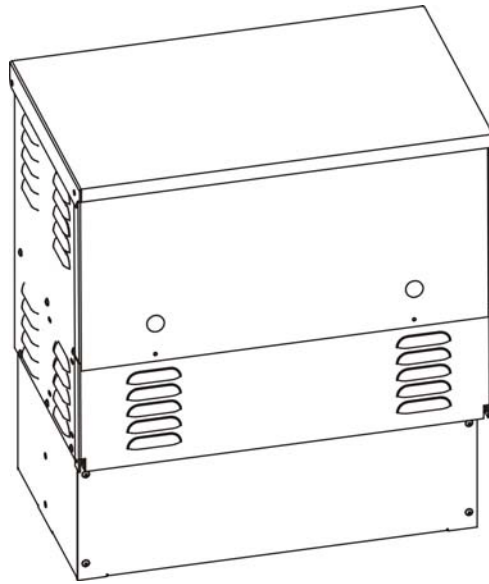


APC[®] **BroadBand CTSLP/G**
www.apc.com

Uninterruptible Power Supply 60 VAC

User Manual



Chapter 1 General Information

The SLP/G Series Standby Power Supply provides an uninterruptible power source for broadband cable operations. Batteries are housed inside the module. A battery vault may be used to provide additional battery backup. Refer to the APC Web site, www.apc.com for detailed information on additional battery configurations.

Important Safety Instructions – Save These Instructions

This Safety Guide contains important instructions that should be followed during installation and maintenance of the APC equipment and batteries. It is intended for APC customers who setup, install, relocate, or maintain APC equipment.

Changes and modifications to this unit not expressly approved by APC could void the warranty.

Failure to observe these warnings may result in serious injury, death or damage to the equipment.

Electrical Warnings

Do not work alone under hazardous conditions.

Do not handle any metallic connector before the power has been disconnected.

Servicing this equipment may require working with protective covers removed and AC power connected. Use extreme caution during these procedures.

High short circuit current through conductive materials could cause severe burns.

When grounding cannot be verified, disconnect the equipment from the utility power outlet before installing or connecting to other equipment. Reconnect the power cord only after all connections are made.

Check that the power cord(s), plug(s), and sockets are in good condition.

Replacement of fuses or other parts must be with identical types and ratings. Substitution of nonidentical parts may cause safety and fire hazards.

Overhead Warnings

Never stand underneath anything while it is hoisted. Always wear a hard hat.

Lifting Warnings

Transformer modules are heavy. Use proper lifting techniques to avoid injury.

Battery Warnings

Danger of explosion if battery is incorrectly connected or replaced. Replace batteries only with same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Specifications

Environmental Specifications

Operating Temperature	-40° F to +140° F (-40° C to +60° C)
Humidity	5% to 95% noncondensing within enclosure

Physical Specifications

Characteristic	Specification
Height Pole Mount Ground Mount	18" (45.7 cm) 25" (33 cm)
Width Pole Mount/Ground Mount	23" (58.4 cm)
Depth Pole Mount/ Ground Mount	16" (41 cm)
Weight <i>Pole Mount</i> without batteries with 3 batteries <i>Ground Mount</i> without batteries with 3 batteries	82 lbs (37.2 kg) 154 lbs (70 kg) 92 lbs (41.8 kg) 164 lbs (75.5 kg)

Electrical Specifications

Input Characteristic	Input Specification
Input Voltage	120 VAC Nominal 220 VAC Nominal
Input Current	15 A Max
Input Frequency	60 Hz ± 1 Hz
Output Characteristic	Output Specification
Output Voltage	60 VAC ± 3%
Output Current	9 A/15 A
Output Frequency	60 Hz ± 1%
Output Regulation <i>Normal</i> <i>Standby</i>	± 3% ± 5%
Output Protection	20 A Circuit Breaker (optional)
Transfer Time	<20 milliseconds

Chapter 2 Installation and Maintenance

Only trained service personnel should install and maintain the Power Supply.

Prior to installing the Power Supply AC line voltage must be routed to the enclosure. Local, state, federal and/or National Electric Code (NEC) regulations regarding location, permits and electrical wiring must be adhered to.

Do not operate the Power Supply where the temperature and humidity are outside the specified limits. See *Specifications* in this manual.

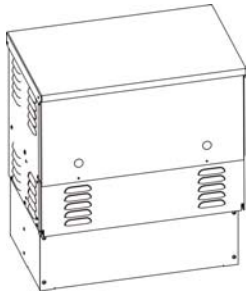
Unpacking

Inspect the unit upon receipt. Notify the carrier if there is damage.

