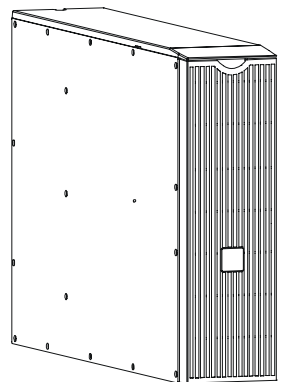


# Smart-UPS<sup>®</sup> RT

**Isolation Transformer  
Models: SURT001 and SURT002**

**Isolation and Step-Down Transformer  
Models: SURT003 and SURT004**

## User Manual



990-1673B English 03/2005



General Information

About APC

American Power Conversion (APC) is the leading manufacturer of state-of-the art uninterruptible power supplies, power management software, and related equipment. APC products protect hardware, software, and data from power disturbances in business and government offices throughout the world.

Safety Information

Ensure that you read, understand and comply with the safety instructions and warnings contained in the Safety Manual shipped with this product before installing, operating or maintaining APC equipment.

Regulatory Agency Approvals and Radio Frequency Warnings

200, 208, 220, 230, 240 Models:

This is a Class A product. In a domestic environment this product may cause radio interference, in which case, the user may be required to take corrective actions.



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user is responsible for correcting the interference.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Declaration of  
Conformity



2003

EC Declaration of Conformity

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

<b>Standards to Which Conformity Declared:</b>	EN62040-1-1, EN50091-1-1, IEC60950-1, EN 60950-1, EN50091-2, EN55022, EN55024, EN61000-2-2, -3-2, -3-3, -4-3, -4-5, -4-6, -4-8, -4-11
<b>Application of Council Directives:</b>	73/23EEC, 93/68/33C
<b>Type of Equipment:</b>	89/336/EEC, 92/31/33C, 93/68/EEC, 91/157/EEC
<b>Model Numbers:</b>	Smart-UPS RT Transformer
<b>Manufacturer's Name and Address:</b>	SURT001, SURT002 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 Canlubang, 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
<b>Importer's Name and Address:</b>	
<b>Place:</b>	N. Billerica, MA U.S.  <i>Stephen A. Lee</i> 14 Aug 03 Stephen Lee, Regulatory Compliance Engineer
<b>Place:</b>	Galway, Ireland  <i>Ray S. Ballard</i> 14 Aug 03 Ray S. Ballard, Managing Director, Europe Phone: 353 917 02000 Fax: 353 9175 6909

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Trademark  
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### Service

If the transformer requires service do not return it to the dealer. Instead, follow these steps:

1. Contact APC Customer Service through the APC web site, [www.apc.com/support](http://www.apc.com/support).
  - Note the model number of the transformer, the serial number, and the date purchased. If you call APC Customer Service, a technician will ask you to describe the problem and try to solve it over the phone, if possible. If this is not possible, the technician will issue a Returned Material Authorization Number (RMA#).
  - If the transformer is under warranty, repairs are free. If not, there is a repair charge.
2. Pack the transformer in its original packaging. If the original packing is not available, refer to the APC web site, [www.apc.com/support](http://www.apc.com/support), for information about obtaining a new set.
  - Pack the transformer 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 transformer by insured, prepaid carrier to the address given to you by Customer Service.

### 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.

### Contacting APC

In the USA: Refer to the APC web site, [www.apc.com/support](http://www.apc.com/support).

Outside the USA: Refer to the APC web site, [www.apc.com](http://www.apc.com). Select the appropriate country from the country selection field. Select the Support tab at the top of the web page.

### User Manual

The User Manual and Safety Guide are accessible on the supplied User Manual CD and on the APC web site, [www.apc.com](http://www.apc.com).

Overview

**About This Product**

The Smart-UPS® RT transformer is designed for use as an isolation transformer. Models SURT003 and SURT004 also function as a step-down transformer.

The tower unit can be placed in a standard 19-inch rack. It should be mounted in the rack above the UPS using a specialized APC rail kit. The rail kit, SURTRK2, is sold separately as an accessory. See the APC website [www.apc.com](http://www.apc.com) or contact your APC sales representative for additional information.



