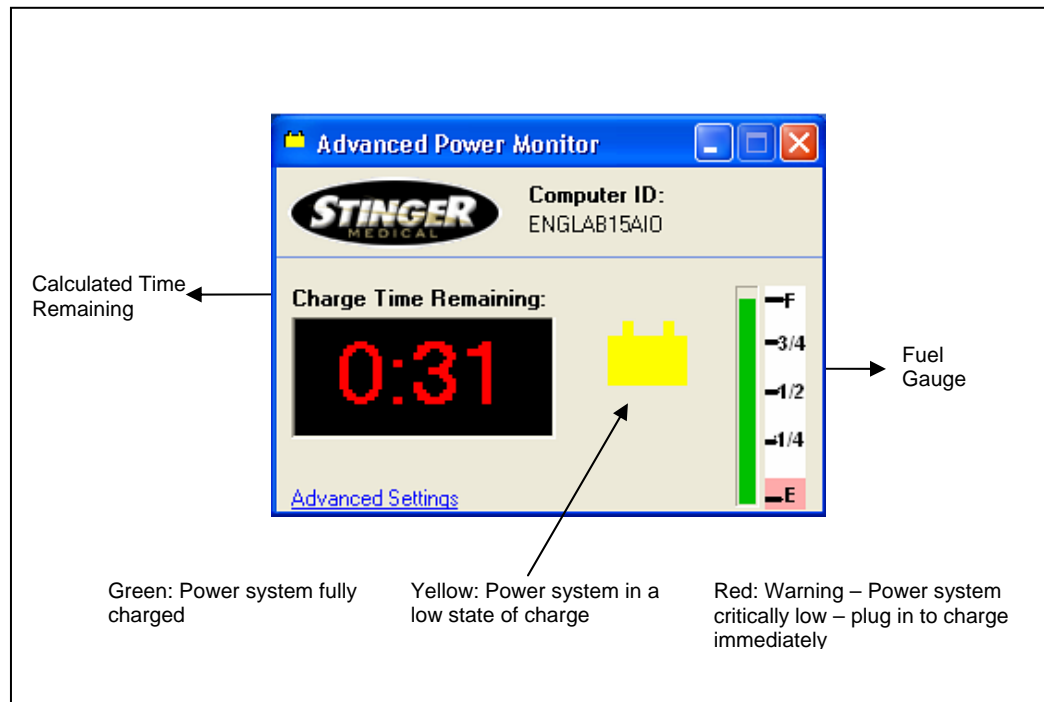


- 10 Select the COM port noted in step 6.
 11 Click **Minimize Settings** to close the **Advanced Settings** options.

Communication between the computer and power system is successful when the semicolon in the time clock is blinking off and on.

Understanding the Advanced Power Management Software

Launch the Advanced Power Monitor application. The following window is displayed:



Chapter 7: Troubleshooting

The following table describes some of the most common troubleshooting options for the MC² power systems:

Symptom	Possible Cause	Possible Solution
No output	Re-settable fuse	See "No Output Reset Procedure"
	Power system not charged	Charge Power System
	Power system section not connected	Connect both sections of power system together (26 Amp-Hour unit only). See "Preparing for Operation."
Reduced runtime	Power output disconnect switch in OFF position	See "Preparing for Operation" in the MC ² Power System Series 35 Amp-Hour topic.
	Power system not charged	Charge power system
	Battery life exceeded	Contact Stinger Medical C.A.R.E. department
Component not powering	Component not plugged in	Plug in to power system
	No output from power system	See "No Output Reset Procedure"
	Dip switch incorrectly set	26 Amp-Hour units: see "User-selectable Switch Settings" OR 35 Amp-Hour units: see "User-selectable Switch Settings"
Power system beeping	Power system not charged	Charge power system
	Overload	Contact Stinger Medical C.A.R.E. department
	Power system discharged	Plug in to charge
Not charging	Faulty wall outlet	Plug into alternate wall outlet
	Faulty cord set	Replace cord set (per policy)
	Charger timed out	See "Charger Timed-out Reset Procedure"
	Battery life exceeded	Contact Stinger Medical C.A.R.E. department

