

Installation Instructions

SPS-2M2 24vdc - 2A - 2 Power Limited Outputs – Supervised Power Supply/Charger module

SPS-3.6M2 12vdc - 3.6A - 2 Power Limited Outputs - Supervised Power Supply/Charger module

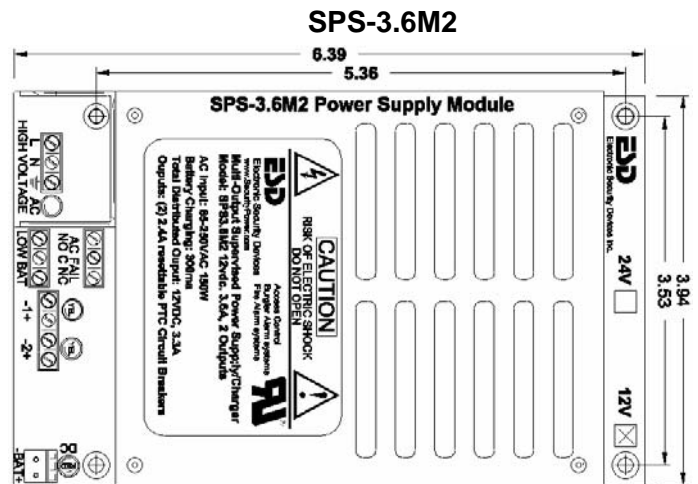
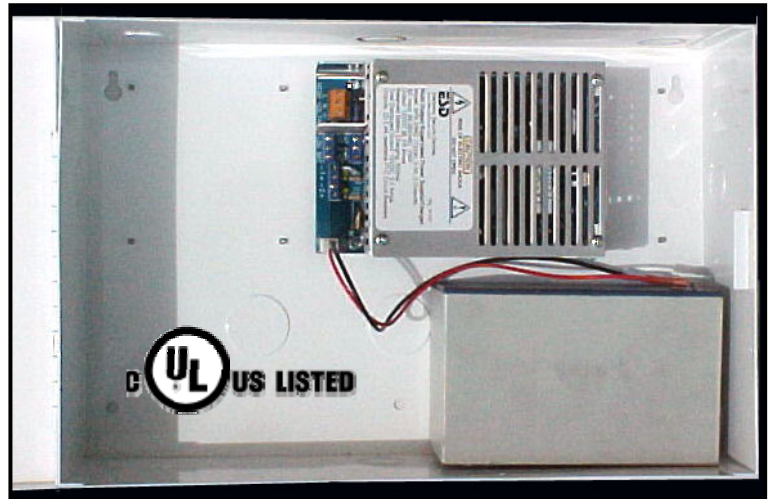
SPS-2M2E SPS-2M2 mounted in Enclosure

SPS-3.6M2E

SPS-3.6M2E SPS-3.6M2 mounted in Enclosure

Features:

- Super Clean DC Outputs
- Tolerates Brownouts
- Universal Input: 85vac – 260vac
- Self contained No External Transformer Required
- Precision Battery Charging and Output Regulation.
- All outputs are class II Power Limited with PTC Circuit Breakers
- Indicating LED's:
AC Input, Green
DC Main Power, Red
Each Output Yellow
- AC Fail Alarm Form C Contacts
- Low Battery Alarm Form C Contacts
- Battery Cut-off Relay Prevents Deep Discharge
- Battery is Float Charged for Faster Charging with No Switch Over when AC fails.
- Thermal Protection
- Short Circuit Protection
- Plug-in Battery cable assembly is provided
- 36" Plug-in Battery cable assembly is available (WA-36IBAT) for remote battery mounting.
- Quality Manufactured in the USA
- UL and CUL Listed
UL603 Burglar Alarm System Power Supply
UL294 Access Control Accessory
UL1481 & NFPA72 Power Supplies for Fire-Protective Signaling Systems
- Certified Compliance with EN 55022 & FCC