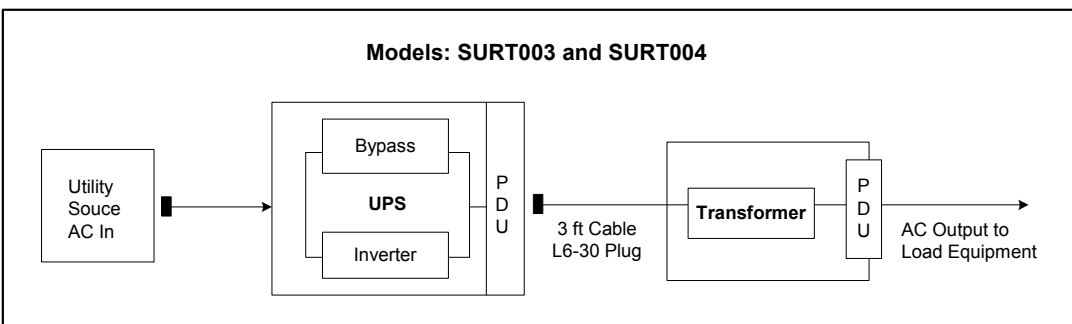
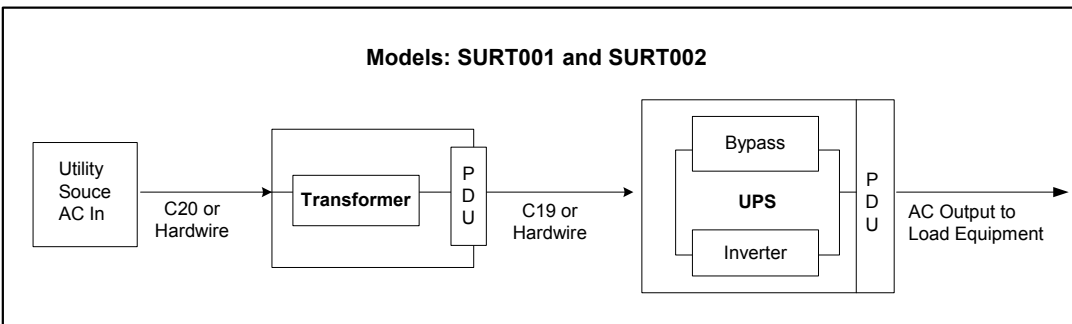
**Note**

Your transformer model may vary from the examples depicted in this manual.

**Electrical Specifications**

	<b>SURT001</b>	<b>SURT002</b>	<b>SURT003</b>	<b>SURT004</b>
<b>Nominal Input Voltage (VAC)</b>	220–240		208 or 220-240	200 or <b>220</b>
<b>Input Voltage Range (VAC)</b>	170–280			
<b>Input Service Maximum Current (Amps)</b>	16	30		
<b>Input Connection</b>	IEC C20	Hardwire (10 AWG)	3 ft. cord with L6-30P	
<b>Line Frequency (Hz)</b>	45–65			
<b>Nominal Output Voltage (VAC)</b>	220–240		220-240/ 208/110/120	200/100 or <b>220/110</b>
<b>Output Receptacles</b>	IEC C19	Hardwire (10 AWG)	(2) L6-20R (1) L6-30R (1) L14-30R (8) 5-20R T-slot	(1) L6-20R (1) L6-30R (2) L5-20R (8) 5-20R T-slot
<b>Maximum Output Power (VA)</b>	3000	5000	4800	4600
<b>Maximum Output Power (Watt)</b>	3000	5000	4800	4600

Wiring  
Diagrams



**Typical System Configuration**

Model	Utility Voltage	UPS Output	Input Voltage Selection Switch Position	Transformer Output Voltage
SURT001	230	230	N/A	230
SURT002	230	230	N/A	230
SURT003	208	208	208	240/208/120
SURT003	240	240	240	240/208/120
SURT003	220	220	240	220//110
SURT004	200	200	N/A	200/100
<b>SURT004</b>	<b>220</b>	<b>220</b>	<b>N/A</b>	<b>220/110</b>

Receiving and Handling

Unpacking

Inspect the transformer upon receipt. APC designed robust packaging for this product. However, accidents and damage may occur during shipment. Notify the carrier and dealer if there is any damage.



The shipping materials are recyclable. Please save them for later use, or dispose of them appropriately.