Symptom	Possible Cause	Possible Solution
No LEDs lit on power system	Power system not properly connected	See “Power Output Disconnect Switch Location” Reconnect power system sections (reference the section of this document specific to your power system)
	Re-settable fuse	See “No Output Reset Procedure”
	Battery in state of unrecoverable discharge	Contact Stinger Medical C.A.R.E. department
COM port In use	USB not plugged in or assigned COM port is used by another device OR another copy of the application is running	Contact Stinger Medical C.A.R.E. department
Will not recognize USB connection	Drivers not loaded	See “Installing the Advanced Power Monitor Software”

Reset Procedures

No Output Reset Procedure

The Stinger Medical DC-to-DC circuit boards have been upgraded to self-resetting polyfuses. If a situation occurs that could cause harm to a circuit, these fuses will trip and protect the circuit from damage. The result of a tripped fuse is no output. Many reasons could cause a fuse to trip. If a fuse is reset and the system continues to have a problem, discontinue use of the system and contact the Stinger Medical C.A.R.E. department. Below is an order of operation for resetting these fuses:

- 1 Remove all devices that are connected to the power system's outputs.
- 2 Wait approximately 30-45 seconds after devices have been removed.
- 3 Insure that all devices are switched off, and then reconnect those devices.
- 4 Power on connected devices one at a time.
- 5 If fuse does not reset, repeat Steps 1-4 until fuse is reset.

If you continue to experience problems with the power system, discontinue use of the system and contact the Stinger Medical C.A.R.E. department.

Charger Timed-out Reset Procedure

Note:

The following procedure is designed for use only with the MC² Power System Series 26 Amp-Hour Unit.

- 1 Remove all devices that are connected to the power system's outputs.
- 2 Unplug AC power source.
- 3 Remove the power system from under the workstation.

- 4 Remove the stabilizer plates and separate power system enclosures.
- 5 Wait 30 seconds.
- 6 Follow the steps listed in the MC² Power System Series 26 Amp-Hour topic ["Preparing Your MC² Power System for Operation"](#).
- 7 Reconnect devices.
- 8 Plug in to charge until the fully charged notification light has illuminated.

If you continue to experience problems with the power system, discontinue use of the system and contact the Stinger Medical C.A.R.E. department.

Chapter 8: Preventative Maintenance

Important note:

Please put the MC² Power System on a quarterly preventative maintenance schedule to clean air intake filter(s). Failure to do so will void warranty.

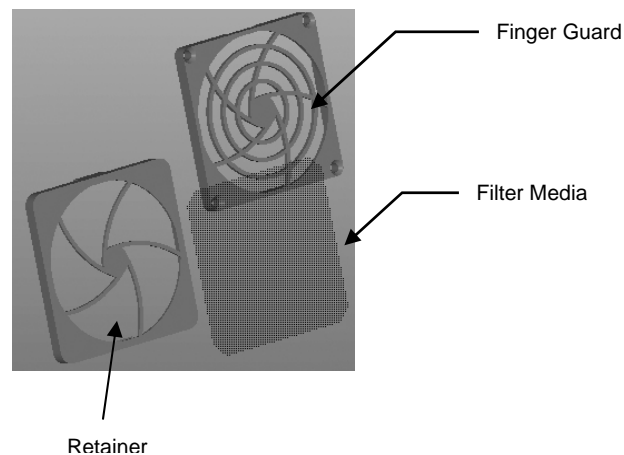
Cleaning Procedures

When cleaning the MC² Power System, disconnect AC power source and separate electronic enclosure and battery enclosure. Refer to “[Charger Timed-out Reset Procedure](#)” for separation instructions. Use a damp (slightly wet), mildly soapy cloth to clean the exterior of the power system. The following is a listing of approved cleaners that are effective for cleaning the exterior of the power system:

- Quaternary ammonium chloride compounds (such as AirX 109®)
- Bleach – household strength (1:10 minimum dilution strength)
- Ethyl or Isopropyl alcohol – 70%
- Hydrogen Peroxide
- Phenolic Disinfectants (such as Lysol®)
- WexCide®
- Ovation®
- Fantastic®
- Formula 409®
- 1.6% Aqueous ammonia
- “Green Soap” USP (United States Pharmacopoeia)

Cleaning the Filter Kit

The following instructions are recommended for cleaning the filter on the power system. The filter kit is made up of three parts: finger guard, filter media, and retainer:



- 1 Remove the retainer from the finger guard on the power system.
- 2 Remove the filter media from the retainer.
- 3 Rinse the filter media thoroughly under cool running water.
- 4 Carefully squeeze excess water out of the filter media and lay the filter media flat to dry.
- 5 Once the filter media is dry, replace it into the retainer.
- 6 Re-install the retainer onto the finger guard.