SPS-2M2 and SPS-3.6M2 Description

The SPS-2M2 and SPS-3.6M2 are clean, efficient, heavy duty, low frequency off line switching power supplies with precision battery charger and power supervision. These supplies are so clean that they can be used anywhere a linear or switching supply is recommended. The filtering and switching systems we use are very similar to what you would find on high quality computers. Even though the SPS-2M2 (24v) and the SPS-3.6M2 (12v) are both 50 watt power supplies utilizing the same printed wiring board, we use separate supplies for 12v and 24v models for



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optimum performance. The universal input of 85vac to 260vac allows them to be used anywhere in the world without adjustments to the power input. The ability to run at very low AC voltages allows the SPS-3.6M2 and SPS-2M2 to tolerate brown outs very well. The SPS-2M2 and SPS-3.6M2 are fully self-contained and isolated from the AC power input line to all world safety standards. Each power supply weighs less than 1.5 lbs and occupies less than ½ of a cubic foot of cabinet space.

The SPS-2M2 and SPS-3.6M2 become an uninterruptible power supply when a stand by battery(s) is connected with the battery cable provided. These supplies have a special power limiting circuit that allows the batteries to be float charged across the output without lock up or chirping on and off. The battery(s) is protected with an automatic resetting circuit breaker and diode for over current and accidental reversed battery hookup. Precision float charging means faster recovery time and longer life for the battery(s). There is no switch over or voltage drop when input power fails. Standby battery(s) can be any capacity between 4 and 40 Amp hours. The SPS-2M2 24vdc is rated for 1.7 Amps continuous current with 300ma reserved for battery charging. The SPS-3.6M2 12vdc is rated for 3.3 Amps continuous current with 300ma reserved for battery charging.

Power Supervision utilizes 2 relays and electronics to indicate 2 levels of the stand by battery. The AC FAIL relay provides a form C contact set to indicate the AC has failed, the supply is running on standby batteries. The LOW BAT relay provides a form C contact set to indicate the battery(s) is low, not much stand by power is left. Either of these form C contacts can be used to signal a buzzer and/or other signaling device. Both of these relays are normally energized for fail-safe operation.

Battery-Cut Off uses a 3rd relay with electronics to disconnect the battery from the power supply and load at the end of its service limit, preventing deep discharge that will damage the battery(s). This relay is normally energized as are the supervision relays.

Explanation of Terminals and LED's

AC Input Terminals are marked High Voltage (L)ine, (N)eutral, and (G)round. The terminal block and AC LED are mounted within a high voltage barrier. The terminal block is self-clamping and can accept wires from 12awg to 18awg.

AC LED adjacent to the AC input terminals is ON Green when AC is applied.

AC FAIL Terminals NO-Normally Open, C-Common, and NC-Normally Closed. The normal relay position indicates the AC power is on and the relay is energized. The terminal block is self-clamping and can accept wire from 14awg to 24awg. The contacts are rated for up to 2A resistive load to 120 volts. When the AC fails the relay drops off normal.

LOW BAT Terminals NO-Normally Open, C-Common, and NC-Normally Closed. The normal relay position is energized and indicates the output battery voltage is in the normal range. When stand battery(s) reach a low level, the relay drops off normal.

DC Output Terminals on the SPS-2M2 and SPS-3.6M2 are marked (-1+) for dc output number 1, and (-2+) for dc output number 2. Each of these outputs are class II power limited with PTC auto resetting circuit breakers. You must keep a .25" minimum spacing of power-limited wires to non-power limited wiring. See specifications and door label for current ratings. The terminal block is clamping and can accept wires from 14awg to 24awg.

DC Output LED's are adjacent to each output are ON Yellow when output is ON. If a circuit is overloaded and tripped, the associated LED will be off.

DC Power LED adjacent to battery connector is ON Red when main DC is on.

Battery Connector is marked -Bat+. This is a .156" 2 position header with lock. The provided battery cable plugs in to this. The provided cable is 12" long. For remote battery mounting, a 36" battery cable is available, part WA-36IBAT. The battery cable wires are Red and Black. The red connects to the positive and black to the negative of the battery. The SPS-2M2 24vdc model comes with a 12" black wire with female slip on connectors on each end for connecting 2 12v batteries in series.