Check the package contents. The package contains the following items:

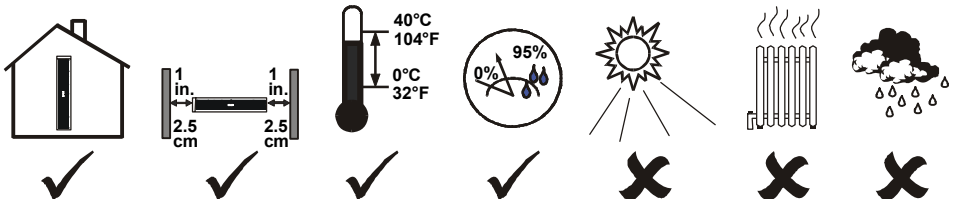
- Transformer
- Front Bezel
- Literature kit containing:
  - Smart-UPS User Manuals CD
  - Product documentation, safety and warranty information
  - 3 tie brackets, 2 screws
- Model SURT001: one 16-Amp, 1-meter, C19/C20 jumper cable



**The transformer is heavy. Three people are required to transport or lift the transformer due to its weight.**

Proper Ventilation

Do not operate the unit where there is excessive dust or the temperature or humidity are outside the specified limits. Ensure that the air vents on the front and rear of the unit are not blocked. See [www.apc.com](http://www.apc.com) for additional information.





Installation

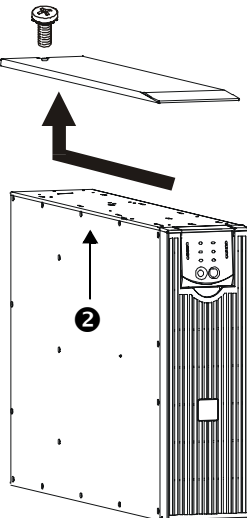
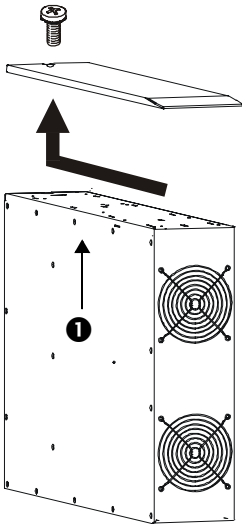
Installing the Tower Transformer

Follows these instructions when installing the transformer with a new or existing Smart-UPS® RT UPS.

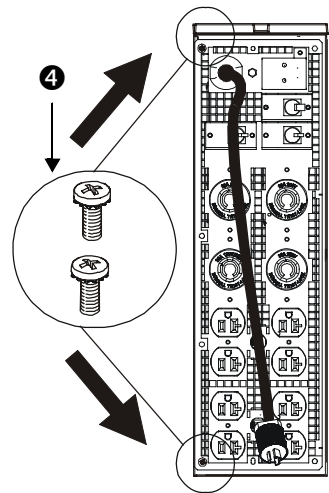
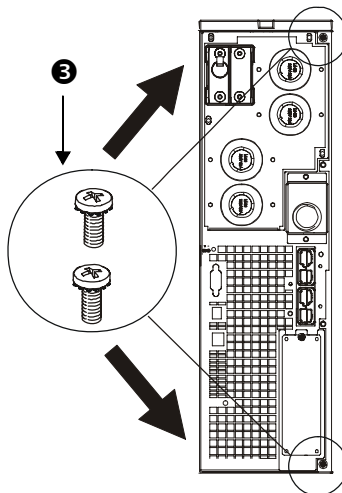


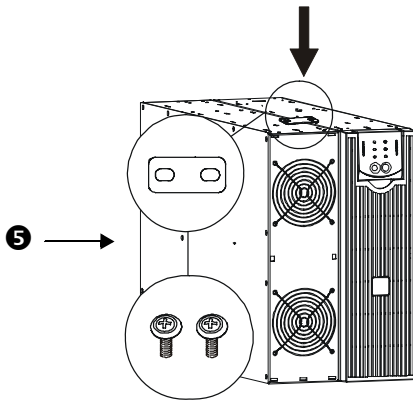
Note

- The transformer must be installed to the LEFT of the UPS when facing the FRONT of the units.
- If your configuration includes the optional bypass panel, ensure that the bypass panel is installed to the LEFT of the transformer when facing the FRONT of the units. Refer to the bypass panel manual for installation instructions.
- Secure the transformer to the UPS using the provided tie brackets.