Chapter 9: Service and Support

Should your power system or workstation require repair, contact the Stinger Medical C.A.R.E. department to obtain an RMA (Return Merchandise Authorization). An RMA is necessary to return the unit to Stinger Medical for servicing and to maintain the product warranty. Any unit without an RMA will be returned at owner's expense. See the warranty for more information. Contact the Stinger Medical C.A.R.E department for questions related to service and/or warranty coverage.

Stinger Medical C.A.R.E. Department
1152 Park Avenue
Murfreesboro, TN 37129

888-445-8970 – Toll free
615-896-1652 – Phone
615-896-8906 – Fax
<http://www.StingerMedical.com>

Chapter 10: Battery Disposal

Industrial batteries contain lead and sulfuric acid, which are both considered 'hazardous substances'. If batteries are improperly disposed of, for example, thrown in the trash or illegally dumped, these substances can eventually leak out and contaminate the surrounding soil and groundwater supply.

It is a violation of federal law to improperly dispose of lead-acid batteries once they can no longer be used. Once a battery is purchased, full liability and responsibility lies on the owner to dispose of the battery.

The law says that responsibility is still on the owner if the battery is disposed of improperly by dumping in a landfill, or shipping to a scrap dealer who does not handle it properly and in which environmental damage occurs.

It is illegal to dispose of batteries in any way other than 'thermal recovery' or recycling of the hazardous substances in batteries according to the Environmental Protection Agency (EPA).

The Department of Transportation (DOT) has strict guidelines for the shipping of hazardous materials, which result in large fines if they are not followed.

Check with your local ordinances for proper disposal procedures.

MSDS sheets are available on-line at <http://www.StingerMedical.com>.

Batteries are consumable goods. For proper operation replace batteries every 18 months.

Appendix A: Power System Specifications

Technical Summary

The power system is a self-contained regulated power supply, battery, and charger unit, packed in an aluminum enclosure.

Features

Medical Filter IEC AC Input	Intelligent Communications (optional)
Regulated Adjustable DC Output	Cooling Fan
Fast Charging	Re-settable Overload Protection

Electrical Specifications

Input	Input Voltage	85 to 125 VAC
	Input Frequency	60 Hz
	Inrush Current Limiting	<70A peak (less than 1MS)
	Input Protection	5A, 250V fuse
Output	Output Voltage	3.3 VDC – 20 VDC \pm 5%
	Output Current	4.0 A per channel maximum
	Output Power	80 watt max channel 1&3, 48 watt max channel 2&4
	Overload Recovery	Follow "No Output Reset Procedure"
	Overload Protection	11A re-settable poly fuse
	Operating Time	Operating time will vary depending on state of charge and load present
	Output Efficiency	>90%

Battery Requirements

Battery Type	Sealed lead acid; quantity 1
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Battery Manufacturer	Powersonic
Capacity	26 or 35 Ah each
Output Voltage Range	12 V nominal 3.3 – 20V \pm 5%
Cycle Life	Approximately 350 full charge cycles

Connectors/Cables

Input Power Connector	Medical Filter IEC power connector
USB Port Connector	Standard USB cable (A male to B male)
Output Power Connector	Mini-DIN 4-pin device