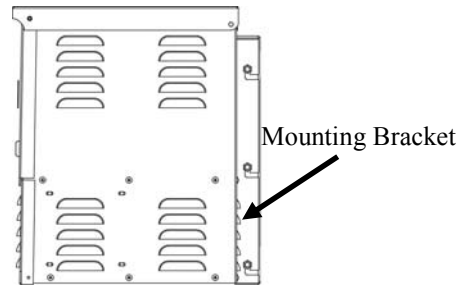
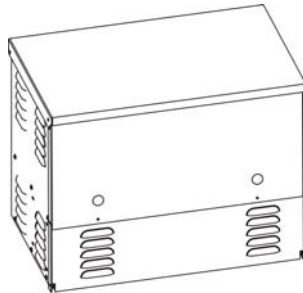
The packaging is recyclable; save it for reuse or dispose of it properly.

Check the package contents. The package contains the Power Supply and product documentation.

SLG Enclosure



SLP Enclosure



Models Supported

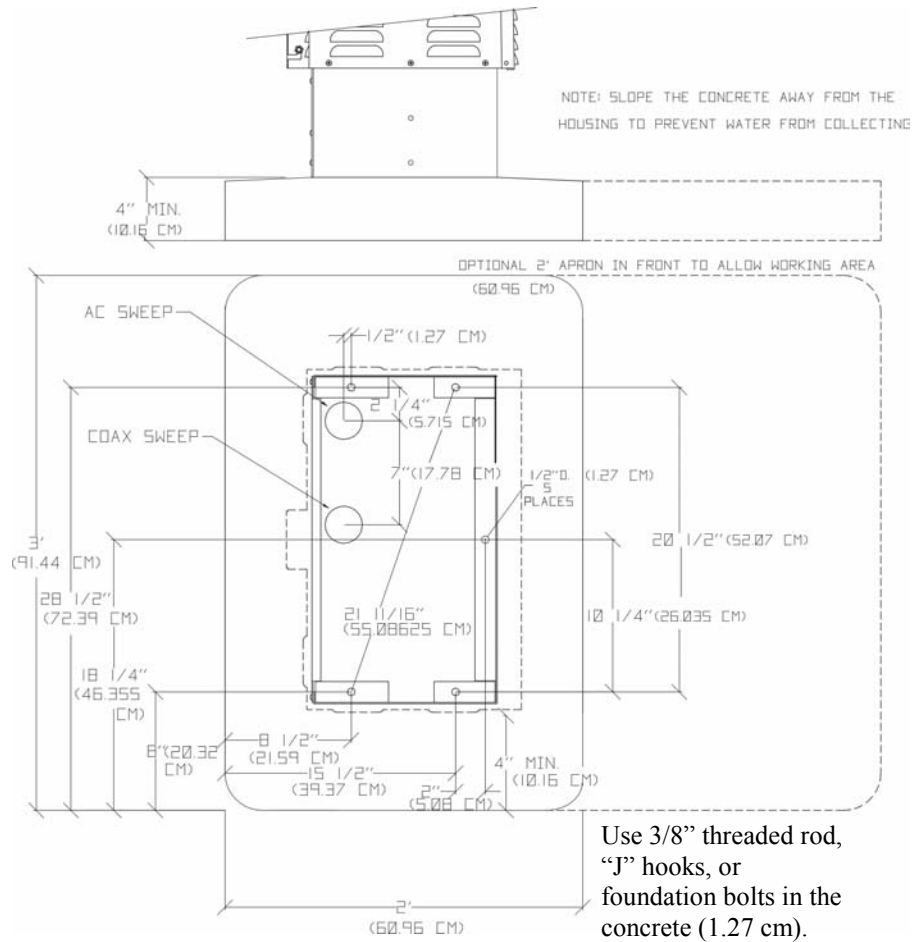
Model Number	Description
CTSLGH220S1	ENCL, SLG, 36V, 220VAC, SM Ready
CTSLPH120S1	ENCL, SLP, 36V, 120VAC, SM Ready
CTSLPH220S1	ENCL, SLP, 36V, 220VAC, SM Ready
CTSLGH710S1	ENCL, SLG, 36V, 120VAC, SM Ready

Installing the Power Supply Enclosure

Use 2" conduit with an outer diameter of 2.5" (5.1 cm/6.4 cm). The mounting holes are 1/2" in diameter.