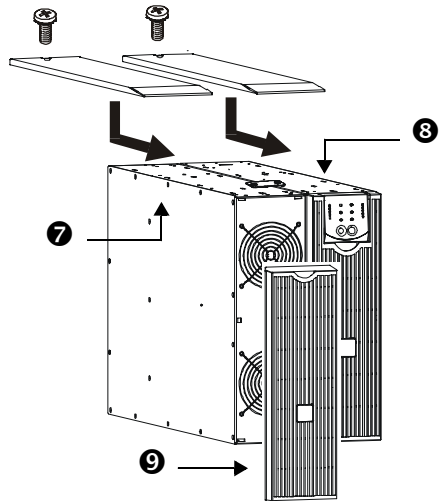
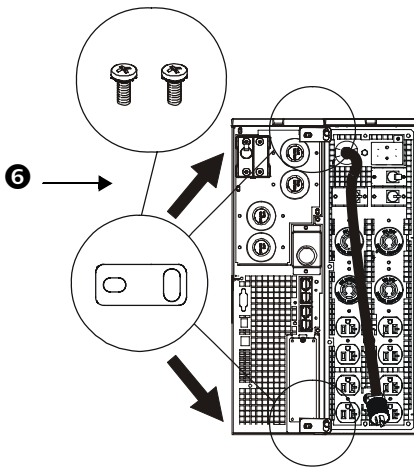


1. Move the transformer to the installation site. See “Unpacking” on page 8 for additional information.
2. Remove the covers on the transformer **1** and UPS **2** as shown.
3. Remove the 2 screws at the top and bottom of the UPS **3** and transformer **4**.

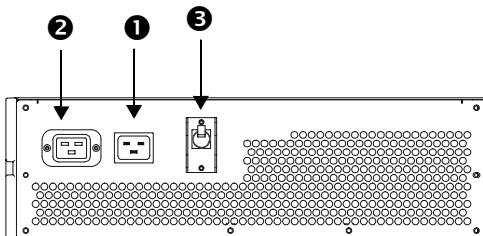




4. Secure the transformer to the UPS.
  - a. Locate the 2 screws and 3 tie brackets from the literature kit.
  - b. Secure the appropriate tie bracket with screws to the top of the units **5**.
  - c. Reuse the screws removed in step 3 to secure tie brackets **6** at the top and bottom of the units.
5. Reuse the screws removed in step 2 to secure the covers to the UPS **7** and transformer **8**.
6. Install the transformer bezel **9** to the front of the unit.
7. See the “Connection and Startup Instructions,” beginning on page 10 to complete the installation.



Connection and Startup Instructions Model SURT001



1. Connect the transformer input (C20) connection **1** to the utility source.
2. Connect the UPS to the transformer output (C19) connection **2** using the provided jumper cable.
3. Ensure that the input circuit breaker **3** is turned ON.

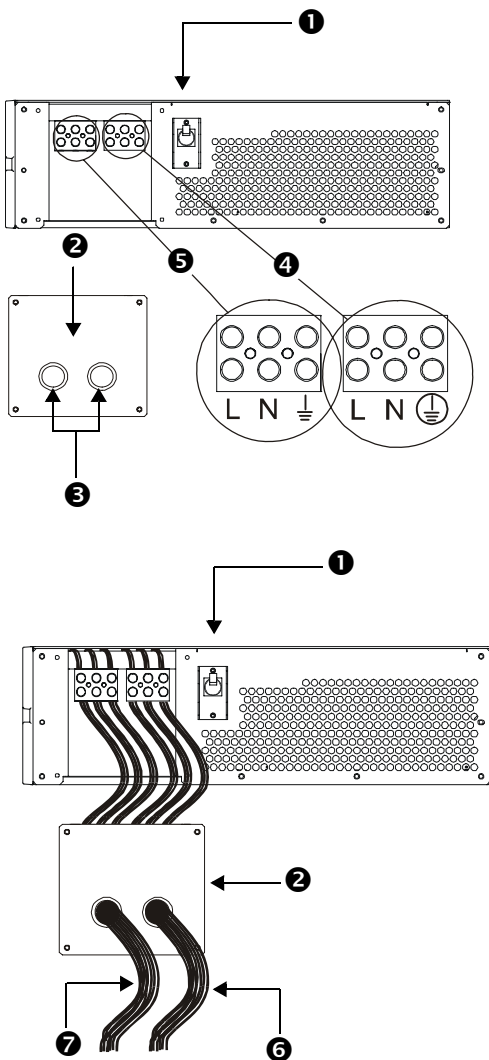
Model SURT002



- Verify that all branch circuit (mains) are de-energized and locked out before installing cables or making connections.
- Wiring by a licensed electrician is required.