Specifications

AC Input: 3 position terminal block in High Voltage barrier. Line, Neutral, and Earth Ground

AC Input	85-260vac/47-63Hz/75W
AC Input UL Rating	90-250vac/47-63Hz/75W
AC LED indicator	Green

Wide range AC input does not require any selection switching. Earth ground terminal must be properly connected to earth ground.

bAC Fuse Link is inside unit for catastrophic failure. This fuse is not field replaceable, unit must be returned to factory for service should this fuse blow. A blown fuse is indicated by the AC LED off with AC power applied.

DC Outputs:

SPS-2M2 and SPS-2M2E Output Rating (total of outputs 1 & 2)	20.4-27.8vdc, 24vdc nominal, 1.7A
Outputs #1 and #2 PTC circuit breakers each rated	1.42A
SPS-3.6M2 and SPS-3.6M2E Output Rating (total of outputs 1 & 2)	10.2-13.9vdc, 12vdc nominal, 3.3A
Outputs #1 and #2 PTC circuit breakers each rated	2.4A
Typical Output Voltage SPS-2M2/SPS-3.6M2 ..	27.3vdc/13.65vdc
Typical Output Ripple & Noise SPS-2M2/SPS-3.6M2	30mv/15mv
Current Overload Short Circuit Protection	Yes
Battery PTC Circuit Breaker SPS-2M2/SPS-3.6M2	2.5A/4.5A
Over Temperature protection	Yes
Ambient Operating Temperature Range	0°C to 49°C
Switching Frequency	43KHz

Supervisory Functions:

Battery Cutoff Voltage SPS-2M2/SPS-3.6M2	10.2vdc/20.4vdc
Battery Cutoff relay contacts (no user connections)	15A Resistive
AC fail trip point SPS-2M2/SPS-3.6M2	<25.8vdc/12.9vdc
AC fail relay form C Contacts	2A up to 120vac
<i>Detected by small drop of DC Output at about 99% capacity remaining in Standby batteries</i>	
Low battery trip point SPS-2M2/SPS-3.6M2	<22.0/11.0vdc
Low battery relay form C Contacts	2A up to 120vac
<i>AC fail, Low Battery, and Battery cut-off Relays are normally energized for fail-safe operation.</i>	

Battery Charging: (Keyed header plug marked –Bat+)

The battery charger is precision set to float charge 12v or 24v sealed or wet lead acid batteries. Typically two 12v batteries are connected in series for 24v. The Amp hour capacity must be between 4Ah and 40Ah capacity.

Mechanical Characteristics:

SPS-2M2/SPS-3.6M2 weight (module only)	1.5 lbs
SPS-2M2E/SPS-3.6M2E weight in enclosure	7.2 lbs
SPS-2M2/SPS-3.6M2 (module only) size	6.40H" x 3.95"W x 2.5"D
SPS-2M2/SPS-3.6M2 module mounting holes center to center (4 holes)	5.36"H x 3.54"W
"E" Enclosure size (inside dimensions)	14W" x 9H" x 3.5"D"
"E" Enclosure mounting holes center to center (4 holes)	12.74" x 6.98"

Note: For knock out and mounting locations, see graphic drawing of SPS-3.6M2E

Approvals:

EMI Conducted and Radiated EN5022 CISPR-22 A, FCC A
UL and CUL Listed UL603, UL294, C294, UL1481, C1481



Specifications are subject to Change without notice.

Battery Selection

The table below shows typical standby time in hours for various loads and batteries. The table works for either SPS-2M2 24v, or SPS-3.6M2 12v.

Approximate Battery Standby Time Table with a reserve of 3 Amps for 5 minutes for Alarm

Total Output Amps	4Ah Battery Standby	7Ah Battery Standby	12Ah Battery Standby	24Ah Standby	40Ah Standby
.5A	5.5 Hrs	12 Hrs	20 Hrs	40 Hrs	65 Hrs
1A	2.5 Hrs	5 Hrs	9 Hrs	19 Hrs	32 Hrs
1.3A	2 Hrs	4 Hrs	7.2 Hrs	15.5 Hrs	24 Hrs
2A	1 Hrs	2 Hrs	5 Hrs	10 Hrs	15 Hrs
3A	.5 Hrs	1 Hrs	3 Hrs	6 Hrs	9.5 Hrs

The recharge table below gives approximate recharge times for different loads and battery sizes. The table is based on batteries depleted to battery cut-off and recharged back to approximately 90% capacity.