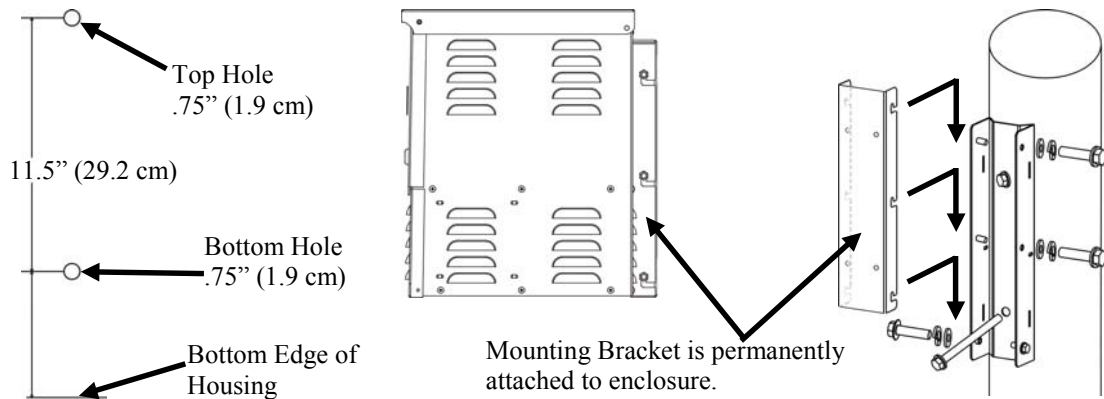
SLG Enclosure Installation

Locate an installation site and setup the concrete pad according to local building code requirements. See the figure below for pad details.



1. Remove the rear panel of the ground mount skirt (four, #8 Phillips head screws).
2. Pull the Coax and AC lines through the sweeps.
3. Set the enclosure onto the rods set in the concrete pad.
4. Secure the enclosure using lockwashers and nuts.
5. Apply a sealant to the concrete pad/ ground skirt to seal the interior of the enclosure against moisture and insects.

SLP Enclosure Installation



Wall Mount Units: Select fasteners that will accommodate the weight of the unit including batteries.

Wiring

Unlock and open the enclosure door. The open door is designed to either rest on the top edge of the enclosure or slide into the enclosure.

Install an approved 20 amp high magnetic circuit breaker between the power source and the power supply unit.

1. Attach conduit to the 1/2 " hole on the bottom of the unit and wire the input line.
2. Connect the wires to the Euro block.
3. Route the power feed Coax to the bottom of the enclosure. Install a pin type connector (not furnished), to the chassis connector located on the bottom of the enclosure.
4. Attach the yellow wire with the clamp to the stinger of the pin connector. Tighten the setscrew on the lug clamp.
5. Place suitable copper ground wire into the ground lug located on the bottom of the enclosure. Route and attach the ground wire.
6. Switch the AC circuit breaker to the ON position.
7. Check voltages between pins 6, 4, 3, 2, and 1 on the ferro connector and the ground. If voltages are present, repeat step 7 above.