Charging

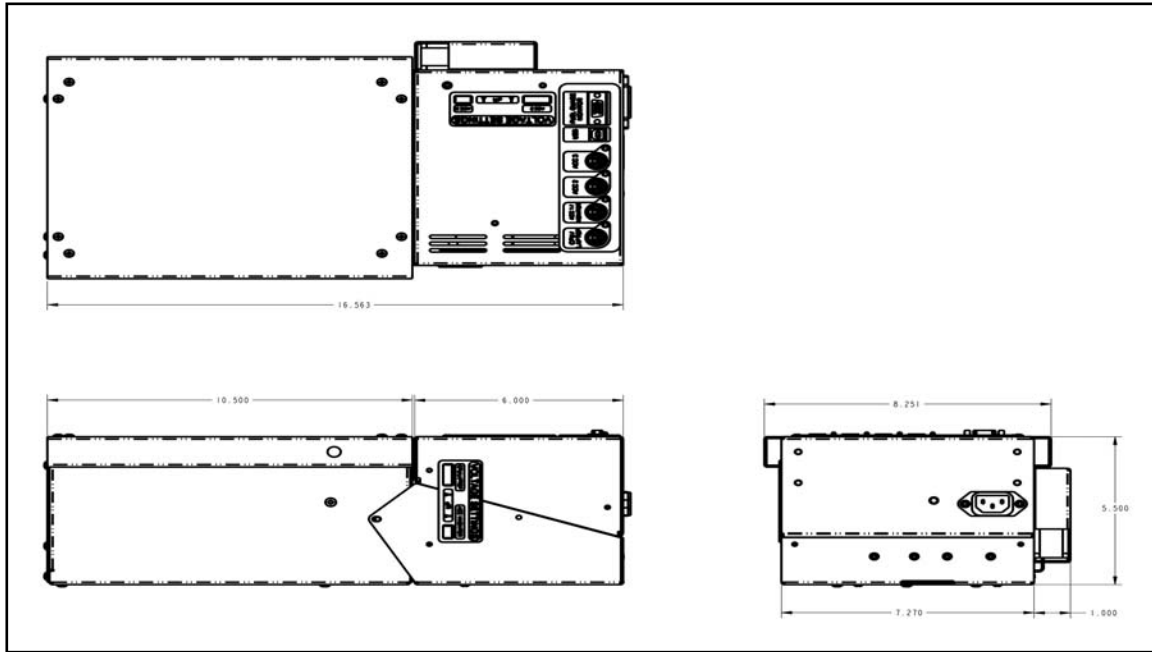
Charge Time (new battery)	~ 6 hours with no load
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Appendix B: Mechanical Specifications

MC² Power System Series 26 Amp-Hour

Maximum Assembled Dimensions: 5.5" x 7.125" x 16.5"

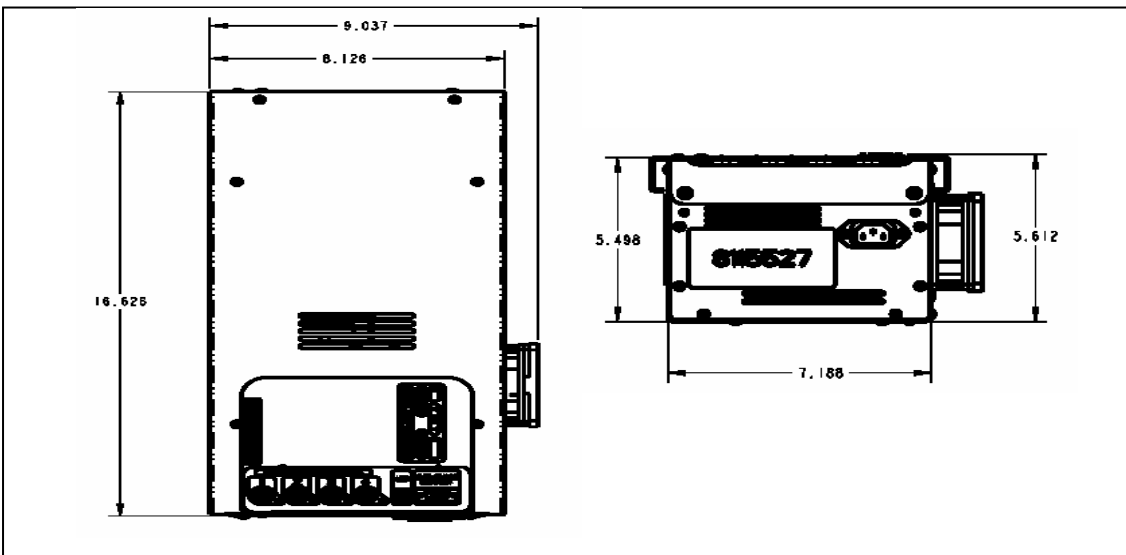
Maximum Weight: 30 lbs or less



MC² Power System Series 35 Amp-Hour

Maximum Assembled Dimensions: 5.5" x 7.2" x 16.6"