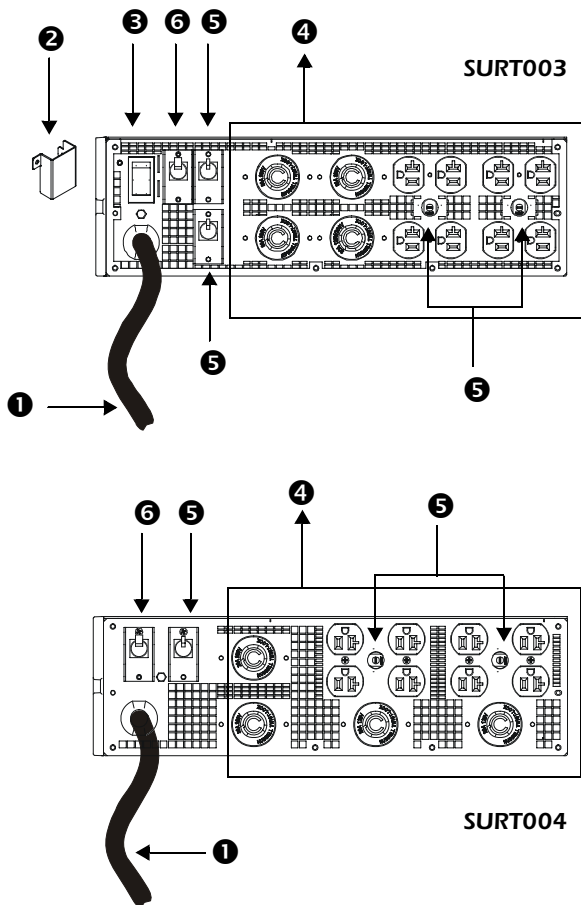


- Adhere to all national and local electrical codes.
- Use 10-AWG wires.



1. Turn OFF the utility circuit breaker.
2. Turn OFF the UPS.
3. Ensure that the transformer input circuit breaker **1** is turned OFF.
4. Remove the wiring cover **2** to access the terminal block.
5. Remove circular knockouts **3**.
6. Locate the transformer input **4** and output **5** terminal connections.
  - The utility circuit breaker is hardwired to the transformer input connection terminals.
  - The UPS is hardwired to the transformer output connection terminals. See the UPS manual for additional information.
7. Feed the input (utility) **6** and output (UPS) **7** cables through the transformer wiring cover **2**.
  - a. Connect the input (utility) cables to the input terminals.
  - b. Connect the output (UPS) cables to the output terminals.
    - The transformer requires a 230 VAC single-phase input with a minimum branch breaker rating of 25-amps.
  - c. Inspect the connections.
  - d. Secure the wiring cover to the transformer with the provided screws.
8. Turn ON the utility circuit breaker.
9. Turn ON the transformer input circuit breaker **1**.
10. Turn ON the UPS.

Models SURT003 and SURT004



1. Ensure that the transformer input cord **1** is unplugged.
2. For Model SURT003:
  - a. Remove the voltage selection switch cover **2**.
  - b. Set the input voltage selection switch **3** to match the utility voltage of 208 or 240 VAC. See the table on page 7.
  - c. If 240V utility is used, program the UPS output for 240V. See the UPS user manual.
  - d. Install the voltage selection switch cover **2**.
3. Plug applicable load equipment into the PDU receptacles **4** on the transformer.
4. Plug the transformer input cord **1** into the appropriate PDU receptacle on the rear of the UPS.
5. Ensure that the output circuit breakers **5** are ON.
6. Ensure that the input circuit breaker **6** is ON.

**Tower to Rack-mount Conversion**

This section contains information on how to install a tower transformer in a 19-inch rack.



**Note**

- **The transformer must be installed directly above the UPS in the rack.**
  - **If your configuration includes the optional bypass panel, ensure that the bypass panel is installed above the transformer in the rack.** Refer to the bypass panel manual for installation instructions.
1. Install the transformer directly above the UPS in the rack. Refer to the *Smart-UPS RT Tower to Rack-mount Conversion Guide* and the optional transformer rail kit.
  2. See the “Connection and Startup Instructions,” beginning on page 10 to complete the installation.