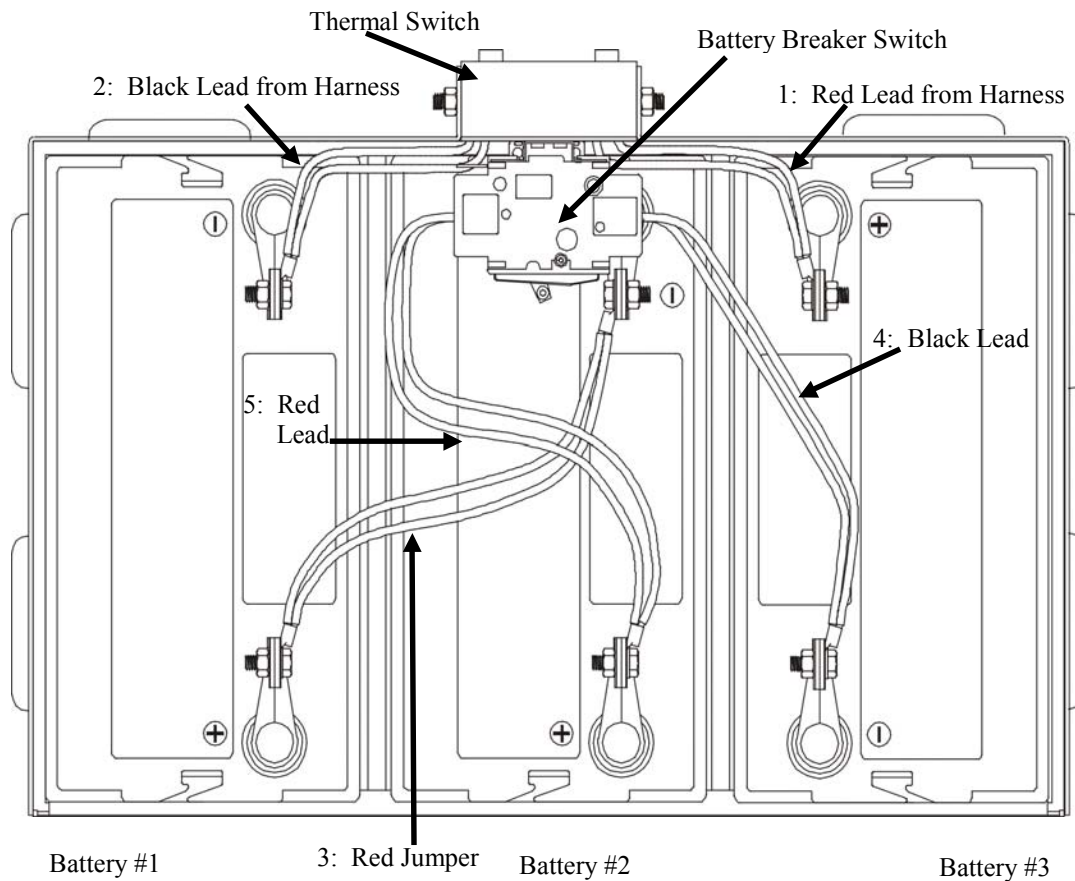
Installing Batteries

Ensure that the battery breaker is in the OFF position during battery installation.

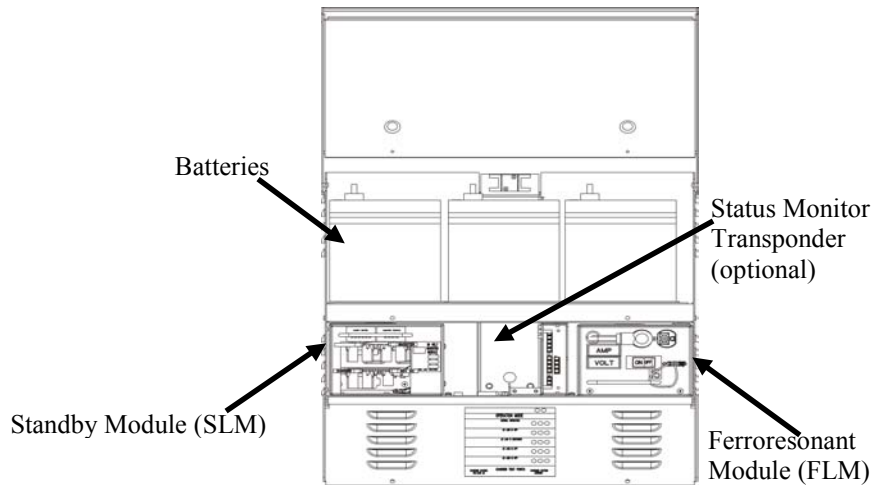
The batteries fit into a battery tray that is installed on the top shelf of the enclosure.

The Thermal Switch provides temperature control during battery charge. Place the Thermal Switch at the top of the batteries.

Install the batteries with the polarities oriented properly. See figure below.



Installing Modules



Ferroresonant Module Installation

1. Switch the AC circuit breaker to the OFF position.
2. Locate the pin connector on the enclosure. Slide the FLM into the enclosure. The guide pin on the FLM will snap into the connector on the enclosure.
3. Switch the AC circuit breaker to the ON position.
4. Switch the breaker located on the front of the FLM, to the ON position. The green lamp on the bottom of the enclosure will illuminate.
5. Verify voltage at the stinger connector. Refer to *Specifications* in this manual.

Standby Module Installation

1. Ensure that the batteries are connected properly and the battery circuit breaker is in the OFF position.
2. Locate the pin connector on the enclosure. Slide the SLM into the enclosure. The guide pin on the SLM will snap into the connector on the enclosure.
3. Switch the battery circuit breaker to the ON position.

Note: Batteries charge during normal operation.

Chapter 3 Operation

Initial Startup

1. Switch the AC circuit breaker to the ON position.
2. Verify that the FLM and SLM circuit breakers are switched to the ON position.
3. Allow 15 seconds for the SLM to run through the time delay cycle.
4. Check the battery float voltage on the charger card at TP1 and TP2.