Maximum Weight: 30lbs or less



Appendix C: Power System Specifications

Storage Requirements

- The unit must be fully charged prior to storing.
- The electronic enclosure on the 26 Amp-Hour unit must be unplugged from AC power source and separated from battery enclosure.
- The Power Output Disconnect Switch on the 35 Amp-Hour unit must be set to the OFF position.

Classifications

- Class 1, Internally Powered
- Degree of Protection against Harmful Ingress of Water, IPX0
- EQUIPMENT not suitable for use in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE.

Environmental Specifications

- Operating Temperature: -25°C to 40°C
- Relative Humidity: 5 – 95% non-condensing

Warranty

- Product Warranty: 1 year limited warranty
- See <http://www.stingermedical.com> for full warranty details

Approvals

ETL/cETL Listing for North America

- UL 60601-1 - UL Standard for Safety Medical Electrical Equipment, Part 1: General Requirements for Safety First Edition
- CSA C22.2 NO 601.1-M90 - Issue:1990/01/11 (R2001) Medical Electrical Equipment - Part 1: General Requirements for Safety General Instruction No 1; Supplement 1; 1994; Amendment 2 - February 1998 (R1997)

Medical Device Directive 93/42/EEC - European Union (EU) Testing and Report Services

- CENELEC EN 60601-1 - Medical Electrical Equipment Part 1: General Requirements for Safety Incorporates Corrigendum July 1994; Includes Amendments A1: 1993, A11: 1993, A12: 1993, A2: 1995 and A13: 1996; IEC 601-1: 1988 + A1: 1991 + A2: 1995 + Corrigendum 1995, Modified
- IEC 60601-1-2 (2001-09) - Medical Electrical Equipment - Part 1-2: General Requirements for Safety - Collateral Standard: Electromagnetic Compatibility - Requirements and Tests Second Edition

CB Scheme Report and Certificate

- IEC 60601-1 - Medical Electrical Equipment Part 1: General Requirements for Safety Second Edition

Appendix D: System Electromagnetic Emissions and Immunity Declarations

MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the ACCOMPANYING DOCUMENTS.

WARNING: Use of unapproved ACCESSORIES may result in degradation which may result in increased Emissions and decreased Immunity.

Guidance and Manufacturer's Declaration – Cables, Transducers and Accessories			
The listed cables, transducers and accessories have been determined by Stinger Medical to be compliant with the emissions and immunity requirements of IEC 60601-1-2: 2001.			
Stinger Part No.	Description	Max. Possible Length	Shielded (Y/N)
8115196	Cable, power 2.5 x 5.5 – Kycon KPP	72'	Y
8115197	Cable, power 2.1 x 5.5 – Kycon KPP	72'	Y
8115198	Cable, power Hirose A – Kycon KPP	72'	Y
8115199	Cable, power Kycon – Kycon KPP	72'	Y
8115200	Cable, power 3 pin din – Kycon KPP	72'	Y
8115201	Cable, power Kycon – Kycon KMDLA	72'	Y
8115202	Cable, power Dell combo power adapter	72'	Y
8115203	Cable, power 1.7 x 4.75 – Kycon KPP	72'	Y
8115204	Cable, power 2.5 x 5.5 locking barrel – Kycon KPP	72'	Y
8115275	Cable, serial for basic fuel board	72'	Y
8115360	Cable, 10 pin ribbon extension	18"	N


Table 201 – Guidance and manufacturer's declaration – electromagnetic emissions – for all EQUIPMENT and SYSTEMS (see 6.8.3.201 a)3)