Approximate Battery Recharge Times in Hours

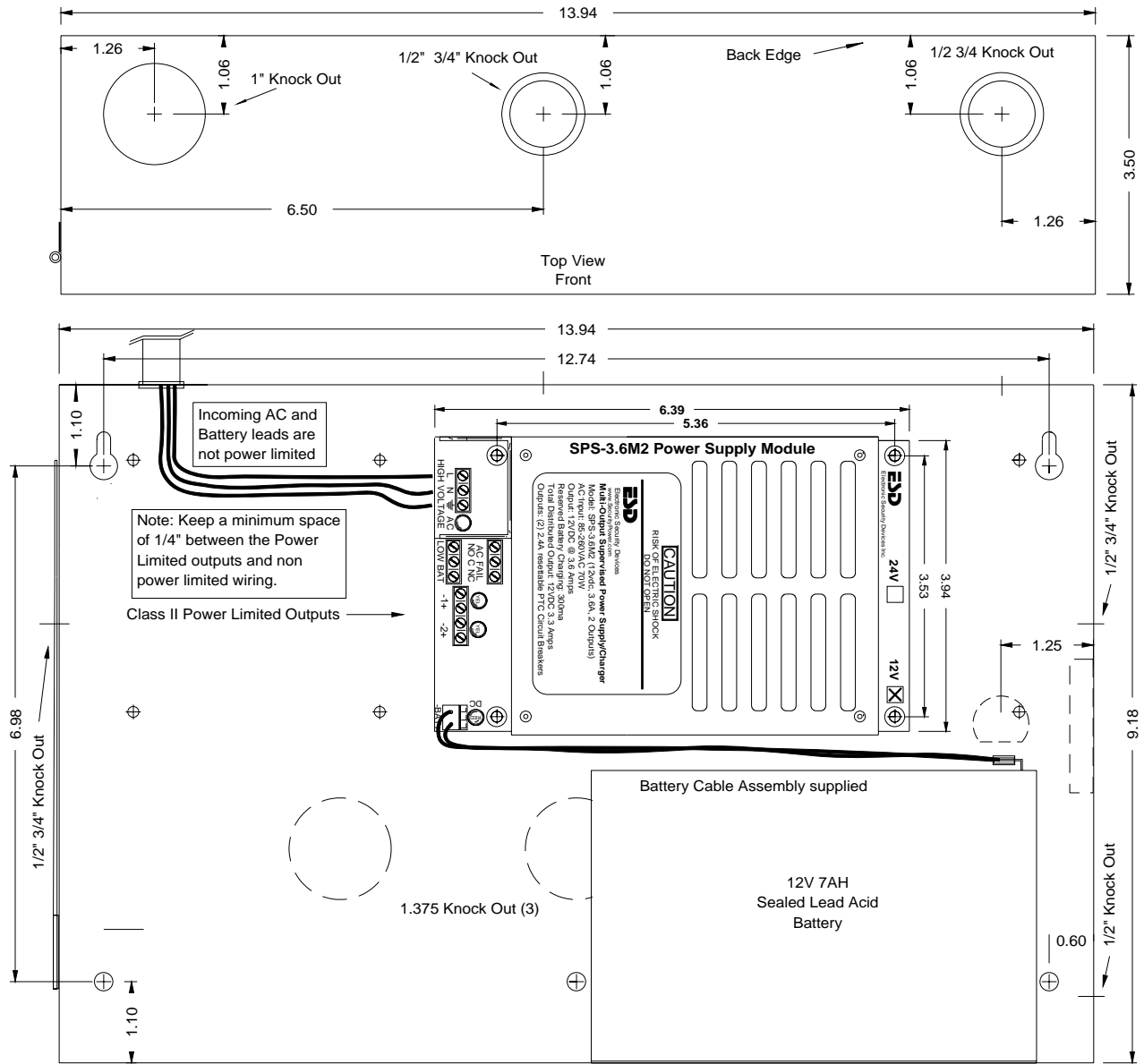
Total Output Amps	4Ah Battery 12v/24v	7Ah Battery 12v/24v	12Ah Bat 12v/24v	24Ah Bat 12v/24v	40Ah Bat 12v/24v
.5A	8Hrs/8Hrs	10Hrs/10Hrs	13Hrs/13Hrs	14Hrs/16Hrs	24Hrs/32Hrs
1A	8Hrs/8Hrs	10Hrs/12Hrs	13Hrs/14Hrs	14Hrs/20Hrs	24Hrs/32Hrs
1.3A	8Hrs/12Hrs	10Hrs/12Hrs	14Hrs/16Hrs	15Hrs/24Hrs	26Hrs/38Hrs
2A	8Hrs/NA	10Hrs/NA	16Hrs/NA	18Hrs/NA	28Hrs/NA
3A	8Hrs/NA	12Hrs/NA	20Hrs/NA	24Hrs/NA	38Hrs/NA