If adjustment is necessary, switch the battery circuit breaker to the OFF position. Attach test leads to TP1 (red) and TP2 (black), adjust potentiometer R2 for correct reading. Switch the battery circuit breaker to the ON position.

5. Measure the voltage at the Coax connector ensuring that 60 VAC are present.

Verify SLM Operation

Allow the batteries to charge for 24 hours prior to testing.

Switch the FLM circuit breaker to the OFF position. The red lamp will illuminate and the SLM will begin standby mode operation.

Shut Down

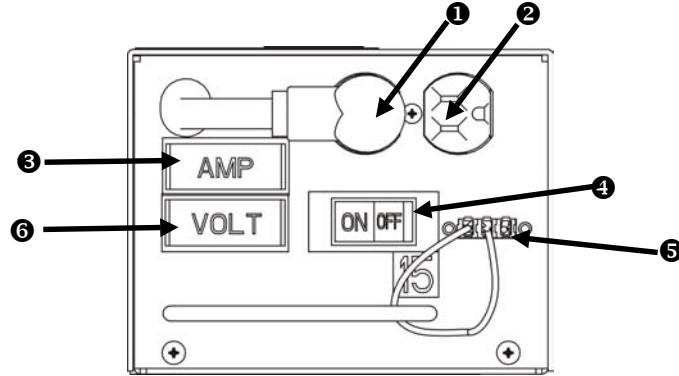
Switch the battery circuit breaker, the FLM circuit breaker, and the AC line circuit breaker to the OFF positions.

Auxiliary Power Supply

1. Set up an auxiliary AC generator and calibrate to $60 \text{ Hz} \pm 1 \text{ Hz}$.
2. Turn the AC main breaker to the OFF position.
3. Unplug the AC input cord from the FLM and attach it to the generator extension cord.
4. The green lamp on the bottom of the enclosure will illuminate.

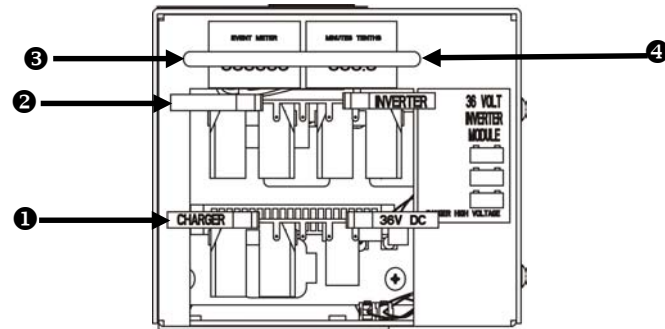
For details regarding available options see the APC Web site www.apc.com.

FLM



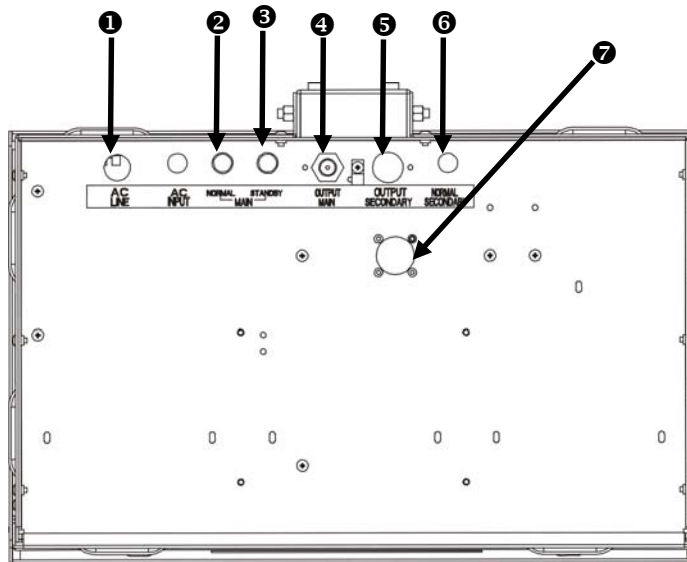
Index	Item	Description
1	Auxiliary AC Input Plug	Provides connection point to operate Power Supply from a generator.
2	AC Auxiliary Receptacle	Provides access to utility power for field tools, lights, etc.
3	Ammeter (optional)	Displays output current while in normal mode.
4	15 A Breaker	Provides input surge protection.
5	Option Plug	Provides an interface for standard APC power supply options.
6	Voltmeter (optional)	Displays output voltage while in normal mode.