1 Guidance and Manufacturer's declaration –electromagnetic emissions			
2	The Fusion™ is intended for use in the electromagnetic environment specified below. The customer or the user of the Fusion™ should assure that it is used in such an environment.		
3	Emissions test	Compliance	Electromagnetic environment - guidance
4	RF emissions CISPR 11	Group 1	The Fusion™ 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. The Fusion™ is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
5	RF emissions CISPR 11	Class A	
6	Harmonic emissions IEC 61000-3-2	Class A	
7	Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Table 202 – Guidance and manufacturer's declaration – electromagnetic immunity – for all EQUIPMENT and SYSTEMS (see 6.8.3.201 a)6)

Guidance and manufacturer's declaration – electromagnetic immunity			
The Fusion™ is intended for use in the electromagnetic environment specified below. The customer or the user of the Fusion™ should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV 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 sec	<5% U _T (>95% dip in U _T) for 0.5 cycle 40% U _T (60% dip in U _T) for 5 cycles 70% U _T (30% dip in U _T) for 25 cycles <5% U _T (>95% dip in U _T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Fusion™ requires continued operation during power mains interruptions, it is recommended that the Fusion™ be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U _T is the a.c. mains voltage prior to application of the test level.			

Table 204 – Guidance and manufacturer’s declaration – electromagnetic immunity – for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING (see 6.8.3.201 b))

Guidance and manufacturer’s declaration – electromagnetic immunity			
The MC ² Series is intended for use in the electromagnetic environment specified below. The customer or the user of the MC ² Series should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic immunity - guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 V</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the MC² Series, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance $d = [3.5/V_1]eP$ $d = [3.5/E_1]eP$ 80 MHz to 800 MHz $d = [7/E_1]eP$ 800 MHz to 2.5 GHz</p> <p>where <i>P</i> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <i>d</i> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the MC² Series is used exceeds the applicable RF compliance level above, the MC² Series should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the MC² Series.</p>			

^b Over the frequency range 150 kHz to 80 MHz, field strength should be less than [V₁] V/m.

Table 206 – Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING (see 6.8.3.201 b)

Recommended separation distances between portable and mobile RF communications equipment and the MC ² Series			
The MC ² Series is intended for use in an electromagnetic environment in which RF disturbances are controlled. The customer or the user of the MC ² Series can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MC ² Series 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 $d = [3.5/V_1]eP$	80 MHz to 800 MHz $d = [3.5/E_1]eP$	800 MHz to 2.5 GHz $d = [7/E_1]eP$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Glossary

AC – Alternating Current: An electric current that reverses direction in a circuit at regular intervals (found in a standard wall outlet)

ACC – Accessory

Ambient – Temperature around the circuit board

AMPS – Ampere: a unit of electric current

Circuit - A closed path followed or capable of being followed by an electric current

Com Port – Communications port for data

Cord Set – Power cord

Cycle – Complete discharge and recharge of power system

Cycle Life – Number of complete cycles a battery can perform before reaching the end of its use

DC – Direct current (such as from a battery)

Deep Discharge – Extreme depletion of energy available from a battery

Discharging - To cause the release of stored energy or electric charge from a battery

Exhaust – Opening for hot air to exit power system

Frequency - The number of repetitions per unit time of a complete waveform, as of an electric current

Fuse - A safety device that protects an electric circuit from excessive current

Hertz - A unit of frequency equal to one cycle per second

Inrush – A sudden initial pull of power from the battery upon start-up

Intake Filter – Protective device for air inlet

Load - A device or the resistance of a device to which power is delivered

Low Battery – Critical state of discharge

Output – Energy produced by a system

Medical Grade – Standard fit for use in hospitals

Meter Display – Visual interface for power management software

Overload - An electrical load that exceeds the available electrical power

Peak - The highest value attained by a varying quantity: a peak in current

Polyfuse – Thermal re-settable fuse

Preventative Maintenance – Required regular care

Retrofit - To fit into or onto equipment already in existence or service

Suspend – Sedentary state

Timed Out – A state of inactivity between the battery and charger after a preset number of attempts at communication have been made

Torx - Has a grooved socket and receives a driver with a grooved shaft.

Unrecoverable Discharge – A drop in voltage beyond the point where the battery will recover in a timely manner

USB - An external peripheral interface standard for communication between a computer and external peripherals

Voltage - The rate at which energy is drawn from a source that produces a flow of electricity in a circuit; expressed in volts