Maintenance

The power supply and stand by battery(s) should be tested at least once a year as follows:

1. Check LED's for normal state. AC ON Green, Output ON Yellow, DC ON Red.
2. Check output voltage with normal load. The SPS-3.6M2 should read between 13.60 and 13.75vdc. The SPS-2M2 should read between 27.20 and 27.7vdc. This assures proper voltage to float charge batteries.
3. With normal load, disconnect AC input. AC LED should be off, all other LED's should remain normal.
4. Check DC Output to be above 12.1vdc for SPS-3.6M2 and 24.2vdc for SPS-2M2. This checks standby batteries to be operational. Sealed lead acid batteries have a typical life of 3 to 5 years.
5. Re Apply AC and verify AC LED ON.

Drawing of SPS-3.6M2E





SPS-2M2 and SPS-3.6M2 Multiple Output, Off Line Supervised Power Supply/Chargers Installation Guide

The SPS-2M2 and SPS-3.6M2 Supervised Power Supply/Chargers with standby battery(s) provide an uninterruptible 24vdc or 12vdc power source. The DC power outputs are class II power limited outputs, each with PTC circuit breaker protection.

1. This installation should be made by a qualified service person, should conform to all local codes and should comply with The National Electrical Code (or equivalent).
2. Mount the Power Supply in desired location.
3. Connect DC devices to the Output Terminals. Observe polarity.
4. The power table below shows the continuous current you may use for each output.
5. Be sure that the total current requirement conforms to the total available output current.
6. Connect AC FAIL alarm contacts. N/O means normally open with AC ON.
7. Connect LOW BAT alarm contacts. N/O means normally open with battery voltage normal.
8. Connect Line voltage, 85 to 260vac and Earth Ground to the 3 position terminal block marked HIGH VOLTAGE. The Earth Ground terminal is connected to the enclosure and outer heat sink case for safety and EMI filtering.
9. Each Output Power/Fuse ready is indicated with a Yellow LED ON centered above each output terminal pair. See instructions for more details regarding LED indicators.
10. To reset a tripped PTC Circuit Breaker, you may have to correct the fault and remove load for up to 1 minute. This allows the PTC re-settable fuse to cool and reset to it's normal "ON" condition.
11. Refer to the Installation Instruction P/N SPS23MInstructions Rev 04/15/02 for further details.

Selection Table

Part number is shown on outside label.

 SPS-2M2 SPS-3.6M2 Power Supplies	Total Continuous DC Amps	Reserved for Battery(s) Charging	DCV Output	Power Limited Class II Output #1 continuous rating	Power Limited Class II Output #2 continuous rating	AC Input rating
SPS-2M2 SPS-2M2E	1.7 Amps	300ma	24vdc	1.42A	1.42A	90-260vac 75W
SPS-3.6M2 SPS-3.6M2E	3.3 Amps	300ma	12vdc	2.4A	2.4A	90-260vac 75W
Each output has a Yellow status LED. The power outputs of the SPS-2M2 and SPS-3.6M2 are class II power limited. Dress wires to keep a minimum space of .25" between non-power limited and power-limited circuits.				 Enclosure "E": 14W x 9"H x 3.5"D Power Supplies UL and ULC 603 Listed Burglar Alarms UL and ULC 294 Listed Access Control UL and ULC 1481 Listed Fire-Protective Signaling		