SLM



Index	Item	Description
1	Charger Card	Contains circuits used to: maintain a charge on the batteries, sense input power loss and provide logic to determine mode of operation.
2	Inverter Card	Contains circuits that receive DC input from the batteries and provide AC output during standby operation.
3	Event Counter (optional)	Displays number of transitions from normal to standby operation.
4	Hour Meter (optional)	Displays total time in standby operation.

SLP/G Enclosure Bottom View



Index	Item	Description
1	AC input	Entry point for AC line conduit.
2	Normal/Main Indicator LED	Green LED, illuminates during normal operation of FLM power supply.
3	Standby/Main	Red LED, illuminates during SLM backup operation.
4	Output Cable Adapter	Coax adapter for FLM power supply output.
5	Ground Wire Lug	Ground wire attachment.
6	FLM Output/Secondary (optional)	Coax adapter for secondary FLM connection.
7	Normal/Secondary Indicator LED	Green LED, illuminates during operation of secondary FLM power supply.
8	Status Monitoring Connector (optional)	Connector space for Status Monitor option.

Chapter 4 Service, Contact and Warranty Information

Service

APC makes every effort to ensure parts and equipment arrive in working condition. Occasionally, it may be necessary to return parts or equipment that are not in working condition.

If the unit requires service do not return it to the dealer. Follow these steps:

1. Contact APC Customer Support through the APC Web site, www.apc.com/support.
 - Note the product model number, the serial number, and the date purchased. If you call APC Customer Support, a technician will ask you to describe the problem and try to solve it over the phone. If this is not possible the technician will issue a Returned Material Authorization Number (RMA#).
 - If the product is under warranty, repairs are free. If not, there is a repair charge.
 - Procedures for servicing or returning products may vary internationally. Refer to the APC Web site. Select the appropriate country from the country selection field. Select Support from the tab at the top of the web page.
2. Pack the product in its original packaging. If the original packing is not available, refer to the APC Web site for information on obtaining appropriate packing materials.
 - Pack the unit properly to avoid damage in transit. Never use Styrofoam beads for packaging. Damage sustained in transit is not covered under warranty.
3. Mark the RMA# on the outside of the package.
4. Return the unit by insured, prepaid carrier to the address given to you by Customer Support.

How to Contact APC

In the USA ...	Outside the USA ...
Refer to the APC Web site, www.apc.com/support .	Refer to the APC Web site, www.apc.com . Select the appropriate country from the country selection field. Select the <i>Support</i> tab at the top of the web page.

Limited Warranty

American Power Conversion (APC) warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

EXCEPT AS PROVIDED HEREIN, AMERICAN POWER CONVERSION MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL APC BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.

Regulatory Approval



CE

2002

EC Declaration of Conformity

We, the undersigned, declare under our sole responsibility that the equipment specified below conforms to the following standards and directives:

Standards to Which Conformity Declared:	EN55022; EN50091-2; EN 60950; EN50091-1-1, 2; 55024; IEC60950; EN61000-3-2, 3-3, 4-2, 4-3, 4-4, 4-5, 4-6, 4-11
Application of Council Directives:	73/23/EEC, 89/336/EEC
Type of Equipment:	Power Supply
Model Numbers:	CTSLP/G
Manufacturer's Name and Address:	American Power Conversion 132 Fairgrounds Road West Kingston, Rhode Island, 02892, USA -or- American Power Conversion (A. P. C.) b. v. Ballybritt Business Park Galway, Ireland -or- American Power Conversion Main Avenue, Peza Rosario, Cavite, Philippines -or- American Power Conversion 2nd Street, Peza, Cavite Economic Zone Rosario, Cavite Philippines -or- American Power Conversion Lot 32 Phase 1 Carmelray Industrial Park Cankhbang, Calamba, Laguna Philippines -or- APC (Suzhou) UPS Co., Ltd No. 189 Suhong Road, China-Singapore Suzhou Industrial Park Suzhou 215021, Jiangsu, P.R.C American Power Conversion (A. P. C.) b. v. Ballybritt Business Park Galway, Ireland
Importer's Name and Address:	
Place:	N. Billerica, MA U.S.
Place:	Galway, Ireland
	<i>Richard J. Everett</i> 5 Jan 02 Richard J. Everett, Sr. Regulatory Compliance Engineer <i>Ray S. Ballard</i> 5 Jan 02 Ray S. Ballard, Managing Director, Europe

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